

# Process Expert General Purpose Library for AVEVA<sup>™</sup> System Platform

**Supervision Services** 

**User Guide** 

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# **Safety Information**

# **Important Information**

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a "Danger" or "Warning" safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

# **DANGER**

**DANGER** indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.



**WARNING** indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

# 

**CAUTION** indicates a hazardous situation which, if not avoided, **could result** in minor or moderate injury.

## NOTICE

NOTICE is used to address practices not related to physical injury.

## **Please Note**

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

## **Before You Begin**

Do not use this product on machinery lacking effective point-of-operation guarding. Lack of effective point-of-operation guarding on a machine can result in serious injury to the operator of that machine.

# **A**WARNING

#### UNGUARDED EQUIPMENT

- Do not use this software and related automation equipment on equipment which does not have point-of-operation protection.
- Do not reach into machinery during operation.

# Failure to follow these instructions can result in death, serious injury, or equipment damage.

This automation equipment and related software is used to control a variety of industrial processes. The type or model of automation equipment suitable for each application will vary depending on factors such as the control function required, degree of protection required, production methods, unusual conditions, government regulations, etc. In some applications, more than one processor may be required, as when backup redundancy is needed.

Only you, the user, machine builder or system integrator can be aware of all the conditions and factors present during setup, operation, and maintenance of the machine and, therefore, can determine the automation equipment and the related safeties and interlocks which can be properly used. When selecting automation and control equipment and related software for a particular application, you should refer to the applicable local and national standards and regulations. The National Safety Council's Accident Prevention Manual (nationally recognized in the United States of America) also provides much useful information.

In some applications, such as packaging machinery, additional operator protection such as point-of-operation guarding must be provided. This is necessary if the operator's hands and other parts of the body are free to enter the pinch points or other hazardous areas and serious injury can occur. Software products alone cannot protect an operator from injury. For this reason the software cannot be substituted for or take the place of point-of-operation protection.

Ensure that appropriate safeties and mechanical/electrical interlocks related to point-of-operation protection have been installed and are operational before placing the equipment into service. All interlocks and safeties related to point-of-operation protection must be coordinated with the related automation equipment and software programming.

**NOTE:** Coordination of safeties and mechanical/electrical interlocks for pointof-operation protection is outside the scope of the Function Block Library, System User Guide, or other implementation referenced in this documentation.

## Start-up and Test

Before using electrical control and automation equipment for regular operation after installation, the system should be given a start-up test by qualified personnel to verify correct operation of the equipment. It is important that arrangements for such a check are made and that enough time is allowed to perform complete and satisfactory testing.

# **A**WARNING

#### EQUIPMENT OPERATION HAZARD

- Verify that all installation and set up procedures have been completed.
- Before operational tests are performed, remove all blocks or other temporary holding means used for shipment from all component devices.
- · Remove tools, meters, and debris from equipment.

# Failure to follow these instructions can result in death, serious injury, or equipment damage.

Follow all start-up tests recommended in the equipment documentation. Store all equipment documentation for future references.

#### Software testing must be done in both simulated and real environments.

Verify that the completed system is free from all short circuits and temporary grounds that are not installed according to local regulations (according to the National Electrical Code in the U.S.A, for instance). If high-potential voltage testing is necessary, follow recommendations in equipment documentation to prevent accidental equipment damage.

Before energizing equipment:

- Remove tools, meters, and debris from equipment.
- · Close the equipment enclosure door.
- · Remove all temporary grounds from incoming power lines.
- · Perform all start-up tests recommended by the manufacturer.

# **Operation and Adjustments**

The following precautions are from the NEMA Standards Publication ICS 7.1-1995 (English version prevails):

- Regardless of the care exercised in the design and manufacture of equipment or in the selection and ratings of components, there are hazards that can be encountered if such equipment is improperly operated.
- It is sometimes possible to misadjust the equipment and thus produce unsatisfactory or unsafe operation. Always use the manufacturer's instructions as a guide for functional adjustments. Personnel who have access to these adjustments should be familiar with the equipment manufacturer's instructions and the machinery used with the electrical equipment.
- Only those operational adjustments actually required by the operator should be accessible to the operator. Access to other controls should be restricted to prevent unauthorized changes in operating characteristics.

# **About the Book**

# **Document Scope**

This document describes the master templates of the EcoStruxure<sup>™</sup> Process Expert - General Purpose Library for AVEVA<sup>™</sup> System Platform.

It describes their default configuration, the dynamic objects that are included in these master templates, and other functional aspects managed from ArchestrA IDE. This document does not cover any operational aspects, nor does it provide information on how to use supervision services to monitor and operate control systems.

This document is written for users with experience in the engineering of control systems and with a working knowledge of ASP and Control Expert.

**NOTE:** The terms *circuit breaker* and *motor starter* that are used in this manual refer to specific Schneider Electric devices for which templates are provided in this library. Refer to the product documentation of these devices for information on the applicable standards, which define these terms.

#### NOTE:

• ASP is abbreviation for AVEVA<sup>™</sup> System Platform.

# **Validity Note**

This document is valid for EcoStruxure<sup>™</sup> Process Expert for AVEVA System Platform 2021or later.

## **Related Documents**

Title of documentation	Reference number
Modicon Libraries General Purpose Process Components User Guide	EIO0000002093 (eng)
Modicon Libraries General Purpose Devices Components User Guide	EIO0000002092 (eng)
Modicon Libraries General Purpose Diagnostics Components User Guide	EIO0000002090 (eng)
Modicon Libraries General Purpose for Wonderware System Platform Equipment Module Components User Guide	EIO0000003013 (eng)

# **Product Related Information**

The application of this library, which is referred to as the *product*, requires expertise in the design and operation of control systems.

# 

#### UNINTENDED EQUIPMENT OPERATION

- Allow only authorized personnel with expertise in the design and operation of control systems to program, install, alter, and apply this product.
- Follow local and national safety codes and standards.

# Failure to follow these instructions can result in death, serious injury, or equipment damage.

Examples described in this manual and the demonstration project are provided for information only.

# 

#### UNINTENDED EQUIPMENT OPERATION

Adapt examples that are given in this manual to the specific functions and requirements of your industrial application before you implement them.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

# **Getting Started**

## What's in This Part

Environment Preparation	
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# **Environment Preparation**

#### What's in This Chapter

# **Library Installation**

#### **Software Compatibility**

The EcoStruxure Process Expert General Purpose Library for AVEVA System Platform has been tested and validated with AVEVA System Platform 2020 R2.

The control resources that are mentioned in this manual are from the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform.

Use OPC Factory Server 3.40.2808.0, 3.50.2908.0 (SP3), or later, page 25.

#### **Installation Methods**

You can install the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform in ArchestrA IDE in two different ways:

- Recommended way to use the library with existing Galaxies: By importing the library installation files, which consist of:
  - The Galaxy package file.
  - Script function libraries.
  - The Galaxy style library.
  - A text (.txt) file with spanish translation of alarm messages.

The EcoStruxure Process Expert for AVEVA System Platform installer copies the installation files at the path C:\ProgramData\Schneider Electric\GPL for Aveva System Platform\Galaxy Backup.

Recommended way to use the library with a new Galaxy: By creating a new Galaxy from the GPLBlank yymmdd.cab Galaxy backup that is copied by the EcoStruxure Process Expert for AVEVA System Platform installer at the path C:\ProgramData\Schneider Electric\GPL for Aveva System Platform\Galaxy Backup. The backup contains the necessary resources, page 26, including alarm messages in English and Spanish.

NOTE: Use this method to install the demonstration project.

#### Installing the Library by Using Installation Files

The installation files are composed of:

- Three script function libraries:
  - PSxLocalize.aaSLIB
  - ww.nasc.btl.modeling.aaSLIB
  - PSxMessaging.aaSLIB (for attributes used by EcoStruxure Process Expert runtime navigation services)
  - System.Windows.Forms.aaSLIB
- A Galaxy style library:
  - GalaxyStyles-yyyymmdd.xml
- Two packages containing the objects:
  - GPLMasterTemplates.aaPKG
  - *GPLApplicationTemplates.aaPKG* (also contains master templates), page 26

0

- A file with spanish translation of alarm messages used in master templates:
  - Galaxy\_GPLDemoProcess yyyymmdd\_3082\_Alarm\_Comments.txt
    - NOTE: This file is for user reference for spanish translation.
- SQL database related files to manage parameter sets:
  - *ParameterSets.bak*, which is a backup file of the blank ParameterSets database. It contains the tables that are required to manage parameter sets by using the parameter set management template.

**NOTE:** To use the backup file, Microsoft SQL Server, page 22 needs to be installed on the PC. Open Microsoft SQL Server Management Studio and select **Restore Database** from the context menu of the **Databases** folder. Select **Device** in the **Source** section of the **Restore Database** dialog box and browse to the backup file.

- GPL for WSP PS schema yymmdd.sql, which is an SQL query file that creates a blank ParameterSets database without needing to restore the backup file provided in the setup.
- PS Schema Migration yyyymmdd.sql, which is an SQL query file for existing users to migrate their <code>ParameterSets</code> database.

**NOTE:** To use the SQL query file, Microsoft SQL Server, page 22 needs to be installed on the PC. Open Microsoft SQL Server Management Studio, select **File**  $\rightarrow$  **Open**  $\rightarrow$  **File**, browse to the required query and open it, then select **Query**  $\rightarrow$  **Execute**.

Proceed as follows to install the library by using the installation files.

Step	Action
1	Open ArchestrA IDE.
2	Click Galaxy > Import > Galaxy Style Library.
3	Select the GalaxyStyles-yyyymmdd.xml file from the Installation Files > Galaxy Styles folder and then click Open.
4	Set the GalaxyStyles-yyyymmdd as the default style .
5	Click Galaxy > Import > Script Function Library.
6	Select the PSxLocalize.aaSLIB file from the Installation Files > Script Function Libraries folder and then click Open.
7	Click Galaxy > Import > Script Function Library.
8	Select the PSxMessaging.aaSLIB file from the Installation Files > Script Function Libraries folder and then click Open.
9	Click Galaxy > Import > Script Function Library.
10	Select the ww.nasc.btl.modeling.aaSLIB file from the Installation Files > Script Function Libraries folder and then click Open.
11	Click Galaxy > Import > Script Function Library.
12	Select the System.Windows.Forms.aaSLIB file from the Installation Files > Script Function Libraries folder and then click Open.
13	Click Galaxy > Import > Object(s).
14	Select the PSxTab.aaPKG file from the Installation Files > Graphic Objects folder and then click Open.
15	Click Galaxy > Import > Object(s).
16	Select the LayoutGP.aaPKG file from the Installation Files > Graphic Objects folder and then click Open.
17	Click Galaxy > Import > Object(s).
18	Select the \$ViewAppGP.aaPKG file from the Installation Files > Graphic Objects folder and then click <b>Open</b> .
19	Click Galaxy > Import > Object(s).
20	Select the <i>GPLMasterTemplates.aaPKG</i> file from the <b>Installation Files &gt; Master</b> <b>Templates</b> folder and then click <b>Open</b> .

Step	Action
21	Click Galaxy > Import > Object(s).
22	Select the <i>GPLApplicationTemplates.aaPKG</i> file from the <b>Installation Files &gt; Application Templates</b> folder and then click <b>Open</b> .
23	Select your import preferences according to your needs and click <b>OK</b> . <b>NOTE:</b> To update library objects that already exist in your Galaxy, select the following import preferences
	Import Preferences
	Objects with same Tagname and Codebase as an existing object         Skip: Do not import         Overwrite objects if the imported configuration version is higher         Image: Overwrite objects regardless of configuration version         Base Templates with a different revision number in the Codebase or a different minor version         Skip: Do not migrate         Image: Migrate         Objects with same Tagname but with a different Codebase         Image: Skip: Do not import         Rename object in Galaxy         Rename importing object         Append to object name:         Template Protection Change Management         Image: Never overwrite an unprotected object with a protected object         OK         Cancel
24	Wait until the import ends.
25	Verify the import log in the Import Automation Object(s) window.

## Installing the Library by Using the Galaxy Backup

Proceed as follows to install the library by using the Galaxy backup of the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform.

Step	Action
1	Copy the Galaxy backup file (.cab) from the path C:\ProgramData\Schneider Electric\GPL for Aveva System Platform\Galaxy Backup to the BackupGalaxies folder at the path C: \Program Files(x86)\ArchestrA\Framework\Bin\BackupGalaxies.
2	Open ArchestrA IDE.
3	Click New Galaxy.
4	Select the Galaxy backup file from the Galaxy type list.
5	Enter your Galaxy name in the Galaxy name field.
6	Click Create.
	<b>Result:</b> Your Galaxy is created from the Galaxy backup of the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform.

# **Content of the GPL**

### What's in This Chapter

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## **Overview**

This chapter describes the contents and features of the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform.

## **Overview**

#### **Library Scope**

The EcoStruxure Process Expert General Purpose Library for AVEVA System Platform provides a supervision function for each control functions in the EcoStruxure Process Expert for AVEVA System Platform - General Purpose Library templates.

Modularity is provided by the object-oriented design with ready-to-use templates, which reduces engineering time.

The EcoStruxure Process Expert General Purpose Library for AVEVA System Platform includes templates for the following categories of control modules:

- Process
- Devices
- · Diagnosis
- Parameter Set

The library is engineered with ArchestrA IDE, page 22.

#### **Key Features**

The EcoStruxure Process Expert General Purpose Library for AVEVA System Platform delivers the following features:

- Situational Awareness (SA): The library look and feel has been designed according to SA principles. You can quickly identify abnormal situations, which are deviations compared to what is expected and to what is considered to be the normal operating mode. (For example, level bars and trends allow you to compare current process values to the configured thresholds, or if the configuration of a function considers the normal operating mode to be program, setting it to operator is indicated as an abnormal situation.).
- AVEVA Situational Awareness Library (SAL) look and feel.
- Device diagnosis and status reporting according to Namur NE-107 recommendation.
- Communication between the control and supervision layers by using OPC Factory Server (OPC UA and OPC DA).
- · Auto references to controller variables.
- · Various process, device, and diagnostic master templates.
- Consistent look and feel.
- Static text of symbols and faceplates, as well as alarm descriptions available in English (default) and Spanish.

• Library style management, which allows you to change the appearance of the library components by modifying the global configuration.

## Architecture

The figure illustrates a typical system architecture.



#### **Resource Description**

The EcoStruxure Process Expert General Purpose Library for AVEVA System Platform contains the following templates and resources:

Templates:	A template is an entity that represents a common functional requirement of a device, family of devices, or function. It only exists in the development environment. There are four types of templates:	
	<ul> <li>Base templates. These are core objects used to create master templates. (For example, \$SPBoolCE.)</li> </ul>	
	<ul> <li>Master templates. Their name starts with the sufixCE. (For example, <i>\$MotorCE</i>). These control module templates are derived from base templates or other parent templates of the <i>Services</i> category. You can copy these templates if you want to modify the default configuration at the template level and then create instances.</li> </ul>	
	<b>NOTE:</b> Some attributes of these master templates may be locked at the template level and/or parent level.	
	<ul> <li>Application templates. Each one is directly derived from a master template for your convenience. Their name starts with the prefix \$a and sufixCE. (For example, \$AnalogInputCE). You can modify these templates and/or create instances from them.</li> </ul>	
ArchestrA Symbols:	ArchestrA symbols are included with master and application templates. They contain graphic objects and faceplates used to visualize data in runtime. A graphic object includes multiple configurations in a single symbol wizard (for example, motor or pump symbols).	

# **List of Master Templates**

#### **Overview**

The master templates described in this document are grouped by category and family.

When the library is installed, templates are located at the following path in the **Template Toolbox**:

- Master templates: EcoStruxure Plant\Master Templates.
- Application templates: EcoStruxure Plant\Application Templates.

For example, the *\$MotorCE* master template is located at the path **EcoStruxure Plant\Master Templates\GPL\Process\Control Modules\On/Off Device Control**.

For other master templates and base templates, their location in the **Template Toolbox** is indicated in the table listing them.

**NOTE:** For each category, the families are the same as those used to group the control resources that are referenced in this manual.

**NOTE:** Templates located in the **Services** folders in each category are intermediate derived templates, which are common to several master templates of a category. You can derive from these templates but Schneider Electric recommends using only master templates located under the **Control Modules** folders in the **Template Toolbox**.

#### **Process Category**

Family	Template name	Purpose
Signal processing	\$AnalogInputCE	Analog inputs with configurable range, page 101
	\$AnalogOutputCE	Analog outputs, page 106
	\$DigitalInputCE	Digital inputs, page 112
	\$DigitalOutputCE	Digital outputs, page 116
	\$AnalogInMultiCE	Multiple analog inputs with configurable range, page 119
	\$TotalCE	Totalizing function, page 124
	\$LoadCellENOD4TCE	Scaime weighing module, page 129
	\$LoadCellPMESWTCE	Scaime weighing module, page 136
On/Off device control	\$HandValveCE	Hand valves, page 143
	\$MotorCE	On/off motors, page 147
	\$Motor2DirCE	2-speed/2-rotation-direction motors, page 153
	\$MValveCE	Discrete motorized valves, page 158
	\$DualOPValveCE	Dual Output Valve, page 163
	\$ValveCE	On/off valves, page 169
Analog device control	\$ControlValveCE	Control valves, page 175
	\$MValvewithPosCE	Motorized valves with position feedback, page 181
	\$MotorVSCE	Motors with variable speed drive, page 187
Process control	\$IMCTLCE	Internal model controllers, page 195
	\$LeadLagCE	Lead-Lag controllers, page 201
	\$PIDCE	PID controllers, page 205
	\$PWMCtICE	Pulse-width modulation controllers, page 209

The table lists the master templates which belong to the **Process** category.

Family	Template name	Purpose
	\$RampCE	Ramps, page 212
	\$RatioCtrICE	Ratio controllers, page 215
	\$SplitRangeCE	Split-range controllers, page 220
	\$Step3Ct/CE	Three-step controllers, page 224
Sequential control	\$SequenceCE	Sequential control, page 230
Batch Phase Manager	\$PhaseCE	Batch phase functions, page 249
Equipment module	\$EMPatternCE	Equipment module functions, page 275
Pump Set	\$PumpSetCtrlCE	Pump Set functions, page 292
Flow Control	\$PumpFlowCtrlCE	Flow Control functions, page 298
Auxiliary functions	\$AlarmSummaryCE	Alarm summary, page 305
	\$AnalogSelectCE	Analog signal selection, page 308
	\$SPBoolCE	Discrete setpoints, page 314
	\$SPRealCE	Real setpoints, page 316
	\$SPIntCE	Integer setpoints, page 318
	\$SPDurationCE	Duration setpoints, page 320
	\$MessageBoxCE	Messages to the operator, page 311
	\$SchedulerCE	Scheduler function, page 323

## **Devices Category**

#### The table lists the master templates which belong to the **Devices** category.

Family	Template name	Purpose
Circuit breakers	\$CompactNSXMBUCE	Compact NSX circuit breakers, page 328
	\$MasterpactMTZCMBUCE	Masterpact MTZ Circuit Breakers with Drawout/Chasis, page 332
	\$MasterpactMTZMBUCE	Masterpact MTZ Circuit Breakers without Drawout/Chasis, page 335
	\$MasterpactNxMBUCE	Masterpact Nx Circuit Breakers without Drawout/Chasis, page 339
	\$MasterpactNxCMBUCE	Masterpact Nx Circuit Breakers with Drawout/Chasis, page 342
	\$MasterpactHWCE	Hardwired Circuit Breaker, page 345
	\$CompactHWCE	Hardwired Compact Circuit Breaker, page 348
Digital protection relays	\$Sepam80ECE	Sepam 80 protection relays, page 351
	\$Sepam80MBCE	
Motor controllers and starters	\$TesysTAIIDataCE	<ul> <li>TeSys T, page 361 communicating by using either:</li> <li>Ethernet Modbus TCP implicit messaging (normal I/O scanning)</li> <li>Ethernet Modbus TCP explicit messaging</li> <li>Modbus serial</li> </ul>
	\$TesysTEFastCE	<ul> <li>TeSys T, page 361 communicating by using either:</li> <li>Ethernet Modbus TCP implicit messaging (fast I/O scanning)</li> <li>CANopen (device connected to an STB island)</li> </ul>
	\$TesysTPBCE	TeSys T, page 361 communicating by using Profibus.
	\$TesysUIOCE	<ul><li>TeSys U, page 365 communicating by using either of:</li><li>Modbus serial.</li><li>CANopen.</li></ul>
	\$TesysUMainDataCE	TeSys U, page 365 communicating by using either of: • Modbus serial.

Family	Template name	Purpose
		CANopen.
	\$TesysUMECCE	TeSys U, page 365 communicating by using Modbus serial.
Power meters	\$PM5350MBCE	PM5350 power meters, page 369
	\$PM53xxEMCE	PM53xx power meters, page 369
	\$PM82xxEMCE	PM82xx power meters, page 372
Soft starters	\$ATS22MBCE	Altistart 22 soft starters, page 376
	\$ATS48MBCE	Altistart 48 soft starters, page 379
	\$ATS480MBTCPCE	Altistart 480 soft starters, page 383
	\$ATS480EIPCE	
Speed drives	\$ATV6xxECE	Altivar 6xx series variable speed drives, page 387
	\$ATV9xxECE	Altivar 9xx series variable speed drives, page 390
	\$ATV6xxxECE	Altivar 6xxx series variable speed drives, page 394
	\$ATV320ECE	Altivar 320 series variable speed drives, page 398
	\$ATV340CE	Altivar 340 series variable speed drives

## **Diagnosis Category**

The table lists the master templates which belong to the **Diagnosis** category.

Template name	Purpose
\$M340DiagCE	Modicon M340 diagnosis, page 408
\$M580DiagCE	Modicon M580 diagnosis, page 408

# Acronym

## **Acronyms and Definitions**

The following table lists the acronyms used in this manual:

Acronym	Definition
ASP	AVEVA system platform
WSP	Wonderware system platform
IDE	-
OPC	-
OPS	-
SQL	-
IDE	-
PID	-
SA	Situational Awareness
OP	Output command
LOP	Local output command
PV	Present value
SP	Setpoint
LSP	Local setpoint
RSP	Remote setpoint

Acronym	Definition
NAN	-
DIO	-
ZSH	-
ZSL	-
PIDFF	-
PWM	-

# **OFS Configuration and Datatypes**

# For users of Modicon Communication Server 2.01 and versions below

The OFS/ MCS has a setting to convert the datatypes to IEC61131-3 format/ Native OPC format. The figure below illustrates the native type setting in MCS.

Diagnostics PLC Software Options Security	
Make sure you click Save button below when you are finished editing.	
Dynamic Consistency	
Cyclic Consistency Check Rate (s)	10
Project Files Options	
Unity/Control Expert Symbols	Use Native Types
Unity/Control Expert DATE, TOD and DT Instances	Use Regional Settings
Unity/Control Expert TIME Instances	Display Underscore
Byte Array Management	Manage as ByteString
Save	

# The snapshot from the MCS help given below provides the details of the impacted datatypes.

Description		
Use Native Types: If enabled, variable instances linked to EcoStructure" Control Expert String, DATE, TOD, DT and TIME data types are converted to the OPC UA built-in String data type, in accordance with the IEC1131-3 representation.		
If Use Native Types is disabled, the following data type conversion occurs:		
EcoStruxure™ Control Expert Type	OPC UA Datatype	
String	Byte array	
DATE	UInt32	
TOD	UInt32	
DT	Double	
TIME	UInt32	
For more details, refer to the examples.		

#### NOTE:

- 1. This library is designed to work with the setting "Native Types" configured as disabled.
- 2. This setting is not available in BME NUA (the in rack OPC server module).

The behavior of the various datatypes with the Native Type setting enabled/ disabled in the OFS DA/OFS UA/ MCS and NUA are as shown in the below table.

Control Expert	Control	OFS UA/ OFS DA/ MCS				NUA	
value	Datatype	Native Type Enabled		Native Type Disabled			
		Value	Datatype	Value	Datatype	Value	Datatype
TestValue	String	TestValue	String	[84, 101, 115, 116, 86, 97, 108, 117, 101]	Byte Array	TestValue	String
T#1s100ms	Time	T#1s100ms	String	1100	UInt32	1100	UInt32
DT#2000-01- 00:40:00	DT	DT#2000-01- 00:40:00	String	1.49E-154	Double	230584417744- 8990000	UInt64
D#2001-1-1	DATE	D#2001-1-1	String	536936705	UInt32	536936705	UInt32
TOD#5:01:01	TOD	TOD#5:01:01	String	83951872	UInt32	83951872	UInt32

There is an inconsistency observed in the BME NUA, as it is does not align with either of the Native type setting. The GPL objects are compatible with OFS DA/

OFS UA/ BME NUA. Users will have to take care of the inconsistency in their custom templates.

# For users of Modicon Communication Server 2.01 SP1 and versions above

The OFS/ MCS has a setting to convert the datatypes to IEC61131-3 format/ Native OPC format.

Diagnostics	PLC Software	Options	Security		
Make sure ye	ou click Save button t	below when you	are finished e	diting.	
Dynamic Co	onsistency				
Cyclic Co	onsistency Check Rat	e (s)		12	
Project Files	s Options				
Unity/Co	ntrol Expert String ins	tances		Use Native Types	
Unity/Col	ntrol Expert DATE, T	OD and DT Inst	ances	Use Native Types	Use Regional Settings
Unity/Co	ntrol Expert TIME Ins	tances		Use Native Types	Display Underscore
Byte Arra	ay Management			Manage as ByteString	
Save					

The snapshot from the MCS help given below provides the details of the impacted datatypes.

Description	
Use Native Types: If enabled, variable instances linked to EcoStruxure <sup>™</sup> Control Expert String, DATE, TOD, DT and TIME data representation.	types are converted to the OPC UA built-in String data type, in accordance with the IEC1131-3
If Use Native Types is disabled, the following data type conversion occurs:	
EcoStruxure" Control Expert Type	OPC UA Datatype
String	Byte array
DATE	UInt32
TOD	UInt32
DT	Double
TIME	UInt32
For more details refer to the examples	

NOTE:

- 1. This library is designed to work with the setting "Native Types" configured as disabled.
- 2. This setting is not available in BME NUA (the in rack OPC server module).

The behavior of the various datatypes with the Native Type setting enabled/ disabled in the OFS DA/OFS UA/ MCS and NUA are as shown in the below table.

Control Expert	Control	OFS UA/ OFS DA/ MCS				NUA	
Value	Expert Datatype	Native Type Enabled Native Type Disabled					
		Value	Datatype	Value	Datatype	Value	Datatype
TestValue	String	TestValue	String	[84, 101, 115, 116, 86, 97, 108, 117, 101]	Byte Array	TestValue	String
T#1s100ms	Time	T#1s100ms	String	1100	UInt32	1100	UInt32
DT#2000-01- 00:40:00	DT	DT#2000-01- 00:40:00	String	1.49E-154	Double	230584417744- 8990000	UInt64
D#2001-1-1	DATE	D#2001-1-1	String	536936705	UInt32	536936705	UInt32
TOD#5:01:01	TOD	TOD#5:01:01	String	83951872	UInt32	83951872	UInt32

# **Supervision Features**

## What's in This Part

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#### **Overview**

This part describes the supervision features that apply to the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform.

# **Access Control**

#### What's in This Chapter

# **Access Control**

#### **Overview**

Attributes of master templates of the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform use the object security classification of ArchestrA IDE for access control.

The settings are identical in the corresponding application templates, page 26 and are propagated to derived templates and instances.

You can modify the configuration of the security classification of attributes in application templates.

For information on the object security classification, refer to the ArchestrA IDE help.

#### **Default Object Security Classification of Attributes**

This table describes the object security classification that is defined by default for attributes of master templates

Classification	Description
Operate	This level is used for regular operation activities (for example, setting of setpoints, operating modes, alarm setpoints) Manual reset of a specific abnormal condition is also available for users with operate rights
Secured write	This level is used for manual resetting of interlock conditions and global reset of the control module (for example, motor reset).
Verified write	This level is used for bypassing interlock conditions, global bypass of interlocks and bypass of an abnormal condition
Tune	This level is used for engineering parameters (for example, alarm priorities, PID sensitivity, ramp adjustments).
Configure	This level is used for UDAs configuration (for example, range, engineering units, format, normal operating modes).
	<b>NOTE:</b> This level is only used for attribute modification during engineering time.

## **Configuration of Object Security Classification**

To configure the security classification of an attribute of an application template, click the shield icon next to the attribute in the configuration page and select a level.

Interlocks Interlocks2 Failures Failures2 Maintenance Local Panel Attributes Scripts Obj	bject Information
Enable Interlocks:  Free Access Enable Bypass of Interlocks:  Free Access Enable Manual Reset of Interlocks:  Free Access Interlock Descriptions Interlock 1: Interlock 1: Interlock 2: Interlock 3: Interlock 3: Interlock 4: Interlock 5: Interlock 6: Interlock 7:	와 (오) 유 (종) 유 (종) 유 (종) 유 (종) 유 (종) 유 (종)

**NOTE:** If the icon is shown in gray, the access control modification is locked in its parent object. For more information about attribute locking and unlocking, refer to the ArchestrA IDE help.

#### **Security Group Configuration**

When you create derived templates or instances, they are added to the **Default** security group.

For information on assigning them to a different security group, refer to the ArchestrA IDE help.

# **Alarm Functions**

#### What's in This Chapter

Alarm Priority	
SA Alarm Severity	
Alarm Shelving	
Namur NE-107 Status Management	

## **Overview**

This chapter describes alarm functions of master templates of the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform.

# **Alarm Priority**

#### **Overview**

Default alarm priorities are configured in master templates for attributes to which an alarm is associated. The priorities are identical in the corresponding application templates, page 26. They are propagated to derived templates and instances that you create.

The security classification of alarm priorities for state alarms is Tune.

The priority value range is 0...999.

You can modify the configuration in the application templates.

**NOTE:** The alarm priority value associates an alarm severity, page 36 to the alarm.

## **Alarm Priority Configuration**

Proceed as follows to configure or modify an alarm priority.

Step	Action
1	Double-click the object (application template, derived template, or instance).
2	Select the Attributes page.
3	Click the filter icon and select State alarm from the list of filters.
4	From the results, select an attribute (for example DevCtl.St.Faild).
5	The alarm configuration appears in the State alarm section of the features area.
6	Set the Priority value, page 36.
	NOTE: You can also modify the Alarm message and the alarm Category.
7	Check in the object.

# SA Alarm Severity

#### **Overview**

Four Situational Awareness (SA) alarm severities are configured in the global configuration of the Galaxy.

Each alarm signal is assigned an alarm severity, which is related to its alarm priority. For example, if an alarm has an alarm priority of 200, it is assigned an alarm severity of 1 by default.
You can change the priority range that is associated to each alarm severity to adapt the behavior to the specific requirements of your project.

To access the alarm configuration screen, click **Galaxy > Configure > Alarms** and Events Configuration.

### **Default Alarm Severity Configuration**

The table describes the alarm severities and their default properties.

Alarm severity	Alarm historization	Priority range	Representation
1	Yes	1250	
2	Yes	251500	2
3	Yes	501750	<b>3</b>
4	Yes	751999	

### **Alarm Shelving**

### **Alarm Shelving Configuration**

When you install the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform by using the supplied Galaxy backup, alarm shelving is enabled for alarms of severity 3 and 4 by default.

You can modify the configuration in the alarm configuration screen if your role has the required permission.

### **Shelving Alarms**

During operation, shelving or unshelving an alarm by using the **Shelve** check box in the alarms tab, page 64 of the faceplate of the instance sets the corresponding *<reference>.AlarmShelve\** attributes.

An alarm does not need to be active to be shelved. The shelving period starts when you shelve the alarm.

To shelve an alarm during runtime, your role needs to have the required operational permission.

For more information, refer to the topic describing how to shelve alarms in the ArchestrA IDE help.

**NOTE:** Shelving an alarm is considered as an abnormal situation, page 43.

### **Representation of Shelved Alarms During Operation**

At the faceplate level, the alarms tab allows you to view the shelved status of alarms by displaying a timer icon, page 45. If the alarm is disabled or silenced while shelved, the timer icon is hidden but the shelving period count-down continues.

At the symbol level, the timer icon is displayed to indicate that an alarm is shelved. However, if for an instance, an alarm is shelved and, at the same time, another alarm is active, the timer icon is not displayed. This is because active alarms are displayed over shelved alarms independently of their respective severity and priority.

## Namur NE-107 Status Management

### **Overview**

The Namur NE-107 recommendation defines that detailed device diagnostic information be summarized as four simple status signals. This allows the operator to view device statuses in a simple and uniform way regardless of the source device.

Device master templates of the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform are preconfigured to manage Namur statuses.

Namur statuses are mapped to the device diagnostic bits of the Control resource, page 86 that is monitored by the template. These bits are associated to state alarms by using scripts so that the detection of a Namur status raises an alarm.

This illustration shows a device with two Namur icons displayed to the right.



### Description

The table describes the Namur statuses as defined in the Namur NE-107 recommendation and their default configuration

Namur status	Description	Alarm priority	Associ- ated alarm severity	lcon
Failure	Output signal invalid due to error detected in the field device or its peripherals.	500	2	$\otimes$
Function check	Output signal temporarily invalid (for example, frozen) due to ongoing work on the device.	750	3	$\mathbf{V}$
Out of specification	The device is operating outside its specified range (for example, measuring or temperature range). Internal diagnosis indicates deviations from measured or set values due to errors detected in the device or process characteristics.	999	4	Ѧ
Maintenance required	Although the output signal is valid, the wear reserve is nearly exhausted or a function will soon be restricted due to operational conditions (for example, aging of a pH-electrode).	999	4	۲

### **Namur Status Mapping**

The mapping of Namur statuses is accessible in the **Discrete 1** to **Discrete n** tabs of the device object. In this example, Namur statuses are mapped to bits 3, 7, and 10 of the ATV\_CFG.DataStatus word, which is monitored by the template.

3 🔽
4 🗸
-
-
-
-
-
-
-
afarancas
ererences.
itatus
R

NOTE: Bit descriptions and Namur statuses are locked attributes.

### **Namur Alarm Priority Configuration**

You can modify the alarm priority of the associated state alarm in the application template or its instance by configuring the corresponding attribute (for example, *AO.Namur.OutOfSpecs*).

For information on modifying state alarm priorities, refer to the topic describing alarm priority configuration, page 36.

# **Multilanguage Support**

### What's in This Chapter

## **Multilanguage Support**

### **Overview**

The engineering environment is in English.

The operation environment supports the following languages:

- English
- Spanish

The default and native language is English.

You have the possibility to add other languages to your application.

Click Galaxy > Configure > Languages to access to the Configure Languages window:

C	Configure Languages			
	Language Name	Locale ID	Font	Add
	Spanish (Spain)	3082	Arial	Remove
	French (France)	1036	Arial	Set Default
	German (Germany)	1031	Arial	
	Chinese (Simplified, PRC)	2052	Arial	
	Default languageEnglish (Uni	ted States)	ОК	Cancel

You can add or remove language or change the default language.

For information on how to use other languages, refer to the ArchestrA IDE online help.

### **Alarm Description Localization**

The alarm description can be localized with the export/import function of alarm messages.

Proceed as follows to localize alarm messages:

Step	Action	
1	Click Galaxy > Export > Localization > All Alarm Messages.	
	Result: The Export Alarm Messages window opens.	
2	Select the language to export and click <b>Export</b> .	
	Result: A text file is generated with all alarm messages.	
3	Insert the translation of the alarm messages in this text file. (A file with spanish translation of alarm messages used in master templates are available in the installation files, page 22).	
4	Click Galaxy > Import > Localization > Alarm Message(s).	
	Result: The Import Alarm Messages window opens.	

Step	Action
5	Select the language and the text file to import and click Import.
	Result: The localizations of alarm messages are imported in the galaxy.
6	The text file has to be imported in the InTouch window maker also. Click <b>Special &gt;</b> Language > Import Alarm Fields.
	<b>Result:</b> The localizations of alarm messages are imported in the InTouch window maker.

### **UDA Values Localization**

The UDA values (for example interlock and detected failure condition descriptions) can be entered with a multilingual format.

This illustration presents an example of multilingual format:

-Interlock Descriptions

Interlock 1:	Valve HV1102 Closed; [3082] Válvula HV1102 Cerrada	£	9
Interlock 2:		ſ	Y

Use the following syntax to enter the value:

<text in default language>;[Language ID]<localized text>;[Language ID]<localized text>...

This table presents the language ID:

Language	Language ID
English	1033
Spanish	3082
French	1036
German	1031
Chinese	2052

In this example the interlock description is localized in Spanish and French:

Valve HV1102 Closed;[3082]Válvula HV1102 Cerrada;[1036]Vanne HV1102 fermée

**NOTE:** If you operate with a non-listed language, the text in default language is used.

### **ArchestrA Symbol Localization**

The static text of the library symbols can be localized with the export/import function of symbol localizations.

Proceed as follows to localize the static text of the library symbols:

Step	Action	
1	Select the graphic toolset to export in the Graphic Toolbox.	
2	Click Galaxy > Export > Localization > Selected Symbol(s).	
	Result: The Export Locale Data window opens.	
3	Select the language to export and click Export.	
	Result: An XML file is generated with all symbol texts of the toolset.	
4	Edit the XML file and insert the text translation between the tags ${\tt Translation}$ and ${\tt Translation}$ .	
5	Click Galaxy > Import > Localization > Symbol(s).	
	Result: The Import Locale Data window opens.	

Step	Action
6	Select the language and the XML file to import and click Import.
	Result: The Import Locale Preferences window opens.
7	Select the import preferences and click Import.
	Result: The text localizations of the symbols are imported.

## **Representation of Supervision Data**

### What's in This Chapter

Situational Awareness (SA)	43
Element Styles	44
Icons	45
Faceplate Tab Icons	
Optional Label Text	

## **Overview**

Graphic symbols and faceplates use icons, animations, and other graphic elements to convey information related to control modules, such as values, setpoints, statuses, or conditions. In particular, styles are used to distinguish between types of information or to highlight changes or situations that require action.

This chapter describes the icons used in supervision components and the styles that are used to represent supervision data. You can modify the definitions of the listed styles as needed, without having to redesign the ArchestrA symbols.

## Situational Awareness (SA)

### **Overview**

The EcoStruxure Process Expert General Purpose Library for AVEVA System Platform uses SA principles. These help you identify states that are different from the expected state and from the normal operating mode that is configured for an object. Such states are considered abnormal states.

Bars and trends allow you to compare current process values with expected thresholds.

### **Symbol Animation**

An abnormal state is represented by an exclamation mark on orange background, which is displayed next to the symbol.



lcon	Description	
•	The control module is in an abnormal configuration or operating mode, for example:	
Static	Simulation mode.	
Static	<ul> <li>The current owner mode is different from the normal mode (as configured by default in the corresponding attribute) or the initial value is different from the possible values normally used for the attribute. In such case, the current owner mode is indicated on the symbol (for example, <b>O</b> for <i>operator</i>).</li> <li>Bypassed interlocks or abnormal conditions.</li> <li>Disabled, silenced, inhibited, or shelved alarm.</li> </ul>	
•	The control module is waiting for an operator action (for example, a motor needs to be reset manually to start again).	
Flashing	<b>NOTE:</b> If at the same time an operator action is requested and an abnormal configuration is detected, which are represented by a flashing and a static icon respectively, the flashing icon prevails.	

NOTE: The symbol uses the User\_Defined\_01 element style, page 44.

### **Faceplate Animation**

An abnormal configuration is represented by an exclamation mark on orange background, which is displayed next to the icon of the faceplate tab.



NOTE: If the tab icon is flashing, an action is required from this tab.

In addition, the item that is in an abnormal configuration or that requires an operator action is displayed with an orange background. In this example, the simulation mode is enabled whereas the normal operating mode has simulation disabled.

Motor1200		×
Motor		
Mode	Override	~
Interlock Bypass:	Normal	~
Service:	In Service	~

## **Element Styles**

### Introduction

The **Element Styles** of the library are configured in the **Galaxy Style Library** (click **Galaxy > Configure > Galaxy Style Library**). You can change the look and feel of the entire library by modifying the global configuration for the Galaxy.

You can modify for each element style:

- · Color and text font.
- Fill color override.
- · Line style.
- · Outline style.

### **Description**

This table describes the default element styles that are used to represent supervision data.

Element	State	Galaxy style	Representation
Static legend	-	Label	Security Group:
Animated legend	Normal state	Label	Interlock Bypass:
	Abnormal state	User_Defined_01	Interlock Bypass:
Configurable legend	-	User_Defined_17	High Level SP
Present value	-	Actual_Value	30.0
Setpoint value	-	Setpoint	1000.0

Element	State	Galaxy style	Representation
	_	User Defined 13	1000.0
	-	User_Delliled_15	1000.0
Other non-editable value	-	User_Defined_04	Security Group:
Editable value	-	User_Defined_05	1000.0
Button and drop-down list	-	User_Defined_08	Reset
Animated text in tables	Value OFF	User_Defined_07	LSL1001 D10 Low Level
	Value ON	User_Defined_06	LSL1001 D10 Low Level
	Value ON	User_Defined_02	data to the Oper
Non-animated text in tables	-	User_Defined_03	Average current
Dynamic value	Value OFF	Passive	
	Value ON	Active	
	Transitioning	Transitioning	Travelling
	Stopped state	Not_Running	
Line separator in faceplates	-	User_Defined_11	
Faceplate and selected tab background	-	User_Defined_09	$\bigcirc$
Unselected tab background	-	User_Defined_10	###
Over range (for example, open and closed at same time or in case of motorised valve, if valve positioner feedback crosses the threshold limit and is not matching with its limit switch indication.)	-	Over-range	
Outputs in trends	-	Control_line	
Bars representing signals not confirmed from field	-	Active_NotAvailable	

### lcons

### Description

The table describes the icons that may be displayed during operation.

Function	lcon	Meaning	Examples of use	Comment
Displaying owner selection	0	Operator	Valve in operator mode (the operator sets the setpoint).	The icon is displayed only if it is not the normal mode.
	Ρ	Program	Valve in program mode (the program sets the setpoint).	

Function	lcon	Meaning	Examples of use	Comment
	C	Cascade	Closed-loop PID controller with an externally set setpoint	
Displaying	Α	Auto	Closed-loop PID	The icon is displayed
mode	М	Manual	controller.	normal mode.
Interlocking		Active	A motor is interlocked because of an interlock condition.	-
Displaying service information	$\boxtimes$	Out of service	A motor is declared out of service in its faceplate.	-
Transitioning		Transitioning state	_	-
Informing of abnormal configuration		The control module is in abnormal configuration.	The control module is in simulation. Global bypass is activated. Partial bypass	Represented on the element that is in abnormal configuration, page 43.
Requesting operator action	<b>I</b> Iashing	The control module is waiting for an operator action.	A motor needs a reset to start again.	-
Resetting required	R	Awaiting a reset	Motor waiting to be reset after thermal trip.	Displayed if mandatory manual resetting is enabled in the resource controlling the device.
Displaying Namur statuses	A	Out of specification	Speed setpoint is outside the limit.	Namur NE-107 Management, page 38
	٩	Maintenance required	Replace the pH electrode.	
	$\otimes$	Failure detected	Inoperable device.	
	$\nabla$	Check function	Substitute value entered.	
Displaying operator messages	<b>(</b> )	Information	A message is shown to the operator.	See \$MessageBoxCE
	?	Question	A value or confirmation is requested from the operator.	
	$\triangle$	Exclamation	The operator is informed of an abnormal condition.	
	$\otimes$	Stop	An abnormal condition that is equivalent to the Namur <i>Failure</i> status is shown to the operator.	

Function	lcon	Meaning	Examples of use	Comment
Displaying alarms	<b>1</b>	Alarm of severity 1	Very high temperature alarm.	Defined by the style AlarmBorder_Critical_ UNACK
		Alarm of severity 1 returns to normal	-	Defined by the style AlarmBorder_Critical_ RTN
	2	Alarm of severity 2	High temperature alarm.	Defined by the style AlarmBorder_High_ UNACK
		Alarm of severity 2 returns to normal	-	Defined by the style AlarmBorder_High_ RTN
	3	Alarm of severity 3	Function check (Namur status).	Defined by the style AlarmBorder_Medium_ UNACK
	<b>D</b>	Alarm of severity 3 returns to normal	-	Defined by the style AlarmBorder_Medium_ RTN
		Alarm of severity 4	_	Defined by the style AlarmBorder_Low_ UNACK
		Alarm of severity 4 returns to normal	_	Defined by the style AlarmBorder_Low_ RTN
Displaying alarms	<b>(1)</b>	Alarm silenced	_	_
	×	Alarm disabled or inhibited	-	-
	0	The alarm is shelved, page 37.	-	_
Indicating alarm level		Very high	Very high temperature.	-
		High	High temperature.	-
		Setpoint	Temperature outside of setpoint.	-
		Deviation	Temperature outside of deviation.	-
		Low	Low temperature.	-
		Very low	Very low temperature.	-
Indicating Setpoints (bars)	-	Setpoint	Position setpoint of a control valve.	-

Function	lcon	Meaning	Examples of use	Comment
Displaying trend pens		Present value	-	-
		Output value	-	-
		Very high limit	-	-
		High limit	-	-
		Setpoint	-	-
		Deviation	-	-
		Low limit	-	-
		Very low limit	-	-
Opening the trend faceplate	~	Click the icon to open the trend faceplate.	-	-
Displaying labels	FCV1004	Label of symbols	-	Only if labels are made visible.
Extended interlock/ Initial condition		Click to open extended interlock faceplate.	-	Displayed if the interlocks/initial conditions are extended using \$ <i>llckCE</i> template.

**NOTE:** User has to use **PSxLabels** symbol to enable label on the graphic (click **Graphic Toolbox**  $\rightarrow$  **PSx Symbol Library**  $\rightarrow$  **Support**  $\rightarrow$  **PSxLabels**).

## **Faceplate Tab Icons**

### **Overview**

You can access a faceplate, page 54 by clicking a symbol during operation.

Faceplates consist of tabs which group by category, the representation of functionalities that are provided by the associated control resource during operation.

Each category is represented by a tab icon.

Click a tab to access its functionalities.

To access the trend faceplate, click the wave icon that is displayed next to a symbol.

**NOTE:** Some tabs are optional or object-specific and are displayed only if the control module features the corresponding service and the service is enabled for the instance.

**NOTE:** If the tab icon is flashing, an action is required from this tab.

### Description

The table describes the tabs and the functionalities they feature.

Tab/category	lcon	Functionalities	Examples of use
Operation		<ul> <li>Current status (present value, setpoint, output value)</li> <li>Owner change</li> <li>Operating mode change</li> <li>Setpoint (SP) change</li> <li>Resetting</li> <li>Configuration of alarms at control level</li> <li>Local panel monitoring</li> </ul>	<ul> <li>Operator/ program</li> <li>Manual/automatic</li> <li>PID controller setpoint (SP) change in auto mode and output change in manual mode</li> </ul>
Interlocks / initial conditions		<ul> <li>Interlock condition statuses</li> <li>Bypassing and/or manual resetting of interlock conditions</li> </ul>	Interlocks associated with an on-off valve
Failures	$\bigtriangleup$	<ul> <li>Status of detected failure conditions</li> <li>Bypassing of detected failure conditions</li> <li>Manual resetting condition</li> </ul>	Thermal overload of a motor
Maintenance	$\otimes$	<ul> <li>Access to accumulated data regarding the control module operation</li> <li>Counter resetting</li> </ul>	<ul><li>Hours of operation</li><li>Number of operations</li></ul>
Engineering	Es.	Changing settings or parameters	<ul><li>Adjustment of PID control parameters</li><li>Activating the simulation mode</li></ul>
Warning	$\bigtriangleup$	Status of detected warning conditions	To monitor the extended warning conditions from ATV6xx/ATV9xx device
Alarms	$\triangle$	<ul> <li>Acknowledgment of alarms</li> <li>Configuration of alarms at supervision level</li> </ul>	<ul><li>Disable alarm</li><li>Mute alarm</li></ul>
Analog data	***	<ul> <li>Analog data of a device</li> <li>Input and output parameters of a sequence</li> </ul>	Motor speed
Discrete data	Л	Discrete data of a device	Information ready to switch on of an ATV61
RTNS	٢	Provide a user interface that allows you to view system components during runtime (for example, controllers, process objects, process data, and so on) for monitoring and troubleshooting purposes.	For monitoring and troubleshooting purposes.

## **Optional Label Text**

### Description

Label of graphical symbols is optional for user to use as it can be show/hide in the runtime page.

The below table explai	ns the steps to	disable the label:

Step	Action
1	Open the Application Template derived from the \$MotorCE master template, from which the application instances are created.
2	Add the new local graphic symbol (for example, <b>MyBlower_Left</b> ).
3	Open the <b>Blower_Left</b> symbol and also open the <b>MyBlower_Left</b> symbol.
4	Open <b>Blower_Left</b> symbol, copy the entire content of this symbol and paste into <b>MyBlower_Left</b> symbol that is newly created.
5	Select the <b>MyBlower_Left</b> symbol and change the <b>LabelVisibility</b> custom property value to False.

Step	Action
6	Save and Close MyBlower_Left symbol.
7	Instantiate MyBlower_Left symbol on process page and check the runtime.

**LabelVisibility** custom property of **MyBlower\_Left** symbol on process page can be disabled (double click on the **MyBlower\_Left** symbol then edit symbol properties will appear, change **LabelVisibility** default value to false). The label custom property will appear in runtime window as per the modification.

Optional label text is available in graphical symbol of below templates:

SI. No.	Template Name
1	\$DigitalInputCE
2	\$AnalogInputCE
3	\$AnalogInMultiCE
4	\$DigitalOutputCE
5	\$AnalogOutputCE
6	\$TotalCE
7	\$MotorCE
8	\$Motor2DirCE
9	\$ValveCE
10	\$HandValveCE
11	\$MValveCE
12	\$ControlValveCE
13	\$MValvewithPosCE
14	\$MotorVSCE
15	\$IMCTLCE
16	\$LeadLagCE
17	\$PIDCE
19	\$PWMCtlCE
20	\$RampCE
21	\$RatioCtrlCE
22	\$SplitRangeCE
23	\$Step3CtlCE

## **Screen Profile and Layout**

### What's in This Chapter

Screen Profile and Layout ......51

## **Screen Profile and Layout**

### **Screen Profile**

A Screen Profile defines the display assigned to a client. Screen Profile definitions include all the aspects defined for a Screen (size, orientation, resolution, density, touch), but adds the ability to define how many screens are used for the display and how they fit together. For example, the Screen Profile for a control room might include the definitions for three screens, two in landscape orientation and one in portrait orientation, each with a different size and resolution. This library offers one sample screen (*\$screenProfileGP*) profile for a single monitor with HD resolution.

#### Layout

A Layout consists of one more rectangular areas of content (panes) for a screen and is used to define how run-time information is displayed. The Layout determines the type of content to be displayed in each pane, and how the panes are positioned on the screen. A pane can encompass the entire screen, or only a portion of it. This library provides a layout sample (\$LayoutGP) for the user, the details of which are explained below. 1. LayoutGP



Item	Description
1	This slide-in pane is configured with the <i>Navigationtreecontrol</i> app provided by AVEVA system platform.
2	This slide-in pane is configured with the <i>Historicaltrendcontrol</i> app provided by AVEVA system platform.
3	This pane is configured with the <i>Titlebarcontrol</i> app provided by AVEVA system platform.
4	This pane is configured with the <i>Navigationbreadcrumbcontrol</i> app provided by AVEVA system platform.
5	This pane is configured to show level 3 symbols. The graphic must be configured with content type as L3, so that it appears in this pane.
6	This pane is configured to hold the label enable button for the L3 symbols.
7	This area in the layout is reserved to host the faceplate.
8	This pane is configured with the <i>Alarmcontrol</i> app provided by AVEVA system platform. This app helps to manage the alarms.

2. GPLLayout\_Content:



ltem	Description
1	This pane will host the operator tab/ information of the faceplate.
2	This pane will display the tab icons of the services that are configured.
3	This pane will host all the tab contents of the services that are configured.
4	This pane is configured with the Asset Specific Alarmcontrol app provided by AVEVA system platform. This app helps to manage the asset specific alarms.

Please refer to AVEVA help for more details on the apps which are used in the layout.

This Library also delivers a viewapp (viewappGP), which uses the screenprofile and layout samples delivered in the library.

# **Faceplates**

### What's in This Part

Optional Faceplate Tabs for Process Objects	55
Optional Faceplate Tabs for Smart Device Objects	62
Common Faceplate Tabs	64
Faceplate Customization	66

### **Overview**

This part describes the faceplates and faceplate tabs, page 48 that are common to various object categories of the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform.

# **Optional Faceplate Tabs for Process Objects**

### What's in This Chapter

Local Panel Section	55
Interlocks Tab	56
Failures Tab	59
Maintenance Tab	61

### **Overview**

This chapter describes the various optional faceplate tabs, page 48 that are common to objects of the process category.

Their use and functionalities are configured from the corresponding optional pages, page 78 of the master template.

**NOTE:** Template-specific faceplate tabs are described in the chapters documenting the master template.

## **Local Panel Section**

### **Overview**

The operation tab may feature the optional local panel section.

The local panel is enabled from the **Local Panel** page of the process master template.

### **Local Panel Representation**

The figure shows the local panel section only when *ModeSignalsEN* input signal is high.

Local Panel :	Control System
	On: O
	Off. 🔾

The figure shows the local panel section only when *VirtualLPEN* input signal is high.

Local Panel :	Control System	•
	On:	0
	Off	$\bigcirc$

### **Function Description**

The local panel section features a Local Panel mode indication, Local Panel mode selection from the Faceplate and status lights.

For a detailed description of the local panel function, refer to the corresponding control resource (see Modicon Libraries General Purpose, Process Components User Guide).

This table describes the different operating modes of the local panel when enabled:

ltem	State	Description		
Local Panel (Modes)	Control System	User have the choice to control the device through the <b>PROGRAM</b> or the <b>OPERATOR</b> ( <b>OWNER</b> section of the operation tab).		
	Zero	User cannot operate the device neither from the faceplate controls nor from the field (Local Panel).		
	Local Panel	User can operate the control module from the field (Local Panel) only.		
		The Local Panel provides status information of the device on the faceplate (status lights) that is operated from the field (Local Panel).		
Status lights	Passive style, page 44	The status that is indicated by the label is not activated.		
	Active style, page 44	The status that is indicated by the label is activated.		
Local Panel	Local Panel mode on <b>NOTE:</b>	operation can be enabled from the drop-down list on the faceplate.		
	When Vi down list	/irtualLPEN input pin signal is high in DFB, Local Panel mode drop- st appears on the faceplate for operation.		
	<ul> <li>In runtim mode, th</li> </ul>	ne, when the user is not logged-in or if the Owner is in program hen the Local Panel mode drop-down list is disabled for operation.		
	Enable	<i>LPMode</i> operation is enabled in DFB, so the user can operate devices from the field (Local Panel).		
	Disable	<i>LPMode</i> is disabled in DFB. Hence, user cannot operate the devices from the field (Local Panel).		

## Interlocks Tab

### Overview

The optional interlocks tab is available on certain faceplates, allowing you to view and interact with conditions that are configured to interlock a control module.

Depending on the configuration of the corresponding control resource and the process object, the tab allows bypassing each condition. You can also make manual resetting of each input of the corresponding control resource mandatory after the interlock condition is cleared.

When configured, a dialog box is displayed when you click a reset button, which is used to confirm the reset.

The interlocks tab is enabled from the **Interlocks** page of the process master template.

**NOTE:** This tab is also used to display initial conditions for sequential control, page 242 and equipment module, page 288.

### Interlocks Tab Representation

The figure shows an example of the interlocks tab.

$\triangle$	$\triangle$	9 4			
Вура	ass App	bly			Reset
	LSL1001 #	+ LSL1001 D	10 Low Lev	/el	
				Not inter	locked
				Not inter	locked

**NOTE:** When no interlock conditions are present or when all present interlock conditions are bypassed, the message **Not Interlocked** is displayed at the bottom of the tab; otherwise, the message is **Interlocked**.

## **A**WARNING

#### LOSS OF CONTROL AND UNINTENDED EQUIPMENT OPERATION

- Perform a Failure Mode and Effects Analysis (FMEA) of your application, and apply preventive and detective controls before implementation.
- Provide a fallback state for undesired control events or sequences.
- Do not manually bypass or reset an interlock condition without confirming the impact on subsequent process events.
- · Provide separate or redundant control paths wherever required.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and fault conditions) according to the safety analysis and applicable codes, and regulations.
- Apply local accident prevention and safety regulations and guidelines.<sup>1</sup>
- Test each implementation of this library for proper operation before placing it into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

<sup>1</sup> For additional information, refer to NEMA ICS 1.1 (latest edition), Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control and to NEMA ICS 7.1 (latest edition), Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems or their equivalent governing your particular location.

### **Interlock Condition Descriptions**

The tab displays the interlock conditions configured in the **Interlocks** page, page 79 of the process object.

When a configured condition arises, its description is displayed in the tab.

### **Bypassing an Interlock Condition**

After you have selected one or more interlock conditions in the tab, bypassing the selected conditions underlies a security classification, page 79 when you click **Apply**. The default configuration is *verified write*.

Bypassing an interlock condition is configured by default as an abnormal state and is indicated by an orange rectangle, page 43.

**NOTE:** For interlock conditions starting by an asterisk (\*), the **Bypass** check box is not displayed because they are associated to control data that cannot be written to.

### Manual Resetting of an Interlock Condition

When the reset is effective, the command that is shown in the **SetPoint** menu in the operation tab of the faceplate is initiated.

The reset button is available only if the interlock condition has disappeared and depending on the configuration made in the controller.

Resetting an interlock conditions underlies a security classification, page 79. The default configuration is *secured write*.

**NOTE:** When the tab is used as part of the *\$SequenceCE* master template, after performing a reset, you need to restart the process sequence from the operation tab of the faceplate.

### **Reset Confirmation**

For the following master templates of the process category, the *Param*. *InterlockRearmConfirmation* parameter allows you to display a dialog box that requires a confirmation for the reset of an interlock to take effect. The dialog box appears when you click **Apply**:

- \$MotorCE
- \$MValvewithPosCE
- \$MValveCE
- \$MotorVSCE
- \$Motor2DirCE
- \$ValveCE

Refer to *Parameters* in the chapter documenting each master template for a description of the *Param.InterlockRearmConfirmation* parameter.

The figure shows the confirmation dialog box which is model in nature.



Resetting an interlock condition by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

**NOTE:** When the reset confirmation is enabled, the security classification that normally applies when you click a reset button  $\mathbb{R}$  is not effective.

## **Failures Tab**

### **Overview**

The optional failures tab is available on certain faceplates, allowing you to view and interact with abnormal conditions at the control module level.

Depending on the configuration of the monitored control logic and the process object, the tab allows bypassing each condition. You can also make manual resetting of each input of the corresponding control resource mandatory after the abnormal condition is cleared.

The tab is enabled from the **Failures** page, page 79 of the process master template.

**NOTE:** This tab is also used to display:

- Alarm conditions for alarm summary management, page 305.
- Detected failure conditions for sequential control, page 243 and equipment module, page 289.

### **Failures Tab Representation**

The figure shows an example of the **Failures** tab.

$\square$	$\bigtriangleup$ $\oslash$ $\checkmark$ $\bigtriangleup$	
Вура	ss Apply Res	set
	Thermal Overload	
	N2 Flow Low	
	Not failed	

**NOTE:** When no abnormal conditions are present or when all present abnormal conditions are bypassed, the message **Not Failed** is displayed at the bottom of the tab; otherwise, the message is **Failed**.

## **A**WARNING

#### LOSS OF CONTROL AND UNINTENDED EQUIPMENT OPERATION

- Perform a Failure Mode and Effects Analysis (FMEA) of your application, and apply preventive and detective controls before implementation.
- Provide a fallback state for undesired control events or sequences.
- Do not manually bypass or reset a failure condition without confirming the impact on subsequent process events.
- Provide separate or redundant control paths wherever required.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and fault conditions) according to the safety analysis and applicable codes, and regulations.
- Apply local accident prevention and safety regulations and guidelines.<sup>1</sup>
- Test each implementation of this library for proper operation before placing it into service.

# Failure to follow these instructions can result in death, serious injury, or equipment damage.

<sup>1</sup> For additional information, refer to NEMA ICS 1.1 (latest edition), *Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control* and to NEMA ICS 7.1 (latest edition), *Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems* or their equivalent governing your particular location.

### **Abnormal Condition Descriptions**

The tab displays the abnormal conditions configured in the Failures and/or Failures2 pages, page 79 of the process object.

When a configured condition arises, its description is displayed in the tab.

### **Bypassing an Abnormal Condition**

After you have selected one or more abnormal conditions in the tab, bypassing the selected interlock conditions underlies a security classification, page 81 when you click **Apply**. The default configuration is *verified write*.

Bypassing an abnormal condition is configured by default as an abnormal state and is indicated by an orange rectangle, page 43.

**NOTE:** When the tab is used as part of the *\$SequenceCE* master template, resetting a detected failure condition requires a *secured write*.

**NOTE:** For abnormal conditions starting by an asterisk (\*), the **Bypass** check box is not displayed because they are associated to control data that cannot be written to.

### **Manual Resetting of Abnormal Conditions**

The reset button is available only if the abnormal condition has disappeared and depending on the configuration made in the controller.

By default, resetting an abnormal condition underlies a *secured write* security classification, page 81.

Depending on the configuration of the monitored control logic, to reset the control module, you may need to click the **Reset** button on the operation faceplate. Refer to the description of the operation faceplate in the chapter describing the corresponding master template.

**NOTE:** When the tab is used as part of the *\$AlarmSummaryCE* master template, to reset an abnormal condition, your role needs to have permission to modify attributes with *operate* security classification.

**NOTE:** When the tab is used as part of the *\$SequenceCE* master template, after performing a reset, you need to restart the process sequence from the operation tab of the faceplate.

## **Maintenance Tab**

### **Overview**

The maintenance tab is an optional tab that:

- Displays accumulated data related to the operation of the control module.
- Allows resetting the corresponding counters.

The tab is enabled and configured from the **Maintenance** page of the process master template.

### **Maintenance Tab Representation**

The figure shows an example of the maintenance tab.

	0	S		
			h	
	Hours	5	0	Reset
(	Operations	50	0	Reset

### **Resetting of Counters**

Resetting a counter underlies a security classification, page 82.

# **Optional Faceplate Tabs for Smart Device Objects**

### What's in This Chapter

Analog Data Tab	62
Discrete Data Tab	63

## **Overview**

This chapter describes the various optional faceplate tabs, page 48 that are common to templates of the device category.

Their use and functionalities are configured from the corresponding optional pages, page 85 of the master template.

**NOTE:** Template-specific faceplate tabs are described in the chapters documenting the master template.

## **Analog Data Tab**

### **Overview**

The analog data tab contains up to six subtabs displaying the analog data of the device. A subtab is displayed once the corresponding analog group is enabled from the **Main** page of the master template.

The analog data is configured in the Analog 1...Analog 6 pages, page 87 of the device object .

### **Analog Data Tab Representation**

The figure shows an example of the analog data tab.

△ ### 小 ▲	
1 2 3 4	
Motor current speed	0.00 EU
Speed setpoint	0.00 EU
Motor present current	0.00 A
Current motor torque	0.00 %
Current motor power	0.00 kW
Torque setpoint	0.00 %

#### NOTE:

- Analog Data tab if the value from the Unity is NAN then the data displayed on the faceplate will be as per the OS language set on the local System.
- Analog Data tab > Diagnostic codes tab displays the information of diagnostic code of the device. The value displayed is in decimal, user has to manually convert this decimal value to hexadecimal value and refer (see Modicon Libraries General Purpose, Devices Components User Guide) for Diagnostic codes/ Failcode description.

## **Discrete Data Tab**

### **Overview**

The discrete data tab contains up to four subtabs displaying the discrete data of the device. A subtab is displayed once the corresponding word is enabled from the **Main** page of the master template.

The discrete data is configured in the **Discrete 1**...**Discrete 4** pages, page 86 of the device object.

### **Discrete Data Tab Representation**

The figure shows an example of the discrete data tab.

1 2 3 4	
Ready to switch on	
Switched on	
Operation enabled	
Malfunction	
Voltage enabled	
Quick stop	
Switch on disabled	
Detected alarm	
Forced local mode	
Speed setpoint reached	
Speed setpoint is outside the limit	
Stop is done by remote control stop button	
Direction of motion 1=forward, 0=backward	

**NOTE:** Namur icons are displayed in the tab to the right of the description when configured, page 39.

## **Common Faceplate Tabs**

### What's in This Chapter

Alarms Tab ......64

### **Overview**

This chapter describes the various tabs that are common to the faceplates of master templates of the library.

## Alarms Tab

### **Overview**

The alarms tab is available in each faceplate. It allows you to acknowledge alarm notifications that are associated to the control module and to manage the way these notifications are reported at the supervision level.

You can acknowledge and configure alarm notifications either:

- Globally for the alarms that are associated to the control module.
- Individually for each alarm.

**NOTE:** The evaluation of the corresponding signals at the control level is not impacted by the configuration of alarm notifications in this tab.

### **Alarms Tab Representation**

The figure shows an example of the alarms tab.

7
lode Inhibit Shelve Status
En ~
En v
En v
En v
En v

Header	Description
Alarm	Displays the string that is configured in the <b>Alarm message</b> of the alarm feature of the attribute.
	The row (All) applies the configuration globally to alarms of the control module.
	<b>NOTE:</b> The state alarms that are configured by default are described in the chapter documenting each master template.
Mode	Available alarm modes:
	Enable
	Disable
	Silence
Inhibit	When selected, the alarm is inhibited.
	NOTE: It also inhibits any alarm in contained instances of the object.
Shelve	When selected, the alarm is shelved, page 37.
	NOTE: It does not shelve alarms in contained instances of the object.
Status	Shows:
	• The status of the alarm by using the corresponding icon, page 45.
	The Namur icon (when applicable).
	• The alarm severity, page 36.
	<b>NOTE:</b> The tab allows you to see the alarms that are active, whereas the symbol displays only the alarm with the highest priority out of the active alarms.

**NOTE:** Your role needs to have the required operational permission to modify alarm modes.

# **Faceplate Customization**

With the Ecostruxure Process Expert – General Purpose for Aveva System Platform R2 release, the user will be able to modify the standard library tab faceplates and use custom faceplates instead of standard tabs. Also you will be able to extend the faceplate by adding new tabs.

Follow the below mentioned steps to add new tabs.

1. Creation of new tabs in L4 (Faceplates).

There are two methods which can be followed to create new tabs for the existing templates.

- a. Duplicate the existing faceplate and add the required objects.
- b. Create new content and set the following properties.
  - (1) Create a frame of width: 348 and height: 524



(2) Set the symbol (TabxxxxFP) ContentType : User\_Defined\_1



- (3) Add the required Objects / Scripts / Custom Properties are to the frame to complete the L4 symbol (Faceplate).
- (4) Then an attribute (parameter) is created in the Master template to store the name of the content that represents the new tab (Faceplate).

- 2. Creation of Tab Icon.
  - a. You can either use the existing the Standard Tab Icons available in path shown below



or can design/create new icon with abnormal if required in same location depending on the requirements.

b. Create new content in Master Template with the below mentioned syntax:

"Tablconxx\_yyyy"

where "xx" is a numeric value defining the order where tab appears in runtime and "yyyy" is any suffix.

Example: Tablcon10\_LocalPanel where "10" in the name describes the order of the tab from left to right in the ascending order.

	0	0	
$\cap$	A	1	
		2	<u> </u>

c. Instantiate the Tab Symbol in the new content which is created.

Example: In Tablcon10\_LocalPanel, Tabsymbol "Localpanel" is instantiated

😼 \$MotorCE.Tablcon10_LocalPanel - English (United States)				
Graphic Edit View Arrange Format Special Help				
🛃 Save and Close 🛃 🗠 🥝 🕑 🤟 🤟 🖓 👘 😭	s 🗸 🔼 🗄 🎓 🕹 🍕 💀 🗟 🗞 🗹 🛱			
$4  \text{Arial}  \checkmark 12  \lor  \mathbf{B}  \mathbf{I}  \underline{\mathbf{U}}  \mathbf{A}^{*}  \mathbf{A}^{*}  \Box  \mathbf{A}^{*}  \mathbf{A}^{*} $	· <u>/</u> • 🕸 • <u>A</u> • 🚍 • 🚍 • 🛱 • 🖻			
11 12 12 12 12 12 12 12 12 12 12 12 12 1				
Tools				
Y + □ □ ○ □ ↓ ⊰ ♂ ℑ ≧ Ŋ				
Elements				
····· 🍲 Localpanel 1				

d. Write the Abnormal animation conditions in the script (if any of them are applicable).

The image below illustrates an example for Alarms Tab abnormal symbol.

	Languages	
	English (United States) (	(en-US)
	Properties Toolbox	Assets Templates
Edit Scripts		- 🗆 ×
Symbol Scripts + -	Predefined Scripts	
:1 2↓	↓ 1 of 1 ▶	2 🗸
Predefined Scripts		۲
	Trigger type: On Show	V Data Timeout: 1000 ms
		scripts used: 1
		Too 👍 🎳 🖷
	1 2 dim AlarmsActionR as string; 3 dim AlarmsAbnormal as string; 4 5 AlarmsAbnormal = "(me.AlarmMode <> 1 6 "(Me.DevCtl.St.Alar 7 "(Me.DevCtl.St.Alar 8 AlarmsActionR = "(not Me.DevCtl.St.A 9 10 SetCustomPropertyValue("Alarml.Alarm 11 SetCustomPropertyValue("Alarml.Alarm	) or " + m.AlarmMode <> 1) or (Me.DevCtl.St.Fai m.AlarmShelved) or (Me.DevCtl.St.Fai larm.Acked) or (not Me.DevCtl.St.Faild sAbnormal",AlarmsAbnormal,false); sActionR",AlarmsActionR,false);
	Line: 1 Col: 1	
•		OK Cancel

e. Set the Content Type of Tab symbol to "User\_Defined\_3" as illustrated below.

Languages			
English (United States) (en-US)			
Properties	Toolbox	Assets	Templates
<mark>₿≣</mark> ĝ↓			
✓ Graphic			
Description			
Size		Auto	
FixedWidth	1	500	
FixedHeigh	t	500	
✓ Appearan	ce		
AnchorFixe	dTo	Relative	
Locked		False	
AbsoluteA	nchor	75, 65	
RelativeAnchor		0,0	
Smoothing		True	
✓ Runtime E	Behavior		
ContentTyp	pe	User Define	d 3
FaceplateM	lode	False	-
MultiplePo	pupsAllowed	True	
Scripts		(Collection)	
ZoomPerce	ent	100	
ZoomCente	erX	0	
ZoomCente	erY	0	
Custom Pr	roperties		
CustomPro	perties	0 Properties	

f. A custom property **TabName** is created to read the name of the faceplate through the attribute (parameter).

😻 Edit Custom Properties - Er	nglish (United States)			- 0		×
Custom Propertie	es + 🖛	ab Na	me	Local	pan	el1
Actoria Actoria Actoria Tabbic.Selected Actoria Tabbane Z. TooTip	Default Value False False False False Local Panel	Data Type Default Value Visibility Description	4 of 5 4 of 5 5 tring 6 Me. Param. TabLocalPanelFP. LocalPane 6 Public (Property can be seenwhen symbol is embedd 7 Private (Property is hidden when symbol is embedd	LOCAI ed)		✓
Status This property is overridden. The attribute was Me,Param.TabLoca property is configured as a refere Me,Param.TabLocalPaneIFP.Loca	original value of the Ipanel F-Local Panel '. The net o IPane'.		X		V	

g. This custom property **TabName** will be referred in the action script shown below. This action script will set focus to the faceplate.



#### NOTE:

- The faceplate customization is applicable to tabs displayed below operator faceplate.
- The recommended number of tabs are 8, however you can add more tabs. Once the tab count exceeds 8, scroll bar will appear to navigate beyond 8 tabs.

# Adding a Symbol to Open the Operation Client

### **Overview**

This topic describes how to add a symbol to the faceplate or animated graphic (genie) of a user-created template and configure it to open the Operation Client to view asset-related information.

### **Working Principle**

The following action script needs to be executed to open the Operation Client. You can insert it in any graphic and associate it to a trigger.

```
' Call Runtime Navigation Services
dim xref = new PsxMessaging.CrossReference;
xref.System = PESSystemID;
xref.ExecutionDomain = PESExecutionDomainID;
xref.Project = PESProjectID;
xref.Instance = Me.Tagname;
```

PsxMessaging.Messenger.SendFacet(xref);

To provide values to the variables used in this script, the symbol must contain the following custom properties.

Name	Data type	Default value
PESSystemID	String	MyArea.Param.SystemID
PESExecutionDomainID	String	MyArea.Param.DomainID

NOTE:

- PESProjectID is currently not used.
- Me.Tagname automatically takes as value the instance name of the object.
- For more information on the execution domain, refer to the topic describing executable properties (see EcoStruxure Process Expert for AVEVA System Platform, User Guide).

When you use AssetLink and the EcoStruxure Process Expert GPL for AVEVA System Platform, instances of the *\$aAreaRootGP* template contain the following two attributes, which hold the values for the <code>PESSystemID</code> and <code>PESExecutionDomainID</code> variables respectively:

- Param.SystemID
- Param.DomainID

If you do not use the *AreaRoot* and *Area* templates, you need to add these attributes to your templates.

**NOTE:** *\$aAreaRootGP* is selected by default for *Root Area* in the **Configuration** tab of the *\$aEsxCEAssetLink* template. It represents the identifier of the EcoStruxure Process Expert system.

Child areas (instances of *\$aAreaGP* that represent the folders of the application) use the same attributes and a corresponding script to acquire the value from their parent (an area or the root area):

Me.Param.systemID = MyArea.Param.systemID Me.Param.DomainID = MyArea.Param.DomainID

### **Examples**

The following figure shows an example of the action script of a symbol that is executed on a mouse left-click.

🛃 Edit Animations - Eng	glish (United States)		- D X
Animations	+	Action Scripts	PESLinkIcon
Visualization Visibility Interaction	Enabled	Key Equivalent Ctrl Shift Key None 🗸	scripts used: 1
Action Scripts	Enabled 💌	Trigger type: On Left Click/Key/Touch Down 🗸	Every: ms
		<pre>1 ' Call PES Runtime Navigation Services 2 dim xref = new PsxMessaging.CrossReference; 3 xref.System = PESSystemID; 4 xref.ExecutionDomain = PESExecutionDomainID; 5 xref.Project = PESProjectID; 6 xref.Instance = Me.Tagname; 7 'xref.User = InTouch:SOperator.Value; 8 9 PsxMessaging.Messenger.SendFacet(xref);</pre>	

The following figure shows an example of the custom property of a symbol that allows variable <code>PESExecutionDomainID</code> to acquire the value from the *Param. DomainID* of its parent area.

W Edit Custom Properties - English (United	States)		
Custom Properties	+ 15		utionDomainID
Name  EnablePESLink	Default Value Me.Param.EnablePESLink	Data Type	String ~
PESEXECUTIONOGINALIU     PESEVECUTIONOGINALIU     PESEVECUTIONOGINALIU     PESEVECUTIONOGINALIU	MyArea.Param.SostemID	Default Value 💊	MyArea.Param.DomainID
	.,,	Visibility	Public (Property can be seen when symbol is embedded)

The following figure shows an example of the script in an instance of a \$*AreaGP* area template that allows assigning a value to its *Param*. *SystemID* and *Param*. *DomainID* attributes (rows 4 and 5).

Sti Aci	dTank						
General	Attribute	s S	Goripts	Obje	ect Inf	formatio	1
				+		. «	Script name: Status
Scripts:							Aliases:
Name		St	On	Ex	Of	Sh	Declarations:
							Scripts:
							<pre>1 'Update scan state command attribute used in L4 2 Me.AO.ScanStateCmd = Me.ScanStateCmd; 3 4 Me.Param.DomainID = MyArea.Param.DomainID; 5 Me.Param.SystemID = MyArea.Param.SystemID;</pre>

The following figure shows an example of the faceplate of a template of the EcoStruxure Process Expert GPL for AVEVA System Platform that uses the *PSxPESLink* symbol to open the Operation Client. The symbol is pointed out by the arrow.



# **Implementing the Library**

### What's in This Part

Implementing the Library ......73

### **Overview**

This part describes how to implement the Modicon Libraries - General Purpose for Wonderware System Platform to create an application.

It does not describe how to deploy objects nor the Galaxy. Refer to the ArchestrA IDE help.
# **Implementing the Library**

## What's in This Chapter

Implementation Overview	73
Creating the Model View	73
aOPCClientGP Configuration	74
Template or Instance Configuration (Object Editor)	74
Graphic Symbol Integration	75

## **Overview**

This chapter describes how to implement the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform to create an application.

It does not describe how to deploy objects nor the Galaxy. Refer to the ArchestrA IDE help.

## **Implementation Overview**

## **Quick Reference**

The table indicates the steps to follow and the topic describing each step.

	1	
Step	Action	Refer to
1	Import library objects in your Galaxy.	Library Installation, page 22.
2	Create the <b>Model</b> view hierarchy.	Creating the Model View.
3	Create application object instances.	Instance Creation.
4	Configure application object instances.	Template or Instance Configuration, page 74.
5	Deploy the Galaxy.	ArchestrA IDE help.
6	Create your supervision application in ArchestrA Graphic Editor.	Graphic Symbol Integration, page 75.

## **Creating the Model View**

## Introduction

The **Model** view shows objects in terms of their physical or containment relationships and allows you to create your system architecture.

An area represents a physical section of a plant or automation process or a logical part of an automation application.

The area instances are created from the *\$aAreaRootGP* and *\$aAreaGP* application templates.

The *\$aAreaRootGP* template is used to create the top-level areas of the **Model** view.

## **Model View Creation**

This procedure describes the creation of a typical model view by using instances of application templates.

Step	Action
1	Select Model view.
2	Create instances of the <i>\$aAreaRootGP</i> application template.
3	Create instances of the <i>\$aAreaGP</i> application template.
4	Drag each area instance from the <b>UnassignedArea</b> folder to the required area instances to create your <b>Model</b> view hierarchy (up to 10 levels).
	<b>NOTE:</b> The <i>\$aAreaGP</i> instances must not be placed at the top of the model view hierarchy. They need to have <i>\$aAreaRootGP</i> instances as parent.
5	Configure each <i>\$aAreaRootGP</i> and <i>\$aAreaGP</i> instances.
6	Create system object instances by using the <i>\$aWinplatformGP</i> , <i>\$aAppEngineGP</i> , and <i>\$aViewEngineGP</i> application templates.
7	Configure the system objects.
8	Create instances of the \$aOPCClientGP application template.
9	Drag the <i>\$aOPCClientGP</i> instance from the <b>UnassignedArea</b> folder to the <i>\$aAreaRootGP</i> instance.
10	Configure the aOPCClientGP instance (refer to aOPCClient Configuration, page 74).
11	Create your application object instances by using the appropriate application templates.
12	Drag the application object instances from the <b>UnassignedArea</b> folder to the areas corresponding to your system architecture.

# aOPCClientGP Configuration

## Overview

OPC client instances are created from the \$aOPCClientGP template.

They are used to communicate with Modicon controllers through OPC Factory Server (OFS).

## Configuring aOPCClientGP

Proceed as follows to configure an OPC DA and OPC UA client instance.

Step	Action
1	Create an instance of the \$aOPCClientGP template.
2	Double-click the instance to open it in the object editor
3	In the General page, configure the Server node with the name or IP address of the PC that hosts the OFS server.
4	To set the <b>Server name</b> , you can use the OFS server program ID ( <i>Schneider-Aut.OFS</i> ) or select the instance of the OFS server from the menu. <b>NOTE:</b> For OPC UA Configuration OFS Program ID is OI.GATEWAY.3.
5	In the Scan Group page, you need to configure at least one scan group. A scan group is a collection of OPC items with a common update interval. NOTE: By default, Scan Mode is set to ActiveOnDemand. In this mode, the items that are not actively being referenced by any client or object are not scanned. For more information about Scan Mode, refer to the ArchestrA IDE help.
6	Check in the object.

# **Template or Instance Configuration (Object Editor)**

## **Overview**

The object editor features native configuration pages but also pages that are specific to the objects of EcoStruxure Process Expert General Purpose Library for

AVEVA System Platform, page 77. Typically, the library-specific pages are used to configure optional supervision functions provided by templates.

Use the Attributes page to:

- · List the attributes associated with the template or instance.
- Add attributes to a template or instance.
- Configure parameters of core supervision functions (attributes with the Param. prefix)
- Configure state alarms.
- Configure the aliases if needed (attributes with the .Alias suffix).

#### **Diagnostic Messages When Saving Changes to Unassigned Instances**

If you edit an instance that is not assigned to an area or host yet and save your changes, ArchestrA IDE may display a message about unresolved references in attributes.

Indeed, most templates of the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform have attributes with references, which require that their instances be assigned to an area or host so that the reference can be resolved.

This is the case, for example, for instances that have attributes with references to *MyEngine*. The reference can be resolved only once the instance is assigned to a host, which is an instance of any template derived from the *\$aAppEngineGP* template, page 92.

Similarly, instances of templates derived from *\$aAreaGP* trigger a message about unresolved references to *MyArea*. These references are resolved when the instances are assigned to another area. This other area is an instance of any template derived from the *\$aAreaGP* or *\$aAreaRootGP* templates, page 94.

Edit instances after you have assigned them to the appropriate area or host to avoid these references from being reported as unresolved.

**NOTE:** This type of message can also be triggered if ArchestrA IDE cannot resolve a reference as a result of an incorrect modification in a derived template or its instances. Verify that your configuration allows references in attributes to be resolved.

## **Graphic Symbol Integration**

#### Introduction

The graphic symbols are associated with the automation objects (object instances).

The ArchestrA Graphic Editor allows you to embed graphic symbols into another symbol.

You can create part of your supervision application in a symbol and integrate this symbol in an InTouch window and use it at runtime.

#### **Integrating Graphic Symbols**

Proceed as follows to insert a graphic symbol into another symbol.

Step	Action
1	In the Graphic Toolbox view, double-click the symbol in which you want to insert a symbol.
	Result: The ArchestrA Graphic Editor opens.
2	Click Edit > Embed Graphic or click the following icon in the toolbar.
	Result: The Galaxy Browser opens.
3	Display the instances by clicking the following icon in the toolbar
4	Select an instance from the list
5	Select one of the graphic symbols associated with this instance
	<b>NOTE:</b> Faceplate symbols also appear in the list but they do not open dynamically when you click them at runtime. You do not need to embed them. Faceplates open when you click a symbol at runtime.
6	Click Ok.
7	Click the area where you want to position the symbol.
	Result: The symbol is added.

# **Object Configuration Pages (Object Editor)**

## What's in This Part

Optional Process Object Configuration Pages	78
Optional Device Object Configuration Pages	85
Common Configuration Pages	89

#### **Overview**

This part describes the configuration pages that are common to various object categories of the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform.

# **Optional Process Object Configuration Pages**

#### What's in This Chapter

## **Overview**

This chapter describes the configuration pages that are common to master templates of the process category and specific to the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform.

They allow you to configure optional supervision functions of process application templates and their instances.

Data that you configure from these pages affects the corresponding optional tabs, page 55 and common tabs, page 64 of process object faceplates. If a page contains no data, the corresponding faceplate tab is not displayed.

The default security classification to modify references is *Configure*.

**NOTE:** Depending on the master template, some of these pages may not be available and/or not configured.

## Interlocks Page Default Configuration

#### **Overview**

Depending on the configuration of the corresponding control resource, the **Interlocks** page is used to:

- Enable or disable monitoring of interlocks and define the interlock condition descriptions. When enabled, it allows you to:
  - Enable or disable the bypass of interlocks.
  - Enable or disable the manual resetting of interlocks.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform.

For a description of the default template-specific configuration of interlocks management, refer to the chapter documenting each master template of the process category.

## **Interlocks Page Description**

Interlocks	Interlocks2	Failures	Failures2	Maintenance	Local Panel	Attributes	Scripts	Object Inform	ation
	Enable	Interlocks		<b>V</b>					
Enab	le Bypass of	Interlocks		<b>v</b>					
Enable Mar	ual Reset of	Interlocks		<b>V</b>					
	- Interlock I	Descriptior	15						
	Int	erlock 1:						🗗 😽	
	Int	erlock 2:						🗗 🐶	
	Int	erlock 3:						🗗 🔜	
	Int	erlock 4:						🗗 🔜	
	Int	erlock 5:						🗗 🔜 🚽	
	Int	erlock 6:						🗗 🔜	
	Int	erlock 7:						🗗 😽	

Element	Description				
Enable Interlocks	Select this check box to enable monitoring of interlock conditions.				
	The default security classification is Configure.				
Enable Bypass of	Select this check box to enable bypassing of interlock conditions.				
Interiocks	The default security classification is <i>Configure</i> to enable the bypassing function and <i>Verified Write</i> to bypass interlocks during operation.				
Enable Manual Reset	Select this check box to enable manual resetting of interlocks.				
of interlocks	The default security classification is <i>Configure</i> to enable the reset function and <i>Secured Write</i> to reset interlocks during operation.				
Interlock Descriptions	Enter the interlock condition descriptions (up to 7).				
	Interlock descriptions starting with an asterisk (*) are associated to control data that cannot be written to; they cannot be bypassed. For these, the <b>Bypass</b> check box is therefore not displayed in the faceplate tab.				
	The default security classification is Configure.				
	<b>NOTE:</b> The descriptions can be entered in multiple languages, page 40.				
Customized References	Specify a variable reference if the automatic referencing mechanism is not used.				

# **Failures Page Default Configuration**

## Overview

Depending on the configuration of the corresponding control resource, the **Failures** page is used to:

- Enable or disable monitoring of abnormal conditions and define the descriptions. When enabled, it allows you to:
  - Enable or disable the bypass of abnormal conditions.
  - Enable or disable the manual resetting of abnormal conditions.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform.

For a description of the default template-specific configuration of abnormal condition management, refer to the chapter documenting each master template of the process category.

**NOTE:** Two identical pages are available to configure abnormal condition management, **Failures** and **Failures2**. Only the suffixes that are configured by default vary.

#### Management of Abnormal Conditions for Direction and Speed

Two identical pages are available to configure abnormal condition management, **Failures** and **Failures2**. Only the suffixes that are configured by default vary:

- The Failures page references the CONDSUM\_ST datatype.
- The Failures2 page references the RC\_CONDSUM\_ST datatype.

The table describes the possible scenarios to manage abnormal conditions for control resources with two motor directions and two speeds that feature these functions by using either or both pages.

Monitoring of abnormal conditions for	Use Failures page	Use Failures2 page
None	No	No
Forward direction/speed 1 and reverse direction/speed 2	Yes	No
Forward direction/speed 1 and reverse	Yes	Yes
	Forward direction/speed 1	Reverse direction/speed 2

## Failures and Failures2 Page Description

Interlocks	Interlocks2	Failures	Failures2	Maintenance	Local Panel	Attributes	Scripts	Obje	ct Info	rmation
	Enable	e Failures:		1						
				-						
Ena	ble Bypass o	f Failures:		1						
Enable Ma	anual Reset o	f Failures:	🖸 🖆 🤇	-						
	-Failure De	scriptions -								
	F	ailure 1:						ſ		
	F	ailure 2:						ſ	Ŭ.	
	F	ailure 3:						ſ	Ţ.	
	F	ailure 4:						£.	<b>I</b>	
	F	ailure 5:						£,	Ţ.	
	F	ailure 6:						£.	Ţ.	
	F	ailure 7:						L.	Ţ.	
	F	ailure 8:						£	9	
	F	ailure 9:						<b>_</b>	<u> </u>	
	Fa	ilure 10:						۲.	<u> </u>	
	Fa	ilure 11:						<b>_</b>	<u> </u>	
	Fa	ilure 12:						<u> </u>	2	
	Fa	ilure 13:						<u> </u>	8	
	Fa	ilure 14:						<u> </u>	2	
	Fa	ilure 15:						<u> </u>		

Element	Description				
Enable Failures	Select this check box to enable monitoring of abnormal conditions.				
	The default security classification is Configure.				
Enable Bypass of	Select this check box to enable bypassing of abnormal conditions.				
	The default security classification is <i>Configure</i> to enable the bypassing function and <i>Verified Write</i> to bypass abnormal conditions during operation.				
Enable Manual Reset	Select this check box to enable manual resetting of abnormal conditions.				
or ranures	The default security classification is <i>Configure</i> to enable the reset function and <i>Secured Write</i> to reset abnormal conditions during operation.				
Failure Descriptions	Enter the description of the detected failure conditions (up to 15).				
	Descriptions starting with an asterisk (*) are associated to control data that cannot be written to; they cannot be bypassed. For these, the <b>Bypass</b> check box is therefore not displayed in the faceplate tab.				
	The default security classification is Configure.				
	<b>NOTE:</b> The descriptions can be entered in multiple languages, page 40.				
Customized References	Specify a variable reference if the automatic referencing mechanism is not used.				

## **Maintenance Page Default Configuration**

## **Overview**

Depending on the configuration of the corresponding control resource, the **Maintenance** page is used to enable monitoring of maintenance data. When enabled, it allows you to count and reset:

- · Operation hours.
- Number of switches.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform.

For a description of the default template-specific configuration of maintenance data management, refer to the chapter documenting each master template of the process category.

#### Maintenance Page Description

Interlocks Interlocks	2 Failures	Failures2	Maintenance	Local Panel	Attributes	Scripts	Object Information				
Enable Maintenance:		<b>V</b>									
	1			Element Description							
		Enable Ma	intenance	Select this che	ck box to ena	ble supervision for maintenance data.					
				The default sec	urity classific	ation is Co	onfigure.				
		Status Wo	rd	Status word							
		Configurat	tion Word	Configuration v	/ord						
				The default sec during operatio	urity classific n.	ation is Ve	erified Write to reset co	unters			
		Running H	lours	Counter of ope	ration hours						
				The default sec	urity classific	ation is Co	onfigure.				
		Number of	Operations	Counter of num suffix for auto-r	ber of operat	i <b>ons; by d</b> <instan< th=""><th>efault the variable refe ce name&gt;_DEVMNT_S</th><th>rence with</th></instan<>	efault the variable refe ce name>_DEVMNT_S	rence with			

not used.

## Local Panel Page Default Configuration

Customized

References

#### **Overview**

Depending on the configuration of the corresponding control resource, the **Local Panel** page is used to enable the local panel.

Specify a variable reference if the automatic referencing mechanism is

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform.

For a description of the default template-specific configuration of the local panel function, refer to the chapter documenting each master template of the process category.

## **Local Panel Page Description**

Interlocks Interlocks2 Failures Failures2 Maintenance Local Panel Attributes Scripts Object Information

Enable Local Panel: 🔽 🖆 📝

Element	Description
Enable Local Panel	Select this check box to enable the local panel function at the supervision level.
	The default security classification is Configure.
Status Word	Status word; the variable reference is specific to the type of control module associated with the local panel.
	The default security classification is Configure.
Configuration Word	Configuration Word; the variable reference is specific to the type of control module associated with the local panel.
	The default security classification is Configure.
Customized References	Specify a variable reference if the automatic referencing mechanism is not used.

**NOTE:** User has to match **Suffix for Auto References** with the DDT structure of the control resource (DFB) of the instance.

## **Alarms Page Default Configuration**

#### **Overview**

Depending on the configuration of the corresponding control resource, the **Alarms** page is used to enable level alarm functions for analog signals. When enabled, it allows you to manage individually the following alarm level signals:

- · Very high level
- · High level
- Deviation
- Low level
- · Very low level

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform.

For a description of the default template-specific configuration of the level alarm function, refer to the chapter documenting each master template of the process category.

## **Alarms Page Description**

Alarms	Interlocks	LocalPanel	Attribu	ites	Scripts	Object Information
	E	nable Alarms	s: 🗸	ſ	<b>&gt;</b>	
Er	able High H	ligh Set Poin	t: 🗌	ſ	Ţ	
	Enable H	ligh Set Poin	t: 🗌	ſ		
E	nable Devia	tion Set Poin	t: 🗌	ſ	•	
	Enable	Low SetPoint	:	ſ	<b>P</b>	
E	nable Low I	.ow Set Point	t: 🗌	ſ	Ģ	

Element	Description
Enable Alarms	Select this check box to enable supervision for analog alarms.
	The default security classification is <i>Configure</i> to enable the alarm function and <i>Tune</i> to during operation.
Enable High High Setpoint	Select this check box to enable supervision for very high-level alarms.
Enable High Setpoint	Select this check box to enable supervision for high-level alarms.
Enable Deviation Setpoint	Select this check box to enable supervision for deviation alarms.
Enable Low Setpoint	Select this check box to enable supervision for low-level alarms.
Enable Low Low Setpoint	Select this check box to enable supervision for very low-level alarms.
Customized References	Specify a variable reference if the automatic referencing mechanism is not used.

**NOTE:** For setpoints, the default security classification is *Configure* to enable setpoint supervision and *Tune* to modify it during operation.

# **Optional Device Object Configuration Pages**

#### What's in This Chapter

Main Page Default Configuration	85
Discrete Page Default Configuration	86
Analog Page Default Configuration	87

## **Overview**

This chapter describes the configuration pages that are common to master templates of the device category and specific to the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform.

They are used to configure optional supervision functions of device application templates and their instances.

Data that you configure from these pages affects the corresponding optional tabs and subtabs, page 62 and common tabs, page 64 of device object faceplates. If a page contains no data, the corresponding faceplate tab is not displayed.

The default security classification to modify references is Configure.

**NOTE:** Depending on the master template, some of these pages may not be available and/or not configured.

## Main Page Default Configuration

#### **Overview**

Depending on the configuration of the corresponding control resource, the **Main** page is used to:

- Enable or disable discrete words related to the device (displayed in the discrete data tab of the device faceplate).
- Enable or disable analog groups related to the device (displayed in the analog data tab of the device faceplate).

When enabled, it allows you to configure the corresponding discrete and analog configuration pages.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform.

For a description of the default template-specific configuration of device data management, refer to the chapter documenting each master template of the process category.

## **Main Page Description**

Main	Discrete 1	Discrete 2	Discrete 3	Discrete 4	Analog 1	Analog 2	Analog 3	Analog 4	Analog 5	Analog	g 6	Attributes	Scripts	Object Information		
			PV:	Customize	d Referenc	es (only if	Suffix is lef	t on blank):			Suff	fix for Auto	Referenc	es:		
	Status	s Word:								<b>A</b>	.st	W			iii	9
	Configuratio	nWord: (	£ Ø						ſ	<b>V</b>	.CF	GW			đ	· 🐶
		Enable	e Discrete Wo	ords: 🔓	Pr	irpose:				ſ	7					
			W	ord 1	Γ							]				
			W	ord 2												
			W	ord 3												
			W	ord 4												
												1				
		Enable	e Analog Gro	up: 🖆	P	urpose:				ſ	<b>V</b>					
			Gr	oup 1	Γ											
			Gr	oup 2								1				
			Gr	oup 3								1				
			Gr	oup 4								]				
			Gr	oup 5								]				
			Gr	oup 6								]				

Element	Description
Status Word	Reference variable of the status word of the device.
Configuration Word	Reference variable of the configuration word of the device.
	The default security classification is Operate.
Enable Discrete Words	Select the check box to enable monitoring of the corresponding discrete word.
	Enabling Word 1 to Word 4 enables Discrete 1 to Discrete 4 pages, page 86 respectively.
	The text that you enter in the <b>Purpose</b> field is displayed in the tooltip of the corresponding subtabs (1 to 4) of the discrete data tab of faceplates, page 63.
	The default security classification is Configure.
	NOTE: Text can be entered in multiple languages, page 40.
Enable Discrete Group	Select the check box to enable monitoring of the analog group.
	Enabling Group 1 to Group 6 enables Analog 1 to Analog 6 pages, page 87 respectively.
	The text that you enter in the <b>Purpose</b> field is displayed in the tooltip of the corresponding subtabs (1 to 6) of the analog data tab of faceplates, page 62.
	<b>NOTE:</b> Text can be entered in multiple languages, page 40.
Customized References	Specify a variable reference if the automatic referencing mechanism is not used.

## **Discrete Page Default Configuration**

## **Overview**

The **Discrete 1** to **Discrete 4** pages are used to:

- Define the bit descriptions of the discrete words.
- Define the Namur status associated with each bit.
- Define the variable references associated with each discrete word.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform.

For a description of the default template-specific configuration of device data management, refer to the chapter documenting each master template of the process category.

**NOTE:** First, you need to enable the corresponding discrete word in the **Main** page, page 85.

## **Discrete 1 to Discrete 4 Page Description**

Main	Discret	e 1	Discrete 2	Discrete 3	Discrete 4	Analog 1	Analog 2	2 Analog 3	Analog 4	Analog 5	Analog 6					
		BitD	escriptions			Q	1	Namur Icor		A	1					
						LC:										
	0	Faul	lt;[3082]Fall	0				Failure								
	1	Ope	ned;[3082]	Abierto				None	None 🔻							
	2	Clos	ed;[3082]C	errado				None			-					
	3	Trip	;[3082]Dispa	aro				None			-					
	4	Sep	am in remot	e mode;[308	2]Sepam en	modo remot	o	None			-					
	5	Adju	ustment A is	in service;[3	082]Juego d	le ajustes A	en ser	None			-					
	6	Adju	ustment B is	in service;[3	082]Juego d	le ajustes B	en ser	None			-					
	7	Sep	am is not on	time;[3082]	Sepam no es	tá en hora		None			-					
	8	Sep	am in local a	djustment m	ode;[3082]S	epam modo	de aju	None			-					
	9	Loss	s of syncron	;[3082]Pérdi	da de sincror	nismo	1	Failure			-					
	10	Loss	of event 1	data;[3082]	Pérdida de d	atos evento	1	Failure			-					
	11	Eve	nt Zone 1;[3	3082]Evento	zona 1		1	None			-					
	12	Part	tial fault;[30	82]Fallo parc	ial			Failure			-					
	13	Majo	or fault;[308	32]Fallo mayo	r			Failure			-					
	14	Loss	s of event 2	data;[3082]	Pérdida de d	atos evento	2	Failure			-					
	15	Digit	tal output O	3 status;[308	32]Digital ou	tput O3 stat	us	None			-					
		Cust	omized Pef	erences (on	v if Suffix is	left on bla	nk)•		Suffix f	for Auto Re	ferences:					
		Cust	onizeu Kei	crences (011	y a burnk is	none on bia		0	CEDAN		Ctable					
								🖬 🔍	_SEPAR	M_CFG.Data	IStatus					

Element	Description
Bit Descriptions	Description of the bits. The text is displayed in the subtabs (1 to 4) of the corresponding discrete data tab of device faceplates, page 63. NOTE: Descriptions can be entered in multiple languages, page 40.
Namur Icon	<ul> <li>Select a Namur, page 38 status from the menu:</li> <li>None</li> <li>Failure</li> <li>Function check</li> <li>Out of specs</li> <li>Maintenance required</li> </ul>
Suffix for Auto References	Variable reference of the configuration word of the control resource controlling the device. By default, the variable reference is <instance name="">_<device-specifc dfb_ddt="">.<configuration word="">.</configuration></device-specifc></instance>
Customized References	Specify a variable reference if the automatic referencing mechanism is not used.

# Analog Page Default Configuration

## **Overview**

- The Analog 1 to Analog 6 pages are used to:
  - Define descriptions of data of the analog groups.

- Define the numerical format, engineering unit, and style, page 44 of the analog values that are displayed in the faceplate of devices.
- Define the variable references associated with each analog data.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform.

For a description of the default template-specific configuration of device data management, refer to the chapter documenting each master template of the process category.

**NOTE:** First, you need to enable the corresponding analog group in the **Main** page, page 85.

## Analog 1 to Analog 6 Page Description

								1.				- 1	-					1
Main	Discrete 1	Discrete 2	Discrete 3	Discrete 4	Analog 1	Analog 2	Analog 3	Ana	alog 4   A	Analog 5	Analo	og 6	Object I	nform	ation	Scripts	UDAs	Extension
Enab	le Analog Da	ta: 🔒 🛛 📝	Descript	ions:			8	<b>V</b>	Format:	8	🥑 е	:U:	8	4	Style:	ß		
		√ Data 1	Device i	nformation;[	3082]Inforr	nación Disp	ositivo								PV		*	
		√ Data 2	Remote	indications 0	;[3082]Tele	eserizalizaci	ón 0		0		1				PV		-	
		√ Data 3	Remote	indications 1	;[3082]Tele	eserizalizaci	ón 1		0		1				PV		-	
		🗸 Data 4	Remote	indications 2	;[3082]Tele	eserizalizaci	ón 2		0		1				PV		-	
		√ Data 5	Remote	indications 3	;[3082]Tele	eserizalizaci	ón 3		0		1				PV		-	
		🗸 Data 6	Intensit	y phase 1;[3	082]Intensi	idad fase 1			0		1	A			PV		-	
		√ Data 7	Intensit	y phase 2;[3	082]Intensi	idad fase 2			0			A			PV		-	
		√ Data 8	Intensit	y phase 3;[3	082]Intensi	idad fase 3			0		1	A			PV		-	
		√ Data 9	Amount	of residual ir	ntensity;[30	82]Cantida	d de Inten	sidad	0			A			PV		-	
		√ Data 10	) Intensit	y phase 1;[3	082]Intensi	idad fase 1			0			A			PV		-	
		Data 11	1								-i				No D	ata	-	
		Data 12	2												No D	ata	-	

Customized References (only if Suffix is left on blank):

1:		 £ 📝
2:		 £ 💡
3:		 £ 📝
4:		 £ 💡
5:		 £ 📝
6:		 £ 💡
7:		 £ 📝
8:		 £ 💡
9:		 £ 📝
10:		 £ 💡
	-	

#### Suffix for Auto References:

_SEPAM_CFG.Info	ß	1
_SEPAM_IO80.TS0		4
_SEPAM_IO80.TS1		4
_SEPAM_IO80.TS2		4
_SEPAM_IO80.TS3		4
_SEPAM_MEA.CurrentI1	6	4
_SEPAM_MEA.CurrentI2	8	1
_SEPAM_MEA.CurrentI3	ß	1
_SEPAM_MEA.ResidualCurrentSum	8	Y
_SEPAM_MEA.ResidualCurrentMeasured	8	1

Element	Description	
Descriptions	Description of the analog data. The text is displayed in the subtabs (1 to 6) of the corresponding analog data tab of device faceplates, page 62.	
	<b>NOTE:</b> The descriptions can be entered in multiple languages, page 40.	
Format	Specify the number format of analog data to be displayed in faceplate tabs.	
	<b>NOTE:</b> For configuration purposes, the decimal separator must be <b>Dot</b> (.) and not any other type of separator, for example, <b>Comma</b> (,). The run-time will use the configured language settings of the local system.	
EU	Specify the engineering unit of analog data to be displayed in faceplate tabs.	
Format	Select the style from the menu:	
	PV: Present value style	
	SP: Setpoint style	
	OP: Output style	
	Alarm Code: Alarm style	
	• No Data: The analog data is not displayed in the faceplate	
Customized References	Specify a variable reference if the automatic referencing mechanism is not used.	
Suffix for Auto References	Variable reference of the control resource for each analog data.	

# **Common Configuration Pages**

## What's in This Chapter

Attributes Page	
Scripts Page	
Object Information Page	90

## **Overview**

This chapter provides an overview of the standard ArchestrA IDE configuration pages that are common to master templates of the library.

## **Attributes Page**

#### **Overview**

Use the Attributes page to:

- · List the attributes associated with a template or instance.
- Add attributes to a template or instance.
- Configure the parameters of core functions of the object (attributes with the Param. prefix). The object-specific parameters are described in the chapter documenting each master template.
- Configure the aliases, if needed (attributes with the .Alias suffix). The control/supervision relationship that is configured by default in master templates is described in the chapter documenting each master template.
- Configure extendable attributes.
- · Configure features such as state alarms.
  - **NOTE:** The necessary **I/O** features are already preconfigured in the master templates.

For more information about attribute configuration, refer to the ArchestrA IDE help.

## **Me Suffix of Attributes**

The *Me* suffix in an attribute means that the attribute is owned by the object. That is, the attribute does not come from the field.

Such attributes may point to another attribute of the same object; otherwise, they are calculated based on various information coming from the field, operators, and so on.

## **AO Attributes**

The AO element in the syntax of an attribute means that the attribute is calculated.

Such attributes may be calculated by using scripts or by pointing to another attribute of the same object for clarity and flexibility.

## **Scripts Page**

## **Description**

The Scripts page contains scripts associated with the object, for example:

Script to summarize statuses.

• Script to calculate attributes.

•

- Script to evaluate abnormal conditions.
- Script to calculate references.
- For more information about scripts, refer to the ArchestrA IDE help.

**NOTE:** This page does not require further configuration but you can add your own scripts.

## **Object Information Page**

#### **Overview**

The **Object Information** page provides general information about an object, its configuration, and dependencies.

## **Object Description**

The description that you enter in the **Description** field is displayed on the faceplate of the object.

NOTE: You can enter descriptions in multiple languages, page 40.

# **System and Device Integration Objects**

## What's in This Part

\$aAppEngineGP: Application Engine	92
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\$aOPCClientGP: OPC Client	96
\$aRedundantDIObjectGP: Redundant Communication Object	
Diagnosis	98

#### **Overview**

This part describes system and device integration objects, and the diagnostic functions that they provide.

Schneider Electric provides the templates described in this document. These templates can be used in various applications to minimize engineering efforts but the use, integration, configuration, and validation of the system is the sole responsibility of the user. Said user must ensure the safety of the system as a whole by performing a safety analysis, including the resources provided by Schneider Electric through procedures that the user deems appropriate.

## **A**WARNING

#### LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA) of your application, and apply preventive and detective controls before implementation.
- Provide a fallback state for undesired control events or sequences.
- Provide separate or redundant control paths wherever required.
- Supply appropriate parameters, particularly for limits.
- Review the implications of transmission delays and take actions to mitigate.
- Review the implications of communication link interruptions and take actions to mitigate.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and fault conditions) according to the safety analysis and applicable codes, and regulations.
- Apply local accident prevention and safety regulations and guidelines.<sup>1</sup>
- Test each implementation of this library for proper operation before placing it into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

<sup>1</sup> For additional information, refer to NEMA ICS 1.1 (latest edition), Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control and to NEMA ICS 7.1 (latest edition), Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems or their equivalent governing your particular location.

# *\$aAppEngineGP*: Application Engine

## What's in This Chapter

Supervision Functions	
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# **Supervision Functions**

## Description

The *\$aAppEngineGP* master template provides the following functions:

- Viewing and setting the scan state of the application engine.
- Viewing the application engine status.
- Viewing redundancy information and status.
- Alarm management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

# Parameters

## **Parameter Configuration**

The default values of parameters of the *\$aAppEngineGP* master template are the same as those of the *\$aAppEngineGP* template.

However, the *\$aAppEngineGP* master template contains attributes and scripts, which are configured to allow monitoring data related to the application engine.

The configurable parameters associated to attributes are described in this topic.

# **Default State Alarms**

## **State Alarms for Application Engines**

The table indicates for which attributes a state alarm is configured in the *\$aAppEngineGP* master template and provides the default values.

Attribute	Alarm message	Priority
Redundancy.AO.StandbyUnavailable.Condition	Standby Unavailable	250
Redundancy.AO.StandbyNotReady.Condition	Standby Not Ready	250

**NOTE:** You can modify the configuration from the **Attributes** page.

## **Graphic Representation**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

## **Symbol Description**

The table describes the symbols that are included in the *\$aAppEngineGP* master template to display data related to the application engine during operation.

Name	Graphic symbol	Description
Symbol	PSxAppEngine_001	<ul> <li>Displays the application engine icon and to the right, the instance name by using:</li> <li>Element style User_Defined_06 if Scan State is set to On.</li> <li>Element style User_Defined_07 if Scan State is set to Off.</li> </ul>

# \$aAreaGP and \$aAreaRootGP: Areas

## What's in This Chapter

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# **Supervision Functions**

## Description

The *\$aAreaGP* and *\$aAreaRootGP* master templates provide the following functions:

- Viewing and setting the scan state for instances assigned to the area.
- · Viewing the status of alarms for instances assigned to the area.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

# Parameters

## **Parameter Configuration**

The default values of parameters of the *\$aAreaGP* and *\$aAreaRootGP* master templates are the same as those of the *\$aAreaGP* template.

However, the *\$aAreaGP* and *\$aAreaRootGP* master templates contain attributes and scripts, which are configured to allow monitoring data related to the area.

The configurable parameters associated to attributes are described in this topic.

You can modify the parameter values in the derived application template or in its instances.

## **Parameter Description**

The table describes the parameters that are defined as part of the *\$aAreaGP* and *\$aAreaRootGP* master template attributes.

Name	Data type	Initial value	Description
Param.EnablePESLink	Boolean	False	<b>NOTE:</b> The feature that you can configure by using this parameter is not supported in this version of the library. This EcoStruxure Process Expert feature is only available when the object is used.

# **Default State Alarms**

## **State Alarms for Areas**

No state alarms are configured for attributes of the *\$aAreaGP* and *\$aAreaRootGP* master templates.

**NOTE:** You can modify the configuration from the **Attributes** page.

## **Graphic Representation**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

## **Symbol Description**

The table describes the symbols that are included in the *\$aAreaGP* and *\$aAreaRootGP* master templates to display data related to areas during operation.

Name	Graphic symbol	Description
Symbol	C11Column	<ul> <li>Displays the area icon and to the right, the instance name by using:</li> <li>Element style User_Defined_06 if Scan State is set to On.</li> <li>Element style User_Defined_07 if Scan State is set to Off.</li> </ul>

# \$aOPCClientGP: OPC Client

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## **Supervision Functions**

## Description

The *\$aOPCClientGP* master template provides the following functions:

- Viewing and setting the scan state of the OPC client.
- Viewing the connection and related alarm status.
- Viewing scan group information.
- Alarm management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

## **Parameters**

## **Parameter Configuration**

The default values of parameters of the *\$aOPCClientGP* master template are the same as those of the *\$OPCClientGP* template.

However, the *\$aOPCClientGP* master template contains attributes and scripts, which are configured to allow monitoring data related to the OPC client.

You can modify the configuration in the derived application template or in its instances.

**NOTE:** No configurable parameters (attributes with the *Param.* prefix) are associated to attributes of the *\$aOPCClientGP* master template.

## **Default State Alarms and Additional Alarm Conditions**

## **Overview**

In the *\$aOPCClientGP* master template, alarms related to core supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain parameters of the **General** page are associated to alarms.

You can manage the alarms from the alarms tab of the faceplate during operation.

## **State Alarms for OPC Clients**

The table indicates for which attributes a state alarm is configured in the *\$aOPCClientGP* master template and provides the default values.

Attribute	Alarm message	Priority
AO.ScanGroupAlarm	Off Scan Alarm	500

**NOTE:** You can modify the configuration from the **Attributes** page.

## **Additional Alarm Conditions for OPC Clients**

The table indicates the parameters to which an alarm is associated by default in the *\$aOPCClientGP* master template.

Parameter	Alarm message	Priority
Detect connection alarm	OPC Server Connection	250

NOTE: You can modify the configuration from the General page.

## **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

## **Symbol Description**

The table describes the symbols that are included in the *\$aOPCClientGP* master template to display data related to OPC clients during operation.

Name	Graphic symbol	Description
aOPCClientGP	PSxOPCClient_001	<ul> <li>Displays the OPC client icon and to the right, the instance name by using:</li> <li>Element style User_Defined_06 if Scan State is set to On.</li> <li>Element style User_Defined_07 if Scan State is set to Off.</li> </ul>

# *\$aRedundantDIObjectGP*: Redundant Communication Object Diagnosis

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## **Supervision Functions**

## Description

The \$aRedundantDIObjectGP master template provides the following functions:

- Viewing the status of redundant communication objects (sources).
- Switching between primary and backup communication objects.
- Viewing the connection and related alarm status.
- Viewing scan group information.
- Alarm management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

## **Parameters**

#### **Parameter Configuration**

The default values of parameters of the *\$aRedundantDIObjectGP* master template are the same as those of the *\$aRedundantDIObjectGP* template.

However, the *\$aRedundantDIObjectGP* master template contains attributes and scripts, which are configured to allow monitoring data related to redundant communication objects.

You can modify the configuration in the derived application template or in its instances.

**NOTE:** No configurable parameters (attributes with the *Param.* prefix) are associated to attributes of the *\$aRedundantDIObjectGP* master template.

## **Default State Alarms and Additional Alarm Conditions**

#### **Overview**

In the *aRedundantDIObjectGP* master template, alarms related to core supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain parameters of the **General** page are associated to alarms.

You can manage the alarms from the alarms tab of the faceplate during operation.

## State Alarms for Redundant Communication Object Diagnosis

The table indicates for which attributes a state alarm is configured in the *\$aRedundantDIObjectGP* master template and provides the default values.

Attribute	Alarm message	Priority
AO.ConnectionAlarm	OPC Server Connection	250
AO.ScanGroupAlarm	Off Scan Alarm	500
AO.SwitchoverAlarm	Switchover Alarm	500

**NOTE:** You can modify the configuration from the **Attributes** page.

#### **Additional Alarm Conditions**

By default, no additional alarm conditions are configured for the *\$aRedundantDIObjectGP* master template.

**NOTE:** You can modify the configuration from the **General** page.

## **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

## **Symbol Description**

The table describes the symbols that are included in the *\$aRedundantDIObjectGP* master template to display data related to redundant communication objects during operation.

Name	Graphic symbol	Description
symbol	PSxOPCClient_002	<ul> <li>Displays the redundant communication icon and to the right, the name of the redundant communication object being monitored (active source) by using:</li> <li>Element style User_Defined_06 if Scan State is set to On.</li> <li>Element style User_Defined_07 if Scan State is set to Off.</li> </ul>

# **Signal Processing**

## What's in This Part

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#### **Overview**

This part describes the master templates that provide the supervision functions for the signal processing family.

Schneider Electric provides the templates described in this document. These templates can be used in various applications to minimize engineering efforts but the use, integration, configuration, and validation of the system is the sole responsibility of the user. Said user must ensure the safety of the system as a whole by performing a safety analysis, including the resources provided by Schneider Electric through procedures that the user deems appropriate.

## **A**WARNING

#### LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA) of your application, and apply preventive and detective controls before implementation.
- Provide a fallback state for undesired control events or sequences.
- Provide separate or redundant control paths wherever required.
- Supply appropriate parameters, particularly for limits.
- · Review the implications of transmission delays and take actions to mitigate.
- Review the implications of communication link interruptions and take actions to mitigate.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and fault conditions) according to the safety analysis and applicable codes, and regulations.
- Apply local accident prevention and safety regulations and guidelines.<sup>1</sup>
- Test each implementation of this library for proper operation before placing it into service.

# Failure to follow these instructions can result in death, serious injury, or equipment damage.

<sup>1</sup> For additional information, refer to NEMA ICS 1.1 (latest edition), *Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control* and to NEMA ICS 7.1 (latest edition), *Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems* or their equivalent governing your particular location.

# *\$AnalogInputCE*: Analog Inputs with Configurable Range

## What's in This Chapter

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## **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of analog inputs with configurable range.

## **Supervision Functions**

## Description

Core and optional resources provide the following monitoring and operation functions:

- Main core functions encompass input monitoring, Override, Maintenance mode, and the configuration of range-related parameters (in engineering units).
- Optional alarm function allows you to monitor level setpoints (very-high, high, low, and very-low) in engineering units, a setpoint used as a reference for deviation alarm evaluation, and a setpoint indicating the maximum deviation allowed (in engineering units).

You can activate/deactivate the detection of each alarm during operation.

These functions are implemented in runtime through symbols and their associated faceplate.

## **Parameters**

## **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The table describes the parameters that are defined as part of the *\$AnalogInputCE* master template attributes.

Name	Туре	Initial value	Description
Param. ContainerDesc	Bool	False	<i>True</i> = The description of the master template that contains a derivation of this template is used.
			NOTE: The parameter is only used when the template is contained in another template. For example, the <i>\$MValvewithPosCE</i> master template contains a derivation of <i>\$AnalogInputCE</i> .
Param.EngUnits	String	olo	Unit of the output value.
Param.NumFormat	String	0.00	Specifies the display format of values.
			For example, enter 0.00 to display 2 decimals.
Param. TrendPeriodMin	Integer	15	Refer to the description of this parameter that is documented for \$AnalogInputCE.

**NOTE:** Param.EngUnits and Param.NumFormat will be generated by Assetlins.

## **Default State Alarms**

## State Alarms for Analog Inputs With Configurable Range

The table indicates for which attributes a state alarm is configured in the *\$AnalogInputCE* master template and provides the default values.

Attribute	Alarm message	Priority
AInput1.St.AD	Deviation	500
AInput1.St.AHH	High High	250
AInput1.St.AH	High	500
AInput1.St.AL	Low	500
AInput1.St.ALL	Low Low	250
AInput1.St.BadSt	Bad Quality	250

**NOTE:** You can modify the configuration from the **Attributes** page.

## **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

## **Symbol Description**

The table describes the symbols that are included in the *\$AnalogInputCE* master template to display data of analog inputs with configurable range during operation.

Name	Graphic symbol	Description
Bar_Horiz_PV	WI1101 322.0	Displays the label, a horizontal bar with engineering units, and present value (PV).
Bar_Horiz_PV_SP	WI1101 322.0 500.0	Displays the label, a horizontal bar with engineering units, present value (PV), and setpoint (SP).
Bar_Vert_PV	WI1101	Displays the label, a vertical bar with engineering units, and present value (PV).
Bar_Vert_PV_SP	WI1101	Displays the label, a vertical bar with engineering units, present value (PV), and setpoint (SP).
Bar_Vert_PV_SP_ Trend	WI1101	Displays the label, a vertical bar with engineering units, present value (PV), and setpoint (SP). In addition, the symbol displays trends and allows you to select the trend period in minutes. Refer to the description of the <i>Param</i> . <i>TrendPeriodMin</i> parameter of the master template.
Bar_Vert_PV_Trend	WI1101	Displays the label, a vertical bar with engineering units, and present value (PV). In addition, the symbol displays trends and allows you to select the trend period in minutes. Refer to the description of the <i>Param</i> . <i>TrendPeriodMin</i> parameter of the master template.
Indicator_PV	WI1101 322.0	Displays the label, engineering units, and present value (PV).
Indicator_PV_SP	WI1101 322.0 500.0	Displays the label, engineering units, present value (PV), and setpoint (SP).
Label	PSxLabel	Displays the ObjectTagName, StaticText and CustomPropertyLabel.

**NOTE:** The optional alarm, setpoint, and deviation levels appear in bar graphs only when enabled in the operation tab of the faceplate. At the same time, the corresponding trends are also displayed in symbols, which feature a trend panel.

## **Faceplates**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

## **Available Tabs**

During operation, clicking an analog input symbol opens a faceplate with the following tabs:

- Operation with optional analog alarm management section.
- Engineering
- Alarms, page 64

NOTE: The master template also features the trends faceplate.

## **Operation Tab**

The figure shows an example of the **Operation** tab.

WI1101 Reactive weight in T	[11		٢
<b>0.00</b> 400.00	j		_
Alarm	En	Setpoint	_
High High:	✓	900.00	
High:	1	800.00	
SP:	✓	400.00	
Deviation:		120.00	
Low:	✓	200.00	
Low Low:	✓	100.00	
	Ар	ply	

The **En** check boxes allow you to enable or disable the evaluation of level alarms at the controller level. Select or unselect the corresponding check box and click **Apply**.

## **Engineering Tab**

S A	
	Kq
High Range:	0.0
Low Range:	0.0
Bad PV	
Dadi V.	Ka
Cut Off:	0.0
Mode:	Normal ~
	Kg
Override Value:	0.0
Input Value:	Кд 0.0

The figure shows an example of the **Engineering** tab.

**NOTE:** This tab features the **Simulation** menu, which allows setting the control module to simulation mode.

In addition, the tab may feature another menu or text field, which allows you to configure the state or value to be simulated.

Enabling the simulation mode underlies a security classification, page 79. The default configuration is *tune*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

**NOTE:** Input Value: If external PV is enable from the control, then input value is equal to external PV. If external PV is disable from the control, then input value is equal to channel value.

# *\$AnalogOutputCE*: Analog Outputs

## What's in This Chapter

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Faceplates

## **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of analog outputs.

## **Supervision Functions**

## Description

Core and optional resources provide the following monitoring and operation functions:

- Main core functions encompass setpoint management, owner selection, simulation mode, resetting, and global bypassing of interlock conditions.
- Optional functions encompass a local panel and individual interlock condition management.

These functions are implemented in runtime through symbols and their associated faceplate.

## **Parameters**

## **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

## **Parameter Description**

The table describes the parameters that are defined as part of the *\$AnalogOutputCE* master template attributes.

Parameter	Туре	Default	Description
Param.EngUnits	String	010	Engineering unit of attributes.
Param.HiOP	Float	100.0	High limit for the output value.
Param.LoOP	Float	0.0	Low limit for the output value.
Param.ModeNormal	String	0, P, C	Specifies the normal owner modes (separated by a comma): • O: Operator • P: Program • C: Cascade For example P, C.

Parameter	Туре	Default	Description
Param.NumFormat	String	0.0	Specifies the displaying format of values.
			For example, enter 0.00 for 2 decimals.
Param. TrendPeriodMin	Integer	0	Refer to the description of this parameter that is documented for <i>\$AnalogOutputCE</i> .

## **Default State Alarms**

#### **State Alarms for Analog Outputs**

The table indicates for which attributes a state alarm is configured in the *\$AnalogOutputCE* master template and provides the default values.

Attribute	Alarm message	Priority
AOutput.St.BadSt	Channel Failure	500

NOTE: You can modify the configuration from the Attributes page.

## **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### **Three-Way Valve Symbol Naming Convention**

For analog outputs represented as three-way valve symbols, the naming convention is as follows:

Valve type\_Valve orientation\_Inlet position\_Port normally open.

For example, V3V\_Horiz\_Down\_Left means:

- Three-way valve.
- Shown horizontally.
- Inlet positioned downwards.
- The left-hand port is normally open.

#### **Three-Way Valve Symbol Graphic Convention**

For operator convenience, the graphic convention for analog outputs represented as three-way valve symbols is as follows:

- The inlet is shown fully filled independently of the position of the valve.
- The area of the outlets that is shown filled gives an indication of the position of the valve. The filled area shows approximately how much each port is open.

The example shows a V3V\_Horiz\_Left\_Down symbol representing a three-way valve 60% open. The normally open *Down* port is shown 40% filled (40% open) and the normally closed *Right* port 60% filled (60% open).



## Representation

In addition to icons, the symbols display:

- The label.
- The trend client icon to open the trends faceplate.
- A bar graph showing the setpoint and the present valve position.
- The setpoint value with engineering units.
- States, shown in a square, page 45.
- The owner mode if it is detected as an abnormal situation, page 43.

The table describes the symbols that are included in the *\$AnalogOutputCE* master template to display data of analog outputs as two-way valves during operation.

Name	Graphic symbol	Description
V2V_Horiz	FCV1004	Two-way control valve shown horizontally
V2V_Vert_Left	FCV1004	Two-way control valve shown vertically
V2V_Vert_Right	FCV1004	Two-way control valve shown vertically
Label	PSxLabel	Displays the <b>ObjectTagName</b> , StaticText and CustomPropertyLabel.

**NOTE:** For two-way valve symbols, both ports are shown fully filled as soon as the setpoint > 0.

The table describes the symbols that are included in the *\$AnalogOutputCE* master template to display data of analog outputs as three-way valves during operation.
Name	Graphic symbol
V3V_Horiz_Down_Left	FCV1004
V3V_Horiz_Down_Right	FCV1004
V3V_Horiz_Left_Down	FCV1004
V3V_Horiz_Left_Right	FCV1004
V3V_Horiz_Right_Down	FCV1004
V3V_Horiz_Right_Left	FCV1004 25.00%
V3V_Vert_Down_Right	FCV1004 25.00%
V3V_Vert_Down_Up	FCV1004 25.00%

L

Name	Graphic symbol
V3V_Vert_Right_Down	FCV1004 25.00%
V3V_Vert_Right_Up	FCV1004
V3V_Vert_Up_Down	FCV1004 25.00%
V3V_Vert_Up_Right	FCV1004 25.00%

# **Faceplates**

### **Overview**

During operation, clicking the graphic symbol allows you to display a faceplate with the following tabs:

- Standard tabs:
  - Operation with optional local panel, page 55
  - Engineering
  - Alarms, page 64
- Optional tab:
  - Interlocks, page 56

NOTE: The master template also features the trends faceplate.

### **Operation Tab**

The figure shows an example of the **Operation** tab.

FCV1004 Water dosing valve	D10		٢
r			
¥	0.0%		
Owner:	Program	~	
Setpoint Mode:	Local		
Setpoint:		0 %	

### **Engineering Tab**

The figure shows an example of the **Engineering** tab.

	Â		
Mode	Normal		
Wode.		-	
Interlock Bypass:	Normal	Ý	
Service:	In Service	¥	

**NOTE:** This tab features the **Interlock Bypass** menu, which allows bypassing interlocks globally.

When the control module is reset, the current setpoint that is shown in the operation tab of the faceplate is effective.

Bypassing interlocks by selecting **Bypass** underlies a security classification, page 79. The default configuration is *verified write*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

# **\$DigitalInputCE:** Digital Inputs

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# **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of digital inputs.

# **Supervision Functions**

### Description

Core and optional resources provide the following monitoring and operation functions:

- Main core functions encompass setpoint management, alarm configuration, enabling/disabling of alarm, and simulation mode.
- Optional functions allow you to track operating hours and switching operations.

These functions are implemented in runtime through symbols and their associated faceplate.

# **Parameters**

### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

### **Parameter Description**

The table describes the parameters that are defined as part of the *\$DigitalInputCE* master template attributes.

Parameter	Туре	Initial value	Description
Param. AlarmEnable	Bool	True	If true, the alarm evaluation at the supervision level is enabled.
			If false, the alarm evaluation at the supervision level is disabled.
			<b>NOTE:</b> The alarm signal is not interpreted as an alarm at the supervision level but it continues being evaluated at the controller level. It is useful for signals to be monitored but not associated to an alarm.
Param. BadStEnable	Bool	True	If true, the diagnostic status of the channel, indicated by the <b>Channel Failure</b> alarm, is enabled.
			If false, the diagnostic status of the channel is disabled.
Param. ContainerDesc	Bool	False	<i>True</i> = The description of the master template that contains a derivation of this template is used.
			<b>NOTE:</b> The parameter is only used when the template is contained in another template. For example, the <i>\$MValveCE</i> master template contains a derivation of <i>\$DigitalInputCE</i> .

# **Default State Alarms**

#### **State Alarms for Digital Inputs**

The table indicates for which attributes a state alarm is configured in the *\$DigitalInputCE* master template and provides the default values.

Attribute	Alarm message	Priority
AO.Alarm	Digital Alarm	999
AO.BadSt	Channel Failure	500

**NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### **Description**

This table describes the symbols available for representing the digital inputs:

Name	Graphic symbol	Description
AlarmText	LSL1001 Digital Input	Alarm text
Arrow_H	LSL1001	Arrow with the label above
	5/	

Name	Graphic symbol	Description
Arrow_V	LSL1001	Arrow with the label on the right
Bullet_H	LSL1001	Bullet with the label above
Bullet_V	O LSL1001	Bullet with the label on the right
EmergencyStop_H	LSL1001	Stop button with the label above
EmergencyStop_V	() LSL1001	Stop button with the label on the right
PressureLimit	LSL1001	Pressure limit switch
ElectricalSwitch_H_ Thin	LSL1001	Electrical switch represented horizontally
ElectricalSwitch_V_ Thin	LSL1001	Electrical switch represented vertically
TemperatureLimit	LSL1001	Temperature limit switch
Label	PSxLabel	Displays the ObjectTagName, StaticText and CustomPropertyLabel.

# **Faceplates**

### Overview

During operation, clicking the graphic symbol allows you to display a faceplate with the following tabs:

- Standard tabs:
  - Operation
  - Engineering
  - Alarms, page 64
- Optional tab:
  - Maintenance, page 61

### **Operation Tab**

The figure shows an example of the **Operation** tab.

L O	SL1001 Ixidant low level D10	)		٢
	Status:	Off		]
	Alarm	En	Alarm Setpoint	
	Alarm State:	1	On	

The **En** check box allows you to enable/disabe the evaluation of the alarm at the controller level.

#### **Engineering Tab**

The figure shows an example of the Engineering tab.

$\odot$ 2 $\triangle$	
Mode:	Normal ~
Override Value:	Off v
Input Value:	OFF

**NOTE:** This tab features the **Simulation** menu, which allows setting the control module to simulation mode.

In addition, the tab may feature another menu or text field, which allows you to configure the state or value to be simulated.

Enabling the simulation mode underlies a security classification, page 79. The default configuration is *tune*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

**NOTE:** Input Value: Indicates the channel value.

# *\$DigitalOutputCE*: Digital Outputs

### What's in This Chapter

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## **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of digital outputs.

# **Supervision Functions**

### Description

Core and optional resources provide the following monitoring and operation functions:

- Main core functions encompass owner selection, setpoint management, global bypassing of interlock conditions.
- Optional functions encompass individual interlock condition management, tracking of operating hours and switching operations.

These functions are implemented in runtime through symbols and their associated faceplate.

# **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

### **Parameter Description**

This table describes the parameters of the automation object:

Parameter	Туре	Default	Description
Param. ModeNormal	String	0, P, C	Specifies the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> <li>C: Cascade</li> </ul> For example P, C.

### **Default State Alarms**

### **State Alarms for Digital Outputs**

The table indicates for which attributes a state alarm is configured in the *\$DigitalOutputCE* master template and provides the default values.

Attribute	Alarm message	Priority
DOutput.St.BadSt	Channel Failure	500

NOTE: You can modify the configuration from the Attributes page.

## **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### **Description**

This table describes the symbols available for representing the digital outputs:

Name	Graphic symbol	Description
Electrical_Switch_H_Thin	HS1001	Electrical switch represented horizontally
Electrical_Switch_V_Thin	HS1001	Electrical switch represented vertically
StatusIndicator_H	HS1001	Status indicator with the label above
StatusIndicator_V	O HS1001	Status indicator with the label on the right
Label	PSxLabel	Displays the <b>ObjectTagName</b> , <b>StaticText</b> and <b>CustomPropertyLabel</b> .

## **Faceplates**

#### **Overview**

During operation, clicking the graphic symbol allows you to display a faceplate with the following tabs:

- Standard tabs:
  - Operation
  - Engineering
  - Alarms, page 64

- Optional tab:
  - Interlocks, page 56
  - Maintenance, page 61

### **Operation Tab**

#### The figure shows an example of the **Operation** tab.

H \$1001 D10 lamp	۲	
Output:	Off	
Owner:	Program ~	
Setpoint Mode:	Local	
Setpoint:	Off ~	

### **Engineering Tab**

The figure shows an example of the **Engineering** tab.

	Â	
		7
Mode:	Normal	
Interlock Bypass:	Normal ~	
Service:	In Service ~	

**NOTE:** This tab features the **Interlock Bypass** menu, which allows bypassing interlocks globally.

When the control module is reset, the current setpoint that is shown in the operation tab of the faceplate is effective.

Bypassing interlocks by selecting **Bypass** underlies a security classification, page 79. The default configuration is *verified write*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

# \$AnalogInMultiCE: Multiple Analog Inputs

#### What's in This Chapter

Supervision Functions	119
Parameters	
Default State Alarms	120
Graphic Representation	120
Faceplates	

### **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of multiple analog inputs (up to 4) with configurable range.

## **Supervision Functions**

#### **Description**

Core resources provide the following monitoring and operation functions:

- Monitoring of up to four analog inputs
- Owner selection
- Simulation mode
- Configuration of parameters: High/Low Range, Bad PV, Cut Off values
- Selection of one input signal based on one of these predefined criteria:
  - First present value
  - Direct selection of input signal
  - Median
  - Average
  - Minimum
  - Maximum

These functions are implemented in runtime through symbols and their associated faceplate.

### **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The table describes the parameters that are defined as part of the *\$AnalogInMultiCE* master template attributes.

Parameter	Туре	Default	Description
Param.EngUnits	String	90	Defines the engineering unit of attributes.
Param.ModeNormal	String	0, P	Specifies the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> <li>C: Cascade</li> </ul> <li>For example P, C.</li>
Param.NumFormat	String	0.00	Specifies the display format of values. For example, enter 0.00 to display 2 decimals.
Param. TrendPeriodMin	Integer	15	Refer to the description of this parameter that is documented for \$ <i>AnalogInputCE</i> .

## **Default State Alarms**

### **State Alarms for Multiple Analog Inputs**

The table indicates for which attributes a state alarm is configured in the *\$AnalogInMultiCE* master template and provides the default values.

Attribute	Alarm message	Priority
MAInput1.Cfg.PV1Fail	PV1 Channel Failure	250
MAInput1.Cfg.PV2Fail	PV2 Channel Failure	250
MAInput1.Cfg.PV3Fail	PV3 Channel Failure	250
MAInput1.Cfg.PV4Fail	PV4 Channel Failure	250
MAInput1.St.BadSt	Selected Channel Failure	250
MAInput1.St.DevAlm	Deviation Fail	500

**NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

### Representation

The table describes the symbols that are included in the *\$AnalogInMultiCE* master template to display data of multiple analog inputs during operation.

Name	Graphic symbol	Description
Bar_Horiz_PV	TI1100 0.00	Displays the label, a horizontal bar with engineering units, and present value (PV).
Bar_Vert_PV	TI1100	Displays the label, a vertical bar with engineering units, and present value (PV).
Bar_Vert_PV_ Trend	TI1100	Displays the label, a vertical bar with engineering units, and present value (PV). In addition, the symbol displays trends and allows you to select the trend period in minutes. Refer to the description of the <i>Param</i> . <i>TrendPeriodMin</i> parameter of the master template.
Indicator_PV	TI1100 0.0	Displays the label, engineering units, and present value (₽⊽).
Label	PSxLabel	Displays the ObjectTagName, StaticText and CustomPropertyLabel.

# **Faceplates**

#### **Overview**

During operation, clicking the graphic symbol allows you to display a faceplate with the following tabs:

Standard tabs:

•

- Operation
- Engineering
- Alarms, page 64

**NOTE:** The master template also features the trends faceplate.

### **Operation Tab**

AnalogInMulti Multiple Analog Input example		
39.08 <sup>%</sup>		
Present Value 1:	39.08	
Present Value 2:	41.77	
Present Value 3:	46.41	
Present Value 4:	48.85	
Owner:	Program v	_
Selection Mode:	Local	
Selection:	~	

The **Selection** drop-down list allows you to select the following input signal:

- First present value
- Present value 1
- Present value 2
- Present value 3
- Present value 4
- Median
- Average
- Minimum
- Maximum

### **Engineering Tab**

0 1	
High Range:	% 0.0 %
Low Range:	0.0
Bad PV:	0.0
Cut Off:	0.0
Mode:	Normal ~
Override Value:	0.0

**NOTE:** This tab features the **Simulation** menu, which allows setting the control module to simulation mode.

In addition, the tab may feature another menu or text field, which allows you to configure the state or value to be simulated.

Enabling the simulation mode underlies a security classification, page 79. The default configuration is *tune*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

# **\$TotalCE:** Totalizing Function

#### What's in This Chapter

Supervision Functions	
Parameters	
Default State Alarms	
Graphic Representation	
Faceplates	

### **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of totalizing function.

## **Supervision Functions**

#### Description

The *\$TotalCE* master template provides the following monitoring and operation functions:

- Core functions:
  - Command management.
  - Owner selection.
  - Totalizing.
  - Monitoring.
  - State Management
- Optional functions:
  - · Viewing, bypassing, and resetting of abnormal conditions.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

## **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The table describes the parameters that are defined as part of the *\$TotalCE* master template attributes.

Name	Data type	Initial value	Description
Param.EngUnits	String	EU	Defines the engineering unit of attributes.
Param.HiPV	Double	9999999- 999.0	Defines the high limit of the present value to scale the Y axis for trending.
Param.	Bool	False	If true, the <b>Hold</b> button is not displayed.
HIGHOIGBULLON			If false, the <b>Hold</b> button is displayed.
Param.	Bool	False	If true, the <b>Reset</b> button is not displayed.
HIDERESELBULLON			If false, the <b>Reset</b> button is displayed.
Param.	Bool	False	If true, the <b>Restart</b> button is not displayed.
ton			If false, the <b>Restart</b> button is displayed.
Param.	Bool	False	If true, the Start button is not displayed.
HideStartButton			If false, the Start button is displayed.
Param.	Bool	False	If true, the <b>Stop</b> button is not displayed.
HideStopButton			If false, the <b>Stop</b> button is displayed.
Param.LoPV	Double	0	Defines the low limit of the present value to scale the Y axis for trending.
Param.ModeNormal	String	O,P,C	Specifies the normal owner modes (separated
			• O: Operator
			• P: Program
			• C: Cascade
	Otaina		
Param. TotalModeNormal	String	1, R, H, S	(separated by a comma):
			• I: Idle
			• R: Running
			<ul> <li>s: Stopped</li> </ul>
			For example I, R, S.
Param.NumFormat	String	0.0	Specifies the display format of values.
			For example, enter 0.00 to display 2 decimals.
Param.	Integer	15	The parameter has two functions:
TrendPeriodMin			<ul> <li>It defines the trend period in minutes that is used by default.</li> </ul>
			<ul> <li>When you enter a value that is different from one of the five predefined values (5, 15, 30, 60, 120, which are displayed below the trend graph), your value replaces the 120 value.</li> </ul>
			For example, if you enter 45, the values that are displayed below symbols featuring a trend panel, page 102 are (from left to right) 45, 60, 30, 15, and 5.
			Range: 110080. (10080 = 1 week)
			<b>NOTE:</b> If the initial value is 0, the trend period that is used becomes 15 minutes but the predefined values that are displayed are unchanged.
Param. EnablePESLink	Boolean	False	<b>NOTE:</b> The features that you can configure by using these parameters are not
Param. PESExecutionDo- mainId	String	Blank	supported in this version of the library. These EcoStruxure Process Expert features are only available when the object is used
Param. PESProjectId	String	Blank	
Param. PESSystemId	String	Blank	

## **Default State Alarms**

### State Alarms for TOTAL

The table indicates an attribute for which a state alarm is configured in the *\$TotalCE* master template and provides the default values.

Attribute	Alarm message	Priority
Total.St.Alarm	Failure detected while totalizing	999

**NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

### **Symbol Description**

The table describes the symbols that are included in the *\$TotalCE* master template to display data of analog inputs during operation.

Name	Graphic symbol	Description
PanelWithButtons_PV_SP	Total Running 230004500.0 655000000.0 C	<ul> <li>Graphic symbol displays(from top to bottom):</li> <li>The label.</li> <li>Engineering units.</li> <li>To the right, a horizontal bar showing the present value and the setpoint.</li> <li>The present value.</li> <li>The setpoint value.</li> <li>The current state of the totalizer.</li> <li>Control buttons</li> </ul>
PanelWithButtons_PV	Total  Running  230004500.0  D  C	<ul> <li>Graphic symbol displays(from top to bottom):</li> <li>The label.</li> <li>Engineering units.</li> <li>To the right, a horizontal bar showing the present value.</li> <li>The present value.</li> <li>The current state of the totalizer.</li> <li>Control buttons</li> </ul>
Numeric_PV_SP	Total EU 23000450.0 40030000.0 √	<ul> <li>Graphic symbol displays(from top to bottom):</li> <li>The label.</li> <li>Engineering units.</li> <li>The present value.</li> <li>The setpoint value.</li> </ul>
Numeric_PV	Total 23000450.0 ∬ ■	<ul> <li>Graphic symbol displays(from top to bottom):</li> <li>The label.</li> <li>Engineering units.</li> <li>The present value.</li> </ul>

Name	Graphic symbol	Description
Bar_Vert_PV_SP	Total 560258.3 2000000.0 √	<ul> <li>Graphic symbol displays(from top to bottom):</li> <li>The label.</li> <li>Engineering units.</li> <li>A vertical bar showing the setpoint and the present value.</li> <li>The present value.</li> <li>The setpoint value.</li> </ul>
Bar_Vert_PV_SP_Trend	Total	Displays in addition to data of Bar_Vert_PV_SP, a trend panel with configurable trend period in minutes. Refer to the description of the Param. TrendPeriodMin parameter.
Bar_Horz_PV_SP	Total 560258.3 2000000.0 ∫	<ul> <li>Graphic symbol displays(from top to bottom):</li> <li>The label.</li> <li>Engineering units.</li> <li>To the right, a horizontal bar showing the setpoint and the present value.</li> <li>The present value.</li> <li>The setpoint value.</li> </ul>
Label	PSxLabel	Displays the ObjectTagName, StaticText and CustomPropertyLabel.

NOTE:

- The trends are displayed in the *Bar\_Vert\_PV\_SP\_Trend* symbol which feature a trend panel.
- When *AUTOSTART* input pin is high in unity, the start button disappears. This is applicable for Operator selection in faceplate also.
- When *AUTORESET* input pin is high in unity, the reset button disappears. This is applicable for Operator selection in faceplate also.

# **Faceplates**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

#### **Available Tabs**

During operation, clicking the graphic symbol opens a faceplate with the following tabs:

- Tabs for core functions:
- Operation
- Alarms, page 64
- Tabs for optional functions, which appear only if configured:
  - Detected failures, page 59

### **Operator Tab**

The figure shows an example of the **Operation** tab.

FQ1004 Water flow to D10 to	() otalizer
Status:	??????
EU NaN. 0.0	<u> </u>
Last Total:	NaN. EU
Owner:	Program v
Rollover:	Acknowledge

**NOTE:** The **Operator** tab features the control module **Acknowledge** button. This button is used to acknowledge the rollover indication (Rollover flag) in the control module.

# **\$LoadCellENOD4TCE - Scaime Weighing Module**

#### What's in This Chapter

Supervision Function	
Default State Alarms	
Graphic Representation	
Faceplate	

This chapter describes the supervision resources and runtime services that are available for the management of  $\$  DodCellENOD4TCE - Scaime Weighing Module.

### **Supervision Function**

Core resources provide monitoring and operation functions. Weighing functions like Zero, Tare, Preset tare, cancel tare, Device reset, Factory reset, diagnostic information management, resetting, owner selection.

These functions are implemented in runtime through a symbol and its associated faceplate.

## **Default State Alarms**

The table indicates for which attributes a state alarm is configured in the \$LoadCellENOD4TCE template and provides the default values:

Attribute	Alarm message	Priority
AO.Namur.CheckFunction	Function check	750
AO.Namur.Failure	Failure	500
AO.Namur.MaintenanceR	Maintenance Required	999
AO.Namur.OutOfSpecs	Out Of Specs	999

# **Graphic Representation**

#### **Graphical Representation**

The various types of symbols available in this template are illustrated in the table:

Sr No.	Name	Graphic Symbol	Description
1	Enod4T		Device Status: Namur Alarms

### **Faceplate**

During operation, clicking the graphic symbol allows you to display a faceplate with the following tabs:

- Operation
- Analog Data

- Discrete Data
- Alarms

### **Operator Tab**

#### The figure shows the operator tab.

ENOD4T1100	۲
Off	
Communications Disabled	1
Communications Failure	
Unknown status	
Not Ready	
Failure None	2
Management is a shall.	
warning [Measurement is not stable.	
Owner: Program   Reset	3
Owner:         Program         Reset           Command:	3
Owner:     Program     Reset       Command:        Device Status:	4
Owner:       Program       Reset         Command:          Device Status:          Gross Measurement:       0 g	4
Owner:       Program       Reset         Command:           Device Status:           Gross Measurement:       0 g       g         Net Measurement:       0 g       g	3 4 5

This tab provides information about the operator actions and the device information:

Item	Description
1	This section provides information about the device Communication and device status.
2	This section provides information about the latest alarms and alerts generated.
3	This section allows the operator to change the mode from Program mode to Operator mode or vice versa.
4	This section allows the operator to execute various weighing commands like Zero, Tare, Device Reset. This section also provides the current Device status.
	<b>NOTE:</b> Command combo becomes active only when it is in Operator mode.
5	This section displays the major weighing measurements like Gross, Net and Flow measurements.

NOTE: Command combo becomes active only when it is in Operator mode.

### Analog Tab

This tab provides information about the analog data of the device:

**Analog Tab 1:** Provides information of Weighing measurements like Gross & Net measurements.

### N 🔝	
1 2	
Gross Measurement	<b>0</b> g
Net Measurement	<b>0</b> g
TimeLCT 🗠 AlarmComm	ient ^
	$\sim$
<	>

Analog Tab 2: Provides information of detected Failure and Alerts codes.

#### JJ /	í.	
1 2		
Fail Code		1
Warning Code		16
L		
TimeLCT	AlarmCommer	nt ^
<		>

### **Discrete Tab**

This tab provides information about the digital data of the device:

Digital Tab 1: Provides information about the current device status

**** N A	
1 2 3	
Measurement is Stable  Measurement ok  Atleast one Tare is processed  EEPROM Ok	
TimeLCT 🛆 AlarmComment	^
<	~

### Digital Tab 2: Provide the Input channel status of eNod4T Module

**** N A	
1 2 3	
Digital Input IO Status	
Digital Input I1 Status	
Timel CT / Alexed Comment	~
AlarmComment	-
	$\vee$
S 3	

#### JJ 🔝	
1 2 3	
Output S0 Status	
Output S1 Status	
Output S2 Status	
Output S3 Status	
TimeLCT / AlarmComment	$\wedge$
	~
< >	

### **Alarm Tab**

Refer to Alarms Tab.

# **\$LoadCellPMESWTCE - Scaime weighing module**

#### What's in This Chapter

Supervision Function	
Default State Alarms	
Graphic Representation	
Faceplate	

### **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of \$LoadCellPMESWTCE - Scaime Weighing Module.

## **Supervision Function**

Core resources provide monitoring and operation functions. Weighing functions like Zero, Tare, Preset tare, cancel tare, Device reset, Factory reset, diagnostic information management, resetting, owner selection.

These functions are implemented in runtime through a symbol and its associated faceplate.

### **Default State Alarms**

The table indicates for which attributes a state alarm is configured in the <code>\$LoadCellPMESWTCE</code> template and provides the default values:

Attribute	Alarm message	Priority
AO.Namur.CheckFunction	Function check	750
AO.Namur.Failure	Failure	500
AO.Namur.MaintenanceR	Maintenance Required	999
AO.Namur.OutOfSpecs	Out Of Specs	999

# **Graphic Representation**

#### **Graphical Representation**

The various types of symbols available in this template are illustrated in the table:

Sr No.	Name	Graphic Symbol	Description
1	Genie		Device Status:
		∎ ®& &	Namur Alarms

## **Faceplate**

During operation, clicking the graphic symbol allows you to display a faceplate with the following tabs:

- Operation
- Analog Data
- Discrete Data
- Alarms

### **Operator Tab**

The figure shows the operator tab.

PMESWT1100 Scaime PMEWSWT Weighing Module		٢		
On				
Communicat	tions Disabled			1
Communicat	tions Failure			
Unknown sta	atus			
Not Ready	-			
Failure	Device not Healthy.			2
Warning	Measurement is not s	able.		
Owner:	Program		Depot	3
l			Reset	
Comm	and:		reset	4
Comm Preset	hand: Tare: 0	]	v	] 4
Comm Preset <sup>-</sup> Device St	and: Tare: 0 9 atus: None	]	v	] 4
Comm Preset Device Sta Gross Me	Tare: 0	]	Veser v	] 4 5
Comm Preset Device St Gross Me Net Me	aand: Tare: 0 s atus: None easurement: easurement:	3	Neser 0 g 0 g	] 4 5

This tab provides information about the operator actions and the device information:

Item	Description
1	This section provides information about the device Communication and operation status.
2	This section provides information about the latest alarms and alerts generated.
3	This section allows the operator to change the mode from Program mode to Operator mode or vice versa.
4	This section allows the operator to execute various weighing commands like Zero, Tare, Preset Tare and also allows the operator to specify the Preset tare value in prior to executing Preset Tare command. This section also provides the current Device status
5	This section displays the major weighing measurements like Gross, Net and Flow measurements.

#### The figure shows the extended operator tab

<u>Г тт Л</u>	Â		
			6
Enable d	osing:		
Comm	ands:		~
I	Logic:	Negative	~
1	Mode:	CF	~
Dire	ection:	Unloading	~
Con	npare:	Net	~
Coarse Feed Cutoff	point:	0	1
Fine Feed Cutoff	point:	0	I Contraction
Fine Feed Mask	Time:	<b>0</b> r	ns
Device in W Write Mode	/rite to )evice	Save in F	lash
TimeLCT A	larmCon	nment	1
1			>

Item	Description
6	This section allows the user to perform Dosing functions

**NOTE:** Command combo becomes active only when it is in Operator mode.

#### **Analog Tab**

This tab provides information about the analog data of the device:

Analog Tab 1: Provides information about

- Weighing measurements like Gross, Net, Flow
- Set points of Preset Tare Value
- Dosing set points like Coarse feed cut-off point and Fine feed cut-off points and
- Few Monitoring timers.

<u>∩</u> <i>****</i> <u>∧</u>	
1 2	
Gross Measurement	<b>0</b> g
Net Measurement	<b>0</b> g
Flow Value	<b>0</b> g/s
Preset Tare Value	0 g
Inputs Holding time	0 ms
Coarse feed cutoff point	0 g
Fine feed cutoff point	0 g
Fine feed mask time	0 ms
TimeLCT 🛆 Alarr	nComment ^
	~ ~
<	>

Analog Tab 2: Provides information of Detected Failure and Alerts codes.

<u>Г</u> ### Л	
1 2	
Fail Code	32
Warning Code	0
Timel CT	Alarma Cammant
	AlarmComment
<	>

### **Discrete Tab**

This tab provides information about the digital data of the device:

Digital Tab 1: Provides information about the current device status

<u>∩</u> #### N <u>∧</u>	
1 2 3	
Module Running	
Measurement is Stable	
Measurement ok	
Atleast one Tare is processed	
Atleast one Tare/Zero is processed	
Atleast one Preset Tare is processed	
EEPROM Ok	
T 10T ( 1) 0 (	~
AlarmComment	
	V
< >>	

Digital Tab 2: Provide the digital Input channel status of PMESWT0100 Module

$\square$	****	N	À			
1	2	3				
Digital T	nnut 10 S	tatus				1
Digital I	nput I1 S	tatus				1
L						-
						-
<u> </u>						
						1
					 	-
						-
<u> </u>					 	-
TimeLC	т	∧	AlarmCo	mment		^
	_					~
1					)	

Digital Tab 3: Provide the digital Output channel status of PMESWT0100 Module

<u>∩</u> #### <u>N</u> <u>∧</u>	
1 2 3	
Output S0 Status	
Output S1 Status	
Output S2 Status	
Output S3 Status	
	-
	-
	-
	-
	-
	-
	-
TimeLCT 🛆 AlarmComment	^
	-
	~
< 2	•

### Alarm Tab

Refer to Alarms Tab, page 64

# **On/Off Device Control**

### What's in This Part

\$HandValveCE: Hand Valves1	43
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\$DualOPValveCE: Dual Output Valves1	63
\$ <i>ValveCE</i> : On/Off Valves	69

#### **Overview**

This part describes the master templates that provide the supervision functions for the on/off device control family.

Schneider Electric provides the templates described in this document. These templates can be used in various applications to minimize engineering efforts but the use, integration, configuration, and validation of the system is the sole responsibility of the user. Said user must ensure the safety of the system as a whole by performing a safety analysis, including the resources provided by Schneider Electric through procedures that the user deems appropriate.

# 

#### LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA) of your application, and apply preventive and detective controls before implementation.
- Provide a fallback state for undesired control events or sequences.
- Provide separate or redundant control paths wherever required.
- Supply appropriate parameters, particularly for limits.
- Review the implications of transmission delays and take actions to mitigate.
- Review the implications of communication link interruptions and take actions to mitigate.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and fault conditions) according to the safety analysis and applicable codes, and regulations.
- Apply local accident prevention and safety regulations and guidelines.<sup>1</sup>
- Test each implementation of this library for proper operation before placing it into service.

# Failure to follow these instructions can result in death, serious injury, or equipment damage.

<sup>1</sup> For additional information, refer to NEMA ICS 1.1 (latest edition), *Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control* and to NEMA ICS 7.1 (latest edition), *Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems* or their equivalent governing your particular location.

# \$HandValveCE: Hand Valves

#### What's in This Chapter

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### **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of hand valves.

### **Supervision Functions**

#### **Description**

Core resources provide the following monitoring and operation functions: Simulation mode and setpoint management.

These functions are implemented in runtime through symbols and their associated faceplate.

### **Parameters**

#### **Parameter Configuration**

There are no configurable parameters for hand valves.

## **Default State Alarms**

#### **State Alarms for Hand Valves**

The table indicates for which attributes a state alarm is configured in the *\$HandValveCE* master template and provides the default values.

Attribute	Alarm message	Priority
HValve.AO.PosFail	Unknown Position	750

NOTE: You can modify the configuration from the Attributes page.

# **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### Representation

This table describes the symbols available for representing the hand valve:

Name	Graphic symbol	Description
V2V_Horiz	V1001	Horizontal two-way valve
V2V_Vert	V1001	Vertical two-way valve
V3V_Horiz_Down_ Left	V1001	Horizontal three-way valve (down to left way when closed, down to right way when open)
V3V_Horiz_Down_ Right	V1001	Horizontal three-way valve (down to right way when closed, down to left way when open)
V3V_Horiz_Left_ Down	V1001	Horizontal three-way valve (left to down way when closed, left to right way when open)
V3V_Horiz_Left_ Right	V1001	Horizontal three-way valve (left to right way when closed, left to down way when open)
V3V_Horiz_Right_ Down	V1001	Horizontal three-way valve (right to down way when closed, right to left way when open)
V3V_Horiz_Right_ Left	V1001	Horizontal three-way valve (right to left way when closed, right to down way when open)
V3V_Vert_Down_ Right	V1001	Vertical three-way valve (down to right way when closed, down to up way when open)
V3V_Vert_Down_Up	V1001	Vertical three-way valve (down to up way when closed, down to right way when open)
V3V_Vert_Right_ Down	V1001	Vertical three-way valve (right to down way when closed, right to up way when open)
V3V_Vert_Right_Up	V1001	Vertical three-way valve (right to up way when closed, right to down way when open)
V3V_Vert_Up_Down	V1001	Vertical three-way valve (up to down way when closed, up to right way when open)
V3V_Vert_Up_Right	V1001	Vertical three-way valve (up to right way when closed, up to down way when open)
Label	PSxLabel	Displays the ObjectTagName, StaticText and CustomPropertyLabel.
# **Faceplates**

### **Overview**

During operation, clicking the graphic symbol opens a faceplate with the following tabs:

- Standard tabs:
  - Operation
  - Engineering
  - Alarms, page 64

# **Operation Tab**

The figure shows an example of the **Operation** tab.

V1001 Discharge manual	valve D10	۲
Status:	Travelling	

### **Engineering Tab**

The figure shows an example of the **Engineering** tab.

\$ A			
Mode:	Normal	~	
Override Value:	Closed	Ŷ	

**NOTE:** This tab features the **Simulation** menu, which allows setting the control module to simulation mode.

In addition, the tab may feature another menu or text field, which allows you to configure the state or value to be simulated.

Enabling the simulation mode underlies a security classification, page 79. The default configuration is *tune*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

# \$MotorCE: On/Off Motor

### What's in This Chapter

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# **Overview**

This chapter describes the *\$MotorCE* master template, which contains supervision resources to monitor and operate 1-speed/1-rotation-direction on/off motors.

# **Supervision Functions**

### **Description**

The *\$MotorCE* master template provides the following monitoring and operation functions:

- Core functions:
  - Status monitoring.
  - Owner selection.
  - Simulation mode.
  - Resetting.
  - Global bypassing of interlock conditions.
- · Optional functions:
  - Operation from a local panel.
  - Viewing, bypassing, and resetting of individual interlock conditions and abnormal conditions.
  - Tracking of operating hours and switching operations.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

# **Parameters**

### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

### **Parameter Description**

The tables describe the parameters that are defined as part of the *\$MotorCE* master template attributes.

Data type	Initial value	Description
String	0, P, C	Specifies the normal owner modes (separated by a comma):
1	Data type String	Data     Initial value       type     value       String     0, P, C

Name	Data type	lnitial value	Description
Param. FailureRearmCon- firmation	Boolean	True	False = After you click the Reset button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.         True = After you click the Reset button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking OK and validating the command according to the configured security classification.
			By default, the security classification is <i>secured</i> write.
Param. IlckRearmConfir- mation	Boolean	False	When manual resetting of interlock conditions is enabled:
			<ul> <li>Parse = After you click the Reset button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.</li> </ul>
			True = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i> .

# **Default State Alarms**

### State Alarms for On/Off Motor

The table indicates for which attributes a state alarm is configured in the *\$MotorCE* master template and provides the default values.

Attribute	Alarm message	Priority
Devctl.AO.Alarm	Confirmation Failure	999
Devctl.AO.PosFail	Unknown Position	750
Devctl.St.Faild	Device Failure	500

**NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

# **Symbol Description**

The table describes the symbols that are included in the *\$MotorCE* master template to display data of 1-speed/1-rotation direction on/off motors during operation.

Name	Graphic symbol	Description
Blower_Left	AG1001	Left blower
Blower_Right	AG1001	Right blower
Motor_Down	AG1001	Motor down
Motor_Left	AG1001	Motor left
Motor_Right	AG1001	Motor right
Motor_Up	AG1001	Motor up
Pump_Left	AG1001	Left pump
Pump_Right	AG1001	Right pump
RotaryValve	AG1001	Rotary valve
ScrewPump_Left	AG1001	Screw pump left
ScrewPump_Right	AG1001	Screw pump right
Label	PSxLabel	Displays the ObjectTagName, StaticText and CustomPropertyLabel.

# **Faceplates**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

### **Available Tabs**

During operation, clicking an on/off motor symbol opens a faceplate with the following tabs:

- Tabs for core functions:
  - Operation with optional local panel, page 55
  - Engineering

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- Alarms, page 64
- Tabs for optional functions, which appear only if configured:
- Interlocks, page 56
- Failures, page 59
- Maintenance, page 61

## **Operation Tab**

#### The figure shows an example of the **Operation** tab.

A2F1_P1102 Discharge pump		۲
Status:	Travelling	
Current Setpoint:	Off	]
Output:	Off	]
Owner:	Program ~	]
Setpoint Mode:	Local	
Setpoint:	Off ~	]
	Reset	

NOTE: This tab features the control module Reset button.

When the control module is reset, the current setpoint that is shown in this tab is effective.

By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect.

Refer to *Parameters* in this chapter for a description of the *Param. FailureRearmConfirmation* parameter, which allows you to configure the reset confirmation.

The figure shows the confirmation dialog box which is model in nature.

AG1001 - Reset	×
Resetting the failure m Are you sure you want	ay start the device immediately. to reset?
	OK Cancel

Resetting the control module by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

When the reset confirmation dialog box is enabled, the security classification that normally applies when you click **Reset** is not effective.

## **Engineering Tab**

The figure shows an example of the **Engineering** tab.

$\Box \Box \Box$	$\odot$ $\checkmark$ $\land$	
Mode:	Normal	~
Interlock Bypass:	Normal	~
Service:	In Service	~

# **A**WARNING

#### LOSS OF CONTROL AND UNINTENDED EQUIPMENT OPERATION

Before switching the monitored device back into service:

- · Verify the current setpoint of the monitored device.
- Confirm the current status of the process.

# Failure to follow these instructions can result in death, serious injury, or equipment damage.

**NOTE:** This tab features the **Simulation** menu, which allows setting the control module to simulation mode.

In addition, the tab may feature another menu or text field, which allows you to configure the state or value to be simulated.

Enabling the simulation mode underlies a security classification, page 79. The default configuration is *tune*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

**NOTE:** This tab features the **Interlock Bypass** menu, which allows bypassing interlocks globally.

When the control module is reset, the current setpoint that is shown in the operation tab of the faceplate is effective.

Bypassing interlocks by selecting **Bypass** underlies a security classification, page 79. The default configuration is *verified write*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

**NOTE:** This tab features the **Service** menu, which allows setting the control module out of service.

When the control menu is set back into service by selecting **In Service** in the **Service** menu, the current setpoint that is shown in the operation tab of the faceplate is effective.

Setting the control module out of service underlies a security classification, page 79. The default configuration is *tune*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

# *\$Motor2DirCE*: 2-Speed/2-Rotation-Direction Motors

#### What's in This Chapter

Supervision Functions	
Parameters	
Default State Alarms	
Graphic Representation	
Faceplates	
F	

# **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of 2-speed/2-rotation-direction motors.

# **Supervision Functions**

### **Description**

Core and optional resources provide the following monitoring and operation functions:

- Main core functions encompass status monitoring, owner selection, simulation mode, resetting, rotation direction, and global bypassing of interlock conditions.
- Optional functions encompass a local panel, individual interlock condition and diagnostic information management, tracking of operating hours and switching operations.

These functions are implemented in runtime through symbols and their associated faceplate.

# **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The tables describe the parameters that are defined as part of the *\$Motor2DirCE* master template attributes.

Parameter	Data type	Initial value	Description
Param. ContainerDesc	Bool	False	If true, the container description is used. If false, the container description is not used. <b>NOTE:</b> This parameter is used for object contained by another object, for example <i>\$MValveCE.M2</i> .
Param.ModeNormal	String	0, P, C	Specifies the normal owner modes (separated by a comma): • O: Operator • P: Program • C: Cascade For example P, C.

Name	Data type	Initial value	Description
Param. FailureRearmCon- firmation	Boolean	True	<i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.
			faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured</i> <i>write</i> .
Param. IlckRearmConfir- mation	Boolean	False	<ul> <li>When manual resetting of interlock conditions is enabled:</li> <li>False = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.</li> </ul>
			• <i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i> .

# **Default State Alarms**

# State Alarms for 2-Speed/2-Rotation-Direction Motors

The table indicates for which attributes a state alarm is configured in the *\$Motor2DirCE* master template and provides the default values.

Attribute	Alarm message	Priority
Motor2.St.Alarm1	Confirmation Failure 1	999
Motor2.St.Alarm2	Confirmation Failure 2	999
Motor2.AO.PosFail	Unknown Position	750
Motor2.St.Faild1	Device Failure 1	500
Motor2.St.Faild2	Device Failure 2	500

**NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

### Representation

This table describes the symbols available for representing the 2-speed/2-rotation direction motors:

Name	Graphic symbol	Description
Motor_Direction_Down	M1102	Down vertical motor with 2 rotation directions
Motor_Direction_Left	M1102	Left horizontal motor with 2 rotation directions
Motor_Direction_Right	M1102	Right horizontal motor with 2 rotation directions
Motor_Direction_Up	M1102	Up vertical motor with 2 rotation directions
Motor_Speed_Down	M1102	Down vertical motor with 2 speeds
Motor_Speed_Left	M1102	Left horizontal motor with 2 speeds
Motor_Speed_Right	M1102	Right horizontal motor with 2 speeds
Motor_Speed_Up	M1102	Up vertical motor with 2 speeds
Label	PSxLabel	Displays the <b>ObjectTagName</b> , <b>StaticText</b> and <b>CustomPropertyLabel</b> .

# **Faceplates**

### **Overview**

During operation, clicking the graphic symbol opens a faceplate with the following tabs:

- Standard tabs:
  - Operation with optional local panel, page 55
  - Engineering
  - Alarms, page 64
- Optional tabs:
  - Interlocks, page 56
  - Failures , page 59
  - Maintenance, page 61

### **Operation Tab**

#### The figure shows an example of the **Operation** tab.

M1102 Reactive dosing scr	ew 🛞
Status:	Stopped
Current Setpoint:	Off
Output 1:	Off
Output 2:	Off
Owner:	Program ~
Setpoint Mode:	Local
Setpoint:	Off v
	Reset

NOTE: This tab features the control module Reset button.

When the control module is reset, the current setpoint that is shown in this tab is effective.

By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect.

Refer to *Parameters* in this chapter for a description of the *Param. FailureRearmConfirmation* parameter, which allows you to configure the reset confirmation.

The figure shows the confirmation dialog box which is model in nature.



Resetting the control module by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

When the reset confirmation dialog box is enabled, the security classification that normally applies when you click **Reset** is not effective.

# **Engineering Tab**

The figure shows an example of the Engineering tab.



# 

#### LOSS OF CONTROL AND UNINTENDED EQUIPMENT OPERATION

Before switching the monitored device back into service:

- Verify the current setpoint of the monitored device.
- Confirm the current status of the process.

# Failure to follow these instructions can result in death, serious injury, or equipment damage.

**NOTE:** This tab features the **Simulation** menu, which allows setting the control module to simulation mode.

In addition, the tab may feature another menu or text field, which allows you to configure the state or value to be simulated.

Enabling the simulation mode underlies a security classification, page 79. The default configuration is *tune*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

**NOTE:** This tab features the **Interlock Bypass** menu, which allows bypassing interlocks globally.

When the control module is reset, the current setpoint that is shown in the operation tab of the faceplate is effective.

Bypassing interlocks by selecting **Bypass** underlies a security classification, page 79. The default configuration is *verified write*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

**NOTE:** This tab features the **Service** menu, which allows setting the control module out of service.

When the control menu is set back into service by selecting **In Service** in the **Service** menu, the current setpoint that is shown in the operation tab of the faceplate is effective.

Setting the control module out of service underlies a security classification, page 79. The default configuration is *tune*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

# *\$MValveCE*: Discrete Motorized Valves

# What's in This Chapter

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	-

# **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of discrete motorized valves.

# **Supervision Functions**

## Description

Core and optional resources provide the following monitoring and operation functions:

- Main core functions encompass status monitoring, owner selection, resetting, setpoint management, and global bypassing of interlock conditions.
- Optional functions encompass a local panel, and individual interlock condition and diagnostic information management.

These functions are implemented in runtime through symbols and their associated faceplate.

**NOTE:** The discrete motorized valve template includes three contained objects:

- \$MValveCE.M2: motor management (a derived template of \$Motor2DirCE, page 153 with interlock and detected failure conditions enabled by default, and the parameter Param.ContainerDesc enabled)
- \$MValveCE.ZSH: high limit switch management (a derived template of \$DigitalInputCE, page 112 with the parameter Param.ContainerDesc enabled)
- *\$MValveCE.ZSL*: low limit switch management (a derived template of \$DigitalInputCE, page 112 with the parameter Param.ContainerDesc enabled)

# **Parameters**

## **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

### **Parameter Description**

The tables describe the parameters that are defined as part of the *\$MValveCE* master template attributes.

Parameter	Data type	Initial value	Description
Param.ModeNormal	String	0, P, C	Specifies the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> <li>C: Cascade</li> </ul> <li>For example P, C.</li>

Name	Data type	Initial value	Description
Param. FailureRearmCon- firmation	Boolean	True	False = After you click the Reset button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.         True = After you click the Reset button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking OK and validating the command according to the security classification. By default, the security classification is secured write.
Param. IlckRearmConfir- mation	Boolean	False	<ul> <li>When manual resetting of interlock conditions is enabled:</li> <li><i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.</li> <li><i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i>.</li> </ul>

# **Default State Alarms**

### **State Alarms for Discrete Motorized Valves**

The table indicates for which attributes a state alarm is configured in the *\$MValveCE* master template and provides the default values.

Attribute	Alarm message	Priority
MValveD.St.Alarm1	Open Confirmation Fail	999
MValveD.St.Alarm2	Closed Confirmation Fail	999
MValveD.AO.PosFail	Unknown Position	750
MValveD.St.Faild	Device Failure	500

**NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

### Representation

This table describes the symbols available for representing the discrete motorized valves:

Name	Graphic symbol	Description
V2V_Horiz	MV1102	Horizontal valve
V2V_Vert	MV1102	Vertical valve
PenStockV	MV1102	Penstock valve (Open position)
PenStockV	MV1102	Penstock valve (Intermediate position)
PenStockV	MV1102	Penstock valve (Closed position)
Label	PSxLabel	Displays the ObjectTagName, StaticText and CustomPropertyLabel.

**NOTE:** The discrete motorized valve symbol is composed of four symbols:

- Valve
- Motor
- High limit switch
- · Low limit switch

Navigation to display the related faceplate of contained objects motor and limit switches are provided on main faceplate of discrete motorised valves.

# **Faceplates**

#### **Overview**

During operation, clicking the graphic symbol opens a faceplate with the following tabs:

- · Standard tabs:
  - Operation with optional local panel, page 55
  - Engineering
  - Alarms, page 64
- Optional tabs:
  - Interlocks, page 56

**NOTE:** Navigation to display the related faceplate of contained objects motor and limit switches are provided on main faceplate of discrete motorised valves.

### **Operation Tab**

The figure shows an example of the Operation tab.

MV1102 Motorized valve		٢
Valve State:	Stop	
Owner:	Operator ~	]
Setpoint Mode:	Local	
Setpoint:	Stop ~	]
	Reset	

NOTE: This tab features the control module Reset button.

When the control module is reset, the current setpoint that is shown in this tab is effective.

By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect.

Refer to *Parameters* in this chapter for a description of the *Param. FailureRearmConfirmation* parameter, which allows you to configure the reset confirmation.

The figure shows the confirmation dialog box which is model in nature.

AG1001 - F	Reset	( and the second	×
<b></b>	Resetting the failure ma Are you sure you want t	y start the device in o reset?	mmediately.
		ОК	Cancel

Resetting the control module by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

When the reset confirmation dialog box is enabled, the security classification that normally applies when you click **Reset** is not effective.

## **Engineering Tab**

The figure shows an example of the **Engineering** tab.

$\square \square \square \square$	8 I A
Mode:	Normal
Interlock Bypass:	Normal ~
Service:	In Service v

**NOTE:** This tab features the **Interlock Bypass** menu, which allows bypassing interlocks globally.

When the control module is reset, the current setpoint that is shown in the operation tab of the faceplate is effective.

Bypassing interlocks by selecting **Bypass** underlies a security classification, page 79. The default configuration is *verified write*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

# **\$DualOPValveCE:** Dual Output Valves

#### What's in This Chapter

Supervision Functions	
Parameters	
Default State Alarms.	
Graphic Representation	
Faceplates	

# **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of dual output valves.

# **Supervision Functions**

#### **Description**

Core and optional resources provide the following monitoring and operation functions:

- Main core functions encompass status monitoring, owner selection, resetting, setpoint management, simulation mode, and global bypassing of interlock conditions.
- Optional functions encompass tracking of operating hours and switching operations, individual interlock condition and diagnostic information management.

These functions are implemented in runtime through symbols and their associated faceplate.

# **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template prefix or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The tables describe the parameters that are defined as part of the *\$DualOPValveCE* master template attributes.

Parameter	Data type	Initial value	Description
Param.ModeNormal	String	0, P, C	Specifies the normal owner modes (separated by a comma):
			O: Operator
			• ₽: Program
			• C: Cascade
			For example P, C.

Name	Data type	Initial value	Description
Param. FailureRearmCon- firmation	Boolean	True	<i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required. <i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i> .
Param. IlckRearmConfir- mation	Boolean	False	<ul> <li>When manual resetting of interlock conditions is enabled:</li> <li><i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.</li> <li><i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i>.</li> </ul>

# **Default State Alarms**

### **State Alarms for Dual Output Valves**

The table indicates for which attributes a state alarm is configured in the *\$DualOPValveCE* master template and provides the default values.

Attribute	Alarm message	Priority
DVALVE.ST.AlarmH	Open Confirmation Fail	999
DVALVE.ST.AlarmL	Close Confirmation Fail	999
DVALVE.ST.FAILD	Device failure	500

**NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

### Representation

This table describes the symbols available for representing the dual output valves:

Name	Graphic symbol	Description
V2V_Horiz		Horizontal two-way valve
V2V_Vert		Vertical two-way valve
V2V_Butterfly_Vert_ Left	DV1	Vertical butterfly with control on the left
V2V_Butterfly_Vert_ Right	DV1	Vertical butterfly with control on the right
V3V_Horiz_Down_Left	DV1	Horizontal three-way valve (down to left way when closed, down to right way when open)
V3V_Horiz_Down_Right		Horizontal three-way valve (down to right way when closed, down to left way when open)
V3V_Horiz_Left_Down	DV1	Horizontal three-way valve (left to down way when closed, left to right way when open)
V3V_Horiz_Left_Right	DV1	Horizontal three-way valve (left to right way when closed, left to down way when open)
V3V_Horiz_Right_Down	DV1	Horizontal three-way valve (right to down way when closed, right to left way when open)
V3V_Horiz_Right_Left	DV1	Horizontal three-way valve (right to left way when closed, right to down way when open)
V3V_Vert_Down_Right	DV1	Vertical three-way valve (down to right way when closed, down to up way when open)

Name	Graphic symbol	Description
V3V_Vert_Down_Up	DV1	Vertical three-way valve (down to up way when closed, down to right way when open)
V3V_Vert_Right_Down	DV1	Vertical three-way valve (right to down way when closed, right to up way when open)
V3V_Vert_Right_Up	DV1	Vertical three-way valve (right to up way when closed, right to down way when open)
V3V_Vert_Up_Down		Vertical three-way valve (up to down way when closed, up to right way when open)
V3V_Vert_Up_Right	DV1	Vertical three-way valve (up to right way when closed, up to down way when open)
Label	PSxLabel	Displays the ObjectTagName, StaticText and CustomPropertyLabel.

# **Faceplates**

### **Overview**

During operation, clicking the graphic symbol opens a faceplate with the following tabs:

- Standard tabs:
  - Operation
  - Engineering
  - Alarms, page 64
  - Optional tabs:

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- Interlocks, page 56
- Failures, page 59
- Maintenance, page 61

### **Operation Tab**

The figure shows an example of the **Operation** tab.

HV1002 Heating valve D10		٢
Status:	Travelling	
Current Setpoint:	Off	]
Output:	Off	]
Owner:	Program ~	]
Setpoint Mode:	Local	
Setpoint:	Off ~	]
	Reset	

NOTE: This tab features the control module Reset button.

When the control module is reset, the current setpoint that is shown in this tab is effective.

By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect.

Refer to *Parameters* in this chapter for a description of the *Param. FailureRearmConfirmation* parameter, which allows you to configure the reset confirmation.

The figure shows the confirmation dialog box which is model in nature.

AG1001 - I	Reset	( parties	×
4	Resetting the failure ma Are you sure you want t	y start the device i o reset?	mmediately.
		ОК	Cancel

Resetting the control module by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

When the reset confirmation dialog box is enabled, the security classification that normally applies when you click **Reset** is not effective.

# **Engineering Tab**

The figure shows an example of the **Engineering** tab.

$\square \square \oslash$	1 <u>A</u>	
Mode:	Normal	¥
Interlock Bypass:	Normal	~
Service:	In Service	~

# **A**WARNING

#### LOSS OF CONTROL AND UNINTENDED EQUIPMENT OPERATION

Before switching the monitored device back into service:

- Verify the current setpoint of the monitored device.
- Confirm the current status of the process.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

**NOTE:** This tab features the **Interlock Bypass** menu, which allows bypassing interlocks globally.

When the control module is reset, the current setpoint that is shown in the operation tab of the faceplate is effective.

Bypassing interlocks by selecting **Bypass** underlies a security classification, page 79. The default configuration is *verified write*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

**NOTE:** This tab features the **Service** menu, which allows setting the control module out of service.

When the control menu is set back into service by selecting **In Service** in the **Service** menu, the current setpoint that is shown in the operation tab of the faceplate is effective.

Setting the control module out of service underlies a security classification, page 79. The default configuration is *tune*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

# \$ValveCE: On/Off Valves

#### What's in This Chapter

Supervision Functions	
Parameters	
Default State Alarms	
Graphic Representation	
Faceplates	

# **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of on/off valves.

# **Supervision Functions**

#### **Description**

Core and optional resources provide the following monitoring and operation functions:

- Main core functions encompass status monitoring, owner selection, simulation mode, resetting, and global bypassing of interlock conditions.
- Optional functions encompass a local panel, individual interlock condition management, tracking of operating hours and switching operations.

These functions are implemented in runtime through symbols and their associated faceplate.

# **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

This table describes the parameters of the automation object:

Parameter	Туре	Default	Description
Param.ModeNormal	String	0, P, C	Specifies the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> <li>C: Cascade</li> </ul> <li>For example P, C.</li>

# **Default State Alarms**

## State Alarms for On/Off Valves

The attributes for which a state alarm is configured in the *\$ValveCE* master template are the same as for *\$MotorCE*.

**NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

### Representation

This table describes the symbols available for representing the on/off valves:

Name	Graphic symbol	Description
V2V_Butterfly_Vert_ Left	HV1002	Vertical butterfly with control on the left
V2V_Butterfly_Vert_ Right	HV1002	Vertical butterfly with control on the right
V2V_Horiz	1002 ₩□□\	Horizontal two-way valve
V2V_Vert		Vertical two-way valve
V3V_Horiz_Down_Left	HV1002	Horizontal three-way valve (down to left way when closed, down to right way when open)
V3V_Horiz_Down_Right	HV1002	Horizontal three-way valve (down to right way when closed, down to left way when open)
V3V_Horiz_Left_Down	HV1002	Horizontal three-way valve (left to down way when closed, left to right way when open)
V3V_Horiz_Left_Right	HV1002	Horizontal three-way valve (left to right way when closed, left to down way when open)

Name	Graphic symbol	Description
V3V_Horiz_Right_Down	HV1002	Horizontal three-way valve (right to down way when closed, right to left way when open)
V3V_Horiz_Right_Left	HV1002	Horizontal three-way valve (right to left way when closed, right to down way when open)
V3V_Vert_Down_Right	HV1002	Vertical three-way valve (down to right way when closed, down to up way when open)
V3V_Vert_Down_Up	HV1002	Vertical three-way valve (down to up way when closed, down to right way when open)
V3V_Vert_Right_Down	HV1002	Vertical three-way valve (right to down way when closed, right to up way when open)
V3V_Vert_Right_Up		Vertical three-way valve (right to up way when closed, right to down way when open)
V3V_Vert_Up_Down		Vertical three-way valve (up to down way when closed, up to right way when open)
V3V_Vert_Up_Right	HV1002	Vertical three-way valve (up to right way when closed, up to down way when open)
Label	PSxLabel	Displays the ObjectTagName, StaticText and CustomPropertyLabel.

# **Faceplates**

# Overview

During operation, clicking the graphic symbol opens a faceplate with the following tabs:

- Standard tabs:
  - Operation with optional local panel, page 55
  - Engineering
  - Alarms, page 64
- Optional tabs:
  - Interlocks, page 56
  - Failures, page 59
  - Maintenance, page 61

NOTE: The same faceplate is used for on/off motor and on/off valve.

# **Operation Tab**

The figure shows an example of the **Operation** tab.

HV1002 Heating valve D10		۲
Status:	Travelling	
Current Setpoint:	Off	]
Output:	Off	]
Owner:	Program ~	
Setpoint Mode:	Local	
Setpoint:	Off ~	]
	Reset	]

NOTE: This tab features the control module Reset button.

When the control module is reset, the current setpoint that is shown in this tab is effective.

By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect.

Refer to *Parameters* in this chapter for a description of the *Param. FailureRearmConfirmation* parameter, which allows you to configure the reset confirmation.

The figure shows the confirmation dialog box which is model in nature.



Resetting the control module by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

When the reset confirmation dialog box is enabled, the security classification that normally applies when you click **Reset** is not effective.

## **Engineering Tab**

The figure shows an example of the Engineering tab.

	$\sqrt{\Delta}$	
Mode:	Normal ~	-
Interlock Bypass:	Normal ~	- -
Service:	In Service ~	Ī



#### LOSS OF CONTROL AND UNINTENDED EQUIPMENT OPERATION

Before switching the monitored device back into service:

- Verify the current setpoint of the monitored device.
- Confirm the current status of the process.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

**NOTE:** This tab features the **Simulation** menu, which allows setting the control module to simulation mode.

In addition, the tab may feature another menu or text field, which allows you to configure the state or value to be simulated.

Enabling the simulation mode underlies a security classification, page 79. The default configuration is *tune*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

**NOTE:** This tab features the **Interlock Bypass** menu, which allows bypassing interlocks globally.

When the control module is reset, the current setpoint that is shown in the operation tab of the faceplate is effective.

Bypassing interlocks by selecting **Bypass** underlies a security classification, page 79. The default configuration is *verified write*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

**NOTE:** This tab features the **Service** menu, which allows setting the control module out of service.

When the control menu is set back into service by selecting **In Service** in the **Service** menu, the current setpoint that is shown in the operation tab of the faceplate is effective.

Setting the control module out of service underlies a security classification, page 79. The default configuration is *tune*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

# **Analog Device Control**

### What's in This Part

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\$MotorVSCE: Devices with Variable Speed Drive	. 187

#### **Overview**

This part describes the master templates that provide the supervision functions for the analog device control family.

Schneider Electric provides the templates described in this document. These templates can be used in various applications to minimize engineering efforts but the use, integration, configuration, and validation of the system is the sole responsibility of the user. Said user must ensure the safety of the system as a whole by performing a safety analysis, including the resources provided by Schneider Electric through procedures that the user deems appropriate.

# **A**WARNING

#### LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA) of your application, and apply preventive and detective controls before implementation.
- Provide a fallback state for undesired control events or sequences.
- Provide separate or redundant control paths wherever required.
- Supply appropriate parameters, particularly for limits.
- · Review the implications of transmission delays and take actions to mitigate.
- Review the implications of communication link interruptions and take actions to mitigate.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and fault conditions) according to the safety analysis and applicable codes, and regulations.
- Apply local accident prevention and safety regulations and guidelines. 1
- Test each implementation of this library for proper operation before placing it into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

<sup>1</sup> For additional information, refer to NEMA ICS 1.1 (latest edition), Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control and to NEMA ICS 7.1 (latest edition), Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems or their equivalent governing your particular location.

# \$ControlValveCE: Control Valves

### What's in This Chapter

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	•

# **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of control valves.

# **Supervision Functions**

### **Description**

Core and optional resources provide the following monitoring and operation functions:

- Main core functions encompass status monitoring, owner selection, simulation mode, position indication (current setpoint, position output, current valve position, in engineering units), and global bypassing of interlock conditions.
- Optional functions encompass a local panel and individual interlock condition management.

These functions are implemented in runtime through symbols and their associated faceplate.

# **Parameters**

### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template prefix or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

### **Parameter Description**

This table describes the parameters of the automation object:

Parameter	Туре	Default	Description
Param.EngUnits	String	%	Unit of the present value
Param.HiPV	Float	100.0	High limit for the present value
Param.LoPV	Float	0.0	Low limit for the present value
Param.ModeNormal	String	0, P, C	Specifies the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> <li>C: Cascade</li> </ul> <li>For example P, C.</li>

Parameter	Туре	Default	Description
Param.NumFormat	String	0.0	Specifies the displaying format of setpoint.
			For example, enter 0.00 for 2 decimal.
Param. TrendPeriodMin	Integer	0	Specifies the default trend period in minutes.

# **Default State Alarms**

### **State Alarms for Control Valves**

The table indicates for which attributes a state alarm is configured in the *\$ControlValveCE* master template and provides the default values.

Attribute	Alarm message	Priority
CValve.St.Alarm	Position Failure	500
CValve.St.ChinFailure	Input Channel Failure	500
CValve.St.ChoutFailure	Output Channel Failure	500
CValve.St.Fail	Device Failure	500

NOTE: You can modify the configuration from the Attributes page.

# **Graphic Representation**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

### **Three-Way Valve Symbol Naming Convention**

For three-way control valve symbols, the naming convention is as follows:

Valve type\_Valve orientation\_Inlet position\_Port normally open.

For example, V3V\_Horiz\_Left\_Down means:

- Three-way valve.
- Shown horizontally.
- Inlet positioned left-hand side.
- The down port is normally open.

#### **Using Limit Switches with Control Valves**

You can configure the control valve object to monitor limit switches. By default, bits 11 and 12 of the CVALVE\_ST.STW status word are used. These are parameters *ZSLPOS* and *ZSHPOS* respectively.

In such case, the symbol:

- Uses the over-range element style to show both outlet ports fully filled (open) if both limit switch signals are true.
- Shows either outlet port fully filled (open) when the corresponding limit switch signal is true, independently of the actual valve position. For example, if *ZSLPOS* for a *V3V\_Horiz\_Left\_Down* symbol is true, the down port (normally open) is shown fully filled (open) even if *PV* indicates 25%. In this case, the down port would normally be shown 75% filled.

## **Two-Way Valve Symbol Graphic Convention**

For operator convenience, the graphic convention for two-way control valve symbols indicates the limit switch signals.

Both valve ports are filled depending on the signals transmitted by the limit switches:

- If ZSLPOS is true (closed state), the valve ports are shown not filled (white).
- If ZSHPOS is true (open state), both valve ports are shown fully filled.
- If there is no limit switch signal or if both signals are true, both valve ports are shown fully filled (open state).

**NOTE:** The valve position is indicated by the bar graph and the numerical value.

#### **Three-Way Valve Symbol Graphic Convention**

For operator convenience, the graphic convention for three-way control valve symbols is as follows:

- The inlet is shown fully filled independently of the position of the valve.
- The area of the outlets that is shown filled gives an indication of the position of the valve. The filled area shows approximately how much each port is open.

The example shows a V3V\_Horiz\_Left\_Down symbol representing a three-way valve with a position 60% open. The normally open *Down* port is shown 40% filled (40% open) and the normally closed *Right* port 60% filled (60% open).



### Representation

In addition to icons, symbols display:

- The label.
- The trend client icon to open the trends faceplate.
- A bar graph showing the present valve position.
- The value of the present valve position with engineering units.
- States, shown in a square, page 45.
- The owner mode if it is detected as an abnormal situation, page 43.

The table describes the symbols that are included in the *ControlValveCE* master template to display data of two-way control valves during operation.

Name	Graphic symbol	Description
V2V_Horiz	0.0%	Horizontal two-way valve
V2V_Vert_Left	0.0%	Vertical two-way valve

Name		Graphic symbol	Description
V2V_Vert_	Right	0.0%	Vertical two-way valve
Label		PSxLabel	Displays the ObjectTagName, StaticText and CustomPropertyLabel.

#### NOTE:

The table describes the symbols that are included in the *\$ControlValveCE* master template to display data of three-way control valves during operation.

Name	Graphic symbol
V3V_Horiz_Down_Left	0.0%
V3V_Horiz_Down_Right	0.0%
V3V_Horiz_Left_Down	0.0%
V3V_Horiz_Left_Right	0.0%
V3V_Horiz_Right_Down	0.0%
V3V_Horiz_Right_Left	0.0%
V3V_Vert_Down_Right	0.0%
V3V_Vert_Down_Up	0.0%
V3V_Vert_Right_Down	0.0%
V3V_Vert_Right_Up	0.0%

Name	Graphic symbol
V3V_Vert_Up_Down	0.0%
V3V_Vert_Up_Right	0.0%

# **Faceplates**

### **Overview**

During operation, clicking the graphic symbol opens a faceplate with the following tabs:

- Standard tabs:
  - Operation with optional local panel, page 55
  - Engineering
  - Alarms, page 64
- Optional tabs:
  - Interlocks, page 56
  - Failures, page 59
  - Maintenance, page 61

**NOTE:** The master template also features the trends faceplate.

### **Operation Tab**

The figure shows an example of the **Operation** tab.

A1F1_FCV1101 Feeding flow valve	0
0.0 0.0	
% 0.0	•
Owner:	Program v
Setpoint Mode:	Local
Setpoint:	0.0 %

This table describes the **SetPoint** button functions in **Operator** owner mode:

Button	Description		
₹	Large decrement of the setpoint value (-5)		
•	Small decrement of the setpoint value (-1)		
	Small increment of the setpoint value (+1)		
	Large increment of the setpoint value (+5)		

# **Engineering Tab**

#### The figure shows an example of the **Engineering** tab.

	$\triangle$			
	Mada	Normal		
	Mode:	Normai	Ý	
Interlock	Bypass:	Normal	~	
	Service:	In Service	~	

**NOTE:** This tab features the **Interlock Bypass** menu, which allows bypassing interlocks globally.

When the control module is reset, the current setpoint that is shown in the operation tab of the faceplate is effective.

Bypassing interlocks by selecting **Bypass** underlies a security classification, page 79. The default configuration is *verified write*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.
# *\$MValvewithPosCE*: Motorized Valve With Feedback

#### What's in This Chapter

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F	

# **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of motorized valves with feedback.

# **Supervision Functions**

### **Description**

Core and optional resources provide the following monitoring and operation functions:

- Main core functions encompass status monitoring, owner selection, threestep controller functions, resetting, and global bypassing of interlock conditions.
- Optional functions encompass a local panel, individual interlock condition and diagnostic information management, tracking of operating hours and switching operations.

These functions are implemented in runtime through symbols and their associated faceplate.

NOTE: The motorized valve template includes four contained objects:

- *\$MValvewithPosCE.AI*: analog input management (a derived template of \$AnalogInputCE, page 101 with alarms disabled and the parameter Param.ContainerDesc enabled)
- \$MValveCE.M2: motor management (a derived template of \$Motor2DirCE, page 153 with interlock and detected failure conditions enabled by default, and the parameter Param.ContainerDesc enabled)
- \$MValveCE.ZSH: high limit switch management (a derived template of \$DigitalInputCE, page 112 with the parameter Param.ContainerDesc enabled)
- \$MValveCE.ZSL: low limit switch management (a derived template of \$DigitalInputCE, page 112 with the parameter Param.ContainerDesc enabled)

## **Parameters**

#### Parameter Configuration

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

## **Parameter Description**

The tables describe the parameters that are defined as part of the *\$MValvewithPosCE* master template attributes.

Parameter	Data type	Initial value	Description
Param.EngUnits	String	%	Unit of the present value
Param.HiPV	Float	100.0	High limit for the present value.
Param.LoPV	Float	0.0	Low limit for the present value.
Param.ModeNormal	String	0, P, C	Specifies the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> <li>C: Cascade</li> </ul> <li>For example P, C.</li>
Param.NumFormat	String	0.0	Specifies the displaying format of setpoint. For example, enter 0.00 for 2 decimal.

Name	Data type	Initial value	Description
Param. FailureRearmCon- firmation	Boolean Tr	True	<i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.
			<i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i> .
Param. IlckRearmConfir- mation	Boolean	False	<ul> <li>When manual resetting of interlock conditions is enabled:</li> <li><i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.</li> <li><i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i>.</li> </ul>

# **Default State Alarms**

## **State Alarms for Motorized Valves**

The table indicates for which attributes a state alarm is configured in the *\$MValvewithPosCE* master template and provides the default values.

Attribute	Alarm message	Priority
MValve.St.Alarm	Auxiliary Device Fail	999
MValve.St.PMIS	Position Mismatch	999

Attribute	Alarm message	Priority
MValve.AO.PosFail	Unknown Position	750
MValve.St.Faild	Switching Operation Fault	500

**NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### Representation

This table describes the symbols available for representing the motorized valves with feedback

Name	Graphic symbol	Description
V2V_Horiz	MV1101	Horizontal bar with current value of the valve position Horizontal two-way valve
V2V_Vert	MV1101	Vertical bar with current value of the valve position Vertical two-way valve
Label	PSxLabel	Displays the ObjectTagName, StaticText and CustomPropertyLabel.

NOTE: The motorized valve symbol is composed of five symbols:

- Valve
- · Analog input
- Motor
- · High limit switch
- · Low limit switch

Navigation to display the related faceplate of contained objects analog input, motor and limit switches are provided on main faceplate of motorised valves with feedback.

# **Faceplates**

#### **Overview**

During operation, clicking the graphic symbol opens a faceplate with the following tabs:

- · Standard tabs:
  - Operation with optional local panel, page 55
  - Engineering
  - Alarms, page 64
- Optional tabs:
  - Failures, page 59
  - Maintenance, page 61

**NOTE:** Navigation to display the related faceplate of contained objects analog input, motor and limit switches are provided on main faceplate of motorised valves with feedback.

**NOTE:** The master template also features the trends faceplate.

## **Operation Tab**

MV1101			۲
Motorized Valve wit	h Positioner		
Valve State:	Stopped		
Target Setpoint:	0.0 %		
Error:	0.0 %		
% 0.0 0.0			
Owner:	Operator	~	
Setpoint Mode:	Local		
Start Order:	Off	~	
Setpoint:	0.0 %		
	Reset		
		_	

The figure shows an example of the **Operation** tab.

NOTE: This tab features the control module Reset button.

When the control module is reset, the current setpoint that is shown in this tab is effective.

By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect.

Refer to *Parameters* in this chapter for a description of the *Param. FailureRearmConfirmation* parameter, which allows you to configure the reset confirmation.

The figure shows the confirmation dialog box which is model in nature.

r	AG1001 - Reset
	Resetting the failure may start the device immediately. Are you sure you want to reset?
	OK Cancel

Resetting the control module by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

When the reset confirmation dialog box is enabled, the security classification that normally applies when you click **Reset** is not effective.

This table describes the **SetPoint** button functions in **Operator** owner mode:

Button Description			
44	Large decrement of the setpoint value (-5)		
•	Small decrement of the setpoint value (-1)		
	Small increment of the setpoint value (+1)		
$\mathbb{A}$	Large increment of the setpoint value (+5)		

## **Engineering Tab**

	I I A
Mode:	Normal ~
Interlock Bypass:	Normal v
Service:	In Service v
Upper Deviation	5 %
(>=0):	
Lower Deviation	-5 %
Hustoropia (>=0):	E or
Trysteresis (>-0).	5 %

The figure shows an example of the **Ongineering** tab.

**NOTE:** This tab features the **Simulation** menu, which allows setting the control module to simulation mode.

In addition, the tab may feature another menu or text field, which allows you to configure the state or value to be simulated.

Enabling the simulation mode underlies a security classification, page 79. The default configuration is *tune*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

**NOTE:** This tab features the **Interlock Bypass** menu, which allows bypassing interlocks globally.

When the control module is reset, the current setpoint that is shown in the operation tab of the faceplate is effective.

Bypassing interlocks by selecting **Bypass** underlies a security classification, page 79. The default configuration is *verified write*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

**NOTE:** This tab features the **Service** menu, which allows setting the control module out of service.

When the control menu is set back into service by selecting **In Service** in the **Service** menu, the current setpoint that is shown in the operation tab of the faceplate is effective.

Setting the control module out of service underlies a security classification, page 79. The default configuration is *tune*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

# *\$MotorVSCE*: Devices with Variable Speed Drive

#### What's in This Chapter

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## **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of devices with variable speed drive.

# **Supervision Functions**

#### **Description**

Core and optional resources provide the following monitoring and operation functions:

- Main core functions encompass status monitoring, owner selection, simulation mode, motor operation indication, multispeed setpoints, resetting, and global bypassing of interlock conditions.
- Optional functions encompass a local panel, individual interlock condition and diagnostic information management, tracking of operating hours, and switching operations.

These functions are implemented in runtime through symbols and their associated faceplate.

# **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The tables describe the parameters that are defined as part of the *\$MotorVSCE* master template attributes.

Parameter	Data type	Initial value	Description
Param.EngUnits	String	olo	Unit of present value (PV) and setpoint (SP)
Param.EngUnitsOP	String	olo	Unit of output value (OP)
Param.HiOP	Float	100.0	High limit for output value (OP)
Param.HiPV	Float	100.0	High limit for present value (PV)
Param.LoOP	Float	0.0	Low limit for output value (OP)
Param.LoPV	Float	0.0	Low limit for present value (PV)

Parameter	Data type	Initial value	Description
Param.ModeNormal	String	0, P, C	Specifies the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> <li>C: Cascade</li> </ul> <li>For example P, C.</li>
Param.NumFormat	String	0.0	Specifies the displaying format of present value (PV). For example, enter 0.00 for 2 decimal.
Param. NumFormatOP	String	0.0	Specifies the displaying format of output value (OP). For example, enter 0.00 for 2 decimal.

Name	Data type	Initial value	Description
Param. FailureRearmCon- firmation	Boolean	True	<i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required. <i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command
			according to the configured security classification. By default, the security classification is <i>secured</i> <i>write</i> .
Param. IlckRearmConfir- mation	Boolean	False	<ul> <li>When manual resetting of interlock conditions is enabled:</li> <li>False = After you click the Reset button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.</li> </ul>
			<ul> <li><i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i>.</li> </ul>

## **State Alarms for Variable Speed Drives**

The table indicates for which attributes a state alarm is configured in the *\$MotorVSCE* master template and provides the default values.

Attribute	Alarm message	Priority
SDDevctl.St.Alarm	Confirmation Failure	500
SDDevctl.St.Faild	Device Failure	500

**NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

## Representation

This table describes the symbols available for representing the devices with variable speed drive:

Name	Graphic symbol	Description
Bar_Horz_OP	P1001	Horizontal bar with output (OP) of motor with speed driver
Bar_Hor_PV_SP	P1001	Horizontal bar with present value (PV) and setpoint (SP) of motor with speed driver
Bar_Hor_PV_SP_OP	P1001 0.0 2000.0 U/h 0.0 •	Horizontal bar with present value (PV), setpoint (SP), and output (OP) of motor with speed driver
Bar_Vert_OP	P1001	Vertical bar with output (OP) of motor with speed driver
Bar_Vert_PV_SP	P1001	Vertical bar with present value (PV) and setpoint (SP) of motor with speed driver

Name	Graphic symbol	Description
Bar_Vert_PV_SP_OP	P1001	Vertical bar with present value (PV), setpoint (SP), and output (OP) of motor with speed driver
Bar_Vert_PV_SP_Trend	P1001	Vertical bar and trend with present value (PV) and setpoint (SP) of motor with speed driver
Bar_Vert_PV_SP_OP_ Trend	P1001	Vertical bar and trend with present value (PV), setpoint (SP), and output (OP) of motor with speed driver
Display_PV_SP	P1001 0.0 2000.0	Display with present value (PV) and setpoint (SP) of motor with speed driver
Display_PV_SP_OP	P1001 0.0 2000.0 0.0	Display with present value (PV), setpoint (SP), and output (OP) of motor with speed driver
Motor_Down	0.01/h P1001	Down vertical motor and horizontal bar with present value (PV)
Motor_Left	P1001	Left horizontal motor and horizontal bar with present value (PV)

Name	Graphic symbol	Description
Motor_Right	P1001	Right horizontal motor and horizontal bar with present value (₽♡)
Motor_Up	P1001	Up vertical motor and horizontal bar with present value (PV)
Pump_Left	P1001	Left pump and horizontal bar with present value ( ${\tt PV}$ )
Pump_Right	P1001	Right pump and horizontal bar with present value ( ${\tt PV}$ )
ScrewPump_Left	P1001	Screw pump left
ScrewPump_Right	P1001	Screw pump right
Label	PSxLabel	Displays the ObjectTagName, StaticText and CustomPropertyLabel.

**NOTE:** Based on screw pump application, its symbol is available only for forward direction.

# **Faceplates**

## **Overview**

During operation, clicking the graphic symbol opens a faceplate with the following tabs:

- Standard tabs:
  - Operation with optional local panel, page 55
  - Engineering
  - Alarms, page 64

#### • Optional tabs:

- Interlocks, page 56
- Failures, page 59
- Maintenance, page 61

**NOTE:** The master template also features the trends faceplate.

#### **Operation Tab**

#### The figure shows an example of the **Operation** tab.

P1001 Oxidant dosing pum	ip 1	۲
Device State:	Stopped	
Current Direction:	None	
% 0.0 0.0		
% 0.0	•	
Owner:	Program	¥
Setpoint Mode:	Local	
Setpoint:	Off	~
Speed Selection:	~	
Speed Setpoint:	0.0 %	
Direction:	Forward	~
	Reset	

NOTE: This tab features the control module Reset button.

When the control module is reset, the current setpoint that is shown in this tab is effective.

By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect.

Refer to *Parameters* in this chapter for a description of the *Param. FailureRearmConfirmation* parameter, which allows you to configure the reset confirmation.

The figure shows the confirmation dialog box which is model in nature.

AG1001 - I	Reset	(Approx	×
4	Resetting the failure may Are you sure you want to	start the device in reset?	mmediately.
	(	ОК	Cancel

Resetting the control module by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

When the reset confirmation dialog box is enabled, the security classification that normally applies when you click **Reset** is not effective.

## **Engineering Tab**

The figure shows an example of the Engineering tab.

Mada:	Normal	
woue.	Norman	
Interlock Bypass:	Normal	~
Service:	In Service	~

# **A**WARNING

#### LOSS OF CONTROL AND UNINTENDED EQUIPMENT OPERATION

Before switching the monitored device back into service:

- Verify the current setpoint of the monitored device.
- Confirm the current status of the process.

# Failure to follow these instructions can result in death, serious injury, or equipment damage.

**NOTE:** This tab features the **Simulation** menu, which allows setting the control module to simulation mode.

In addition, the tab may feature another menu or text field, which allows you to configure the state or value to be simulated.

Enabling the simulation mode underlies a security classification, page 79. The default configuration is *tune*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

**NOTE:** This tab features the **Interlock Bypass** menu, which allows bypassing interlocks globally.

When the control module is reset, the current setpoint that is shown in the operation tab of the faceplate is effective.

Bypassing interlocks by selecting **Bypass** underlies a security classification, page 79. The default configuration is *verified write*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

**NOTE:** This tab features the **Service** menu, which allows setting the control module out of service.

When the control menu is set back into service by selecting **In Service** in the **Service** menu, the current setpoint that is shown in the operation tab of the faceplate is effective.

Setting the control module out of service underlies a security classification, page 79. The default configuration is *tune*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

# **Process Control**

## What's in This Part

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\$SplitRangeCE: Split Range Controllers	
\$Step3Ct/CE: Three-Step Controllers/Positioners	

#### **Overview**

This part describes the master templates that provide the supervision functions for the process control family.

Schneider Electric provides the templates described in this document. These templates can be used in various applications to minimize engineering efforts but the use, integration, configuration, and validation of the system is the sole responsibility of the user. Said user must ensure the safety of the system as a whole by performing a safety analysis, including the resources provided by Schneider Electric through procedures that the user deems appropriate.

# **A**WARNING

#### LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA) of your application, and apply preventive and detective controls before implementation.
- Provide a fallback state for undesired control events or sequences.
- Provide separate or redundant control paths wherever required.
- Supply appropriate parameters, particularly for limits.
- · Review the implications of transmission delays and take actions to mitigate.
- Review the implications of communication link interruptions and take actions to mitigate.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and fault conditions) according to the safety analysis and applicable codes, and regulations.
- Apply local accident prevention and safety regulations and guidelines.<sup>1</sup>
- Test each implementation of this library for proper operation before placing it into service.

# Failure to follow these instructions can result in death, serious injury, or equipment damage.

<sup>1</sup> For additional information, refer to NEMA ICS 1.1 (latest edition), *Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control* and to NEMA ICS 7.1 (latest edition), *Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems* or their equivalent governing your particular location.

# *\$IMCTLCE*: Internal Model Controllers

#### What's in This Chapter

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## **Overview**

This chapter describes the *\$IMCTLCE* master template, which contains supervision resources to monitor and operate internal model controllers (IMCs).

## **Supervision Functions**

### **Description**

The *\$IMCTLCE* master template provides the following monitoring and operation functions:

- Core functions:
  - Status monitoring.
  - Owner selection.
  - Setpoint management: IMC tuning and action.
  - IMC operation indication.
  - · Global bypassing of interlock conditions.
- Optional functions:
  - Viewing, bypassing, and resetting of individual interlock conditions.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

# **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The table describes the parameters that are defined as part of the *\$IMCTLCE* master template attributes.

Name	Data type	Initial value	Description
Param.EngUnits	String	00	Defines the unit of inputs and parameters.
Param.EngUnitsOP	String	90	Defines the unit of outputs.
Param.HiOP	Float	100.0	Highest value that the controller can output.
Param.HiPV	Float	100.0	Highest value that the controller accepts as setpoint.
Param.LoOP	Float	0.0	Lowest value that the controller can output.
Param.LoPV	Float	0.0	Lowest value that the controller accepts as setpoint.
Param. LoopModeNormal	String	Α,Μ	Specifies the operating mode of the IMC (separated by a comma):
Param.ModeNormal	String	0, P, C	Specifies the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> <li>C: Cascade</li> </ul> <li>For example P, C.</li>
Param.NumFormat	String	0.0	Specifies the display format of values. For example, enter 0.00 to display 2 decimals.
Param. NumFormatOP	String	0.0	Specifies the display format of the <i>OP</i> variable. For example, enter 0.00 to display 2 decimals.
Param. TrendPeriodMin	Integer	0	Refer to the description of this parameter that is documented for \$AnalogInputCE.

### **State Alarms for IMC**

No state alarm is configured by default for the *\$IMCTLCE* master template. **NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

### Representation

The table describes the symbols that are included in the *\$IMCTLCE* master template to display data of IMCs during operation.

Name	Graphic symbol	Description
Bar_Horz_OP	FIC1004 % 10	In addition to icons, displays: <ul> <li>The label.</li> <li>Engineering units.</li> <li>The output value.</li> </ul> <li>A horizontal line with configured high and low limits showing the relative position of the output.</li>
Bar_Hor_PV_SP	FIC1004	In addition to icons, displays (from top to bottom): • The label. • Engineering units. • The present value. • The setpoint value. • States. • To the right, a horizontal bar showing the setpoint and the present value.
Bar_Hor_PV_SP_OP	FIC1004	In addition to icons, displays (from top to bottom): <ul> <li>The label.</li> <li>Engineering units.</li> <li>The present value.</li> <li>The setpoint value.</li> <li>States.</li> <li>To the right, a horizontal bar showing the setpoint and the present value.</li> <li>Below the bar, a horizontal line with configured high and low limits showing the relative position of the output.</li> <li>Engineering units and value of the output are displayed to the left of the line.</li> </ul>
Bar_Vert_OP	FIC1004	<ul> <li>In addition to icons, displays:</li> <li>The label.</li> <li>A vertical line with configured high and low limits showing the relative position of the output.</li> <li>Engineering units.</li> <li>The ouput value.</li> </ul>

Name	Graphic symbol	Description
Bar_Vert_PV_SP	FIC1004	<ul> <li>In addition to icons, displays (from top to bottom):</li> <li>The label.</li> <li>A vertical bar showing the setpoint and the present value.</li> <li>Engineering units.</li> <li>The present value.</li> <li>The setpoint value.</li> </ul>
Bar_Vert_PV_SP_OP	FIC1004	<ul> <li>In addition to icons, displays (from top to bottom):</li> <li>The label.</li> <li>A vertical bar showing the setpoint and the present value.</li> <li>Engineering units.</li> <li>The present value.</li> <li>The setpoint value.</li> <li>States.</li> <li>To the right of the bar, a vertical line with configured high and low limits showing the relative position of the output.</li> <li>Engineering units and value of the output are displayed below the line.</li> </ul>
Bar_Vert_PV_SP_OP_ Trend	FIC1004	Displays in addition to data of <i>Bar_Vert_PV_SP_OP</i> , a trend panel with configurable trend period in minutes. Refer to the description of the <i>Param.</i> <i>TrendPeriodMin</i> parameter.
Bar_Vert_PV_SP_Trend	FIC1004	Displays in addition to data of <i>Bar_Vert_PV_SP</i> , a trend panel with configurable trend period in minutes. Refer to the description of the <i>Param.</i> <i>TrendPeriodMin</i> parameter.
Display_PV_SP	FIC1004	In addition to icons, displays (from top to bottom): • The label. • Engineering units. • The present value.

Name	Graphic symbol	Description
Display_PV_SP_OP	FIC1004	In addition to icons, displays (from top to bottom): • The label. • Engineering units. • The present value. • The setpoint value. • States. • Engineering units and value of the output.
Label	PSxLabel	Displays the ObjectTagName, StaticText and CustomPropertyLabel.

# **Faceplates**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

## **Available Tabs**

During operation, clicking an IMC symbol opens a faceplate with the following tabs:

- Tabs for core functions:
  - Operation
  - Engineering
  - Alarms, page 64
- Tabs for optional functions, which appear only if configured:
  - Interlocks, page 56

NOTE: The master template also features the trends faceplate.

## **Operation Tab**

The figure shows an example of the **Operation** tab.

IMC			۲
Current Mode:	Manual		
0.0 0.0 % 0.0	۹ ۱		,
Owner:	Program	~	
Setpoint Mode:	Local		
Mode:	Manual	~	
Setpoint:	0.0 %		
Output:	0.0 %		
OP High Limit:	100.0 %		
OP Low Limit:	0.0 %		

## **Engineering Tab**

The figure shows an example of the **Engineering** tab.

Interlock Bypass:	Normal	~
Action:	Reverse	~
Static Gain (1/K):	10.000	
Open Loop Time (Integral):	0.010 s	
Integral Gain:	1.000	
Pure Delay Time:	0.010 s	

**NOTE:** This tab features the **Interlock Bypass** menu, which allows bypassing interlocks globally.

When the control module is reset, the current setpoint that is shown in the operation tab of the faceplate is effective.

Bypassing interlocks by selecting **Bypass** underlies a security classification, page 79. The default configuration is *verified write*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

# \$LeadLagCE: Lead Lag Controllers

#### What's in This Chapter

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## **Overview**

This chapter describes the *\$LeadLagCE* master template, which contains supervision resources to monitor and operate lead lag controllers.

## **Supervision Functions**

#### **Description**

The *\$LeadLagCE* master template provides the following monitoring and operation functions:

- Core functions:
  - Status monitoring.
  - Owner selection.
  - Operating mode.
  - Setpoint management: Lead-lag configuration tuning, lead-lag operation indication.
  - Global bypassing of interlock conditions.
- · Optional functions:
  - Viewing, bypassing, and resetting of individual interlock conditions.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

# **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The table describes the parameters that are defined as part of the *\$LeadLagCE* master template attributes.

Name	Data type	Initial value	Description
Param.EngUnits	String	olo	Indicates the unit of inputs and parameters.
Param.EngUnitsOP	String	oło	Indicates the unit of outputs.
Param.HiOP	Float	100.0	Highest value that the controller can output.
Param.HiSP	Float	100.0	Highest value that the controller accepts as setpoint.
Param.LoOP	Float	0.0	Lowest value that the controller can output.
Param.LoSP	Float	0.0	Lowest value that the controller accepts as setpoint.
Param. LoopModeNormal	String	А,М	Specifies the normal loop operating mode of the lead lag controller (separated by a comma): A: Automatic M: Manual
Param.ModeNormal	String	0, P, C	Specifies the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> <li>C: Cascade</li> </ul> <li>For example P, C.</li>
Param.NumFormat	String	0.0	Specifies the display format of values. For example, enter 0.00 to display 2 decimals.
Param. NumFormatOP	String	0.0	Specifies the display format of the <i>OP</i> variable. For example, enter <i>0.00</i> to display 2 decimals.
Param. TrendPeriodMin	Integer	0	Refer to the description of this parameter that is documented for \$AnalogInputCE.

## **State Alarms for Split Range Controllers**

No state alarm is configured by default for the *\$LeadLagCE* master template. **NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

## **Symbol Description**

The table describes the symbols that are included in the *\$LeadLagCE* master template to display data of lead lag controllers during operation.

Name	Graphic symbol	Description
Bar_Hor_SP_OP	LL1100	<ul> <li>In addition to icons, displays (from top to bottom):</li> <li>The label.</li> <li>A horizontal bar graph showing the setpoint and the output.</li> <li>The output value with engineering units.</li> </ul>
Label	PSxLabel	Displays the ObjectTagName, StaticText and CustomPropertyLabel.

# **Faceplates**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

## **Available Tabs**

During operation, clicking a lead lag controller symbol opens a faceplate with the following tabs:

- Tabs for core functions:
  - Operation
  - Engineering
  - Alarms, page 64
- Tabs for optional functions, which appear only if configured:
  - Interlocks, page 56

**NOTE:** The master template also features the trends faceplate.

### **Operation Tab**

#### The figure shows an example of the **Operation** tab.

LeadLag (§ Leadlag Controller example		
Current Mode:	Manual	
	0.0%	
Owner:	Operator	~
Setpoint Mode:	Local	
Mode:	Manual	*
Setpoint:	0.0 %	
Output:	0.0 %	

## Engineering Tab

Interlock Bypass:	Normal ~
Gain Factor:	0.000
Time: Lag/Delayed Time:	0.000 s

The figure shows an example of the **Engineering** tab.

**NOTE:** This tab features the **Interlock Bypass** menu, which allows bypassing interlocks globally.

When the control module is reset, the current setpoint that is shown in the operation tab of the faceplate is effective.

Bypassing interlocks by selecting **Bypass** underlies a security classification, page 79. The default configuration is *verified write*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

# **\$PIDCE: PID Controllers**

#### What's in This Chapter

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•	

## **Overview**

This chapter describes the *\$PIDCE* master template, which contains supervision resources to monitor and operate PIDFF regulators with monitoring interface.

# **Supervision Functions**

### **Description**

The PID controller supervision functions help you to monitor and control a PIDFFtype controller by providing the operating modes used in the other resources for process control.

The *\$PIDCE* master template provides the following monitoring and operation functions:

- Core functions:
  - Owner selection
  - PID operation monitoring
  - PID mode selection
  - Tuning
  - Forward/reverse action
  - Formula management
  - Global bypassing of interlock conditions
- Optional functions:
  - Individual interlock condition management

These functions are implemented in runtime through symbols and their associated faceplate.

# **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The table describes the parameters that are defined as part of the *\$PIDCE* master template attributes.

Parameter	Туре	Initial value	Description
Param.EngUnits	String	90	Unit of present value (PV) and setpoint (SP)
Param.EngUnitsOP	String	olo	Unit of output value (OP)
Param.HiOP	Float	100.0	High limit for output value (OP)
Param.HiPV	Float	100.0	High limit for present value (PV)
Param.LoOP	Float	0.0	Low limit for output value (OP)
Param.LoPV	Float	0.0	Low limit for present value (PV)
Param. LoopModeNormal	String	А,М	<ul> <li>Specifies the loop normal modes (separated by a comma):</li> <li>A: Auto, regardless it is in Override mode (external output) or not</li> <li>M: Manual</li> </ul>
Param.ModeNormal	String	0, P, C	Specifies the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> <li>C: Cascade</li> </ul> <li>For example P, C.</li>
Param.NumFormat	String	0.0	Specifies the displaying format of present value $(PV)$ . For example, enter 0.00 for 2 decimals.
Param. NumFormatOP	String	0.0	Specifies the displaying format of output value (OP). For example, enter 0.00 for 2 decimals.
Param. TrendPeriodMin	Integer	0	Refer to the description of this parameter that is documented for \$AnalogInputCE.

### **State Alarms for PIDs**

No state alarm is configured by default for the *\$PIDCE* master template. **NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

## **Symbol Description**

The symbols that are included in the *\$PIDCE* master template to display data of PIDFF regulators with monitoring interface during operation are the same as those of the *\$IMCTLCE* master template, page 196.

# **Faceplates**

### **Overview**

During operation, clicking the graphic symbol allows you to display a faceplate with the following tabs:

- Standard tabs:
  - Operation
  - Engineering
  - Alarms, page 64
- Optional tabs:
  - Interlocks, page 56

**NOTE:** The master template also features the trends faceplate.

## **Operation Tab**

The figure shows an example of the **Operation** tab.

FIC1004 Water flow to D10 re	legulator - PID Control
Current Mode: % 0.0 % 0.0	Manual
Owner:	Program ~
Setpoint Mode:	Local
Mode:	Manual
Setpoint:	0.0 %
Output:	0.0 %
OP High Limit:	100.0 %
OP Low Limit:	0.0 %

## **Engineering Tab**

The figure shows an example of the **Engineering** tab.

$\triangle$		
Interlock Bypass:	Normal	
Action:	Reverse ~	
Proportional Gain:	0.050	
Integral Time:	0.000 s	
Derivative Time:	0.000 s	
Derivative Gain:	0.000	
Derivative Applied To:	Present Value v	
Gain Applied To:	All Terms ~	•
SP High Limit:	10000.0 %	
SP Low Limit:	0.0 %	

**NOTE:** This tab features the **Interlock Bypass** menu, which allows bypassing interlocks globally.

When the control module is reset, the current setpoint that is shown in the operation tab of the faceplate is effective.

Bypassing interlocks by selecting **Bypass** underlies a security classification, page 79. The default configuration is *verified write*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

# *\$PWMCtICE*: Pulse-Width Modulation Controllers

### What's in This Chapter

Supervision Functions	
Parameters	
Default State Alarms	
Graphic Representation	
Faceplates	
	-

# **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of pulse-width modulation controllers.

# **Supervision Functions**

### **Description**

Core and optional resources provide the following monitoring and operation functions:

- Main core functions encompass status monitoring, owner selection, PWM activation, setpoint management (PWM configuration), and global bypassing of interlock conditions.
- · Optional functions encompass individual interlock condition management.

These functions are implemented in runtime through symbols and their associated faceplate.

# **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

### **Parameter Description**

This table describes the parameters of the automation object:

Parameter	Туре	Default	Description
Param.EngUnits	String	olo	Unit of the setpoint value
Param.HiSP	Float	100.0	High limit for the setpoint value
Param.LoSP	Float	0.0	Low limit for the setpoint value

Parameter	Туре	Default	Description
Param.ModeNormal	String	O,P,C	Specifies the normal owner modes (separated by a comma):
			Operator
			• P: Program
			• C: Cascade
			For example P, C.
Param.NumFormat	String	0.0	Specifies the displaying format of values.
			For example, enter 0.00 for 2 decimal.

## **State Alarms for Pulse-Width Modulation Controllers**

No state alarm is configured by default for the *\$PWMCtICE* **NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

## Representation

This table describes the symbols available for representing the pulse-width modulation controllers:

Name	Graphic symbol	Description
Bar_Horiz_SP	A1F4_FIC1103	Horizontal bar with setpoint value (SP)
Label	PSxLabel	Displays the ObjectTagName, StaticText and CustomPropertyLabel.

# **Faceplates**

### **Overview**

During operation, clicking the graphic symbol opens a faceplate with the following tabs:

- Standard tabs:
  - Operation
  - Engineering
  - Alarms, page 64
  - Optional tabs:
    - Interlocks, page 56

NOTE: The master template also features the trends faceplate.

## **Operation Tab**

The figure shows an example of the **Operation** tab.

A1F4_FIC1106 Reflux valve control	ller	۲
Status:	Off	
Output Increase:	Off	
Output Decrease:	Off	
	0.0%	
Owner:	Program ~	
Setpoint Mode:	Local	
Mode:	Off ~	
Setpoint:	0.0 %	

## **Engineering Tab**

The figure shows an example of the **Engineering** tab.

≙ √	
Mode: Interlock Bypass: Service:	Normal~Normal~In Service~
Period: Min Pulse Width:	T#10s T#1s

**NOTE:** This tab features the PWM configuration data:

- Period in seconds.
- Minimum pulse width in seconds.

# \$RampCE: Ramps

#### What's in This Chapter

Supervision Functions	
Parameters	
Default State Alarms	
Graphic Representation	
Faceplates	

## **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of ramps.

# **Supervision Functions**

#### **Description**

Core resources provide the following monitoring and operation functions: Status monitoring, owner selection, and setpoint management (ramp activation and configuration).

These functions are implemented in runtime through symbols and their associated faceplate.

## **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

This table describes the parameters of the automation object:

Parameter	Туре	Default	Description
Param.EngUnits	String	010	Unit of the setpoint value
Param.HiSP	Float	100.0	High limit for the setpoint value
Param.LoSP	Float	0.0	Low limit for the setpoint value
Param.ModeNormal	String	0, P, C	Specifies the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> <li>C: Cascade</li> </ul> <li>For example P, C.</li>
Param.NumFormat	String	0.0	Specifies the displaying format of values. For example, enter 0.00 for 2 decimal.

#### **State Alarms for Ramp Management**

No state alarm is configured by default for the *RampCE* master template. **NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### Representation

This table describes the symbols available for representing the ramps:

Name	Graphic symbol	Description
Bar_Horiz_SP_Target	FIC1004R	Horizontal bar with setpoint (SP)
Label	PSxLabel	Displays ObjectTagName, StaticText and CustomPropertyLabel.

# **Faceplates**

#### **Overview**

During operation, clicking the graphic symbol allows you to display a faceplate with the following tabs:

- Standard tabs:
  - Operation
  - Engineering
  - Alarms, page 64

NOTE: The master template also features the trends faceplate.

# **Operation Tab**

FIS1001 Water Dosing ramp	to D10	۲
Status:	Inactive	
Owner:	Program 🗸	
Setpoint Mode:	Local	
Mode:	Off ~	
Target Setpoint:	0.0 %	

# Engineering Tab

L		
Daising Gradient:	250.000	1/e
Raising Gradient.	230.000	115
Falling Gradient:	1000.000	1/s
Maximum Deviation:	20.0	%

# \$RatioCtrICE: Ratio Controllers

#### What's in This Chapter

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## **Overview**

This chapter describes the *\$RatioCtrICE* master template, which contains supervision resources to monitor and operate ratio controllers.

## **Supervision Functions**

#### **Description**

The *\$RatioCtrlCE* master template provides the following monitoring and operation core functions:

- Status monitoring.
- Owner selection.
- Setpoint management: Ratio configuration.
- Ratio operation indication.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

## **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The table describes the parameters that are defined as part of the *\$RatioCtrlCE* master template attributes.

Name	Data type	Initial value	Description
Param.EngUnits	String	olo	Defines the unit of attributes.
Param.HiPV	Float	100.0	Highest value that the controller accepts as setpoint.
Param.LoPV	Float	0.0	Lowest value that the controller accepts as setpoint.
Param.ModeNormal	String	0, P, C	Specifies the normal owner modes (separated by a comma):

Name	Data type	Initial value	Description
			O: Operator
			• P: Program
			• C: Cascade
			For example P, C.
Param.NumFormat	String	0.00	Specifies the display format of values.
			For example, enter 0.00 to display 2 decimals.
Param. TrendPeriodMin	Integer	0	Refer to the description of this parameter that is documented for <i>\$AnalogInputCE</i> .

#### **State Alarms for Ratio Controller**

No state alarm is configured by default for the *\$RatioCtrlCE* master template. **NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### **Present and Output Value Description**

Ratio controller symbols display the following values:

- Present value: Current value of the variable that is controlled by the ration controller.
- Output value: Output OP generated by the controller based on the measurement and the configured ratio, page 218. OP = (K) \* PV\_TRACK + BIAS where (K) is the local ratio.

### **Symbol Description**

The table describes the symbols that are included in the *\$RatioCtrlCE* master template to display data of ratio controllers during operation.
Name	Graphic symbol	Description	
Bar_Hor_PV_SP	RC1100 0.00 0.00 ×	<ul> <li>In addition to icons, displays (from top to bottom):</li> <li>The label.</li> <li>Engineering units.</li> <li>The present value.</li> <li>The output value.</li> <li>The trend client icon.</li> <li>States, shown in a square, page 45.</li> <li>To the right, a horizontal bar showing the setpoint and the present value.</li> </ul>	
Bar_Vert_PV_SP	RC1100	<ul> <li>In addition to icons, displays (from top to bottom):</li> <li>The label.</li> <li>A vertical bar showing the setpoint and the present value.</li> <li>Engineering units.</li> <li>The present value.</li> <li>The output value.</li> <li>The trend client icon.</li> <li>States, shown in a square, page 45.</li> </ul>	
Bar_Vert_PV_SP_Trend		Displays in addition to data of <i>Bar_Vert_PV_SP</i> , a trend panel with configurable trend period in minutes. Refer to the description of the <i>Param</i> . <i>TrendPeriodMin</i> parameter.	
Display_PV_SP	RC1100 0.00 .00 ⊾	In addition to icons, displays (from top to bottom): <ul> <li>The label.</li> <li>Engineering units.</li> <li>The present value.</li> <li>The output value.</li> <li>The trend client icon.</li> <li>States, shown in a square, page 45.</li> </ul>	
Label	PSxLabel	Displays ObjectTagName, StaticText and CustomPropertyLabel.	

# **Faceplates**

# **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

### Available Tabs

During operation, clicking a ratio controller symbol opens a faceplate with the following tabs:

- Operation
- Engineering
- · Alarms, page 64
  - **NOTE:** The master template also features the trends faceplate.

#### **Operation Tab**

The figure shows an example of the **Operation** tab.

RC1100 RatioCtl example		۲
0/		
<b>0.00</b> 0.00		
Ratio PV/SP:	0.00 ×	
Reference PV:	0.00 %	
Owner:	Program v	
Setpoint Mode:	Local	
Ratio Setpoint:	0.00	

Ratio setpoint value: Ratio coefficient for the ration between the generated output and the measurement that is being applied according to the current operating mode.

Present value ratio: Actual ration coefficient generated by the ratio controller. Actual ratio *KAct* = (*PV* - *BIAS*)/*PV\_TRACK*.

### **Engineering Tab**

The figure shows an example of the **Engineering** tab.

S	
	Bias 0.000

# *\$SplitRangeCE*: Split Range Controllers

### What's in This Chapter

Supervision Functions	
Parameters	
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Graphic Representation	
Faceplates	
F	

# Overview

This chapter describes the *\$SplitRangeCE* master template, which contains supervision resources to monitor and operate split range controllers.

# **Supervision Functions**

### Description

The *\$SplitRangeCE* master template provides the following monitoring and operation functions:

- Core functions:
  - Status monitoring.
  - Owner selection.
  - Operating mode.
  - Setpoint management: Split range configuration.
  - Global bypassing of interlock conditions.
- Optional functions:
  - Viewing, bypassing, and resetting of individual interlock conditions.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

# Parameters

### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

### **Parameter Description**

The table describes the parameters that are defined as part of the *\$SplitRangeCE* master template attributes.

Name	Data type	Initial value	Description	
Param.EngUnits	String	010	Defines the unit of inputs and parameters.	
Param.HiOP	Float	100.0	Highest value that the controller can output.	
Param.HiSP	Float	100.0	Highest value that the controller accepts as setpoint.	
Param.LoOP	Float	0.0	Lowest value that the controller can output.	
Param.LoSP	Float	0.0	Lowest value that the controller accepts as setpoint.	
Param.ModeNormal	String	0, P, C	Specifies the normal owner modes (separated by a comma): • O: Operator • P: Program • C: Cascade For example P, C.	
Param.NumFormat	String	0.0	Specifies the display format of values. For example, enter 0.00 to display 2 decimals.	
Param. TrendPeriodMin	Integer	0	Refer to the description of this parameter that is documented for <i>\$AnalogInputCE</i> .	

## **Default State Alarms**

#### **State Alarms for Split Range Controllers**

No state alarm is configured by default for the *\$SplitRangeCE* master template. **NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### **Symbol Description**

The table describes the symbols that are included in the *\$SplitRangeCE* master template to display data of split range controllers during operation.

Name	Graphic symbol	Description	
Numeric_SP_OP1_OP2_ Sates	SR1100 % 0.0 0.0 0.0 □ ↓	<ul> <li>The symbol displays (from top to bottom):</li> <li>The label.</li> <li>Engineering units.</li> <li>The setpoint.</li> <li>Output 1.</li> <li>Output 2.</li> <li>States.</li> </ul>	
Label	PSxLabel	Displays ObjectTagName, StaticText and CustomPropertyLabel.	

# **Faceplates**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

#### **Available Tabs**

During operation, clicking a split range controller symbol opens a faceplate with the following tabs:

- Tabs for core functions:
  - Operation

•

- Engineering
- Alarms, page 64
- Tabs for optional functions, which appear only if configured:
- Interlocks, page 56

**NOTE:** The master template also features the trends faceplate.

#### **Operation Tab**

The figure shows an example of the **Operation** tab.

SplitRange SplitRange example	•			۲
Output1:		0.0 %		
Output2:		0.0 %		
Owner:	Program		~	
Setpoint Mode:	Local			
Setpoint:		0.0 %		

### **Engineering Tab**

The figure shows an example of the **Engineering** tab.

Interlock	Bypass: Normal	Ŷ
Output 1	Setpoint	Output
Point 1:	0 %	0 %
Point 2:	0 %	0 %
Output 2	Setpoint	Output
Point 1:	0 %	0 %
Point 2:	0 %	0 %

**NOTE:** This tab features the **Interlock Bypass** menu, which allows bypassing interlocks globally.

When the control module is reset, the current setpoint that is shown in the operation tab of the faceplate is effective.

Bypassing interlocks by selecting **Bypass** underlies a security classification, page 79. The default configuration is *verified write*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

# *\$Step3CtICE*: Three-Step Controllers/Positioners

#### What's in This Chapter

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### **Overview**

This chapter describes the *\$Step3Ct/CE* master template, which contains supervision resources to monitor and operate three-step controllers/positioners.

### **Supervision Functions**

#### **Description**

The *\$Step3CtICE* master template provides the following monitoring and operation functions:

- Core functions:
  - Status monitoring.
  - Owner selection.
  - Setpoint mode selection.
  - Controller operation indication.
  - Global bypassing of interlock conditions.
- Optional functions:
  - · Viewing, bypassing, and resetting of individual interlock conditions.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

### **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The table describes the parameters that are defined as part of the *\$Step3Ct/CE* master template attributes.

Name	Data type	Initial value	Description	
Param.EngUnits	String	olo	Indicates the unit of attributes	
Param.HiPV	Float	100.0	Highest value that the controller accepts as setpoint.	
Param.LoPV	Float	0.0	Lowest value that the controller accepts as setpoint.	
Param.ModeNormal	String	0, P, C	Specifies the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> <li>C: Cascade</li> </ul> <li>For example P, C.</li>	
Param.NumFormat	String	0.0	Specifies the display format of values. For example, enter 0.00 to display 2 decimals.	
Param. TrendPeriodMin	Integer	0	Refer to the description of this parameter that is documented for \$ <i>AnalogInputCE</i> .	

# **Default State Alarms**

#### **State Alarms for Three-Step Controller**

No state alarm is configured by default for the *\$Step3CtICE* master template. **NOTE:** You can modify the configuration from the **Attributes** page.

### **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### **Symbol Description**

The table describes the symbols that are included in the *\$Step3CtICE* master template to display data of three-step controllers/positioners during operation.

Name	Graphic symbol	Description
Bar_Horiz_ PV_SP_States	TIC1001 18.9 20.0 20.0 18.9 0	In addition to icons, displays (from top to bottom): • The label. • Engineering units. • The present value. • The setpoint value. • States. • To the right, a horizontal bar showing the setpoint and the present value.
Bar_Vert_PV_ SP_OP_ States_Trend	TIC1001	Displays in addition to data of Bar_Vert_PV_SP_ States_Trend, a vertical line showing the output.
Bar_Vert_PV_ SP_States	TIC1001	<ul> <li>In addition to icons, displays (from top to bottom):</li> <li>The label.</li> <li>A vertical bar showing the setpoint and the present value.</li> <li>Engineering units.</li> <li>The present value.</li> <li>The setpoint value.</li> <li>States.</li> </ul>
Bar_Vert_PV_ SP_States_ Trend	FIC1004	Displays in addition to data of <i>Bar_Vert_PV_SP_</i> <i>States</i> , a trend panel with configurable trend period in minutes. Refer to the description of the <i>Param.TrendPeriodMin</i> parameter.
Numeric_PV_ SP_States	TIC1001 °C 18.6 20.0 ▲▽■O	In addition to icons, displays (from top to bottom): <ul> <li>The label.</li> <li>Engineering units.</li> <li>The present value.</li> <li>The setpoint value.</li> <li>States.</li> </ul>

Name	Graphic symbol	Description
Numeric_PV_ States	TIC1001 18.9 O	In addition to icons, displays (from top to bottom): • The label. • Engineering units. • The present value. • States.
Label	PSxLabel	Displays <b>ObjectTagName</b> , <b>StaticText</b> and <b>CustomPropertyLabel</b> .

# **Faceplates**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

### **Available Tabs**

During operation, clicking a three-step controller/positioner symbol opens a faceplate with the following tabs:

- Tabs for core functions:
  - Operation

٠

- Engineering
- Alarms, page 64
- Tabs for optional functions, which appear only if configured:
- Interlocks, page 56

**NOTE:** The master template also features the trends faceplate.

#### **Operation Tab**

#### The figure shows an example of the **Operation** tab.

TIC1001 Temperature Contro	oller D10	٢
Status:	On	
Output Increase:	Off	
Output Decrease:	Off	
38.0 <sup>%</sup>		
20.0		
Error:	18.0 %	
Owner:	Operator ~	
Owner: Setpoint Mode:	Operator v	
Owner: Setpoint Mode: Start Order:	Operator ~ Local On ~	
Owner: Setpoint Mode: Start Order: Setpoint:	Operator   Local On   20.0 %	
Owner: Setpoint Mode: Start Order: Setpoint:	Operator Local On 20.0 %	
Owner: Setpoint Mode: Start Order: Setpoint:	Operator v Local On v 20.0 %	
Owner: Setpoint Mode: Start Order: Setpoint:	Operator v Local On v 20.0 %	

### **Engineering Tab**

<u>A</u>	
Interlock Bypass:	Normal v
Upper Deviation (>=0)	2.0 %
Lower Deviation (<=0):	-2.0 %
Hysteresis (>=0):	1.0 %

The figure shows an example of the **Engineering** tab.

**NOTE:** This tab features the **Interlock Bypass** menu, which allows bypassing interlocks globally.

When the control module is reset, the current setpoint that is shown in the operation tab of the faceplate is effective.

Bypassing interlocks by selecting **Bypass** underlies a security classification, page 79. The default configuration is *verified write*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

# **Sequential Control**

### What's in This Part

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#### **Overview**

This part describes the master templates that provide the supervision functions for sequential control. It also describes the template-specific configuration pages of the ArchestrA IDE object editor.

# **\$SequenceCE:** Sequential Control Functions

### What's in This Chapter

Description	
Parameters	
Default State Alarms	
Graphic Representation	
Faceplates	
•	

## **Overview**

This chapter describes the master templates that provide the supervision functions for Sequential Control.

Schneider Electric provides the templates described in this document. These templates can be used in various applications to minimize engineering efforts but the use, integration, configuration, and validation of the system is the sole responsibility of the user. Said user must ensure the safety of the system as a whole by performing a safety analysis, including the resources provided by Schneider Electric through procedures that the user deems appropriate.

# 

#### LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA) of your application, and apply preventive and detective controls before implementation.
- Provide a fallback state for undesired control events or sequences.
- Provide separate or redundant control paths wherever required.
- Supply appropriate parameters, particularly for limits.
- Review the implications of transmission delays and take actions to mitigate.
- Review the implications of communication link interruptions and take actions to mitigate.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and fault conditions) according to the safety analysis and applicable codes, and regulations.
- Apply local accident prevention and safety regulations and guidelines. 1
- Test each implementation of this library for proper operation before placing it into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

<sup>1</sup> For additional information, refer to NEMA ICS 1.1 (latest edition), *Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control* and to NEMA ICS 7.1 (latest edition), *Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems* or their equivalent governing your particular location.

# Description

### Introduction

This object is used for monitoring sequences based on the ISA-S88.01-1995 standard for batch control.

#### **Supervision Functions**

The table describes the main functions for sequential control management:

Function	Description	
State management	Shows the status of the sequence.	
Owner selection	Allows you to configure whether the sequence commands come from the program or the operator.	
Operating mode	Allows you to operate the sequence in automatic/semi-automatic or manual mode.	
Command management	Allows you to send commands (such as <i>Start</i> and <i>Stop</i> ) to the sequence.	
Parameter management	Allows you to select a strategy, enter input parameter values, and monitor output values.	
Initial condition management	Optional function that allows you to manage initial conditions that are not satisfied and that block the start of the sequence.	
Diagnostic information management	Optional function that allows you to manage abnormal conditions detected by the sequence.	

These functions are implemented in runtime through symbols and their associated faceplate.

### **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. User can modify the values in the derived application template or in its instances. User can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allows user to configure core functions.

**NOTE:** You can configure optional functions from the template-specific configuration pages, page 241.

#### **Parameter Description**

This table describes the parameters of the automation object:

Parameter	Туре	Default	Description
Param.Datal.Desc	String		Data1 description (only displayed in the PanelAll symbol).
Param.Data1.Format	String	0.00	Specifies the displaying format of the Data1 value. For example, enter 0.00 for 2 decimal <b>NOTE:</b> For configuration purposes, the decimal separator must be <b>Dot</b> (.) and not any other type of separator, for example, <b>Comma</b> (.). The run-time will use the configured language settings of the local system.
Param.Data1.PV	Float	0.0	Datal value attribute. <b>NOTE:</b> To display the Datal variable, you need to define it in the <b>Extensions</b> tab as an input extension of the attribute Param.Datal.PV (for example Me.SeqPar.OPO1.OP.PV for displaying the output parameter 1).
Param.Data2.Desc	String		Data2 description (only displayed in the PanelAll symbol).

Parameter	Туре	Default	Description
Param.Data2.Format	String	0.00	Specifies the displaying format of the Data2 value.
			For example, enter 0.00 for 2 decimal
			<b>NOTE:</b> For configuration purposes, the decimal separator must be <b>Dot</b> (.) and not any other type of separator, for example, <b>Comma</b> (,). The run-time will use the configured language settings of the local system.
Param.Data2.PV	Float	0.0	Data2 value attribute.
			NOTE: To display the Data2 variable, you need to define it in the Extensions tab as an input extension of the attribute Param.Data2.PV (for example Me.SeqPar.OP02.OP.PV for displaying the output parameter 2).
Param.HideAbortButton	Bool	False	If true, the Abort button is not displayed.
			If false, the <b>Abort</b> button is displayed.
Param.HideHoldButton	Bool	False	If true, the <b>Hold</b> button is not displayed.
			If false, the <b>Hold</b> button is displayed.
Param.HidePauseButton	Bool	False	If true, the <b>Pause</b> button is not displayed.
			If false, the <b>Pause</b> button is displayed.
Param.HideResetButton	Bool	False	If true, the <b>Reset</b> button is not displayed.
			If false, the <b>Reset</b> button is displayed.
Param.	Bool	False	If true, the <b>Restart</b> button is not displayed.
HideRestartButton			If false, the <b>Restart</b> button is displayed.
Param.HideStartButton	Bool	False	If true, the <b>Start</b> button is not displayed.
			If false, the Start button is displayed.
Param.HideStopButton	Bool	False	If true, the <b>Stop</b> button is not displayed.
			If false, the <b>Stop</b> button is displayed.
Param.ModeNormal	String	0,P	Specifies the normal owner modes (separated by a comma):
			• o: Operator
			• P: Program

# **Default State Alarms**

### **State Alarms for Sequential Control**

The table indicates for which attributes a state alarm is configured in the *\$SequenceCE* master template and provides the default values.

Attribute	Alarm message	Priority
AO.Failure	Failure condition triggered during execution	999

**NOTE:** You can modify the configuration from the **Attributes** page.

## **Graphic Representation**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### Representation

This table describes the symbols available for representing the sequential control:

Name	Graphic symbol	Description
PanelAll PanelWithButtons	PlantStruxure Sequrential C         Running       00:00:21.5         003-Dose Water         Water Charged (I)       47         Reactive Charged (Kg)       0         Image: Ima	<ul> <li>The symbol displays:</li> <li>The current state of the sequence.</li> <li>The step being executed.</li> <li>The strategy that is applied (if configured and selected).</li> <li>The time elapsed for the current step.</li> <li>Control buttons.</li> <li>Two configurable data (<i>Data1</i> and <i>Data2</i>).</li> </ul>
	PlantStruxure Sequrential C         Running       00:00:29.9         003-Dose Water         Image:	<ul> <li>The current state of the sequence.</li> <li>The step being executed.</li> <li>The strategy that is applied (if configured and selected).</li> <li>The time elapsed for the current step.</li> <li>Control buttons</li> </ul>
PanelState	PlantStruxure Sequrential C Running 00:01:37.5 003-Dose Water	<ul> <li>The symbol displays:</li> <li>The current state of the sequence.</li> <li>The step being executed.</li> <li>The strategy that is applied (if configured and selected).</li> <li>The time elapsed for the current step.</li> </ul>

# **Faceplates**

#### **Overview**

During operation, clicking a sequential control graphic symbol opens a faceplate with the following tabs:

- Standard tabs:
  - Operation
  - Parameters (input and output parameters)
  - State machine
  - Alarms, page 64
- Optional tabs:
  - Initial Conditions, page 56
  - Failures, page 59

### **Operation Tab in Automatic Mode**

This figure shows the **Operation** tab when **Operator** and the **Auto** mode are selected.



The sequence runs in automatic mode after clicking the **Start** button, and the bottom section of the faceplate displays:

- · The step that is being executed and its number.
- The transition to the next step:
  - Passive Galaxy style, page 44: The condition is not yet fulfilled.
  - Active Galaxy style: The condition is true.
- The next step to be executed when the current step is completed and the transition is true.

This table describes the command that corresponds to each button on the **Operation** tab.

Button	Command
	Start
	Hold
	Pause
	Restart/resume

Button	Command
	Stop
$\otimes$	Abort
$\triangleleft$	Reset

**NOTE:** Only buttons that correspond to available commands are active (*Active* Galaxy style, page 44). Unavailable commands are displayed with the *Passive* Galaxy style.

This table describes the mode that corresponds to each button on the **Operation** tab.

Button	Mode	Description
$\triangleright$	Auto	Normal execution
$\checkmark$	Semi	Asks for confirmation before transitioning
R	Man	Allows you to select the step to execute

### **Operation Tab in Semi-Automatic Mode**

This figure shows the **Operation** tab when **Operator** and the **Semi** mode are selected.

PREACT1_	_D10	۲
Reactive p	preparation D10	
Idle	00:00:00.0	
-		
	Owner: Operator v	
$\triangleright$		
Auto:	Semi: 🖌 Man: 🔊	
	Continue to next step	1
		_

The sequence starts in semi-automatic mode after clicking the **Start** button, and the bottom section of the faceplate displays:

- The step that is being executed and its number.
- The transition to the next step:
  - Passive style: The condition is not yet fulfilled
  - Active style: The condition is true.
- The next step to be executed.
- A **Continue to Next Step** button requiring the operator to confirm the execution of the next step when the transition is true.

### **Operation Tab in Manual Mode**

This figure shows the  $\ensuremath{\text{Operation}}$  tab when  $\ensuremath{\text{Operator}}$  and the  $\ensuremath{\text{Man}}$  mode are selected.

PREACT1_D10 Reactive preparation D10	۲
Idle 00:00:00.0	
-	
Owner: Operator v	
Auto: 📐 Semi: 🖌 Man: 🔊	
Select the step to execute:	_
	<b></b>
	r
Go to step	

The sequence starts in manual mode after clicking the **Start** button. The bottom section of the faceplate displays:

- The steps of the sequence that are programmed in the **Running** state.
- A Go To Step button allowing to execute the step selected in the Select the Step to execute list.

You can scroll up and down (in six-step increments) through the list of steps by using the two arrow buttons.

### Input/Ouput Parameters Tab

This figure shows the  $\ensuremath{\textbf{Parameters}}$  tab when the  $\ensuremath{\textbf{Input}}\ensuremath{\textbf{Parameters}}$  subtab is selected

## \$ 1	
##       Image: Constraining the second	
TimeLCT	<u> </u>
< >	~

You can select a strategy from the ones that have been defined and enter the corresponding values for enabled parameters.

Parameters that do not pertain to the selected strategy are disabled.

**NOTE:** The parameters can be only modified when the sequence is in **Idle** state.

This figure shows the **Parameters** tab when the **Output Parameters** subtab is selected.

## 🖌 \Lambda	
L û	
Water charged (I)	0.000 0.000 0.000 0.000
TimeLCT	^
	~
<	>

Displays the values of output parameters, which are calculated while the sequence is executed.

### **State Machine Tab**



The state diagram allows the operator to execute available commands by using the buttons.

Names of states appear in *Passive* style while the current state appears in *Active* style.

**NOTE:** Only buttons that correspond to available commands are active (*Active* style). Unavailable commands are displayed with the *Passive* style.

# **Sequential Control Object Configuration Pages**

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Parameters Page Default Configuration	244
Input Parameters Page Default Configuration	245
Output Parameters Page Default Configuration	
1 5 5	

### **Overview**

This chapter describes the default configuration of pages for sequential control objects.

They allow you to configure optional supervision functions of process application templates and their instances.

The default security classification to modify references is Configure.

# Main Page Default Configuration

#### **Overview**

The **Main** page is used to modify the variable references used by the sequential control object.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert - General Purpose Library.

For a description of the default template-specific configuration of sequential control management, refer to the chapter documenting master template of the sequential control.

### **Main Page Description**

Main	Initial Conditions	Failu	ure Con	ditions	Parameters	Input Parameters	Output Paramet	ers 0	bject	Informat	ion Scripts	UDAs	Extensions	Graph	ics
			PV:	C	Customized Re	ferences (only if Su	uffix is left on bla	nk):			Suffix for /	Auto Refe	rences:		
	State:								ſ	9	_SEQCTL1	_ST.STAT	ΓE	£	<b>Y</b>
	Comm	and:	ſ	0 [					ſ	<b>V</b>	_SEQCTL1	_ST.COM	IMAND	ſ	4
	Status W	ord:		[					ſ		_SEQCTL1	_ST.STW		ſ	-
	ConfigurationW	ord:	ſ	0 [					ſ	9	_SEQCTL1	_ST.CFG	W	ſ	<b>Y</b>
	Elapsed T	Time:		[					ſ	<b>Y</b>	_SEQCTL1	_ST.ETIM	IE	ſ	4
Cur	rrent Step Descrip	tion:		[					ſ	<b>y</b>	_SEQCTL1	_ST.CSTE	EPD;C	ſ	-
	Next Step (Man	ual):	ſ	0					ſ	1	_SEQCTL1	_CFG.NS	TEP	£	<b>Y</b>
	Step Descripti	ions:		[					ſ	<b>V</b>	_SEQCTL1	_CFG.STI	EPD;C	ſ	-
т	ransition Descript	ions:		[					ſ	1	_SEQCTL1	_CFG.TR	ANSD;C	6	<b>Y</b>
					Elen	nent	Def	ault	varia	able re	ference	with s	uffix for a	uto-i	referenc
					State	State <instance name="">_SEQCTL1_ST.STATE.</instance>									
					Com	nmand	<instance name="">_SEQCTL1_ST.COMMAND.</instance>								
						The default security classification is Operate.									
					Stat	us Word	<in< td=""><td>star</td><td>nce</td><td>name&gt;</td><td>SEQCI</td><td>L1_SI</td><th>.STW.</th><td></td><td></td></in<>	star	nce	name>	SEQCI	L1_SI	.STW.		

Element	Default variable reference with suffix for auto-referencing							
Configuration Word	<instance name="">_SEQCTL1_ST.CFGW.</instance>							
	The default security classification is <i>Operate</i> .							
Elapsed Time	<instance name="">_SEQCTL1_ST.ETIME.</instance>							
Current Step Description	<instance name="">_SEQCTL1_ST.CSTEPD;C.</instance>							
Next Step (Manual)	<instance name="">_SEQCTL1_CFG.NSTEP.</instance>							
	The default security classification is Secured Write.							
Step Descriptions	<instance name="">_SEQCTL1_CFG.STEPD;C.</instance>							
Transition Descriptions	<instance name="">_SEQCTL1_CFG.TRANSD;C.</instance>							
Customized References	Specify a variable reference if the automatic referencing mechanism is not used.							

# **Initial Conditions Page Default Configuration**

#### **Overview**

Depending on the configuration of the corresponding control resource, the **Initial Conditions** page is used to:

- Enable or disable initial conditions and define the initial condition descriptions. When enabled, it allows you to:
  - Enable or disable the bypass of initial conditions.
  - Enable or disable the manual resetting of initial conditions.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert - General Purpose Library.

For a description of the default template-specific configuration of initial conditions, refer to the chapter documenting master template of the Sequential control.

### **Initial Conditions Page Description**

Ma	in Initi	al Conditions	Failure Co	nditions	Parameters	Input Parameters	Output P	Parameters	; 0	Object In	formation	Scripts	UDAs	Extens	ions	Graphics			
						P	/:	Customiz	ed I	Referenc	es (only if	Suffix is	left on b	lank):			Suffix for Auto References:		
	En	able Initial Co	onditions:	7 🔓		Status Word:									6	· 🖓	_IC_CONDSUM_ST.CONDW	6	~
	Enable	Bypass of Co	onditions:	7 🗗		BypassWord: G	6 9								6	- <b>-</b>	_IC_CONDSUM_ST.BYPASSW	6	4
Ena	ble Manu	al Reset of Co	nditions:	6	Mar	nual Reset Word: 🛔	2 7								6			6	7
		-Initial Cond	dition Descri	iptions															
		Cond	dition 1:	Water do	sing process	in OPERATOR Mode;	[3082]Dos	sifica: 🗉	r	9									
		Cond	dition 2:	Missing V	/ater dosing	Initial Conditions;[308	2]No se c	umpl 🗉	r	9									
		Cond	dition 3:	Water do	sing process	not yet completed;[3	082]Dosif	ficaci:	r	1									
		Cond	dition 4:	Reactive	dosing proce	ess in OPERATOR Mod	le;[3082][	Dosifi 🗉	î.	1									
		Cond	dition 5:	Missing R	eactive dosir	ng Initial Conditions;[3	8082]No s	e cun 🗉	2	-									
		Cond	dition 6:	Reactive	dosing proce	ess not yet completed	;[3082]Do	osifica 🗉	2	-									
		Cond	dition 7:	Take San	nple in Opera	tor Mode;][3082]Tom	a de Mue:	stras 🗉	r	-									
		Cond	dition 8:	Take San	ple not yet o	completed;][3082]Ton	na de Mue	estras 🗉	r	1									
		Cond	dition 9:						î.	1									
		Condi	tion 10:						r.	-									
		Condi	tion 11:						r.	1									
		Condi	tion 12:						P.	-									
		Condi	tion 13:						r	1									
		Condi	tion 14:						r	1									
		Condi	tion 15:						î	9									

Element	Description						
Enable Initial	Select this check box to enable initial condition management.						
Conditions	By default the variable reference with suffix for auto-referencing is						
	The default security classification is <i>Free Access</i> .						
Enable Bypass of	Select this check box to enable bypass of conditions.						
Conditions	By default the variable reference with suffix for auto-referencing is <instance name="">_IC_CONDSUM_ST.BYPASSW.</instance>						
	The default security classification is <i>Free Access</i> to enable the bypassing function and <i>Secured Write</i> to bypass conditions during operation.						
Enable Manual Reset	Select this check box to enable the manual resetting of conditions.						
of conditions	By default the variable reference with suffix for auto-referencing is <instance name="">_IC_CONDSUM_ST.REARMREQW.</instance>						
	The default security classification is <i>Free Access</i> to enable the manual reset function and <i>Secured Write</i> to reset conditions during operation.						
Initial Condition	Enter the initial condition descriptions (up to 15).						
Description	The default security classification is Configure.						
	<b>NOTE:</b> The descriptions can be entered in multiple languages, page 40.						
Customized References	Specify a variable reference if the automatic referencing mechanism is not used.						

## **Failure Conditions Page Default Configuration**

#### **Overview**

Depending on the configuration of the corresponding control resource, the **Failure Conditions** page is used to:

- Enable or disable monitoring of detected failure conditions and define the detected failure condition descriptions. When enabled, it allows you to:
  - Enable or disable the bypass of detected failure conditions.
  - Enable or disable the manual resetting of detected failure conditions.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert - General Purpose Library.

For a description of the default template-specific configuration of detected failure condition management, refer to the chapter documenting master template of the sequential control.

#### **Failure Conditions Page Description**

Main	Initial Conditions	Failure Conditions	Parameters	Input Parameters	Output	Parameters	Object In	formation	Scripts	UDAs	Extensio	ins	Graphics			
					PV:	Customized	Referenc	es (only if	Suffix is	left on b	lank):			Suffix for Auto References:		
	Enable Failure Co	inditions: 🔽 🗳	<b>9</b>	Status Word:								ď	4	_FC_CONDSUM_ST.CONDW	6	7
	Enable Bypass of Co	onditions: 📄 🔐		BypassWord:	£ 6							ĥ	2		6	2
Enable	Manual Reset of Co	inditions: 📄 🔐	Manı	ual Reset Word:	4 B							6			6	ŀ
	-Failure Cor	ndition Descriptions														
	Cond	dition 1:				6	9									
	Conc	dition 2:					-									
	Conc	dition 3:				d'	9									
	Conc	dition 4:					1									
	Conc	dition 5:				dî 🖌	-									
	Conc	dition 6:				6	-									
	Conc	dition 7:				d'	9									
	Conc	dition 8:				6	-									
	Conc	dition 9:				ď	9									
	Condi	tion 10:				6	9									
	Condi	tion 11:				6	-									
	Condi	tion 12:														
	Condi	tion 13:				6										
	Condi	tion 14:				ď										
	Condi	tion 15:														
							~									

Element	Description						
Enable Failure Conditions	Select this check box to enable the management of detected failure conditions.						
	By default the variable reference with suffix for auto-referencing is <instance name="">_FC_CONDSUM_ST.CONDW.</instance>						
	The default security classification is <i>Free Access</i> .						
Enable Bypass of	Select this check box to enable bypass of detected failure conditions.						
Conditions	By default the variable reference with suffix for auto-referencing is <instance name="">_FC_CONDSUM_ST.BYPASSW.</instance>						
	The default security classification is <i>Free Access</i> to enable the bypassing function and <i>Secured Write</i> to bypass conditions during operation.						
Enable Manual Reset of Conditions	Select this check box to enable the manual resetting of detected failure conditions.						
	By default the variable reference with suffix for auto-referencing is <instance name="">_FC_CONDSUM_ST.REARMREQW.</instance>						
	The default security classification is <i>Free Access</i> to enable the manual reset function and <i>Secured Write</i> to reset conditions during operation.						
Failure Condition	Enter the condition descriptions (up to 15).						
Descriptions	The default security classification is Free Access.						
	<b>NOTE:</b> The descriptions can be entered in multiple languages, page 40.						
Customized References	Specify a variable reference if the automatic referencing mechanism is not used.						

# **Parameters Page Default Configuration**

#### **Overview**

Depending on the configuration of the corresponding control resource, the **Parameters** page is used to:

- · Define the number of input parameters.
- Define the number of output parameters.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert - General Purpose Library.

For a description of the default template-specific configuration of parameters for sequential control, refer to the chapter documenting master template of the sequential control.

### **Parameters Page Description**

Main	Initial Conditions	Failure Con	ditions Parameters	Input Parameters	Output Parameters	Object I	nformation	Scripts	UDAs	Extensions	Graphics		
	# Input Parameters: 3 🔹 🗇 🕕												
	# Output/Report Parameters: 4 🔹												
		PV:	Customized Refere	nces (only if Suffix i	s left on blank):		Suffix fo	r Auto R	eference	s:			
	Status Word:					£ 🖲	_SEQP/	AR05_ST.	STW	6	۰ 🕑 👘		
C	onfigurationWord:	<b>f</b> 🖗				£ 🖗	_SEQP/	AR05_ST.	CFGW	6	• 🐨		

Element	Description
# Input Parameters	Select the number of input parameters from the drop-down list (up to 16).
	The default security classification is <i>Free Access</i> .
# Output/Report Parameters	Select the number of output and report parameters from the drop-down list (up to 16).
	The default security classification is <i>Free Access</i> .
Status Word	Status word; by default the variable reference with suffix for auto- referencing is <instance name="">_SEQPARxx_ST.STW<sup>(1)</sup>).</instance>
Configuration Word	Status word; by default the variable reference with suffix for auto- referencing is <instance name="">_SEQPARxx_ST.CFGW(1)).</instance>
	The default security classification is Operate.
Customized References	Specify a variable reference if the automatic referencing mechanism is not used.
(1) xx = 05, 10, or 16 acco	ording to the number of parameters.

By combining the number of input and output parameters (the higher one), the object automatically selects the control block for the parameters being used at the control level (no parameters, *SEQPAR05*, *SEQPAR10*, or *SEQPAR16*).

## **Input Parameters Page Default Configuration**

#### **Overview**

Depending on the configuration of the corresponding control resource, the **Input Parameters** page is used to:

- Define input parameter descriptions.
- Enable or disable strategies for the input parameters.
- · Configure the strategies when enabled.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert - General Purpose Library.

For a description of the default template-specific configuration of input parameters for sequential control, refer to the chapter documenting master template of the sequential control.

### **Input Parameters Page Description**

Main	Initial Conditions	Failure Conditions	Parameters	Input Para	ameters	Outp	out Parameters	Object Infor	mation	Scripts	UDAs	Extensio
	Input Paramet	er Descriptions:					Alias:					
0	1: Strategy				£	<b>V</b>	_SEQPAR05_S	T.IP01	£.	<b>V</b>		
0	2: Water to char	ge (l);[3082]Agua a	cargar (l)		£.	1	_SEQPAR05_S	T.IP02	£.	1		
0	3: Water flow se	t point (l/h);[3082]C	onsigna caud	al Agua	£	1	_SEQPAR05_S	T.IP03	£	1		
0	4:				62	7			62	2		
0	5:				62	7			62	2		
0	6:				62	7			6	2		
0	7:				62	6			62	2		
0	8:				62	6			62	6		
0	9:				62	7			6	2		
1	0:				62	6			62	2		
1	1:				62	6			62	6		
1	2:				62	7			6	2		
1	3:				62	6			62	2		
1	4:				62	6			62	6		
1	5:				62	6			62	12		
1	6:				62	Ā			62	2		
										_		

#### Enable Strategies (Parameter 1): 👽 🕒 🅑

	Strategy Descriptions:	£ 🖳	List of applicable Input Parameters (separated by comma): 🖆	1 🐨
01:	Charge;[3082]Cargar		2	
02:	Dose;[3082]Dosificar		2,3	
03:				

Element	Description
Input Parameter Descriptions	Enter the input parameter descriptions. The number of parameters depends of the configuration made in the parameter tab, page 244.
	The default variable reference (Alias) is <instance name="">_ SEQPAR16_ST.IP01<instance name="">_SEQPAR16_ST.IP16.</instance></instance>
	<b>NOTE:</b> Descriptions can be entered in multiple languages, page 40.
Enable Strategies (Parameter 1)	Select this check box to enable strategy management. <b>NOTE:</b> If the strategies are enabled, the parameter 1 is reserved for strategy management.
Strategy Descriptions	Enter the description of strategies (up to 8). <b>NOTE:</b> Descriptions can be entered in multiple languages, page 40.
List of applicable Input Parameters	Enter the input parameters applicable in each strategy separated by a comma.
	For example, if parameters 02 and 03 are applicable for the strategy, enter 2 , 3.

NOTE: The default security classification of attributes of this page is Operate.

### **Output Parameters Page Default Configuration**

#### **Overview**

Depending on the configuration of the corresponding control resource, the **Output Parameters** page is used to define output and report parameter descriptions.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert - General Purpose Library.

For a description of the default template-specific configuration of parameters for sequential control, refer to the chapter documenting master template of the sequential control.

### **Output Parameters Page Description**

Main Initial Conditions Failure Conditions Parameters Input Parameters Output Parameters Object Information Scripts UDAs Extensions Graphics

	Output/Report Parameter Descriptions:			Alias Output:			Alias Report:		
01:	Water Charged ();[3082]Agua Cargada ()	6	1	_SEQPAR05_ST.OP01	ß	<b>V</b>	_SEQPAR05_ST.RPT01	ß	9
02:	Reactive Charged (Kg);[3082]Reactivo Cargado (Kg)	6	1	_SEQPAR05_ST.OP02	6	<b>V</b>	_SEQPAR05_ST.RPT02	6	1
03:	Concentration (%);[3082]Concentractión (%)	6	<b>V</b>	_SEQPAR05_ST.OP03	6	1	_SEQPAR05_ST.RPT03	6	1
04:	Density (Kg/l);[3082]Densidad (Kg/l)	6	1	_SEQPAR05_ST.OP04	6	<b>V</b>	_SEQPAR05_ST.RPT04	6	9
05:		6	7		6	2		6	?
06:		6	7		6	7		6	7?
07:		6	7		6	7		6	7
08:		6	7		6	7		6	?
09:		62	2		6	2		6	2
10:		62	2		6	?		6	?
11:		62	2		6	?		6	?
12:		62	2		62	2		6	?
13:		62	7		6	2		6	?
14:		62	2		6	2		6	2
15:		62	2		6	?		6	2
16:		62	72		62	?		6	7

Element	Description				
Output/Report Parameter Descriptions	Enter the output/report parameter descriptions. The number of parameters depends of the configuration made in the parameter tab, page 244.				
	<b>NOTE:</b> Descriptions can be entered in multiple languages, page 40.				
Alias Output	The default variable reference is <instance name="">_SEQPAR16_ST. OP01<instance name="">_SEQPAR16_ST.OP16.</instance></instance>				
Alias Report	The default variable reference is <instance name="">_SEQPAR16_ST. RPT01<instance name="">_SEQPAR16_ST.RPT16.</instance></instance>				

NOTE: The default security classification of attributes of this page is Operate.

# **Batch Phase Manager**

#### What's in This Part

\$PhaseCE: Batch Phase Functions	
Batch Phase Object Configuration Pages	
Communication Configuration in InBatch Tool	

#### **Overview**

This part describes the master templates that provide the supervision functions for Batch phase manager. It also describes the template-specific configuration pages of the ArchestrA IDE object editor.

# **\$PhaseCE: Batch Phase Functions**

#### What's in This Chapter

Description	
Parameters	
Default State Alarms	
Graphic Representation	
Faceplates	
F	

### **Overview**

This chapter describes the master templates that provide the supervision functions for Batch phase.

Schneider Electric provides the templates described in this document. These templates can be used in various applications to minimize engineering efforts but the use, integration, configuration, and validation of the system is the sole responsibility of the user. Said user must ensure the safety of the system as a whole by performing a safety analysis, including the resources provided by Schneider Electric through procedures that the user deems appropriate.

# 

#### LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA) of your application, and apply preventive and detective controls before implementation.
- Provide a fallback state for undesired control events or sequences.
- Provide separate or redundant control paths wherever required.
- · Supply appropriate parameters, particularly for limits.
- Review the implications of transmission delays and take actions to mitigate.
- Review the implications of communication link interruptions and take actions to mitigate.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and fault conditions) according to the safety analysis and applicable codes, and regulations.
- Apply local accident prevention and safety regulations and guidelines.<sup>1</sup>
- Test each implementation of this library for proper operation before placing it into service.

# Failure to follow these instructions can result in death, serious injury, or equipment damage.

<sup>1</sup> For additional information, refer to NEMA ICS 1.1 (latest edition), Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control and to NEMA ICS 7.1 (latest edition), Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems or their equivalent governing your particular location.

# Description

#### Introduction

This object is used for monitoring phases based on the ISA-S88.01-1995 standard for batch control.

#### **Supervision Functions**

The table describes the main functions for Batch phase management:

Function	Description
State management	Shows the status of the phase.
Owner selection	Allows user to configure whether the phase commands come from the program or the operator.
Operating mode	Allows user to operate the phase in automatic/semi-automatic or manual mode.
Command management	Allows user to send commands (such as Start and Stop) to the phase.
Parameter management	Allows user to select a strategy, enter input parameter values, and monitor output values.
Initial condition management	Optional function that allows user to manage initial conditions that are not satisfied and that block the start of the phase.
Diagnostic information management	Optional function that allows user to manage abnormal conditions detected by the phase.

These functions are implemented in runtime through symbols and their associated faceplate.

### **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. User can modify the values in the derived application template or in its instances. User can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allows user to configure core functions.

**NOTE:** User can configure optional functions from the template-specific configuration pages, page 241.

#### **Parameter Description**

This table describes the parameters of the automation object:

Parameter	Туре	Default	Description
Param.Datal.Desc	String		Data1 description (only displayed in the PanelAll symbol).
Param.Datal.Format	String	0.00	Specifies the displaying format of the Data1 value. For example, enter 0.00 for 2 decimal <b>NOTE:</b> For configuration purposes, the decimal separator must be <b>Dot</b> (.) and not any other type of separator, for example, <b>Comma</b> (.). The run-time will use the configured language settings of the local system.
Param.Data1.PV	Float	0.0	Datal value attribute. <b>NOTE:</b> To display the Datal variable, you need to define it in the <b>Extensions</b> tab as an input extension of the attribute Param.Datal.PV (for example Me.IBPar.OP01.OP.PV for displaying the output parameter 1).
Param.Data2.Desc	String		Data2 description (only displayed in the PanelAll symbol).

	1		
Parameter	Туре	Default	Description
Param.Data2.Format	String	0.00	Specifies the displaying format of the Data2 value.
			For example, enter 0.00 for 2 decimal
			<b>NOTE:</b> For configuration purposes, the decimal separator must be <b>Dot</b> (.) and not any other type of separator, for example, <b>Comma</b> (,). The run-time will use the configured language settings of the local system.
Param.Data2.PV	Float	0.0	Data2 value attribute.
			NOTE: To display the Data2 variable, you need to define it in the Extensions tab as an input extension of the attribute Param.Data2.PV (for example Me.IBPar.OP02.OP.PV for displaying the output parameter 2).
Param.HideAbortButton	Bool	False	If true, the Abort button is not displayed.
			If false, the <b>Abort</b> button is displayed.
Param.HideHoldButton	Bool	False	If true, the <b>Hold</b> button is not displayed.
			If false, the <b>Hold</b> button is displayed.
Param.HidePauseButton	Bool	False	If true, the <b>Pause</b> button is not displayed.
			If false, the <b>Pause</b> button is displayed.
Param.HideResetButton	Bool	False	If true, the <b>Reset</b> button is not displayed.
			If false, the <b>Reset</b> button is displayed.
Param.	Bool	False	If true, the <b>Restart</b> button is not displayed.
HideRestartButton			If false, the <b>Restart</b> button is displayed.
Param.HideStartButton	Bool	False	If true, the <b>Start</b> button is not displayed.
			If false, the <b>Start</b> button is displayed.
Param.HideStopButton	Bool	False	If true, the <b>Stop</b> button is not displayed.
			If false, the <b>Stop</b> button is displayed.
Param.ModeNormal	String	0,P	Specifies the normal owner modes (separated by a comma):
			O: Operator
			• P: Program

# **Default State Alarms**

#### **State Alarms for Batch Phase**

The table indicates for which attributes a state alarm is configured in the *\$PhaseCE* master template and provides the default values.

Attribute	Alarm message	Priority
AO.Failure	Failure condition triggered during execution	999

**NOTE:** User can modify the configuration from the **Attributes** page.

# **Graphic Representation**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### Representation

This table describes the symbols available for representing the InBatch:

Name	Graphic symbol	Description
PanelState	InBatch Strategy: Charge Ready Step: - 00:00:00.0	<ul> <li>The symbol displays:</li> <li>The current state of the phase.</li> <li>The step being executed.</li> <li>The strategy that is applied (if configured and selected).</li> <li>The time elapsed for the current step.</li> </ul>
PanelWithButtons	InBatch       Strategy:     Charge       Ready       Step:     -       00:00:00.0	<ul> <li>The symbol displays:</li> <li>The current state of the phase.</li> <li>The step being executed.</li> <li>The strategy that is applied (if configured and selected).</li> <li>The time elapsed for the current step.</li> <li>Control buttons</li> </ul>
PanelAll	InBatch         Strategy:       Charge       Ready         Step:       -       00:00:00.0         Data1       0.00         Data2       0         Image:	<ul> <li>The symbol displays:</li> <li>The current state of the phase.</li> <li>The step being executed.</li> <li>The strategy that is applied (if configured and selected).</li> <li>The time elapsed for the current step.</li> <li>Control buttons.</li> <li>Two configurable data (<i>Data1</i> and <i>Data2</i>).</li> </ul>
ControlButtons	Control Button 1 Control Button 2	User configurable control buttons. <b>NOTE:</b> Control buttons will be enabled only if the phase is started in operator owner (during program owner operation, control buttons are disabled). Control buttons will be disabled if phase state is <i>READY</i> or <i>INTERLOCKED</i> .

#### NOTE:

- The display area for the descriptions of State, Strategy and Step is limited, however, since they are user configurable, tooltips are available for these descriptions in the graphical symbols as well as in the **Operator** tab of the faceplate.
- Current state will be shown as: State related to InBatch (Intermediate state of phase). For example, *RUN(HOLDING*)

# **Faceplates**

#### **Overview**

During operation, clicking a Batch phase graphic symbol opens a faceplate with the following tabs:
- Standard tabs:
  - Operation
  - Parameters (input and output parameters)
  - State machine
  - Alarms, page 64
- Optional tabs:
  - Initial Conditions, page 56
  - Detected Failures, page 59

### **Operation Tab in Automatic Mode**

This figure shows the Operation tab when Operator and the Auto mode are selected.

PHREACTD10_IB Reactive Dosing D10	۲
Step: -	Ready 00:00:00.0
Owner: Operator	~
Auto: 📐 Semi: 🖌 Man:	$\overline{\mathbf{x}}$

**NOTE:** Control buttons will be enabled only if the phase is started in operator owner (during program owner operation, control buttons are disabled). Control buttons will be disabled if phase state is *READY* or *INTERLOCKED*.

The phase runs in automatic mode after clicking the **Start** button, and the bottom section of the faceplate displays:

- The step that is being executed and its number.
- The transition to the next step:
  - Passive Galaxy style, page 44: The condition is not yet fulfilled.
  - Active Galaxy style, page 44: The condition is true.
- The next step to be executed when the current step is completed and the transition is true.

This table describes the command that corresponds to each button on the **Operation** tab.

Button	Command
	Start
	Hold
	Pause
	Restart/resume
	Stop
$\otimes$	Abort
$\triangleleft$	Reset

**NOTE:** Only buttons that correspond to available commands are active (*Active* Galaxy style, page 44). Unavailable commands are displayed with the *Passive* Galaxy style.

This table describes the mode that corresponds to each button on the **Operation** tab.

Button	Mode	Description
$\triangleright$	Auto	Normal execution
$\checkmark$	Semi	Asks for confirmation before transitioning
R	Man	Allows you to select the step to execute

### **Operation Tab in Semi-Automatic Mode**

This figure shows the **Operation** tab when **Operator** and the **Semi** mode are selected.



The phase starts in semi-automatic mode after clicking the **Start** button, and the bottom section of the faceplate displays:

- The step that is being executed and its number.
- The transition to the next step:
  - Passive style: The condition is not yet fulfilled
  - Active style: The condition is true.
- The next step to be executed.
- A **Continue to Next Step** button requiring the operator to confirm the execution of the next step when the transition is true.

### **Operation Tab in Manual Mode**

This figure shows the  $\ensuremath{\text{Operation}}$  tab when  $\ensuremath{\text{Operator}}$  and the  $\ensuremath{\text{Man}}$  mode are selected.

PHREACTD10_IB Reactive Dosing D10	۲
	Ready
Step: -	00:00:00.0
Owner: Operator	~
Auto: 📐 Semi: 🖌 Man:	$\overline{\mathbf{x}}$
Select the step to execute:	
	T
Go to step	

The phase starts in manual mode after clicking the **Start** button. The bottom section of the faceplate displays:

- The steps of the sequence that are programmed in the **Running** state.
- A Go To Step button allowing to execute the step selected in the Select the Step to execute list.

User can scroll up and down (in six-step increments) through the list of steps by using the two arrow buttons.

### Input/Ouput Parameters Tab

This figure shows the  $\ensuremath{\textbf{Parameters}}$  tab when the  $\ensuremath{\textbf{Input}}\ensuremath{\textbf{Parameters}}$  subtab is selected

## 🖌 🛆			
ch (th			1
Reactive SP (Kg)		0	
TimeLCT /	AlarmComment		^
			~
<		>	

User can select a strategy from the ones that have been defined and enter the corresponding values for enabled parameters.

Parameters that do not pertain to the selected strategy are disabled.

**NOTE:** The parameters can be only modified when the sequence is in **READY** state.

This figure shows the **Parameters** tab when the **Output Parameters** subtab is selected.

## \$ 1	
d û	
Water charged (I)	0.000
1	
TimeLCT 🛆 AlarmComment	^
<	>

Displays the values of output parameters, which are calculated while the phase is executed.

### **State Machine Tab**



The state diagram allows the operator to execute available commands by using the buttons.

Names of states appear in *Passive* style while the current state appears in *Active* style.

**NOTE:** Only buttons that correspond to available commands are active (*Active* style). Unavailable commands are displayed with the *Passive* style.

# **Batch Phase Object Configuration Pages**

#### What's in This Chapter

Main Page Default Configuration	
Initial Conditions Page Default Configuration	
Failure Conditions Page Default Configuration	
Parameters Page Default Configuration	
Input Parameters Page Default Configuration	
Output Parameters Page Default Configuration	

### **Overview**

This chapter describes the default configuration of pages for Batch phase objects.

They allow you to configure optional supervision functions of process application templates and their instances.

The default security classification to modify references is Configure.

# Main Page Default Configuration

### **Overview**

The **Main** page is used to modify the variable references used by the InBatch object.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert - General Purpose Library.

For a description of the default template-specific configuration of Batch phase management, refer to the chapter documenting each master template of the Batch phase.

### **Main Page Description**

Main	Initial Conditions Fai	lure Cor	nditions	Parameters	Input Parameters	Output Parameters	Attribu	tes !	Scripts	Graphics	Object Information		
		PV:	(	Customized Re	ferences (only if Su	uffix is left on blank):			Suf	fix for Auto	References:		
	InBatch State						🗗	7	_16	BPHASE_ST	IBSTATE	ſ	<b>V</b>
	InBatch Command	- <b>-</b>	Ø				. 🗗	7	_16	PHASE_ST	IBCOMMAND	ſ	<b>&gt;</b>
	Sequence State						. 🗗	7	_16	PHASE_ST	STATE	ſ	<b>?</b>
	Sequence Command	ſ	<b>Ø</b>				. 6	7	_10	PHASE_ST	COMMAND	ſ	<b>V</b>
	Status Word						. 4	9	_10	PHASE_ST	.stw	£	<b>V</b>
	ConfigurationWord	- <b>-</b>	Ø				. 4	7	_16	PHASE_ST	.CFGW	ſ	<b>V</b>
	Elapsed Time	:					. 4	7	_10	PHASE_ST	.ETIME	ſ	<b>?</b>
Cu	rrent Step Description		[				. 🗗	7	_10	PHASE_ST	.CSTEPD;C	ſ	<b>?</b>
	Next Step (Manual)	ſ	Ģ				🗗	4	_16	BPHASE_CF	G.NSTEP	ſ	<b>V</b>
	Step Descriptions	:					. 4	7	_18	PHASE_CF	G.STEPD;C	ſ	7
т	ransition Descriptions						. 🗗	7	_18	PHASE_CF	G.TRANSD;C	ſ	7
			I.	abels (If left b	lank, Buttons will b	oe hidden during ope	ration):	£	<b>?</b>				
	Control Button 1	- <b>-</b>	Ø										
	Control Button 2	- <b>-</b>	Ø										

Element	Default variable reference with suffix for auto-referencing
InBatch State	<instance name="">_IBPHASE_ST.IBSTATE.</instance>
InBatch Command	<instance name="">_IBPHASE_ST.IBCOMMAND.</instance>
Sequence State	<instance name="">_IBPHASE_ST.STATE.</instance>

Element	Default variable reference with suffix for auto-referencing
Sequence Command	<instance name="">_IBPHASE_ST.COMMAND.</instance>
	The default security classification is Operate.
Status Word	<instance name="">_IBPHASE_ST.STW.</instance>
Configuration Word	<instance name="">_IBPHASE_ST.CFGW.</instance>
	The default security classification is Operate.
Elapsed Time	<instance name="">_IBPHASE_ST.ETIME.</instance>
Current Step Description	<instance name="">_IBPHASE_ST.CSTEPD;C.</instance>
Next Step (Manual)	<instance name="">_IBPHASE_CFG.NSTEP.</instance>
	The default security classification is Secured Write.
Step Descriptions	<instance name="">_IBPHASE_CFG.STEPD;C.</instance>
Transition Descriptions	<instance name="">_IBPHASE_CFG.TRANSD;C.</instance>
Customized References	Specify a variable reference if the automatic referencing mechanism is not used.
Control Button 1	Label for Control button 1. Control Button will be available only if the label is defined.
Control Button 2	Label for Control button 2. Control Button will be available only if the label is defined.

**NOTE:** For control button commands, access control is provided on **Main** tab with labels.

### **Initial Conditions Page Default Configuration**

#### **Overview**

Depending on the configuration of the corresponding control resource, the **Initial Conditions** page is used to:

- Enable or disable initial conditions and define the initial condition descriptions. When enabled, it allows you to:
  - Enable or disable the bypass of initial conditions.
  - Enable or disable the manual resetting of initial conditions.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert - General Purpose Library.

For a description of the default template-specific configuration of initial conditions, refer to the chapter documenting each master template of the Batch phase.

### **Initial Conditions Page Description**

\$PSxIBPhase *	
Main Initial Conditions Failure Conditions Parameters Input Parameters Output Para	ameters Attributes Scripts Graphics Object Information
Main         Initial Conditions         Parameters         Input Parameters         Output Parameters           Pr/:         Cu           Enable Initial Conditions:         Image: Status Word:         Image	ameters Attributes Scripts Graphics Object Information ustomized References (only if Suffix is left on blank):
Condition 14: Condition 15:	6 9 6 9

Element	Description
Enable Initial	Select this check box to enable initial condition management.
Conditions	By default the variable reference with suffix for auto-referencing is <instance name="">_IC_CONDSUM_ST.CONDW.</instance>
	The default security classification is <i>Free Access</i> .
Enable Bypass of	Select this check box to enable bypass of conditions.
Conditions	By default the variable reference with suffix for auto-referencing is
	The default security classification is <i>Free Access</i> to enable the bypassing function and <i>Secured Write</i> to bypass conditions during operation.
Enable Manual Reset	Select this check box to enable the manual resetting of conditions.
or conditions	By default the variable reference with suffix for auto-referencing is <instance name="">_IC_CONDSUM_ST.REARMREQW.</instance>
	The default security classification is <i>Free Access</i> to enable the manual reset function and <i>Secured Write</i> to reset conditions during operation.
Initial Condition	Enter the initial condition descriptions (up to 15).
Description	The default security classification is Configure.
	<b>NOTE:</b> The descriptions can be entered in multiple languages, page 40.
Customized References	Specify a variable reference if the automatic referencing mechanism is not used.

## **Failure Conditions Page Default Configuration**

#### **Overview**

Depending on the configuration of the corresponding control resource, the **Failure Conditions** page is used to:

- Enable or disable monitoring of detected failure conditions and define the detected failure condition descriptions. When enabled, it allows you to:
  - Enable or disable the bypass of detected failure conditions.
  - Enable or disable the manual resetting of detected failure conditions.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert - General Purpose Library.

For a description of the default template-specific configuration of detected failure condition management, refer to the chapter documenting each master template of the InBatch.

### **Failure Conditions Page Description**

\$PSxIBPhase *												
Main Initial Conditions Failure Conditions	Parameters Input Parameters C	Output Parar	meters /	Attributes	Scripts	Graphics	Object Informa	tion				
	PV:	: Cu	stomized	Referenc	es (only if	Suffix is le	eft on blank):			Suffix for Auto References:		
Enable Failure Conditions: 👽 🖆	Status Word:		-					ſ	7	_FC_CONDSUM_ST.CONDW	ſ	<b>I</b>
Enable Bypass of Conditions: 👽 🖆	BypassWord: 🚽	r 🧔						đ	<b>?</b>	_FC_CONDSUM_ST.BYPASSW	ſ	<b>P</b>
Enable Manual Reset of Conditions: 💟 🔓	🖓 🛛 Manual Reset Word: 🔒	r 🧔	-					£	3	_FC_CONDSUM_ST.REARMREQW	a	<b>?</b>
Failure Condition Description	s											
Condition 1:			ſ	<b>?</b>								
Condition 2:				<b>?</b>								
Condition 3:				<b>V</b>								
Condition 4:												
Condition 5:												
Condition 6:												
Condition 7:				<b></b>								
Condition 8:				<b>V</b>								
Condition 9:				-								
Condition 10:				<b></b>								
Condition 11:				<b>P</b>								
Condition 12:			- B	-								
Condition 13:				-								
Condition 14:				-								
Condition 15:				9								

Element	Description			
Enable Failure Conditions	Select this check box to enable the management of detected failure conditions.			
	By default the variable reference with suffix for auto-referencing is <instance name="">_FC_CONDSUM_ST.CONDW.</instance>			
	The default security classification is <i>Free Access</i> .			
Enable Bypass of	Select this check box to enable bypass of detected failure conditions.			
Conditions	By default the variable reference with suffix for auto-referencing is <instance name="">_FC_CONDSUM_ST.BYPASSW.</instance>			
	The default security classification is <i>Free Access</i> to enable the bypassing function and <i>Secured Write</i> to bypass conditions during operation.			
Enable Manual Reset of Conditions	Select this check box to enable the manual resetting of detected failure conditions.			
	By default the variable reference with suffix for auto-referencing is <instance name="">_FC_CONDSUM_ST.REARMREQW.</instance>			
	The default security classification is <i>Free Access</i> to enable the manual reset function and <i>Secured Write</i> to reset conditions during operation.			
Failure Condition	Enter the condition descriptions (up to 15).			
Descriptions	The default security classification is Free Access.			
	<b>NOTE:</b> The descriptions can be entered in multiple languages, page 40.			
Customized References	Specify a variable reference if the automatic referencing mechanism is not used.			

### **Parameters Page Default Configuration**

#### **Overview**

Depending on the configuration of the corresponding control resource, the **Parameters** page is used to:

- Define the number of input parameters.
- Define the number of output parameters.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert - General Purpose Library.

For a description of the default template-specific configuration of parameters for sequential control, refer to the chapter documenting each master template of the Batch phase.

### **Parameters Page Description**

•	\$PSxIBPhase *								
Mair	n Initial Conditions Failure Con	ditions Parameters	Input Parameters	Output Parameters	Attributes	Scripts	Graphics	Object Information	
	# Input Parameters:	16 🔻 🖨 🍕							
	# Output Parameters:	16 🔻 🖆 🤘	9						
	PV:	Customized Referer	nces (only if Suffix i	s left on blank):		Suffix for	Auto Refe	erences:	
	Status Word:				£ 🖗	_IBPAR 1	6_ST.STW	e e e e e e e e e e e e e e e e e e e	<b>V</b>
	ConfigurationWord: 🗗 🔯				£ 🔽	IBPAR 1	6 ST.CFG	w a	2

Element	Description
# Input Parameters	Select the number of input parameters from the drop-down list (up to 16).
	The default security classification is <i>Free Access</i> .
# Output Parameters	Select the number of output parameters from the drop-down list (up to 16).
	The default security classification is <i>Free Access</i> .
Status Word	Status word; by default the variable reference with suffix for auto- referencing is <instance name="">_IBPARxx_ST.STW<sup>(1)</sup>.</instance>
Configuration Word	Status word; by default the variable reference with suffix for auto- referencing is <instance name="">_IBPARxx_ST.CFGW<sup>(1)</sup>.</instance>
	The default security classification is Operate.
Customized References	Specify a variable reference if the automatic referencing mechanism is not used.
(1) XX = 05, 10, or 16 acco	rding to the number of parameters.

By combining the number of input and output parameters (the higher one), the object automatically selects the control block for the parameters being used at the control level (no parameters, *IBPAR05*, *IBPAR10*, or *IBPAR16*).

### **Input Parameters Page Default Configuration**

#### **Overview**

Depending on the configuration of the corresponding control resource, the **Input Parameters** page is used to:

- Define input parameter descriptions.
- Enable or disable strategies for the input parameters.
- Configure the strategies when enabled.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert - General Purpose Library.

For a description of the default template-specific configuration of input parameters for InBatch to the chapter documenting each master template of the Batch phase.

### **Input Parameters Page Description**

Main Initial Conditions Failure Conditions Parameters Input Parameters Output Parameters Attributes Scripts Graphics Object Information

1       3 </th <th>PV:</th> <th></th> <th>Input Parameter Descriptions:</th> <th></th> <th></th> <th></th> <th>Customized References (only if Suffix is le</th> <th>ft on blank):</th> <th></th> <th></th> <th>Alias:</th> <th></th> <th></th>	PV:		Input Parameter Descriptions:				Customized References (only if Suffix is le	ft on blank):			Alias:		
Image: Constraint of the second se	01: 🔐	Ø		e e	Ģ	1			6	-	_IBPAR 16_ST.IP01		c
Image: Constraint of the second se	02: 🔓	ø				2			6		_IBPAR 16_ST.IP02	٦.	đ
1       9        1       9       JBPARI6_5T.P04         1       9        1       1       JBPARI6_5T.P04         1       9        1       1       JBPARI6_5T.P05         1       9        1       1       1       JBPARI6_5T.P01         1       9        1       1       JBPARI6_5T.P11       JBPARI6_5T.P12         1       9        1       1       JBPARI6_5T.P12       JBPARI6_5T.P12         1       9        1       1       1       JBPARI6_5T.P12         1       1       1       1       1       1	03: 🔓	ø				1			- -	÷	_IBPAR 16_ST.IP03		đ
1       2	04: 🔐	ø				1			6	-	_IBPAR 16_ST.IP04		c,
G       G	05: 🔐	Ø		ď		1			6	-	_IBPAR 16_ST.IP05		c
1       2           JBPARI6_5T.P07         1       2           JBPARI6_5T.P07         1       3           JBPARI6_5T.P07         1       3           JBPARI6_5T.P07         1       3            JBPARI6_5T.P01         1       3            JBPARI6_5T.P01         1       3             JBPARI6_5T.P12         1       3            JBPARI6_5T.P12         1       3            JBPARI6_5T.P12         1       3            JBPARI6_5T.P12         1       3            JBPARI6_5T.P14         1       3           JBPA	06: 🔐	ø		ď		1			6	-	_IBPAR 16_ST.IP06		¢
Image: Constraint of the second se	)7: 🔐	Ø		ď		1			🗗	9	_IBPAR 16_ST.IP07		đ
G       G	)8: 🔐	Ø		ď		1			6	-	_IBPAR 16_ST.IP08		c
1       1       2         1        JBPAR16_5T.P10         1       1       1       1       1           JBPAR16_5T.P10         1       1       1       1       1           JBPAR16_5T.P11         1       1       1       1       1           JBPAR16_5T.P12         1       1       1       1            JBPAR16_5T.P13         1       1       1       1             JBPAR16_5T.P13         1       1       1       1            JBPAR16_5T.P14         1       1       1       1            JBPAR16_5T.P15         1       1       1       1	09: ず	ø				1			6	-	_IBPAR 16_ST.IP09		¢
습 6 · · · · · · · · · · · · · · · · · ·	LO: 🔐	Ø		ď		1			🗗	<b>?</b>	_IBPAR 16_ST.IP 10		¢.
습 영 </td <td>11: 🔐</td> <td>Ø</td> <td></td> <td>ď</td> <td></td> <td>1</td> <td></td> <td></td> <td>6</td> <td>9</td> <td>_IBPAR 16_ST.IP11</td> <td></td> <td>c</td>	11: 🔐	Ø		ď		1			6	9	_IBPAR 16_ST.IP11		c
1       2          JBPAR16_5T.P13         1       3           JBPAR16_5T.P14         1       3            JBPAR16_5T.P14         1       3            JBPAR16_5T.P15         1       3            JBPAR16_5T.P15         1       3            JBPAR16_5T.P16	12: 🔓	ø				1			6	<b>?</b>	_IBPAR 16_ST.IP 12		c
습 ③	3: 🔐	ø		ď		1			🗳	<b>?</b>	_IBPAR 16_ST.IP13		c
습 ( )	4: 🔐	Ø		ď		1			6	9	_IBPAR 16_ST.IP14		c
යි 🧭 යි 🖗 _BPAR16_ST.1P16	.5: 🔐	ø				1			🗳	-	_IBPAR 16_ST.IP15		c
	.6: 🔐	Ø		ď		1			🗗	<b>?</b>	_IBPAR 16_ST.IP 16		
Enable Strategies (Parameter 1): 🔄 🖆 🤿	13: 👌 14: 🔓 15: 🔐 16: 🚽	000	Enable Strategies (Parameter 1): []							9 9 9 9 9	_IBPAR 16_ST.IP1: _IBPAR 16_ST.IP1: _IBPAR 16_ST.IP1: _IBPAR 16_ST.IP1:	3 4 5 5	3 4 5
	2:												
	3:												
	14:												
	)5:												
	06:							_					
	07:							_					
	08:												

Element	Description
Input Parameter Descriptions	Enter the input parameter descriptions. The number of parameters depends of the configuration made in the parameter tab, page 244.
	The default variable reference (Alias) is <instance name="">_IBPAR16_ ST.IP01<instance name="">_IBPAR16_ST.IP16. NOTE: Descriptions can be entered in multiple languages, page 40.</instance></instance>
Enable Strategies (Parameter 1)	Select this check box to enable strategy management. <b>NOTE:</b> If the strategies are enabled, the parameter 1 is reserved for strategy management.
Strategy Descriptions	Enter the description of strategies (up to 8). <b>NOTE:</b> Descriptions can be entered in multiple languages, page 40.
List of applicable Input Parameters	Enter the input parameters applicable in each strategy separated by a comma.
	For example, if parameters 02 and 03 are applicable for the strategy, enter 2 , 3.

NOTE: The default security classification of attributes of this page is Operate.

## **Output Parameters Page Default Configuration**

### **Overview**

Depending on the configuration of the corresponding control resource, the **Output Parameters** page is used to define output parameter descriptions.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert - General Purpose Library.

For a description of the default template-specific configuration of parameters for InBatch, refer to the chapter documenting each master template of the Batch phase.

### **Output Parameters Page Description**

#### \$PSxIB\_001 \*

Main Initial Conditions Failure Conditions Parameters Input Parameters Output Parameters Attributes Scripts Graphics Object Information

	Output Parameter Descriptions:			Customized References (only if Suffix is left on blank):			Alias:		
01:		_			 a c	-	_IBPAR16_ST.OP01	<b>_</b>	-
02:		_	<b>V</b>		 a c	<b>?</b>	_IBPAR16_ST.OP02	<u> </u>	<b></b>
03:		_	<b>V</b>		 a de la comercia de l	<b>?</b>	_IBPAR16_ST.OP03	) 🗗	<b>V</b>
04:		_	<b></b>		 d		_IBPAR16_ST.OP04	<u> </u>	<b></b>
05:		£.			 a de la comercia de l		_IBPAR16_ST.OP05	a 🖌	7
06:		£.	7		 a de la comencia de l	-	_IBPAR16_ST.OP06	a 🖌	7
07:		£.			 a de la comercia de l	-	_IBPAR16_ST.OP07		7
08:		£.	<b>~</b>		 a de la comercia de l		_IBPAR16_ST.OP08	<u> </u>	7
09:		£.	<b>~</b>		 a de la comercia de l	<b>~</b>	_IBPAR16_ST.OP09	) 🗗	7
10:		d,	7		 a de la comencia de l		_IBPAR16_ST.OP10	d 🖌	7
11:		d			 a de la comercia de l		_IBPAR16_ST.OP11	a 🖌	7
12:		_	<b>P</b>		 a de la comercia de l		_IBPAR16_ST.OP12	a 🖌	7
13:		£.	7		 d d		_IBPAR16_ST.OP13	a 🖌	7
14:		£.	7		 a de la comencia de l	-	_IBPAR16_ST.OP14	a 🖌	7
15:		£.	7		 a de la comercia de l		_IBPAR16_ST.OP15	<u> </u>	7
16:		ſ	7		 ſ	<b>~</b>	_IBPAR16_ST.OP16	d 🖌	9

Element	Description
Output Parameter Descriptions	Enter the output parameter descriptions. The number of parameters depends of the configuration made in the parameter tab, page 244. <b>NOTE:</b> Descriptions can be entered in multiple languages, page 40.
Alias Output	The default variable reference is <instance name="">_IBPAR16_ST. OP01<instance name="">_IBPAR16_ST.OP16.</instance></instance>

**NOTE:** The default security classification of attributes of this page is *Operate*.

# **Communication Configuration in InBatch Tool**

### What's in This Chapter

### **Overview**

This chapter describes the configuration examples that can be implemented to establish the communication between InBatch tool and Batch Phase Manager.

## **Description**

InBatch tool can be configured to communicate with Batch Phase Manager by two approaches:

- InBatch tool on top of the OFS layer InBatch tool will communicate with OFS directly in parallel with Supervisory layer (ASP) and OFS is communicating with Batch Phase Manager.
- InBatch tool on top of the Supervisory layer (ASP) In this approach InBatch tool will communicate with ASP and ASP is communicating with OFS.

### InBatch Tool on Top of the OFS Layer

To configure the InBatch tool to communicate with OFS user has to verify that *IBCli* service is added in the runtime services and all the runtime services are stopped.

The below table shows the steps to configure InBatch tool to communicate with OFS layer for the AVEVA<sup>™</sup> System Platform 2014 R2 SP1.

Step	Action						
1	Go to the ArchestrA System Management Console.						
2	Go to the <b>DAServer Manager</b> in the left side navigation hierarchy.						
3	Create and configure the OPC object as shown in the figure (for example, OFS).						
4	Add and configure <b>OPC</b> group object as shown in the figure (for example, <b>PLCSim</b> ).						

Step	Action								
	SMC - [ArchestrA System Management Console (WIN-7TPVSOSMGH2)\DAServer Manager\Default G         File Action View Help         ArchestrA System Management Console         ArchestrA System Management Console         Conserver Manager								
	SMC - [ArchestrA System Management Console (WIN-7TPVSOSMGH2)\DAServer Manager\] File Action View Help								
	b le Galaxy Database Manager P S Galaxy Database Manager								
	Image: A marger         PLCSim Parameters         Device Items           Image: A marger         Default Group         Item Reference								
	Image: Second Secon								
5	Go to the InBatch tool, <b>Environment Display</b> . Open the <b>TagLinker</b> . Create a new access name. Provide the computer path location where the <b>FSGateway</b> is configured. In this case								
	FSGateway is on the local host. Provide the topic name same as <b>Device Group Name</b> mentioned in the <b>FSGateway</b> server.								
	Tag Linker								
	File Edit View Help         Top Name       Item       Access       Data Class								
6	A								
6	In the below figure, <b>Tag Name</b> column shows the tags created by the InBatch and items are <i>IBCommand</i> and <i>IBState</i> variables from Batch Phase Manager.								
	User will have to configure every tag with the respective bit in the <i>IBCommand</i> and <i>IBState</i> as shown in the below figure.								
	User will have to change the access to the <b>OFS</b> which is created in step 5.								

Step	Action				
					_
	12	Tag Linker			x
	File Edit View Help				
	Tag Name	Item	Access	Data Class	_
	D010.Reactive.CS.ABORT D010.Reactive.CS.ABRTD	PHREACTD10_IBPHASE_ST.IBCOMMAND.07 PHREACTD10_IBPHASE_ST.IBSTATE.06	OFS	Discrete /	^
	D010.Reactive.CS.DONE D010 Reactive CS.HELD	PHREACTDIO_IBPHASE_ST.IBSTATE.14 PHREACTDIO_IBPHASE_ST_IBSTATE_02	OFS	Discrete	
	D010.Reactive.CS.HOLD	PHREACTD10_IBPHASE_ST.IBCOMMAND.01	OFS	Discrete	
	D010.Reactive.CS.INTLK	PHREACTD10_IBPHASE_ST.IBSTATE.15	OFS	Discrete	
	D010.Reactive.CS.READI D010.Reactive.CS.RESEI	PHREACIDIO_IBPHASE_SI.IBSIAIE.00 PHREACIDIO IBPHASE SI.IBCOMMAND.04	OFS	Discrete	
	D010.Reactive.CS.RSTRT	PHREACTD10_IBPHASE_ST.IBCOMMAND.02	OFS	Discrete	
	D010.Reactive.CS.RUN	PHREACTD10_IBPHASE_ST.IBSTATE.01	OFS	Discrete	
	D010.Reactive.CS.STARI D010_Sample_CS_ABORT	PHREACTDIO_ISPHASE_SI.ISCOMMAND.00 PHSAMPLEDIO_ISPHASE_SI.ISCOMMAND.07	OFS	Discrete	
	D010.Sample.CS.ABRTD	PHSAMPLED10 IBPHASE ST.IBSTATE.06	OFS	Discrete	
	D010.Sample.CS.DONE	PHSAMPLED10_IBPHASE_ST.IBSTATE.14	OFS	Discrete	
	D010.Sample.CS.HELD	PHSAMPLED10_IBPHASE_ST.IBSTATE.02	OFS	Discrete	
	D010.Sample.CS.INTLK	PRSAMPLEDIO_IBPRASE_SI.IBCOMPAND.01 PRSAMPLEDIO_IBPRASE_ST_IBSTATE_15	015	Discrete	
	D010.Sample.CS.READY	PHSAMPLED10 IBPHASE ST.IBSTATE.00	OFS	Discrete	
	D010.Sample.CS.RESET	PHSAMPLED10_IBPHASE_ST.IBCOMMAND.04	OFS	Discrete	
	D010.Sample.CS.RSIRT	PHSAMPLEDIO_IBPHASE_ST.IBCOMMAND.02	OFS	Discrete	
	D010.Sample.CS.START	PHSAMPLEDIO_IBPHASE_SI.IBSIAIE.01 PHSAMPLEDIO_IBPHASE_ST.IBCOMMAND.00	OFS	Discrete	
	D010.Water.CS.ABORT	PHWATERDIO_IBPHASE_ST.IBCOMMAND.07	OFS	Discrete	
	D010.Water.CS.ABRID	PHWATERD10_IBPHASE_ST.IBSTATE.06	OFS	Discrete	
	D010.Water.CS.CI	PHWATERDIO_IBPHASE_SI.IBCOMMAND.07	OFS	Discrete	
	D010.Water.CS.HELD	PHWATERD10_IBPHASE_ST.IBSTATE.02	OFS	Discrete	
	D010.Water.CS.HOLD	PHWATERD10_IBPHASE_ST.IBCOMMAND.01	OFS	Discrete	
	IDDID.Water.CS.INILK	PRAKIEKDIO_IDPRASE_SI.IDSIAIE.IS	015	Discrete	
	Ø         Item:         7964175010_1594345_1           Ø         C         Use Tag Neme           C         Idath Memory Tag           Ø	Tr. 1857A7E.14 Pin Rever Instal Values Mar. Rever Data Types	Integer	Min Solied:	
7	After linking all the Environment Disp	required tags, update the <b>E</b> blay.	Environn	nent, Runtim	e and Configuration in
8	Now activate the F	SGateway server in Arche	estrA Sys	stem Manage	ement Console.
9	Start all the service communicate InBa	es from <b>Runtime</b> in <b>Enviro</b> tch tool with Batch Phase N	<b>nment D</b> Manager.	<b>isplay</b> . Now t	he user will be able to

The below table shows the steps to configure InBatch tool to communicate with OFS layer for the AVEVA  $^{\rm m}$  System Platform 2017 Update 2.

Step	Action							
1	Go to the ArchestrA System Management Console.							
2	Go to the <b>OI.GATEWAY.2</b> in the left side navigation hierarchy.							
3	Create and configure the <b>OPC</b> object as shown in the figure (for example, <b>OFS</b> ).							
	<ul> <li>ArchestrA System Management Console (WIN-7T</li> <li>Galaxy Database Manager</li> <li>Node Type: OPC</li> <li>Delimiter: .</li> </ul>							
	Gerations integration server Manager     Gerations and geration server Manager     Gerations and gerations an	/FS Parameters						
		Server Node: localhost						
		Server Name: Schneider-Aut.DFS.2						
	j G1 ▷ CPCUA ▷ III OPCUA	Reconnect Attempts: 3 Reconnect Period: 30000						
4	Add and configure <b>OFS</b> group object as shown in the figure (for example, <b>G1</b> ).							
	<ul> <li>ArchestrA System Management Console (WIN-7T</li> <li>Qalaxy Database Manager</li> </ul>	Node Type: OPCGroup Delimiter: .						
	Gerations Integration Server Manager     Gerault Group     Gerault Group	G1 Parameters Device Items   MQTT Publish Items						
	∠ ≥ Coccin ∠ ≥ Operations Integration Supervisory ∠ ⇒ Woodepuses - Coteway	Device Group Name: OFS_G1						
	△ 🕞 OI.GATEWAY.2	Update Rate: 500 ms						
		OPC Item ID Prefix: PLCSim!						
	▷ ✿ Wonderware - SIM	Use Group Name as Access Path Read Only Demand Read After Poke						

Step	Action
5	ArchestrA System Management Console (WIN-77       Image: Console (WIN-77       Image: Console (WIN-77         Image: Console (WIN-77       Image: Console (WIN-77       Image: Console (WIN-77         Image: Console (WIN-77       Image: Console (WIN-77       Image: Console (WIN-77         Image: Console (WIN-77       Image: Console (WIN-77       Image: Console (WIN-77         Image: Console (WIN-77       Image: Console (WIN-77       Image: Console (WIN-77         Image: Console (WIN-77       Image: Console (WIN-77       Image: Console (WIN-77         Image: Console (WIN-77       Image: Console (WIN-77       Image: Console (WIN-77         Image: Console (WIN-77       Image: Console (WIN-77       Image: Console (WIN-77         Image: Console (WIN-77       Image: Console (WIN-77       Image: Console (WIN-77         Image: Console (WIN-77       Image: Console (WIN-77       Image: Console (WIN-77         Image: Console (WIN-77       Image: Console (WIN-77       Image: Console (WIN-77         Image: Console (WIN-77       Image: Console (WIN-77       Image: Console (WIN-77         Image: Console (Win-77       Image: Console (Win-77       Image: Console (Win-77         Image: Console (Win-77       Image: Console (Win-77       Image: Console (Win-77         Image: Console (Win-77       Image: Console (Win-77       Image: Console (Win-77 <td< th=""></td<>
	Provide the topic name same as Device Group Name mentioned in the OI.GATEWAY.2 server.
	Access Editor     X       Access Names     v       Access Names     v       Application:     \\Localhost\Gateway       C Use Tag Name     v       C Use Tag Name     v       Add     Change       Delete     Close       C Image     V
6	Now Go to <b>View</b> in <b>TagLinker</b> , click on <b>Filter</b> , select the Units and Tag type to create the link. In the below figure, <b>Tag Name</b> column shows the tags created by the InBatch and items are <i>IBCommand</i> and <i>IBState</i> variables from Batch Phase Manager.
	User will have to configure every tag with the respective bit in the <i>IBCommand</i> and <i>IBState</i> as shown in the below figure. User will have to change the access to the <b>OFS</b> which is created in step 5.

Step	Action
	Tag Linker
	Tan Nama Data Class
	Teg Name         Item         Access         Data Class           D010. Reactive.CS. ABGRT         PHERATD10_IBFHASE_ST.IBCOMMAND.07         OFS         Disorete           D010. Reactive.CS. ABGRT         PHERATD10_IBFHASE_ST.IBSTATE.06         OFS         Disorete           D010. Reactive.CS. ABGRT         PHERATD10_IBFHASE_ST.IBSTATE.06         OFS         Disorete           D010. Reactive.CS. ADGE         PHERATD10_IBFHASE_ST.IBSTATE.14         OFS         Disorete           D010. Reactive.CS. HOLD         PHERATD10_IBFHASE_ST.IBSTATE.02         OFS         Disorete           D010. Reactive.CS. HOLD         PHERATD10_IBFHASE_ST.IBSTATE.04         OFS         Disorete           D010. Reactive.CS. NULL         PHERATD10_IBFHASE_ST.IBSTATE.15         OFS         Disorete           D010. Reactive.CS. NULL         PHERATD10_IBFHASE_ST.IBSTATE.01         OFS         Disorete           D010. Reactive.CS. NUL         PHERATD10_IBFHASE_ST.IBSTATE.01         OFS         Disorete           D010. Reactive.CS. START         PHERATD10_IBFHASE_ST.IBCOMAND.07         OFS         Disorete           D010. Sample.CS.ABGRT         PHERATD10_IBFHASE_ST.IBCOMAND.07         OFS         Disorete           D010. Sample.CS.ABRTD         PHERATD10_IBFHASE_ST.IBCOMAND.07         OFS         Disorete           D010. Sample.CS.ABRT
	DD10. Water. CS. INTEX     PHNATERD10_IBPHASE_ST. IDSTATE. 15     OPS     Discrete     V       V     Item:     PHNATERD10_IBPHASE_ST. IDSTATE. 14
7	After linking all the required tags, update the <b>Environment</b> , <b>Runtime</b> and <b>Configuration</b> in <b>Environment Display</b> .
8	Now activate the OI.GATEWAY.2 server in ArchestrA System Management Console.
9	Start all the services from <b>Runtime</b> in <b>Environment Display</b> . Now the user will be able to communicate InBatch tool with Batch Phase Manager.

### InBatch tool on Top of the Supervisory Layer (ASP)

To configure the InBatch tool to communicate with the Batch Phase Manager through the ASP user has to verify that *IBMX* service is added in the runtime services and all the runtime services are stopped. The below table shows the steps to configure InBatch tool to communicate with Batch Phase Manager through the ASP.

Step	Action				
1	Go to the ArchestrA IDE plateform, import the InBatch base templates from the below path C:\Program Files (x86)\Wonderware\InBatch\AppObjects. Here the drive C is the root drive for the installables.				
	💫 Derivation 👻 🕂 🗙				
	Image: Second state of the second s				
2	Go to the ArchestrA IDE Platform, click <b>InBatch</b> tab $\rightarrow$ <b>Import InBatch Model</b> .				

Step	Action					
	A dialog box will appear select the <b>Node Name</b> , click on <b>Connect</b> and after successful					
	Import InBatch Model					
	Batch Server Node Name: localhost Connect					
	Base Templates       Unit:     SInBatchUnit       Phase:     SInBatchPhase       Connection:     SInBatchConnection       Segment:     SInBatchSegment					
	Options         Preview only mode (no Galaxy or TagLinker changes)         Do not update InBatch TagLinker database         Object name prefix/suffix            • Prefix         Suffix         Add to object name:					
	InBatch Security Credentials User Name: Password: Import Cancel					
	The import operation will start importing InBatch application phase as an instance in ASP					
	Segment       Import InBatch Model         Options       Import InBatch Model         Options and probability       Import InBatch Model         Options and probability       Import InBatch Model         Options and probability       Import InBatch Model         Probability       Import InBatch Model         Import InBatch Model       Import InBatch Model         Probability       Import InBatch Model         Import InBatch Model       Import InBatch Model         Probability       Import InBatch Model         Import InBatch Model       Import InBatch Modele					
3	Now open the InBatch phase instance under \$InBatchPhase template. The instance will have phase commands and phase states from InBatch.					
	Enable the IO type of the phase commands and phase states. Connect the respective <i>IBCommand</i> and <i>IBState</i> variable from Batch Phase Manager as shown in figure. For example, Phase.Start - EPEASP.OPCUA_DeviceGroup.OPCUA.DeviceGroup./					
	DA/0:PLCSim!PHASE1100_Phase_ST.PhState					
	Torest     Production       Image:     Pro					
	M. Planci Stack Handholds       M. Planci Handholds					
4	Go to the InBatch tool Environment Display					

Step	Action					
	Open the TagLin select the Galax	nker → Access E Angle Angle	Editor, click Galaxy - drop-down list and c	→ enter <b>GR N</b> click on <b>Chan</b>	l <b>ode Name</b> and then <b>ge</b> button.	
	Ele Edit Man Hale		Tag Linker		_ <b>D</b> X	
	Tao Name	Item		Access	Data Class	
			Access Editor	X		
	Access	Names			~	
	Cont	rolSystem Access Access Access	Name: Galaxy			
	C Item: OFS	uch GR Node f	Name: Localhost		Min Scaled:	
	C InBatch Memo	Galaxy f	Name: Demo1307		Max Scaled:	
	Access.	Add Channel	Dalata dina			
		Add Change	Close			
	Change					
					li.	
5	Now Go to View	in TagLinker, cli	ck on Filter, select th	ne Units and <sup>.</sup>	Tag type to create the	
_	link.	<b>J</b>	, ,		- 3 - 31	
	Select the tag na	ame, click on <b>Acc</b>	ess, select the Gala	xy as Access	Name and click on	
	Change button.					
	A dialog box apr	ears when user o	clicks the browse but	ton of <b>Item</b> a	nd select the attribute	
	from correspond	ling phase instand	ce and click OK as s	hown in the b	elow figure.	
					_	
	File Edit View Help		Tag Linker			
	Tao Name	2	Galaxy Browser - PSxDemo	Process20160922	X	
	D010.Water.CS.DONE D010.Water.CS.HELD	🗄 🐮 Namespace: demo13	807 💌 🦹 F	ilter: Default 💌 🗉	<u>9-</u>	
	D010.Water.CS.HOLD D010.Water.CS.INTLK	E Instances	D010.Water	Data type	Category Security da	
	D010.Water.CS.READY D010.Water.CS.RESET	AG1001_MOTOR_FAILV	Phase.Abort	Boolean	Writeable_USC Free access	
	D010.Water.CS.RSTRT D010.Water.CS.RUN	ATV6xxWarn	Phase.Abort.InvertValue Phase.Aborted	Boolean	Writeable_C_Lo Read only Writeable_USC Free access	
	D010.Water.CS.START	<ul> <li>ATV9xx</li> <li>ATV9xxWarn</li> </ul>	Phase.Aborted.InvertValue Phase.Done	Boolean Boolean	Writeable_C_Lo Read only Writeable_USC Free access	
		D010     D010 Water	Phase.Done.InvertValue	Boolean	Writeable_C_Lo Read only	
	Item: PHWATERD1	D10SHUTDOWN	Phase.Held.InvertValue	Boolean	Writeable_C_Lo Read only	
	C Use Tag Name	Distilation	Phase.Hold.InvertValue	Boolean	Writeable_USC Free access Writeable_C_Lo Read only	
	C InBatch Memory Tag	<ul> <li>EACCUSINE</li> <li>EIOTESYST</li> </ul>	Phase.Interlocked	Boolean Boolean	Writeable_USC Free access Writeable_C_Lo Read only	
		EMCOMPACTNSX EMESTESYST	Phase.Ready	Boolean Boolean	Writeable_USC Free access Writeable_C_Lo Read only	
	Access	EMPM53xx	Phase.Reset	Boolean	Writeable_USC Free access	
	Export Tag	<ul> <li>FCV1004</li> </ul>	Phase.Restart	Boolean	Writeable_USC Free access	
		FI1001	Phase.Restart.InvertValue	Boolean Boolean	Writeable_C_Lo Read only Writeable_USC Free access	
	Change	<ul> <li>FI1002</li> <li>FI1003</li> </ul>	Phase.Run.InvertValue	Boolean Boolean	Writeable_C_Lo Read only Writeable_USC Free access	
	<u> </u>	FI1004	Phase.Start.InvertValue     Strategy Actual	Boolean	Writeable_C_Lo Read only Writeable_LISC Free access	
			Strateov.Target	Integer	Writeable USC Free access	
		Show templates			Property: <none></none>	
					OK Cancel Back	
		175 Objects	33 Attributes	D010.Water	Phase.Start .::	
	Link all the requi	red attributes of t	he phase instance.			
6	Update the Envi	ronment, Runtin	ne and Configuration	on in Environ	ment Display.	
-	Ctart all the series	iooo from Dunting		lonlos New	the uppr will be able to	
1	Start all the serv	ICES ITOM RUNTIM	te III Environment D	through ASD	une user will be able to	
	communicate m	Datch tool with Ba	aton Filase Ividilayel	anough ASP		

# **Equipment Module**

### What's in This Part

\$EMPatternCE: Equipment Module Functions	
Equipment Module Object Configuration Pages	

### **Overview**

This part describes the master templates that provide the supervision functions for equipment module. It also describes the template-specific configuration pages of the ArchestrA IDE object editor.

# *\$EMPatternCE*: Equipment Module Functions

### What's in This Chapter

Description	
Parameters	
Default State Alarms	
Graphic Representation	
Faceplates	

### **Overview**

This chapter describes the master templates that provide the supervision functions for equipment module.

Schneider Electric provides the templates described in this document. These templates can be used in various applications to minimize engineering efforts but the use, integration, configuration, and validation of the system is the sole responsibility of the user. Said user must ensure the safety of the system as a whole by performing a safety analysis, including the resources provided by Schneider Electric through procedures that the user deems appropriate.

# **A**WARNING

#### LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA) of your application, and apply preventive and detective controls before implementation.
- Provide a fallback state for undesired control events or sequences.
- Provide separate or redundant control paths wherever required.
- · Supply appropriate parameters, particularly for limits.
- Review the implications of transmission delays and take actions to mitigate.
- Review the implications of communication link interruptions and take actions to mitigate.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and fault conditions) according to the safety analysis and applicable codes, and regulations.
- Apply local accident prevention and safety regulations and guidelines.<sup>1</sup>
- Test each implementation of this library for proper operation before placing it into service.

# Failure to follow these instructions can result in death, serious injury, or equipment damage.

<sup>1</sup> For additional information, refer to NEMA ICS 1.1 (latest edition), *Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control* and to NEMA ICS 7.1 (latest edition), *Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems* or their equivalent governing your particular location.

# Description

### Introduction

This object is used for monitoring sequences based on the ISA-NS88 standard for continuous control.

### **Supervision Functions**

The table describes the main functions for equipment module management:

Function	Description
Equipment state management	Shows the state of the sequence.
Owner selection	Allows you to configure whether the sequence commands come from the program or the operator.
Operating mode	Allows you to operate the sequence in automatic/semi-automatic or manual mode.
Command management	Allows you to send commands (such as <i>Start</i> and <i>Stop</i> ) to the sequence.
Parameter management	Allows you to select a strategy, enter input parameter values, and monitor output values.
Initial condition management	Optional function that allows you to manage initial conditions that are not satisfied and that block the start of the sequence.
Diagnostic information management	Optional function that allows you to manage abnormal conditions detected by the sequence.

These functions are implemented in runtime through symbols and their associated faceplate.

### **Parameters**

### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

**NOTE:** You can configure optional functions from the template-specific configuration pages, page 241.

#### **Parameter Description**

This table describes the parameters of the automation object:

Parameter	Туре	Initial Value	Description
Param.Datal.Desc	String		Datal <b>description (only displayed in the</b> PanelWithButtons_2Data <b>and</b> PanelWithButtons_4Data <b>symbols)</b> .
Param.Datal.Format	String	0.00	Specifies the displaying format of the Data1 value.
			The valid format entries are D (Duration), T (Date Time) and numeric formats (for example: 0, 0.0, 00000)
			<b>NOTE:</b> For configuration purposes, the decimal separator must be <b>Dot</b> (.) and not any other type of separator, for example, <b>Comma</b> (,). The run-time will use the configured language settings of the local system.
Param.Data1.PV	Double	0.0	Datal value attribute. <b>NOTE:</b> To display the Datal variable, you need to define it in the <b>Extensions</b> tab as an input extension of the attribute Param.Datal.PV (for

Parameter	Туре	Initial Value	Description
			example Me.EMPar.OP01.OP.PV for displaying the output parameter 1).
Param.Data1.EU	String		Engineering unit for Data1.
Param.Data2.Desc	String		Data2 description (only displayed in the PanelWithButtons_2Data and PanelWithButtons_4Data symbols).
Param.Data2.Format	String	0.00	Specifies the displaying format of the Data2 value.
			The valid format entries are D (Duration), T (Date Time) and numeric formats (for example: 0, 0.0, 00000)
			<b>NOTE:</b> For configuration purposes, the decimal separator must be <b>Dot</b> (.) and not any other type of separator, for example, <b>Comma</b> (,). The run-time will use the configured language settings of the local system.
Param.Data2.PV	Double	0.0	Data2 value attribute. <b>NOTE:</b> To display the Data2 variable, you need to define it in the <b>Extensions</b> tab as an input extension of the attribute Param.Data2.PV (for example Me.EMPar.OP02.OP.PV for displaying the output parameter 2).
Param.Data2.EU	String		Engineering unit for Data2.
Param.HideAbortButton	Bool	False	If true, the <b>Abort</b> button is not displayed.
			If false, the <b>Abort</b> button is displayed.
Param.HideHoldButton	Bool	False	If true, the <b>Hold</b> button is not displayed.
			If false, the <b>Hold</b> button is displayed.
Param.HidePauseButton	Bool	False	If true, the <b>Pause</b> button is not displayed.
			If false, the <b>Pause</b> button is displayed.
Param.HideResetButton	Bool	False	If true, the <b>Reset</b> button is not displayed.
			If false, the <b>Reset</b> button is displayed.
Param.	Bool	False	If true, the <b>Restart</b> button is not displayed.
HIDERESTATIBUTION			If false, the <b>Restart</b> button is displayed.
Param.HideStartButton	Bool	False	If true, the <b>Start</b> button is not displayed.
			If false, the <b>Start</b> button is displayed.
Param.HideStopButton	Bool	False	If true, the <b>Stop</b> button is not displayed.
			If false, the <b>Stop</b> button is displayed.
Param.ModeNormal	String	0, P	Specifies the normal owner modes (separated by a comma):
			O: Operator
Daram Data? Daga	String		• P. Flogram
Param.Datas.Desc	Sung		PanelWithButtons_4Data symbol).
Param.Data3.Format	String	0.00	Specifies the displaying format of the Data3 value.
			The valid format entries are D (Duration), T (Date Time) and numeric formats (for example: 0, 0.0, 00000)
			<b>NOTE:</b> For configuration purposes, the decimal separator must be <b>Dot</b> (.) and not any other type of separator, for example, <b>Comma</b> (,). The run-time will use the configured language settings of the local system.

Parameter	Туре	Initial Value	Description
Param.Data3.PV	Double	0.0	Data3 value attribute.
			NOTE: To display the Data3 variable, you need to define it in the Extensions tab as an input extension of the attribute Param.Data3.PV (for example Me.EMPar.OP01.OP.PV for displaying the output parameter 1).
Param.Data3.EU	String		Engineering unit for Data3.
Param.Data4.Desc	String		Data4 description (only displayed in the PanelWithButtons_4Data symbol).
Param.Data4.Format	String	0.00	Specifies the displaying format of the Data4 value.
			The valid format entries are D (Duration), T (Date Time) and numeric formats (for example: 0, 0.0, 00000)
			<b>NOTE:</b> For configuration purposes, the decimal separator must be <b>Dot</b> (.) and not any other type of separator, for example, <b>Comma</b> (.). The run-time will use the configured language settings of the local system.
Param.Data4.PV	Double	0.0	Data4 value attribute.
			NOTE: To display the Data4 variable, you need to define it in the Extensions tab as an input extension of the attribute Param.Data4.PV (for example Me.EMPar.OP01.OP.PV for displaying the output parameter 1).
Param.Data4.EU	String		Engineering units for Data4.

### **Default State Alarms**

### **State Alarms for Equipment Module**

The table indicates for which attributes a state alarm is configured in the *\$EMPatternCE* master template and provides the default values.

Attribute	Alarm message	Priority
AO.Failure	Failure condition triggered during execution	999

**NOTE:** You can modify the configuration from the **Attributes** page.

## **Graphic Representation**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

### Representation

This table describes the symbols available for representing the equipment module:

Name	Graphic symbol	Description
PanelState	PlantStruxure Equipment Module       Image: Comparison of the second secon	<ul> <li>The symbol displays:</li> <li>The current equipment state.</li> <li>The current state of the sequence.</li> <li>The step being executed.</li> <li>The strategy that is applied (if configured and selected).</li> <li>The time elapsed for the current step.</li> </ul>
PanelWithButtons	PlantStruxure Equipment Module       Image: Constraint of the starting         State:       Starting         Strategy:       Strategy 1         Running       Step:         001- valve Open Now       00:00:00.0         Image:	<ul> <li>The symbol displays:</li> <li>The current equipment state.</li> <li>The current state of the sequence.</li> <li>The step being executed.</li> <li>The strategy that is applied (if configured and selected).</li> <li>The time elapsed for the current step.</li> <li>Control buttons</li> </ul>
PanelWithButton_ 2Data	PlantStruxure Equipment Module         State:       Starting         Strategy:       Wet Mode       Running         Step:       001-Initial condition       00:03:35.9         High Level SP       85.00 %         Low Level SP       10.00 %	<ul> <li>The symbol displays:</li> <li>The current equipment state.</li> <li>The current state of the sequence.</li> <li>The step being executed.</li> <li>The strategy that is applied (if configured and selected).</li> <li>The time elapsed for the current step.</li> <li>Control buttons.</li> <li>Two configurable data (<i>Data1</i> and <i>Data2</i>).</li> </ul>
PanelWithButton_ 4Data	PlantStruxure Equipment Module         State:       Starting         Strategy:       Wet Mode       Running         Step:       001-Initial condition       00:03:35.9         High Level SP       85.00 %         Low Level SP       10.00 %         Pump Selected       No Preference         Low SP       063.0 %         Dimensional Dimensiona Dimensiona Dimensiona Dimensional Dimensional Dimensional Dimensio	<ul> <li>The symbol displays:</li> <li>The current equipment state.</li> <li>The current state of the sequence.</li> <li>The step being executed.</li> <li>The strategy that is applied (if configured and selected).</li> <li>The time elapsed for the current step.</li> <li>Control buttons.</li> <li>Four configurable data (<i>Data1</i>, <i>Data2</i>, <i>Data3</i> and <i>Data4</i>).</li> </ul>

**NOTE:** The display area for the descriptions of State, Strategy, Strategy State and Step is limited, however, since they are user configurable, tooltips are available for these descriptions in the graphical symbols as well as in the **Operator** tab of the faceplate.

### **Faceplates**

### **Overview**

During operation, clicking a equipment module graphic symbol opens a faceplate with the following tabs:

Standard tabs:

•

- Operation
- Parameters (input and output parameters)
- State machine
- Alarms, page 64
- Optional tabs:
  - Initial Conditions, page 56
  - Failures , page 59

### **Operation Tab in Automatic Mode**

This figure shows the **Operation** tab when **Operator** and the **Auto** mode are selected.

Distillation	۲
State: Off	
Strategy: -	Idle
Step: - 00:0	0:00.0
Owner: Operator v	
Auto: 📐 Semi: 🖌 Man: 🔊	

The sequence runs in automatic mode. Once user clicks on **Start** button when Owner is Operator, it is navigated to **Parameter**  $\rightarrow$  **Input Parameter** tab, and from **Input Parameter** tab user can select **Strategy** and start the sequence. After clicking the **Start** button, that is placed at the bottom of **Input Parameter** tab, and bottom section of the operator tab on faceplate displays:

- · The step that is being executed and its number.
- The transition to the next step:
  - Passive Galaxy style, page 44: The condition is not yet fulfilled.
  - Active Galaxy style: The condition is true.
- The next step to be executed when the current step is completed and the transition is true.

This table describes the command that corresponds to each button on the **Operation** tab.

Button	Command
	Start
	Hold
	Pause
	Restart/resume
	Stop

Button	Command
$\otimes$	Abort
$\triangleleft$	Reset

**NOTE:** Only buttons that correspond to available commands are active (*Active* Galaxy style, page 44). Unavailable commands are displayed with the *Passive* Galaxy style.

This table describes the mode that corresponds to each button on the **Operation** tab.

Button	Mode	Description
$\square$	Auto	Normal execution
$\checkmark$	Semi	Asks for confirmation before transitioning
R	Man	Allows you to select the step to execute

### **Operation Tab in Semi-Automatic Mode**

This figure shows the **Operation** tab when **Operator** and the **Semi** mode are selected.

Distillation (	٢
State: Off	
Strategy: - Id	lle
Step: - 00:00:00	0.0
Owner: Operator v	
Auto: > Semi: 🖌 Man: 🔊	
Continue to next step	

The sequence starts in semi-automatic mode after clicking the **Start** button, that is placed at the bottom of **Input Parameter** tab, and bottom section of the **Operator** tab faceplate displays:

• The step that is being executed and its number.

- The transition to the next step:
  - Passive style: The condition is not yet fulfilled
  - $\circ$   $\;$  Active style: The condition is true.
- The next step to be executed.
- A **Continue to Next Step** button requiring the operator to confirm the execution of the next step when the transition is true.

### **Operation Tab in Manual Mode**

This figure shows the **Operation** tab when **Operator** and the **Man** mode are selected.

Distillation	۲
State: Off	
Strategy: -	Idle
Step: -	00:00:00.0
Owner: Operator	~
Auto: 📐 Semi: 🖌 Man:	R
Select the step to execute:	
	T
Go to step	

The sequence starts in manual mode after clicking the **Start** button placed at bottom of the **Input Parameter** tab, and the bottom section of the **Operator** tab faceplate displays:

- The steps of the sequence that are programmed in the Running state.
- A Go To Step button allowing to execute the step selected in the Select the Step to execute list.

You can scroll up and down (in six-step increments) through the list of steps by using the two arrow buttons.

### **Input/Ouput Parameters Tab**

This figure shows the **Parameters** tab when the **Input Parameters** subtab is selected.

## \$ 1	
Strategy:    Program SP/Balance	
Reset pumps operation time 0	
Start:	
TimeLCT 🛆 AlarmComment	^
< >	

You can select a strategy from the ones that have been defined and enter the corresponding values for enabled parameters.

• Filter the Strategies shown from the drop-down list based on the currently disabled strategies as determined from the logics in the controller. The drop-down list is only editable while the Strategy status is **Idle** and Owner is in Operator mode.

The Input Parameter tab consists of three columns:

- Description (read only): Description of input parameter.
- Value (read/write): The value is to be formatted as configured. Only editable while the Strategy Status is Idle. Formatted as:
  - Duration: Format of duration is dd.hh:mm:ss.mss
  - Date/Time: Date/Time as per regional settings.
  - Numeric: Numeric value formatted as per the configured **Format** (for example, 0, 0.0, 00000).
- EU (read only): EU is configured for the following specific data types:
  - Duration, Date/Time: NA
  - Numeric: Localized text as per the configured EU.

Sequence **Start** button is located at the bottom of the **Input Parameter** tab, that is to be enabled only in case of the current equipment module Strategy that is in Idle state and Owner is in Operator mode.

Parameters that do not pertain to the selected strategy are disabled.

**NOTE:** The parameters can be only modified when the sequence is in **Idle** state.

This figure shows the **Parameters** tab when the **Output Parameters** subtab is selected.

## \$ 1	
Equipment module diagnosis	0
Requested pumps	2
Active pumps	2
Pump 01 operation time	2109
Pumping asset 01 state	0
Pump 02 operation time	1977
Pumping asset 02 state	0
Pump 03 operation time	1982
Pumping asset 03 state	0
Pump 04 operation time	0
Pumping asset 04 state	0
Pump 05 operation time	0
Pumping asset 05 state	0
TimeLCT 🛆 AlarmCo	omment
	~
<	>

Displays the values of output parameters, which are calculated while the sequence is executed.

#### NOTE:

- Display cell area for column **Value** and **EU** of Input/Output parameter is limited. However, if **Value** or **EU** is exceeding the optimal space available, then it can be seen in tool tip.
- In Input/Output parameters, **Value** column will display **NaN** in case of non-numeric variable or if the variable is not available in the controller.

### State Machine Tab



The above faceplate shows a simplified diagram of state machine.

Names of states appear in *Passive* style while the current state appears in *Active* style.

**NOTE:** All the buttons are displayed with *Passive* style and cannot be used for sending commands.

# **Equipment Module Object Configuration Pages**

#### What's in This Chapter

Main Page Default Configuration	
Initial Conditions Page Default Configuration	
Failure Conditions Page Default Configuration	
Input Parameters Page Default Configuration	
Output Parameters Page Default Configuration	

### **Overview**

This chapter describes the default configuration of pages for equipment module objects.

They allow you to configure optional supervision functions of process application templates and their instances.

The default security classification to modify references is Configure.

## Main Page Default Configuration

#### **Overview**

The **Main** page is used to modify the variable references used by the equipment module object.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert - General Purpose Library.

For a description of the default template-specific configuration of sequential control management, refer to chapter documenting the master template of the equipment module.

### **Main Page Description**

Main Initial Conditions Fail	ure Co	ndition	s Input Parameters	Output Parameters	Attributes S	cripts	Graphics	Object Information	
	PV:		Customized Reference	es (only if Suffix is le	ft on blank):		2	Suffix for Auto References:	
Equipment State:						ď	9	_EMCTL_ST.EMSTATE	
Strategy:	ď	Ø				ſ	9	_EMCTL_ST.STRATEGY	- C - V
Strategy Execution State:						പ്	9	_EMCTL_ST.STATE	69
Command:	£	Ø				ď		_EMCTL_ST.COMMAND	
Status Word:						6	9	_EMCTL_ST.STW	£ 🖲
Configuration Word:	£	Ø				6		_EMCTL_ST.CFGW	
Elapsed Time:						ď	9	_EMCTL_ST.ETIME	6 V
Current Step Description:						പ്		_EMCTL_ST.CSTEPD;C	69
DisableStrategy:						ď	9	_EMCTL_ST.DISSTRATEGY	6 9
Next Step (Manual):	£	Ø				ſ		_EMCTL_CFG.NSTEP	69
Step Descriptions:						6		_EMCTL_CFG.STEPD;C	£ 9
Transition Descriptions:						6	9	_EMCTL_CFG.TRANSD;C	
		0:	efault Equipment Sta	te and Descriptions:	& 9	]	Use 16: [	r Defined Equipment State and	Descriptions: 💩 📝
		1:					17:		
		2:					18:		
		4:					20:		
		5:					21:		
		6:					22:		
		7:					23:		
		0:				{	24:		
		10:				{	26:		
		11:				1	27:		
		12:				1	28:		
		13:				]	29:		
		14:				]	30:		
		15:				J	31:		

Element	Default variable reference with suffix for auto-referencing			
Equipment State	<instance name="">_EMCTL_ST.EMSTATE</instance>			
Strategy	<instance name="">_EMCTL_ST.STRATEGY</instance>			
Strategy Execution State	<instance name="">_EMCTL_ST.STATE</instance>			
Command	<instance name="">_EMCTL1_ST.COMMAND.</instance>			
	The default security classification is Operate.			
Status Word	<instance name="">_EMCTL1_ST.STW.</instance>			
Configuration Word	<instance name="">_EMCTL1_ST.CFGW.</instance>			
	The default security classification is Operate.			
Elapsed Time	<instance name="">_EMCTL1_ST.ETIME.</instance>			
Current Step Description	<instance name="">_EMCTL1_ST.CSTEPD;C.</instance>			
Disable Strategy	<instance name="">_EMCTL_ST.DISSTRATEGY.</instance>			
Next Step (Manual)	<instance name="">_EMCTL1_CFG.NSTEP.</instance>			
	The default security classification is Secured Write.			
Step Descriptions	<instance name="">_EMCTL1_CFG.STEPD;C.</instance>			
Transition Descriptions	<instance name="">_EMCTL1_CFG.TRANSD;C.</instance>			
Customized References	Specify a variable reference if the automatic referencing mechanism is not used.			

There are sixteen default equipment states (0 to 15) available, and user can add sixteen more equipment states (17 to 31) as per requirement.

EMSTATE	Equipment Module Default State Description							
0	Off							
1	Stopped							
2	Starting							
3	Ready							
4	Standby							
5	Producing							
6	Switching							
7	Clearing							
8	Holding							
9	Held							
10	Stopping							
11	Aborting							
12	Aborted							
13	Reserved							
14	Reserved							
15	Reserved							

# **Initial Conditions Page Default Configuration**

### **Overview**

Depending on the configuration of the corresponding control resource, the **Initial Conditions** page is used to:

- Enable or disable initial conditions and define the initial condition descriptions. When enabled, it allows you to:
  - Enable or disable the bypass of initial conditions.
  - Enable or disable the manual resetting of initial conditions.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert - General Purpose Library.

For a description of the default template-specific configuration of initial conditions, refer to chapter documenting the master template of the equipment module.

### **Initial Conditions Page Description**

Ma	in Initia	l Conditions	Failure Co	nditions	Input Parameters	Output Paramete	rs /	Attributes	Scrip	ots Gra	phics	Object Informati	n						
						PV:		Customi	zed Re	eference	es (only	y if Suffix is left o	n blank):			Suffix for	Auto References:		
	Enable Initial Conditions: 😰 🕒 🕕 Status Word:										6	4	_IC_COM	IDSUM_ST.CONDW	ď	Y			
	Enable Bypass of Conditions: 🔽 🖆 🕕 Bypass Word: 🔓 🚳									6	4	_IC_COM	DSUM_ST.BYPASSW	ď	4				
En	able Manua	al Reset of C	onditions:	v 🖞	I Manual F	Reset Word: 🔐	ø							6	4	_IC_COM	DSUM_ST.REARMREQW	6	-
		Initial Con	dition Desc	riptions															
		Con	dition 1:	Init 1					<b>a</b> (	-									
		Con	dition 2:	Init 2					£ (	-									
		Con	dition 3:	Init 3					<b>f</b> (	1									
		Con	dition 4:	Init 4					<b>f</b> (	1									
		Con	dition 5:	Init 5					<b>f</b> (	1									
		Con	dition 6:	Init 6					£ (	1									
		Con	dition 7:	Init 7					£ (	1									
		Con	dition 8:						£ (	1									
		Con	dition 9:						£ (	1									
		Cond	lition 10:						£ (	1									
		Cond	lition 11:					i	<b>£</b> 8	1									
		Cond	lition 12:					i	<b>a</b> (	1									
		Cond	lition 13:						<b>a</b> (	1									
		Cond	lition 14:						<b>a</b> (	-									
		Cond	lition 15:						<b>a</b> (	9									

Element	Description					
Enable Initial	Select this check box to enable initial condition management.					
Conditions	By default the variable reference with suffix for auto-referencing is <instance name="">_IC_CONDSUM_ST.CONDW.</instance>					
	The default security classification is <i>Free Access</i> .					
Enable Bypass of	Select this check box to enable bypass of conditions.					
Conditions	By default the variable reference with suffix for auto-referencing is <instance name="">_IC_CONDSUM_ST.BYPASSW.</instance>					
	The default security classification is <i>Free Access</i> to enable the bypassing function and <i>Secured Write</i> to bypass conditions during operation.					
Enable Manual Reset	Select this check box to enable the manual resetting of conditions.					
or conditions	By default the variable reference with suffix for auto-referencing is <instance name="">_IC_CONDSUM_ST.REARMREQW.</instance>					
	The default security classification is <i>Free Access</i> to enable the manual reset function and <i>Secured Write</i> to reset conditions during operation.					
Initial Condition	Enter the initial condition descriptions (up to 15).					
Description	The default security classification is Configure.					
	<b>NOTE:</b> The descriptions can be entered in multiple languages, page 40.					
Customized References	Specify a variable reference if the automatic referencing mechanism is not used.					
# Failure Conditions Page Default Configuration

### **Overview**

Depending on the configuration of the corresponding control resource, the **Failure Conditions** page is used to:

- Enable or disable monitoring of detected failure conditions and define the detected failure condition descriptions. When enabled, it allows you to:
  - Enable or disable the bypass of detected failure conditions.
  - Enable or disable the manual resetting of detected failure conditions.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert - General Purpose Library.

For a description of the default template-specific configuration of detected failure condition management, refer to chapter documenting the master template of the equipment module.

#### **Failure Conditions Page Description**

Main Initial Conditions Failure C	onditions Input Parameters Output Parameters Attri	ttributes Scripts Graphics Object Information
Enable Failure Conditions	PV: Cu	Customized References (only if Suffix is left on blank): Suffix for Auto References:
Enable Bypass of Conditions	IJ _ U BypassWord: _ @ -	······································
Enable Manual Reset of Conditions	🐨 🗗 🕕 🛛 Manual Reset Word: 🖆 🎯	
Failure Condition De	scriptions	
Condition 1:	Fail 1	£ 🖗
Condition 2:	Fail 2	£ ()
Condition 3:	Fail 3	_£ ()
Condition 4:	Fail 4	<b></b>
Condition 5:	Fail 5	- 1 🐨
Condition 6:	Fail 6	- f 🖗
Condition 7:		- f - 🖓
Condition 8:		
Condition 9:		£ V
Condition 10:		<b></b>
Condition 11:		£ 🕑
Condition 12:		- f 🖗
Condition 13:		- f 🖗
Condition 14:		<b></b>
Condition 15:		£ 🖗

Element	Description
Enable Failure Conditions	Select this check box to enable the management of detected failure conditions.
	By default the variable reference with suffix for auto-referencing is <instance name="">_FC_CONDSUM_ST.CONDW.</instance>
	The default security classification is <i>Free Access</i> .
Enable Bypass of	Select this check box to enable bypass of detected failure conditions.
conditions	By default the variable reference with suffix for auto-referencing is <instance name="">_FC_CONDSUM_ST.BYPASSW.</instance>
	The default security classification is <i>Free Access</i> to enable the bypassing function and <i>Secured Write</i> to bypass conditions during operation.
Enable Manual Reset of Conditions	Select this check box to enable the manual resetting of detected failure conditions.
	By default the variable reference with suffix for auto-referencing is <pre><instance name="">_FC_CONDSUM_ST.REARMREQW.</instance></pre>
	The default security classification is <i>Free Access</i> to enable the manual reset function and <i>Secured Write</i> to reset conditions during operation.
Failure Condition	Enter the condition descriptions (up to 15).
Descriptions	The default security classification is Free Access.
	<b>NOTE:</b> The descriptions can be entered in multiple languages, page 40.
Customized References	Specify a variable reference if the automatic referencing mechanism is not used.

# **Input Parameters Page Default Configuration**

#### **Overview**

Depending on the configuration of the corresponding control resource, the **Input Parameters** page is used to:

- Define input parameter descriptions.
- Configure the strategies.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert - General Purpose Library.

For a description of the default template-specific configuration of input parameters for sequential control, refer to chapter documenting the master template of the equipment module.

#### **Input Parameters Page Description**

lain Initial I	Condition	Input Parameters Output Parameters	ters	Attributes	Scripts Graphics	Objec	t Informa	tion								
		# Input Parameters: 32 🔻	6	3												
PV:		Input Parameter Descriptions:			Format:			EU/Enumeration:			Customized References (only if Suffix is left on blan	k):			Alias:	
01: 🗬	4		ിഷി	3		8	3		6	3			aî l	3		a 🧕
02: 🗬	ġ.		6	٢		8	۲		5	۲		-	6	٢		÷ 🔅
03: 🖉	ġ.		6	۲		£	۲		5	۲		-	aî.	٢		÷ 🔅
04: 🖉	ġ.		6	۲		8	۲		6	۲			aî.	٢		a 🧿
05: 🖉	ġ.		6			8	۲		6	۲			aî.	۲		a 🧿
06: 🔐	ġ.		6	(a)		8	3		6	۲			۰£	٢		a 🧿
07: 🗬	ġ.		6	(a)		<i>a</i>	÷		6	(a)			۵°	٢		a 🧿
08: 🔐	ġ.		്ഷ	÷		8	÷		6	(a)			۵°	٢		a 🧿
09: 🔐	ġ.		6			6	9		6	(a)			۵°	٢		a 🧿
10: 🔐	ġ.		6	÷		6	9		6	(a)			۵°	÷		a 🧿
11: 💣	ġ.		6	÷		6	÷		6	(a)			۵°	÷		a 🧿
12: 💣	ġ.		1 🖉	÷		8	÷		6	(a)			۵°	÷		a 🧿
13: 🗗	á		1.2	ě.		8	ė.		8	ě.		ī	6	ě.		ā 🔅
14: 💣	ō.		1 a	÷		8	9		6	÷			a°.	÷		a 🧿
15: 🗬	ġ.		1 🖉	÷		5	9		6	÷			a°.	÷		a 🧿
16: 🗬	ġ.		1 🖉	÷		8	÷		6	÷			a°.	÷		a 🦻
17: 🚽	ġ.		1 a	3		5	÷		6	3			a°.	٠		a 🦻
18: 🗗	ġ.		1.2	ġ.		8	ė.		8	ė.			6	é.		÷ 🔹
19: 🗗	ġ.		1.2	۲		8	ė.		8	ė.			6	ġ.		÷ 🔅
20: 🔐	ġ.		1.2	٢		4	ė.		8	ė.			6	ġ.		÷ 🔅
21: 🗬	ġ.		1	۲		8	ė.		8	۲			6	ġ.		÷ 🔅
22: 🗳	ġ.		1	۲		8	÷		5	۲			5	٢		÷ 🔅
23:	ġ.		1 a	۲		8	۲		5	۲			5	۲		÷ 🔅
24:	ġ.		6	۲		4	۲		5	۲		-	6	٢		÷ 🔅
25:	ġ.		6	۲		8	۲		5	۲		-	6	٢		÷ 🔅
26:	ġ.		6	۲		8	۲		5	۲		-	6	۲		÷ 🔅
27: 3	ġ.		6	٢		÷.	٢		-8	٢			ŝ	٢		÷ 🔅
28: 0	á		1.5	٢		8	ě.		5	ě.			5	á.		÷ .
29: 0	á		1.5	٢		8	ě.		5	ě.			6	ě.		÷ .
30: 6	á		1.5	٢		8	ě.		8	ě.			6	ě.		÷ .
31: 0	á		1.2	(a)		8	ě.		8	ě.		Ĩ	6	ě.		÷ .
32: 6	á		1.2	ě.		8	ě.		5	ě.			6	ě.		÷ .
-				× .		_	× .		-	× .		_	_	Ť.,		
		Stratagu Dascolationsu 🔐 🗷			List of applicable 5	0.00	cometers	e 🛛								
01.					and an appreciate a											
02:																
02:																
031																
04:																

Element	Description
Input Parameter Descriptions	Enter the input parameter descriptions. The number of parameters depends of the configuration made.
	Customized (Alias) reference for input parameters.
	NOTE: Descriptions can be entered in multiple languages, page 40.
Format	The valid format entries are D (Duration), T (Date Time) and numeric formats (for example: 0, 0.0, 0000).
	<b>NOTE:</b> For configuration purposes, the decimal separator must be <b>Dot</b> (.) and not any other type of separator, for example, <b>Comma</b> (,). The run-time will use the configured language settings of the local system.
Engineering Unit	EU is configured for the following specific data types:
	Duration, Date/Time: NA
	Numeric: Localized text as per the configured <b>EU</b> .
Customized reference	Customized reference for the input parameters.
Alias	Alias for the input parameters.
Strategy Descriptions	Enter the description of strategies (up to 16).
	<b>NOTE:</b> Descriptions can be entered in multiple languages, page 40.
List of applicable Input Parameters	Enter the input parameters applicable in each strategy separated by a comma.
	For example, if parameters 02 and 03 are applicable for the strategy, enter 2 , 3.

NOTE: The default security classification of attributes of this page is Operate.

# **Output Parameters Page Default Configuration**

### **Overview**

Depending on the configuration of the corresponding control resource, the **Output Parameters** page is used to define output parameter descriptions.

The references to control resources that are described use specific control resources of the EcoStruxure Process Expert - General Purpose Library.

For a description of the default template-specific configuration of parameters for sequential control, refer to chapter documenting the master template of the equipment module.

### **Output Parameters Page Description**

				Actionates 30 pts	Grap	riks	Object Information								
# 0 01	Dutput Parameters: 2 🔹 🖆 🕕			Format:			EU:			Customized References (only if Suffix is left on b	ilank):			Alias:	
01: F	inal Product	6	<b>9</b>	0.00	6	9	EU	6	9			6		_OpPar1	66
02: I	ntermediate Product	6	ŵ -	0	3	ġ.	EU	- a	9			) ar	ġ.	_OpPar2	1 a ĝ
03:		63	B		62	Ġ.		63				63	B		6
04:		- 63	6		62	G.		- 63				63	6		6 B
05:		- 63	G.		62	G.		- 63				63			6 B
06:		- 63	6		62	G.		- 63				) බ	6		6 6
07:		- 63	6		62	G.		- 63				63			6 6
08:		- 63	6		63	G.		63				) බ	6		- 6a 🖪
09:		- 63	6		63	G.		- 63				6	6		- 6a 🖪
10:		6	B.		63	G.		63				) බා			1 4a 🖷
11:		63	B		63	G.		63				6	6		1 4a 🖷
12:		63	6		63	G.		63	6			63			4 6
13:		63	6		63	G.		63	6			63	6		
14:		63	6		62	G.		63	6			63			- 6a (k
15:		63	6		63	G.		63				) බා			1 4a 🕠
16:		63	6		63	6		- 63				) 63			6
17:		63			63			63				63			6
18:		63			63			63	6			) 🖓			6
19:		63			63			63	6			63			6
20:		63	6		63			63	6			] 🖓			6
21:		- 63	6		63			ිම	G			6			6
22:		- 62	6		63			ිම	G			] 🖓			6
23:		- 63	6		63			ිම				6	6		6 6
24:					ි බ			63				6			6 6
25:					63			63	G			් ක	G		- 6a 🚯
26:		63			63			ිම	G			්බ			- 1a 🖏
27:		63			63			ිම	6			) 6a	G		- 10 B
28:		63	6		63			ිම				් ක			- 10 B
29:		63	6		63	B		63				) 6a			- 10 B
30:		63	G		63	6		63				) බ			- 12 B
31:		63	G		63	6		63				) බා			3 th 16
32:		63	G		63	6		63				) 🖏			6

Element	Description
Output Parameter Descriptions	Enter the output parameter descriptions. The number of parameters depends of the configuration made. <b>NOTE:</b> Descriptions can be entered in multiple languages, page 40.
Format	The valid format entries are D (Duration), T (Date Time) and numeric formats (for example: 0, 0.0, 0000). <b>NOTE:</b> For configuration purposes, the decimal separator must be <b>Dot</b> (.) and not any other type of separator, for example, <b>Comma</b> (,). The run-time will use the configured language settings of the local system.
Engineering Unit	<ul> <li>EU is configured for the following specific data types:</li> <li>Duration, Date/Time: NA</li> <li>Numeric: Localized text as per the configured EU.</li> </ul>
Customized reference	Customized reference for the output parameters.
Alias	Alias for the output parameters.

**NOTE:** The default security classification of attributes of this page is *Operate*.



### What's in This Part

<i>\$PumpSetCtrlCE</i> : Pump Set Pattern Functions	293
Pump Set Pattern Object Configuration pages	297

# *\$PumpSetCtrICE*: Pump Set Pattern Functions

#### What's in This Chapter

Description	
Parameters	
Default State Alarms	
Graphic Representation	
Faceplates	
•	

### **Overview**

This chapter describes the master templates that provide the supervision functions for Pump Set.

Schneider Electric provides the templates described in this document. These templates can be used in various applications to minimize engineering efforts but the use, integration, configuration, and validation of the system is the sole responsibility of the user. Said user must ensure the safety of the system as a whole by performing a safety analysis, including the resources provided by Schneider Electric through procedures that the user deems appropriate.

# 

#### LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA) of your application, and apply preventive and detective controls before implementation.
- Provide a fallback state for undesired control events or sequences.
- Provide separate or redundant control paths wherever required.
- · Supply appropriate parameters, particularly for limits.
- Review the implications of transmission delays and take actions to mitigate.
- Review the implications of communication link interruptions and take actions to mitigate.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and fault conditions) according to the safety analysis and applicable codes, and regulations.
- Apply local accident prevention and safety regulations and guidelines.<sup>1</sup>
- Test each implementation of this library for proper operation before placing it into service.

# Failure to follow these instructions can result in death, serious injury, or equipment damage.

<sup>1</sup> For additional information, refer to NEMA ICS 1.1 (latest edition), *Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control* and to NEMA ICS 7.1 (latest edition), *Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems* or their equivalent governing your particular location.

# Description

### Introduction

This object is used for controlling 10 pumping assets. A pump, an inlet valve, an outlet valve, and a drain valve are collectively referred to as a pumping asset.

### **Supervision Functions**

For details about the main functions for Pump Set Equipment module management,, page 276.

### **Parameters**

### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

**NOTE:** You can configure optional functions from the template-specific configuration pages, page 297.

### **Parameter Description**

Parameter	Туре	Initial Value	Description
Param.Data1.Desc	String	Pump Set Diagnosis State	Refer to Equipment module,, page 276.
Param.Datal.Format	String	Е	
Param.Data1.PV	Double	Me.EMPar.OP01.OP.PV	
Param.Data1.EU	String	Normal,0:Warning,1: Failure,2	
Param.Data2.Desc	String	Requested Pumps	
Param.Data2.Format	String	0	
Param.Data2.PV	Double	Me.EMPar.OP02.OP.PV	
Param.Data2.EU	String		
Param.Data3.Desc	String	Active Pumps	
Param.Data3.Format	String	0	
Param.Data3.PV	Double	Me.EMPar.OP03.OP.PV	
Param.Data3.EU	String		
Param.Data4.Desc	String	Pump 01 Operation Time	
Param.Data4.Format	String	D	
Param.Data4.PV	Double	Me.EMPar.OP04.OP.PV	
Param.Data4.EU	String		
Param.HideAbortButton	Bool	False	Refer to Equipment module,, page 276.
Param.HideHoldButton	Bool	False	
Param.HidePauseButton	Bool	False	
Param.HideResetButton	Bool	False	
Param.HideRestartButton	Bool	False	
Param.HideStartButton	Bool	False	
Param.HideStopButton	Bool	False	
Param.ModeNormal	String	Ο,Ρ	
Param.NumInputParam		0	Number of input parameters.
Param.NumOutputParam		0	Number of output parameters.

#### This table describes the parameters of the automation object:

Parameter	Туре	Initial Value	Description
Param.DisplaySelection	Integer	0	0: Pump Operation time, 1: Pump Operation Count, 2: Pump Idle time, 3: Pump Run Time
Param.NumberofAssets	Integer	2	Number of assets connected.

# **Default State Alarms**

### State Alarms for Pump Set Module

The table indicates for which attributes a state alarm is configured in the \$PumpSetCtrlCE master template and provides the default values.

Attribute	Alarm message	Priority				
AO.Failure	Failure condition triggered during execution	999				
AO.Diagnosis.PumpSet.Alarm <sup>1</sup>	At least one Pumping Asset is in failure	999				
AO.Diagnosis.PumpSet.Fail <sup>1</sup>	Unable to run requested pumps	500				
AO.Diagnosis.PumpingAsset{x}.Alarm <sup>1</sup>	Asset {y} alarm description	999				
AO.Diagnosis.PumpingAsset{x}.Fail <sup>1</sup>	Asset {y} failure description	500				
<sup>1</sup> indicates that the User should acknowledge these alarms from the alarm banner.						
<b>NOTE:</b> {x} represents from 01 to 10 and {y} represents from 1 to 10.						

**NOTE:** You can modify the configuration from the Attributes page.

For details about the default Strategy and its applicable input parameters, EMState configured for \$PumpSetCtrlCE template refer to, (see Modicon Libraries General Purpose, Equipment Module Components User Guide).

For details about the default configuration for DATA1 to DATA4,, page 294.

### **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

### Representation

The symbols available for representing the Pump Set equipment module, refer, page 278.

# **Faceplates**

#### **Overview**

During operation, clicking a equipment module graphic symbol opens a faceplate with the following tabs:

#### • Standard tabs:

- Operation, page 280
- Parameters (input and output parameters), page 283
- State machine, page 285
- Alarms, page 64
- Optional tabs:
  - Initial Conditions, page 56
  - Failures , page 59

# Pump Set Pattern Object Configuration pages

### What's in This Chapter

# **Default Configuration Pages**

The Object configuration pages for pump set pattern are as follows:

- Main Page Default Configuration, page 286
- Initial Conditions Page Default Configuration, page 288
- Failure Conditions Page Default Configuration, page 289
- Input Parameters Page Default Configuration, page 290
- Output Parameters Page Default Configuration, page 291

# **Flow Control**

### What's in This Part

<i>\$PumpFlowCtrlCE</i> : Flow Control Pattern Functions	
Flow Control Pattern Object Configuration pages	303

# *\$PumpFlowCtrICE*: Flow Control Pattern Functions

#### What's in This Chapter

Description	
Parameters	
Default State Alarms	
Graphic Representation	
Faceplates	

### **Overview**

This chapter describes the master templates that provide the supervision functions for Flow Control.

Schneider Electric provides the templates described in this document. These templates can be used in various applications to minimize engineering efforts but the use, integration, configuration, and validation of the system is the sole responsibility of the user. Said user must ensure the safety of the system as a whole by performing a safety analysis, including the resources provided by Schneider Electric through procedures that the user deems appropriate.

# 

#### LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA) of your application, and apply preventive and detective controls before implementation.
- Provide a fallback state for undesired control events or sequences.
- Provide separate or redundant control paths wherever required.
- · Supply appropriate parameters, particularly for limits.
- Review the implications of transmission delays and take actions to mitigate.
- Review the implications of communication link interruptions and take actions to mitigate.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and fault conditions) according to the safety analysis and applicable codes, and regulations.
- Apply local accident prevention and safety regulations and guidelines.<sup>1</sup>
- Test each implementation of this library for proper operation before placing it into service.

# Failure to follow these instructions can result in death, serious injury, or equipment damage.

<sup>1</sup> For additional information, refer to NEMA ICS 1.1 (latest edition), *Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control* and to NEMA ICS 7.1 (latest edition), *Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems* or their equivalent governing your particular location.

# Description

### Introduction

This object is used for controlling 10 pumping assets. A variable speed pump, an inlet valve, an outlet valve, and a drain valve are collectively referred to as a pumping asset.

### **Supervision Functions**

For details about the Supervision functions for Flow Control Equipment Module, page 276.

### **Parameters**

### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

**NOTE:** You can configure optional functions from the template-specific configuration pages, page 297.

### **Parameter Description**

Parameter	Туре	Initial Value	Description	
Param.Datal.Desc	String	Equipment module diagnosis state	Refer to Equipment module,, page 276.	
Param.Data1.Format	String	Е		
Param.Data1.PV	Double	Me.EMPar.OP01.OP.PV		
Param.Data1.EU	String	Normal,0:Warning,1: Failure,2		
Param.Data2.Desc	String	Current Flow SP		
Param.Data2.Format	REAL	0.0		
Param.Data2.PV	Double	Me.EMPar.OP02.OP.PV		
Param.Data2.EU	String	-		
Param.Data3.Desc	String	Flow PV		
Param.Data3.Format	REAL	0.0		
Param.Data3.PV	Double	Me.EMPar.OP03.OP.PV		
Param.Data3.EU	String	-		
Param.Data4.Desc	String	Pumps required to achieve Flow SP		
Param.Data4.Format	String	0		
Param.Data4.PV	Double	Me.EMPar.OP04.OP.PV		
Param.Data4.EU	String	-		
Param.HideAbortButton	Bool	False	Refer to Equipment module,, page 276.	
Param.HideHoldButton	Bool	False		
Param.HidePauseButton	Bool	False		
Param.HideResetButton	Bool	False		
Param.HideRestartButton	Bool	False		
Param.HideStartButton	Bool	False		
Param.HideStopButton	Bool	False		
Param.ModeNormal	String	0, P		
Param.NumInputParam		0	Number of input parameters.	

#### This table describes the parameters of the automation object:

Parameter	Туре	Initial Value	Description
Param.NumOutputParam		0	Number of output parameters.
Param.DisplaySelection	Integer	0	0: Pump Operation time, 1: Pump Operation Count, 2: Pump Idle time, 3: Pump Run Time
Param.NumberofAssets	Integer	2	Number of assets connected.

## **Default State Alarms**

### **State Alarms for Flow Control Equipment Module**

The table indicates for which attributes a state alarm is configured in the \$PumpFlowCtrlCE master template and provides the default values.

Attribute	Alarm message	Priority	
AO.Failure	Failure condition triggered during execution	999	
AO.Diagnosis.FlowCtl.Alarm <sup>1</sup>	At least one Pumping Asset is in failure	999	
AO.Diagnosis.FlowCtl.Fail <sup>1</sup>	Unable to run requested pumps	500	
AO.Diagnosis.PumpingAsset{x}.Alarm <sup>1</sup>	Asset {y} alarm description	999	
AO.Diagnosis.PumpingAsset{x}.Fail <sup>1</sup>	Asset {y} failure description	500	
<sup>1</sup> indicates that the User should acknowledge these alarms from the alarm banner.			
NOTE: {x} represents from 01 to 15 and {y} represents from 1 to 15			

**NOTE:** You can modify the configuration from the Attributes page.

For details about the applicable input parameters, EMState configured for \$PumpFlowCtrlCE template refer to, (see Modicon Libraries General Purpose, Equipment Module Components User Guide).

For details about the default configuration for DATA1 to DATA4,, page 294.

# **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

### Representation

The symbols available for representing the Flow Control Equipment Module, refer, page 278.

# **Faceplates**

#### **Overview**

During operation, clicking a equipment module graphic symbol opens a faceplate with the following tabs:

#### • Standard tabs:

- Operation, page 280
- Parameters (input and output parameters), page 283
- State machine, page 285
- Alarms, page 64
- Optional tabs:
  - Initial Conditions, page 56
  - Failures , page 59

# Flow Control Pattern Object Configuration pages

### What's in This Chapter

## **Default Configuration Pages**

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The Object configuration pages for Flow Control Equipment Module pattern are as follows:

- Main Page Default Configuration, page 286
- Initial Conditions Page Default Configuration, page 288
- Failure Conditions Page Default Configuration, page 289
- Input Parameters Page Default Configuration, page 290
- Output Parameters Page Default Configuration, page 291

# **Auxiliary Functions**

### What's in This Part

\$AlarmSummaryCE: Alarm Summary	
\$AnalogSelectĆE: Analog Signal Selection	
\$MessageBoxCE: Operator Messages	
\$SPBoolCE: Discrete Setpoints	
\$SPRealCE: Real Setpoints	
\$SPIntCE: Integer Setpoints	
\$SPDurationCE: Duration Setpoints	
\$SchedulerCE: Scheduler function	

#### **Overview**

This part describes the master templates that provide the supervision functions for the auxiliary function family.

You can use these templates with those of other families to provide additional services, data, symbols, and/or faceplates.

Schneider Electric provides the templates described in this document. These templates can be used in various applications to minimize engineering efforts but the use, integration, configuration, and validation of the system is the sole responsibility of the user. Said user must ensure the safety of the system as a whole by performing a safety analysis, including the resources provided by Schneider Electric through procedures that the user deems appropriate.

# **A**WARNING

#### LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA) of your application, and apply preventive and detective controls before implementation.
- Provide a fallback state for undesired control events or sequences.
- Provide separate or redundant control paths wherever required.
- Supply appropriate parameters, particularly for limits.
- Review the implications of transmission delays and take actions to mitigate.
- Review the implications of communication link interruptions and take actions to mitigate.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and fault conditions) according to the safety analysis and applicable codes, and regulations.
- Apply local accident prevention and safety regulations and guidelines.<sup>1</sup>
- Test each implementation of this library for proper operation before placing it into service.

# Failure to follow these instructions can result in death, serious injury, or equipment damage.

<sup>1</sup> For additional information, refer to NEMA ICS 1.1 (latest edition), Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control and to NEMA ICS 7.1 (latest edition), Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems or their equivalent governing your particular location.

# **\$AlarmSummaryCE:** Alarm Summary

### What's in This Chapter

Supervision Functions	
Parameters	
Default State Alarms	306
Graphic Representation	306
Faceplates	306

### **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of alarms based on up to 15 conditions.

### **Supervision Functions**

### **Description**

Core resources provide the following monitoring and operation functions: Alarm configuration, enabling/disabling of alarms, simulation mode, management of individual alarm conditions.

These functions are implemented in runtime through symbols and their associated faceplate.

### **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

This table describes the parameters of the automation object:

Parameter	Туре	Default	Description	
Param. AlarmEnable	Bool	True	If true, the alarm evaluation at the supervision level is enabled. If false, the alarm evaluation at the supervision level is disabled	
			<b>NOTE:</b> The alarm signal is not interpreted as an alarm at the supervision level but it continues being evaluated at the controller level. It is useful for signals to be monitored but not associated to an alarm.	

### **Default State Alarms**

### **State Alarms for Alarm Summary**

The table indicates for which attributes a state alarm is configured in the *\$AlarmSummaryCE* master template and provides the default values.

Attribute	Alarm message	Priority
AO.Alarm	Digital Alarm	500

**NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### Representation

This table describes the symbols available for representing the alarm summary:

Name	Graphic symbol	Description
AlarmText	D10SHUTDOWN Alarm Summary	Alarm text
StatusIndicator_H	D10SHUTDOWN	Bullet with the label above
StatusIndicator_V	D10SHUTDOWN	Bullet with the label on the right

# **Faceplates**

#### **Overview**

During operation, clicking the graphic symbol opens a faceplate with the following tabs:

- Standard tabs:
  - Operation
  - Engineering
  - Alarms, page 64
- Optional tabs:
  - Failures, page 59

### **Operation Tab**

The figure shows an example of the **Operation** tab.

D E	10SHUTDOWN mergency stop D10			۲
	Status:	Off		]
	Alarm	En	Alarm Setpoint	
	Alarm State:	7	Off	

### **Engineering Tab**

The figure shows an example of the **Engineering** tab.

Normal	Ý	
Off	Ŷ	
OFF		
	Normal Off OFF	Normal v Off v OFF

**NOTE:** This tab features the **Simulation** menu, which allows setting the control module to simulation mode.

In addition, the tab may feature another menu or text field, which allows you to configure the state or value to be simulated.

Enabling the simulation mode underlies a security classification, page 79. The default configuration is *tune*. It also triggers the display of an abnormal state, page 43 on the tab and on the symbol.

# \$AnalogSelectCE: Analog Signal Selection

### What's in This Chapter

Supervision Functions	
Parameters	
Default State Alarms	
Graphic Representation	
Faceplates	

### **Overview**

This chapter describes the *\$AnalogSelectCE* master template, which contains supervision resources to monitor and select analog signals.

## **Supervision Functions**

### **Description**

The *\$AnalogSelectCE* master template provides the following core monitoring and operation functions:

- · Monitoring of values of up to four analog signals.
- Selecting one signal out of the monitored signals, either directly or by selecting the one with the highest or lowest value.
- · Owner selection.
- Alarm management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

# **Parameters**

### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

### **Parameter Description**

The table describes the parameters that are defined as part of the *\$AnalogSelectCE* master template attributes.

Name	Data type	Initial value	Description
Param.EngUnits	String	00	Indicates the unit of attributes.
Param.HiSP	Integer	100	High limit for the setpoint.
Param.LoSP	Integer	0	Low limit for the setpoint.
Param.ModeNormal	String	0, P	<ul> <li>Specifies the normal owner modes (separated by a comma):</li> <li>O: Operator</li> <li>P: Program</li> </ul>

Name	Data type	Initial value	Description
			For example, O, P.
Param.NumFormat	String	0.0	Specifies the display format of values.
			For example, enter 0.00 to display 2 decimals.
Param.ShortDescSP1 Param.ShortDescSP4	String	SetPoint x where x corresponds to the number of the parameter.	4 parameters, each one describing an analog signal, which is monitored. NOTE: The initial value is also available in Spanish.

### **Default State Alarms**

#### **State Alarms for Analog Signal Selection**

The table indicates for which attributes a state alarm is configured in the *\$AnalogSelectCE* master template and provides the default values.

Attribute	Description	Priority
ASelect11.St.Error	Signal Error	500

**NOTE:** You can modify the configuration from the **Attributes** page.

## **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

### **Symbol Description**

The table describes the symbols that are included in the *\$AnalogSelectCE* master template to display data for monitoring and selecting analog signals during operation.

Name	Graphic symbol	Description
Desc_SP	A1F2_TIC1101AS Bottom D	In addition to icons, the symbol displays (from top to bottom):     The label.     The short description of the
		selected signal.
Indicator_SP A1F2_TIC1101AS		In addition to icons, the symbol displays (from top to bottom):
	25.0	The label.
	Bottom 🖂	Engineering units.
		The value of the selected signal.
		The short description of the selected signal.

## **Faceplates**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

### **Available Tabs**

During operation, clicking an analog signal selection symbol opens a faceplate with the following tabs:

- Operation
- Alarms, page 64

NOTE: The master template also features the trends faceplate.

### **Operation Tab**

The figure shows an example of the operation tab. The description and value of the selected signal is shown at the top of the tab. The 2 available signals and their value are shown below.

A1F2_TIC1101AS TIC1101 PV Selector	r		۲
:		0.0 %	
Owner:	Program		~
Selection:	~		

# \$MessageBoxCE: Operator Messages

### What's in This Chapter

Supervision Functions	
Parameters	
Default State Alarms	
Graphic Representation	
Faceplates	
•	

### **Overview**

This chapter describes the *\$MessageBoxCE* master template, which contains supervision resources to manage messages to operators.

### **Supervision Functions**

### **Description**

The *\$MessageBoxCE* master template provides the following core functions:

- Display of 1 message in the symbol and, in addition, in the faceplate:
  - Display and capture of up to 2 data items, which are associated with the message.
  - For each data item, display of up to 1 additional message.
- Configuration of the message mode with 4 different icons, which are displayed next to the symbol.
- Message treatment.
- · Alarm management associated to the icons, which are displayed.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

### **Parameters**

### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The table describes the parameters that are defined as part of the *\$MessageBoxCE* master template attributes.

Name	Data type	Initial value	Description
Param.NumFormat	String	0.0	Specifies the display format of values.
			For example, enter 0.00 to display 2 decimals.

### **Default State Alarms**

### **State Alarms for Operator Messages**

The table indicates for which attributes a state alarm is configured in the *\$MessageBoxCE* master template and provides the default values.

Attribute	Description	Priority
MsgBox.AO.Stop	MsgBox Error	999
MsgBox.AO.Exclamation	MsgBox Warning	750

**NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

### **Symbol Description**

The table describes the symbols that are included in the *\$MessageBoxCE* master template to display messages to the operator during operation.

Name	Graphic symbol	Description
MsgBoxTypeNormal- WithIcon	MSGDEMO Show some alarm messages	Displays the message by using element style User_Defined_06. It also displays the following icons, page 45 on the left-hand side of the message box: • Stop • Exclamation mark • Question mark • Information The icons blink when the <b>OK</b> or <b>OK</b> and <b>Cancel</b> buttons are enabled.
MsgBoxTypeNormal- WithoutIcon	MSGDEMO Show some alarm messages	Displays the message by using element style <i>User_Defined_07</i> , no icons.
MsgBoxTypelargeWi- thIcon	MSGDEMO Office or 2 data to the Operator	Displays icons in the same position and with the same behavior as symbol MsgBoxTypeNormalWithIcon but uses element style User_Defined_02, which has large-size text to display the message.

### **Faceplates**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

### **Available Tabs**

During operation, clicking an operator message box symbol opens a faceplate with the following tabs:

- Operation
- Alarms

### **Operation Tab**

The items that are displayed depend on the configuration of the *sc* public variable (MSGBOX\_SC\_DDT) of the associated control resource:

- Icon and message.
- Up to 2 additional messages.
- A data item associated to each message. Entering data underlies the *Operate* security classification, page 34.
- **OK** or **OK** and **Cancel** buttons. Using these buttons underlies the *Operate* security classification, page 34

The figure shows an example of the operation tab featuring the icon, the message, as well as 2 additional messages with their associated data item. It also shows a button.

PREACT1				۲
Operator mes	sage			
There are	e no pending	messages	3	
		, <u> </u>		

### **Alarms Tab**

The *\$MessageBoxCE* master template allows managing two alarms, page 36, which are associated to message modes that display the following icons:

- Exclamation mark icon: Alarm severity 3 (attribute MsgBox.AO.Exclamation).
- Stop icon: Alarm severity 4 (attribute *MsgBox.AO.Stop*).

For a description of the tab, refer to the topic documenting the alarms tab, page 64.

# **\$SPBooICE: Discrete Setpoints**

### What's in This Chapter

Supervision Functions	
Parameters	
Default State Alarms	
Graphic Representation	

### **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of setpoints of discrete data type.

# **Supervision Functions**

### **Description**

The *\$SPBoolCE* template is used to enter a boolean setpoint/value from the supervision runtime. The value can be set by using various types of symbols that are referenced by the template.

### **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

### **Parameter Description**

This table describes the parameters of the automation object:

Parameter	Туре	Default	Description
Param.HideLegend	Bool	False	If true, the legend (object description) is not displayed.
			If false, the legend is displayed.
Param. PulseDuration	Elapsed Time	00:00:0- 5.0000- 000	Period during which the output remains true when the button is clicked. Only applicable if the symbol is pushbutton, page 315 style.

### **Default State Alarms**

### **State Alarms for Discrete Setpoints**

No state alarm is configured by default for the *\$SPBoolCE* master template. **NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

### Representation

This table describes the symbols available to represent discrete setpoints:

Name	Graphic symbol	Description
LatchButton	SIMUTESYST	The output is set (1) when the symbol is latched and remains 1, until unlatched.
CheckBox	SIMUTE SY ST	The output is set (1) when the check box is selected and remains 1, until unselected.
PulseButton	SIMUTESYST	When clicked, the output is set (1) for a period that you can configure. Refer to Parameters, page 314

### Faceplate

No faceplate is available.

# \$SPReaICE: Real Setpoints

#### What's in This Chapter

Supervision Functions	
Parameters	
Default State Alarms	
Graphic Representation	

### **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of setpoints of REAL data type.

# **Supervision Functions**

#### **Description**

The *\$SPRealCE* template is used to enter a real setpoint/value from the supervision runtime.

### **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

### **Parameter Description**

This table describes the parameters of the automation object:

Parameter	Туре	Default	Description
Param.EngUnits	String	-	Unit of the setpoint (SP)
Param.HideLegend	Bool	False	If true, the legend (object description) is not displayed.
			If false, the legend is displayed.
Param.HiPV	Float	100.0	High limit for the setpoint value
Param.LoPV	Float	0.0	Low limit for the setpoint value
Param.NumFormat	String	0.0	Specifies the displaying format of the setpoint.
			For example, enter 0.00 for 2 decimal.

### **Default State Alarms**

### State Alarms for Setpoints of Real Data Type

No state alarm is configured by default for the *\$SPRealCE* master template. **NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

### Representation

This table describes the symbols available to represent REAL setpoints:

Name	Graphic symbol	Description
RealSetPoint	LI1001_SIMU 1340.5   Real SP	Setpoint value

### Faceplate

No faceplate is available.

# **\$SPIntCE:** Integer Setpoints

### What's in This Chapter

Supervision Functions	
Parameters	
Default State Alarms	
Graphic Representation	

### **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of setpoints of INT data type.

# **Supervision Functions**

### **Description**

The *\$SPIntCE* template is used to enter an integer setpoint/value from the supervision runtime.

## **Parameters**

### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

### **Parameter Description**

This table describes the parameters of the automation object:

Parameter	Туре	Default	Description
Param.EngUnits	String	olo	Unit of the setpoint
Param.HideLegend	Bool	False	If true, the legend (object description) is not displayed.
			If false, the legend is displayed.
Param.HiPV	Integer	100	High limit for the setpoint (SP)
Param.LoPV	Integer	0	Low limit for the setpoint
Param.NumFormat	String	0.0	Specifies the displaying format of setpoint.
			For example, enter 0.00 for 2 decimal.

### **Default State Alarms**

### State Alarms for Setpoints of Integer Data Type

No state alarm is configured by default for the *\$SPIntCE* master template. **NOTE:** You can modify the configuration from the **Attributes** page.

# **Graphic Representation**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

### Representation

This table describes the symbols available to represent integer setpoints:

Name	Graphic symbol	Description
IntegerSetPoint	TI1100_MULAI1_AIS4V O raw Integer SetPoint	Setpoint value

### **Faceplates**

No faceplate is available.

# **\$SPDurationCE:** Duration Setpoints

### What's in This Chapter

Supervision Functions	
Parameters	
Default State Alarms	
Graphic Representation	

### **Overview**

This chapter describes the supervision resources and runtime services that are available for the management of setpoints of Duration data type.

# **Supervision Functions**

### **Description**

The *SPDurationCE* template allows you to set a Control Expert variable of type TIME (or DINT) representing a time duration in milliseconds.

During operation, the symbol allows you to enter a duration in various ways, based on the format *DD.HH:MM:SS.MSS*.

Time component	Description		Maximum value <sup>(1)</sup>
DD	Days component		24
НН	Hours component		99(2)
MM	Minutes component		59
SS	Seconds component		59
VSS Milliseconds component 999			
(1) You need to configure the high end of the setpoint range accordingly.			
(2) Values equal to or higher than 24 are converted to days and hours.			

The duration is displayed by using 5 time components:

### **Rules Applicable to Durations**

The table describes the rules that apply when you enter durations in the symbol during operation:

Object of the rule	Description	Example
Conversion of entries	The symbol converts hour values that you enter and that are equal to or higher than 24 to days and hours.	Entering 50:20:10 displays 2.02:20:10.000
Durations starting with minutes components	To enter a duration in minutes and seconds or milliseconds, enter the value in the format MM: SS or MM: SS.MSS.	Entering 20:10 or 20:10.000 displays 20:10.000
Durations expressed in	s expressed in The symbol accepts the entry of durations	Entering 119 displays 1:59.000
Seconds	converts the value to the <i>DD.HH:MM:SS.MS</i> format.	Entering 3 displays 3.000
	You cannot enter more than 6 digits; otherwise your entry is not accepted and the current value that is configured remains.	
	<b>NOTE:</b> You can enter 999999 seconds maximum.	

Object of the rule	Description	Example
Durations expressed in milliseconds	The symbol accepts the entry of durations expressed in milliseconds in the format 0.###.	Entering 0.200 displays 0.200
Maximum duration	You cannot enter a value that is outside of the range configured in the parameters, page 321; otherwise your entry is not accepted and the current value that is configured remains.	-

# **Parameters**

### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

### **Parameter Description**

This table describes the parameters of the automation object:

Parameter	Туре	Default	Description
Param.HideLegend	Bool	False	If true, the legend (object description) is not displayed.
			If false, the legend is displayed.
Param.HiPV	Double	1000.0	High limit for the setpoint value
Param.LoPV	Double	0.0	Low limit for the setpoint value

### **Default State Alarms**

### State Alarms for Setpoints of Duration Data Type

No state alarm is configured by default for the *\$SPDurationCE* master template. **NOTE:** You can modify the configuration from the **Attributes** page.

### **Graphic Representation**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

### Representation

This table describes the symbols available to represent duration setpoints:

Name	Graphic symbol	Description
DurationSetPoint	DURATIONSP_DEMO 0.000 Duration SP	Shows the time value and legend. Default display: 0.000

### **Display Format**

The table describes the rules that apply to display the duration values that you enter:

Description	Data entry example	Display
The symbol displays only the time	0.320	0.320
result of the conversion), if different from 0, in	3.5	3.500
the format DD.HH:MM:SS.MS.	2:10:5	2:10:05.000
NOTE:	50.20.10	2 02.20.10 000
<ul> <li>The leading 0 of the highest time component is not displayed.</li> </ul>	50:20:10	2.02:20:10.000
<ul> <li>The millisecond component is displayed with 3 digits.</li> </ul>		
<ul> <li>The day component is displayed only if you enter a value for this component.</li> </ul>		

### Faceplates

No faceplate is available.

# **\$SchedulerCE: Scheduler function**

### What's in This Chapter

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### **Overview**

This chapter describes the *\$SchedulerCE* master template, which contains supervision resources to schedules based on events or time driven schedules.

### **Supervision Functions**

#### **General Description**

The <code>\$SchedulerCE</code> template is used to schedules based on events or time driven schedules. The template allows user to select up to 10 different schedules which can be configured either event or time schedule

### **Functional Description**

The main functions of motor template are described in the following table:

Function	Description
Time scheduling	The template compares the current PLC time with configured event times in the Schedule data. After comparison, the function block releases the outputs.
Event scheduling	The template compares the status of the event as per the event configured in template and if the event is active, then function block releases the outputs.
Scheduler status	Active or Inactive
	The scheduler module is in operation when scheduler status is set to active on faceplate.
Mode selection	The object can be switched to different modes of operation like On, Off, and Pulse.
Pulse timing	If user selects the mode as Pulse, then user can select the Pulse On time and Off time either in seconds, minutes, or hours based on the selection in Pulse Time In on the faceplate.

### **Parameters**

### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

### **Parameter Description**

The table describes the parameters that are defined as part of the *\$SchedulerCE* master template attributes.

Name	Data type	Initial value	Description
Param.NumFormat	String	0.0	Specifies the display format of values.
			For example, enter 0.00 to display 2 decimals.

## **Default State Alarms**

#### **State Alarms for Scheduler function**

No state alarms are configured for attributes of the \$SchedulerCE master templates.

## **Graphic Representation**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

### **Symbol Description**

The table describes the symbols that are included in the *\$SchedulerCE* master template to display data for monitoring and selecting analog signals during operation.

Name	Graphic symbol	Description
Scheduler	SchedulerCE_2	Active scheduler with input value
Scheduler_SV	SchedulerCE_2 Inactive	Inactive scheduler with input value

# **Faceplates**

### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

### **Available Tabs**

During operation, clicking an analog signal selection symbol opens a faceplate with the following tabs:

Operation
### **Operation Tab**

Current Set Value: Scheduler Status	active	0.0	~	Current Set Valu	e:	0.0
Schedule Details		Mode	SetValue	Scheduler State	Inactive	~
▶ 1. Inactive	00:00	Off	0.0	T1001 Tank le	evel High	
2. T1001 Tank level	High	On	0.0	Statu	s: Inactive	
► 3. Inactive	00:00	Off	0.0	Mod	e: Pulse	~
4. AG1001 Motor St	topped	On	0.0	Dulas Tara I	Casanda	
► 5. Inactive	00:00	Off	0.0	Pulse Time I	1: Seconds	
► 6. Inactive	00:00	Off	0.0	Pulse On Tim	e:	0 Sec
► 7. Inactive	00:00	Off	0.0	Pulse Off Tim	e:	0 Sec
8. Inactive	00:00	Off	0.0	Set Valu	e:	0.0
▶ 9. Inactive	00:00	Off	0.0		L	
chedulerCE_2 cheduler test 2		_	_			
SchedulerCE_2 Scheduler test 2 Current Set Value:	Inactiv	0.0 e	v			
SchedulerCE_2 Scheduler test 2 Current Set Value: Scheduler Status	Inactiv	0.0 e	v			
SchedulerCE_2 Scheduler test 2 Current Set Value: Scheduler Status	Inactiv	0.0 e	~			
SchedulerCE_2 Scheduler test 2 Current Set Value: Scheduler Status [ Time Schedule 1 Day [ Start Time:	Inactiv	0.0 e y	~ ~			
SchedulerCE_2 Scheduler test 2 Current Set Value: Scheduler Status ( Time Schedule 1 Day ( Start Time:	Inactiv	0.0 e y 13:25	v hh:mm			
SchedulerCE_2 Scheduler test 2 Current Set Value: Scheduler Status ( Time Schedule 1 Day ( Start Time: ( Mode: (	Inactive Sunday	0.0 e y 13:25	v bh:mm			
SchedulerCE_2 Scheduler test 2 Current Set Value: Scheduler Status [ Time Schedule 1 Day [ Start Time: [ Mode: [ Pulse Time In: ]	Inactive Sunday Pulse Second	0.0 e y 13:25 ds	v hh:mm v			
SchedulerCE_2 Scheduler test 2 Current Set Value: Scheduler Status ( Time Schedule 1 Day ( Start Time: ( Mode: ( Pulse Time In: ( Pulse On Time: (	Inactive Sunday Pulse Second	0.0 e y 13:25 ds 0	<ul> <li>×</li> <li>hh:mm</li> <li>×</li> <li>Sec</li> </ul>			
SchedulerCE_2 Scheduler test 2 Current Set Value: Scheduler Status Time Schedule 1 Day [ Start Time: [ Mode: [ Pulse Time In: [ Pulse On Time: [	Inactiv Sunday Pulse Second	0.0 e y 13:25 ds 0 0 0	v bh:mm v Sec Sec			
SchedulerCE_2 Scheduler test 2 Current Set Value: Scheduler Status ( Time Schedule 1 Day ( Start Time: ( Pulse Time In: ( Pulse On Time: ( Pulse Off Time: ( Set Value:	Inactive Sunday Pulse Second	0.0 e 13:25 ds 0 0 0	v hh:mm v Sec Sec			

## **Smart Device Control**

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#### **Overview**

This part describes the master templates that provide the supervision functions for families of the device category.

Schneider Electric provides the templates described in this document. These templates can be used in various applications to minimize engineering efforts but the use, integration, configuration, and validation of the system is the sole responsibility of the user. Said user must ensure the safety of the system as a whole by performing a safety analysis, including the resources provided by Schneider Electric through procedures that the user deems appropriate.

## 

#### LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA) of your application, and apply preventive and detective controls before implementation.
- Provide a fallback state for undesired control events or sequences.
- Provide separate or redundant control paths wherever required.
- · Supply appropriate parameters, particularly for limits.
- · Review the implications of transmission delays and take actions to mitigate.
- Review the implications of communication link interruptions and take actions to mitigate.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and fault conditions) according to the safety analysis and applicable codes, and regulations.
- Apply local accident prevention and safety regulations and guidelines.<sup>1</sup>
- Test each implementation of this library for proper operation before placing it into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

<sup>1</sup> For additional information, refer to NEMA ICS 1.1 (latest edition), Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control and to NEMA ICS 7.1 (latest edition), Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems or their equivalent governing your particular location.

## **Default State Alarms for Devices**

#### What's in This Chapter

### **Default State Alarms for Devices**

#### Description

The table indicates for which attributes a state alarm is configured in master templates of the device category, page 27 and provides the default values.

Attribute	Alarm message	Priority
AO.Namur.OutOfSpecs	Out of Specs	999
AO.Namur.MaintenanceR	Maintenance Required	999
AO.Namur.CheckFunction	Check Function	750
AO.Namur.Failure	Failure	500

**NOTE:** You can modify the configuration from the **Attributes** page.

## **Circuit Breakers**

#### What's in This Chapter

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### **Overview**

This chapter describes the master templates that provide the supervision functions for the circuit breaker family.

### \$CompactNSXMBUCE: Compact NSX Circuit Breakers

#### **Overview**

This section describes the *CompactNSXMBUCE* master template, which contains supervision resources to monitor and operate Compact NSX circuit breakers.

#### **Supervision Functions**

#### **Description**

The *\$CompactNSXMBUCE* master template provides the following monitoring and operation functions:

- Device status and data monitoring.
- Monitoring of abnormal conditions.
- Device logic resetting.
- Owner selection.
- Alarm signal management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

#### **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The tables describe the parameters that are defined as part of the *\$CompactNSXMBUCE* master template attributes.

Name	Data type	Initial value	Description
Param.ModeNormal	String	£	Specifies the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> </ul> <li>For example, P, O.</li>

Name	Data type	Initial value	Description
Param. FailureRearmCon- firmation	Boolean	True	False = After you click the Reset button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.True = After you click the Reset button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking OK and validating the command according to the configured security classification. By default, the security classification is secured write.

#### **Default State Alarms and Additional Alarm Conditions**

#### **Overview**

In the *CompactNSXMBUCE* master template, alarms related to core supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

#### **State Alarms for Compact NSX Circuit Breakers**

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

## Additional Namur Alarm Conditions for Compact NSX Circuit Breakers

The table indicates for which bits an alarm is configured in the \$CompactNSXMBUCE master template and provides the associated Namur status.

Word structure	Bit	Description	Namur status
COMPACT_CFG.DataStatus	2	SD electrical trip	Failure
	3	SDE electrical trip	Failure
	4	Status Not available	Failure
COMPACT_CFG.WarningCode	0	User defined flag 201	Failure

Word structure	Bit	Description	Namur status
	1	User defined flag 202	Failure
	2	User defined flag 203	Failure
	3	User defined flag 204	Failure
	4	User defined flag 205	Failure
	5	User defined flag 206	Failure
	6	User defined flag 207	Failure
	7	User defined flag 208	Failure
	8	User defined flag 209	Failure
	9	User defined flag 210	Failure
	10	Long time protection	Failure
	11	Earth leakage	Failure
	12	Ground fault	Failure
	13	Long time pickup	Failure
COMPACT_CFG.WarningOrderCode	1	Wrong password	Check Function
	2	Modbus pad locked	Check Function
	3	Detected internal alarm	Failure
	4	Out of order	Check Function
	5	Need reset	Check Function
	10	Not present	Failure

**NOTE:** You can modify the configuration from the **Discrete 1**, **Discrete 2**, and **Discrete 3** pages.

#### **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### **Symbol Description**

The table describes the symbols that are included in the *\$CompactNSXMBUCE* master template to display data of Compact NSX circuit breakers during operation.

Name	Graphic symbol	Description
CompactNSX	MBCOMPACTNSX	Compact NSX circuit breaker symbol and icons.

#### **Faceplates**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

#### Available Tabs

During operation, clicking a Compact NSX circuit breaker symbol opens a faceplate with the following tabs:

- Operation
- Analog data, page 62
- Discrete data, page 63
- Alarms, page 64

#### **Operation Tab**

The figure shows an example of the operation tab.

CpactNSX CompactNSX control modbus over ULP	٢
Off	
Communication disabled	
Communication failure	
Unknown status	
Not ready	
Failure ???: Unknown error	
Warning -	
Owner: Program - Reset	
Device [??: Unknown status	

NOTE: This tab features the control module Reset button.

When the control module is reset, the current setpoint that is shown in this tab is effective.

By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect.

Refer to *Parameters* in this chapter for a description of the *Param. FailureRearmConfirmation* parameter, which allows you to configure the reset confirmation.

The figure shows the confirmation dialog box which is model in nature.

AG1001 - I	Reset	(Approx	×
	Resetting the failure ma Are you sure you want t	y start the device i o reset?	mmediately.
		ОК	Cancel

Resetting the control module by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

When the reset confirmation dialog box is enabled, the security classification that normally applies when you click **Reset** is not effective.

# *\$MasterpactMTZCMBUCE*: Masterpact MTZ Circuit Breakers with Chassis

#### **Overview**

This section describes the *\$MasterpactMTZCMBUCE* master template, which contains supervision resources to monitor and operate Masterpact MTZ circuit breakers.

#### **Supervision Functions**

#### **Description**

The *\$MasterpactMTZCMBUCE* master template provides the following monitoring and operation functions:

- Device status and data monitoring.
- Monitoring of abnormal conditions.
- Device logic resetting.
- Owner selection.
- Alarm management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

#### **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The table describes the parameters that are defined as part of the *\$MasterpactMTZCMBUCE* master template attributes.

Name	Data type	Initial value	Description
Param.ModeNormal	String	P	Specifies the normal owner modes (separated by a comma):

Name	Data type	lnitial value	Description
Param. FailureRearmCon- firmation	Boolean	True	<i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.
			<i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i> .

#### **Overview**

In the *\$MasterpactMTZCMBUCE* master template, alarms related to supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

#### **State Alarms for Masterpact Circuit Breakers**

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

# Additional Namur Alarm Conditions for Masterpact Circuit Breakers

The table indicates for which bits an alarm is configured in the *\$MasterpactMTZCMBUCE* master template and provides the associated Namur status.

Word structure	Bit	Description	Namur status
Masterpact_CFG.DataStatus	2	SD Electrical trip	Failure
	3	SDE Electrical trip	Failure
	4	Discharged	Check function
	6	Not ready to close	Check function
	10	Chassis disconnected position	Check function
	11	Chassis test position	Check function
Masterpact_CFG.WarningCodeExt	0	Ground fault	Failure
	1	Earth leakage	Failure
	2	Chassis status discordance	Check function
	3	Unknown IO configuration	Check function
Masterpact_CFG.WarningOrderCode	1	Wrong password	Check function

Word structure	Bit	Description	Namur status
	2	IFE locking pad/EIFE intrusive command is locked	Check function
	3	IFM locking pad locked	Check function
	4	Resource/Module does not exist	Check function
	5	Timeout during command	Failure
	6	Circuit breaker tripped, reset before commands	Failure
	7	Circuit breaker already closed	Check function
	8	Circuit breaker already open	Check function
	9	Circuit breaker already reset	Check function
	10	Actuator in manual mode	Check function
	11	Actuator not present	Check function
	12	Inhibit mode on	Check function

**NOTE:** You can modify the configuration from the **Discrete 1**, **Discrete 3** and **Discrete 4** application template tabs.

#### **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### **Symbol Description**

The table describes the symbols that are included in the *\$MasterpactMTZCMBUCE* master template to display data of Masterpact circuit breakers during operation.

Name	Graphic symbol	Description
MasterpactMTZC	MTZC_001	Symbol and icons for Masterpact MTZ circuit breakers with chassis.

#### **Faceplates**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

#### Available Tabs

During operation, clicking a Masterpact circuit breaker symbol opens a faceplate with the following tabs:

- Operation
- Analog data, page 62
- Discrete data, page 63
- Alarms, page 64

#### **Operation Tab**

The figure shows an example of the operation tab.

CB1001 Circuit breaker for D10	٢
Off	
Communication disabled	
Communication failure	
Unknown status	
Not ready	
Failure ???: Unknown error	
Warning -	
Owner: Program v Reset	
Device Info: ???: Unknown status	

**NOTE:** This tab features the control module **Reset** button. By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect. Refer to Parameters, page 332 in this chapter for description of the Param. FailureRearmConfirmation parameter, which allows you to configure the reset confirmation. For Reset Confirmation refer, page 58.

# *\$MasterpactMTZMBUCE*: Masterpact MTZ Circuit Breaker without Chassis

#### **Overview**

This section describes the *\$MasterpactMTZMBUCE* master template, which contains supervision resources to monitor and operate Masterpact MTZ circuit breakers.

#### **Supervision Functions**

#### Description

The *\$MasterpactMTZMBUCE* master template provides the following monitoring and operation functions:

- Device status and data monitoring.
- Monitoring of abnormal conditions.
- Device logic resetting.
- Owner selection.
- Alarm management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

#### **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The table describes the parameters that are defined as part of the *\$MasterpactMTZMBUCE* master template attributes.

Name	Data type	Initial value	Description
Param.ModeNormal	String	Ρ	Specifies the normal owner modes (separated by a comma):
			For example, P, O.

Name	Data type	Initial value	Description
Param. FailureRearmCon- firmation	Boolean	True	<i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.
			<i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i> .

#### **Default State Alarms and Additional Alarm Conditions**

#### **Overview**

In the *\$MasterpactMTZMBUCE* master template, alarms related to supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

#### **State Alarms for Masterpact Circuit Breakers**

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

# Additional Namur Alarm Conditions for Masterpact Circuit Breakers

# The table indicates for which bits an alarm is configured in the *\$MasterpactMTZMBUCE* master template and provides the associated Namur status.

Word structure	Bit	Description	Namur status
Masterpact_CFG.DataStatus	2	SD Electrical trip	Failure
	3	SDE Electrical trip	Failure
	4	Discharged	Check function
	6	Not ready to close	Check function
Masterpact_CFG.WarningCodeExt	0	Ground fault	Failure
	1	Earth leakage	Failure
Masterpact_CFG.WarningOrderCode	1	Wrong password	Check function
	2	IFE locking pad/EIFE intrusive command is locked	Check function
	3	IFM locking pad locked	Check function
	4	Resource/Module does not exist	Check function
	5	Timeout during command	Failure
	6	Circuit breaker tripped, reset before commands	Failure
	7	Circuit breaker already closed	Check function
	8	Circuit breaker already open	Check function
	9	Circuit breaker already reset	Check function
	10	Actuator in manual mode	Check function
	11	Actuator not present	Check function
	12	Inhibit mode on	Check function

**NOTE:** You can modify the configuration from the **Discrete 1**, **Discrete 3** and **Discrete 4** application template tabs.

#### **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### **Symbol Description**

The table describes the symbols that are included in the *\$MasterpactMTZMBUCE* master template to display data of Masterpact circuit breakers during operation.

Name	Graphic symbol	Description
MasterpactMTZwoC	MTZC_001	Symbol and icons for Masterpact MTZ circuit breakers without chassis.

#### **Faceplates**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

#### Available Tabs

During operation, clicking a Masterpact circuit breaker symbol opens a faceplate with the following tabs:

- Operation
- Analog data, page 62
- Discrete data, page 63
- Alarms, page 64

#### **Operation Tab**

CB1001 Circuit breaker for D10		۲
Off		
Communication disabled Communication failure Unknown status Not ready Failure ???: Unknown error	V	
Owner: Program	~	Reset
Device Info: ???: Unknown statu	IS	

**NOTE:** This tab features the control module **Reset** button. By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect. Refer to Parameters, page 332 in this chapter for description of the Param. FailureRearmConfirmation parameter, which allows you to configure the reset confirmation. For Reset Confirmation refer, page 58.

# *\$MasterpactNxMBUCE*: Masterpact Nx Circuit Breaker without Chassis (x= T/W)

#### **Overview**

This section describes the *\$MasterpactNxMBUCE* master template, which contains supervision resources to monitor and operate Nx circuit breakers.

#### **Supervision Functions**

#### Description

The *\$MasterpactNxMBUCE* master template provides the following monitoring and operation functions:

- Device status and data monitoring.
- Monitoring of abnormal conditions.
- Device logic resetting.
- Owner selection.
- Alarm management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

#### **Parameters**

#### Parameter Configuration

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The table describes the parameters that are defined as part of the *\$MasterpactNxMBUCE* master template attributes.

Name	Data type	Initial value	Description
Param.ModeNormal	String	Ρ	Specifies the normal owner modes (separated by a comma):         O: Operator         P: Program For example, P, O.

Name	Data type	Initial value	Description
Param. FailureRearmCon- firmation	Boolean	True	<i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.
			<i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i> .

#### **Overview**

In the *\$MasterpactNxMBUCE* master template, alarms related to supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

#### **State Alarms for Masterpact Circuit Breakers**

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

# Additional Namur Alarm Conditions for Masterpact Circuit Breakers

The table indicates for which bits an alarm is configured in the *\$MasterpactNxMBUCE* master template and provides the associated Namur status.

Word structure	Bit	Description	Namur status
Masterpact_CFG.DataStatus	2	SD Electrical trip	Failure
	3	SDE Electrical trip	Failure
	4	Discharged	Check function
	6	Not ready to close	Check function
Masterpact_CFG.WarningCodeExt	0	Ground fault	Failure
	1	Differential detected alarm (Vigi)	Failure
Masterpact_CFG.WarningOrderCode	1	Wrong password	Check function
	2	IFE locking pad/EIFE intrusive command is locked	Check function
	3	IFM locking pad locked	Check function
	4	Resource/Module does not exist	Check function
	5	Timeout during command	Failure

Word structure	Bit	Description	Namur status
	6	Circuit breaker tripped, reset before commands	Failure
	7	Circuit breaker already closed	Check function
	8	Circuit breaker already open	Check function
	9	Circuit breaker already reset	Check function
	10	Actuator in manual mode	Check function
	11	Actuator not present	Check function
	12	Inhibit mode on	Check function

**NOTE:** You can modify the configuration from the **Discrete 1**, **Discrete 3** and **Discrete 4** application template tabs.

#### **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### **Symbol Description**

The table describes the symbols that are included in the *\$MasterpactNxMBUCE* master template to display data of Masterpact circuit breakers during operation.

Name	Graphic symbol	Description
MasterpactNxwoC	PSxMasterPACT	Symbol and icons for Masterpact Nx circuit breakers without chassis.

#### **Faceplates**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

#### **Available Tabs**

During operation, clicking a Masterpact circuit breaker symbol opens a faceplate with the following tabs:

- Operation
- Analog data, page 62
- Discrete data, page 63
- · Alarms, page 64

**NOTE:** This tab features the control module **Reset** button. By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect. Refer to Parameters, page 332 in this chapter for description of the Param. FailureRearmConfirmation parameter, which allows you to configure the reset confirmation. For Reset Confirmation refer, page 58.

# *\$MasterpactNxCMBUCE*: Masterpact Nx Circuit Breakers with Chassis (x= T/W)

#### **Overview**

This section describes the *\$MasterpactNxCMBUCE* master template, which contains supervision resources to monitor and operate Masterpact Nx circuit breakers.

#### **Supervision Functions**

#### Description

The *\$MasterpactNxCMBUCE* master template provides the following monitoring and operation functions:

- Device status and data monitoring.
- Monitoring of abnormal conditions.
- Device logic resetting.
- Owner selection.
- Alarm management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

#### **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The table describes the parameters that are defined as part of the *\$MasterpactNxCMBUCE* master template attributes.

Name	Data type	Initial value	Description
Param.ModeNormal	String	P	Specifies the normal owner modes (separated by a comma):

Name	Data type	lnitial value	Description
Param. FailureRearmCon- firmation	Boolean	True	<i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.
			<i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i> .

#### **Overview**

In the *\$MasterpactNxCMBUCE* master template, alarms related to supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

#### **State Alarms for Masterpact Circuit Breakers**

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

# Additional Namur Alarm Conditions for Masterpact Circuit Breakers

The table indicates for which bits an alarm is configured in the *\$MasterpactNxCMBUCE* master template and provides the associated Namur status.

Word structure	Bit	Description	Namur status
Masterpact_CFG.DataStatus	2	SD Electrical trip	Failure
	3	SDE Electrical trip	Failure
	4	Discharged	Check function
	6	Not ready to close	Check function
	10	Chassis disconnected position	Check function
	11	Chassis test position	Check function
Masterpact_CFG.WarningCodeExt	0	Ground fault	Failure
	1	Earth leakage	Failure
	2	Chassis status discordance	Check Function
	3	Unknown IO configuration	Check Function
Masterpact_CFG.WarningOrderCode	1	Wrong password	Check Function
	2	IFE locking pad	Check Function

Word structure	Bit	Description	Namur status
	3	IFM locking pad locked	Check Function
	4	Resource/Module does not exist	Check Function
	5	Timeout during command	Failure
	6	Circuit breaker tripped, reset before commands	Failure
	7	Circuit breaker already closed	Check Function
	8	Circuit breaker already open	Check Function
	9	Circuit breaker already reset	Check Function
	10	Actuator in manual mode	Check Function
	11	Actuator not present	Check Function
	12	Inhibit mode on	Check Function

**NOTE:** You can modify the configuration from the **Discrete 1**, **Discrete 3** and **Discrete 4** application template tabs.

#### **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### **Symbol Description**

The table describes the symbols that are included in the *\$MasterpactNxCMBUCE* master template to display data of Masterpact circuit breakers during operation.

Name	Graphic symbol	Description
MasterpactNxC	PSxMasterPACT	Symbol and icons for Masterpact Nx circuit breakers with chassis.

#### **Faceplates**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

#### Available Tabs

During operation, clicking a Masterpact circuit breaker symbol opens a faceplate with the following tabs:

Operation

- Analog data, page 62
- Discrete data, page 63
- Alarms, page 64

**NOTE:** This tab features the control module **Reset** button. By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect. Refer to Parameters, page 332 in this chapter for description of the Param. FailureRearmConfirmation parameter, which allows you to configure the reset confirmation. For Reset Confirmation refer, page 58.

### **\$MasterpactHWCE:** Hardwired Circuit Breaker

#### **Overview**

This section describes the *\$MasterpactHWCE* master template, which contains supervision resources to monitor and operate Hardwired circuit breaker.

#### **Supervision Functions**

#### Description

The *\$MasterpactHWCE* master template provides the following monitoring and operation functions:

- Device status and data monitoring.
- Monitoring of abnormal conditions.
- Device logic resetting.
- · Owner selection.
- Alarm management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

#### **Parameters**

#### Parameter Configuration

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The table describes the parameters that are defined as part of the *\$MasterpactHWCE* master template attributes.

Name	Data type	Initial value	Description
Param.ModeNormal	String	P	Specifies the normal owner modes (separated by a comma):

Name	Data type	lnitial value	Description
Param. FailureRearmCon- firmation	Boolean	True	<i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.
			<i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i> .

#### **Overview**

In the *\$MasterpactHWCE* master template, alarms related to supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

#### **State Alarms for Masterpact Circuit Breakers**

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

# Additional Namur Alarm Conditions for Masterpact Circuit Breakers

The table indicates for which bits an alarm is configured in the *\$MasterpactHWCE* master template and provides the associated Namur status.

Word structure	Bit	Description	Namur status
HWCB_CFG.DataStatus	2	SD Electrical trip	Failure
	3	SDE Electrical trip	Failure
	7	Chassis disconnected position	Check function
	8	Chassis test position	Check function

**NOTE:** You can modify the configuration from the **Discrete 1** application template tab.

#### **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### **Symbol Description**

The table describes the symbols that are included in the *\$MasterpactHWCE* master template to display data of Hardwired circuit breakers during operation.

Name	Graphic symbol	Description
Circuitbreaker	PSxCircuitBreaker	Symbol and icons for Hardwired circuit breaker.

#### **Faceplates**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

#### **Available Tabs**

During operation, clicking a Masterpact circuit breaker symbol opens a faceplate with the following tabs:

- Operation
- Analog data, page 62
- Discrete data, page 63
- Alarms, page 64

#### **Operation Tab**

MPactHW Hardwired masterpact cir	cuit break	er control	٢
Off			
Communication disabled	$\nabla$		
Communication failure	_		
Unknown status	-		
Not ready			_
Failure			
Warning -			
Owner: Program	~	Reset	
Device Info: ???: Unknown state	us		

**NOTE:** This tab features the control module **Reset** button. By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect. Refer to Parameters, page 345 in this chapter for description of the Param. FailureRearmConfirmation parameter, which allows you to configure the reset confirmation. For Reset Confirmation refer, page 58.

### **\$CompactHWCE: Hardwired Compact Circuit Breaker**

#### **Overview**

This section describes the *CompactHWCE* master template, which contains supervision resources to monitor and operate Hardwired Compact Circuit Breaker.

#### **Supervision Functions**

#### **Description**

The *CompactHWCE* master template provides the following monitoring and operation functions:

- Device status and data monitoring.
- Monitoring of abnormal conditions.
- · Device logic resetting.
- Owner selection.
- Alarm management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

#### Parameters

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The table describes the parameters that are defined as part of the *\$CompactHWCE* master template attributes.

Name	Data type	Initial value	Description
Param.ModeNormal	String	P	Specifies the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> </ul> <li>For example, P, O.</li>

Name	Data type	lnitial value	Description
Param. FailureRearmCon- firmation	Boolean	True	<i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.
			<i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i> .

#### **Overview**

In the *CompactHWCE* master template, alarms related to supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

#### **State Alarms for Compact Circuit Breakers**

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

# Additional Namur Alarm Conditions for Compact Circuit Breakers

The table indicates for which bits an alarm is configured in the *CompactHWCE* master template and provides the associated Namur status.

Word structure	Bit	Description	Namur status
HWCB_CFG.DataStatus	2	SD Electrical trip	Failure
	3	SDE Electrical trip	Failure

**NOTE:** You can modify the configuration from the **Discrete 1** application template tab.

#### **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### **Symbol Description**

The table describes the symbols that are included in the *CompactHWCE* master template to display data of Hardwired circuit breakers during operation.

Name	Graphic symbol	Description
hwcompact	P SxCompact	Symbol and icons for Hardwired Compact Circuit Breaker.

#### **Faceplates**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

#### Available Tabs

During operation, clicking a Compact circuit breaker symbol opens a faceplate with the following tabs:

- Operation
- Analog data, page 62
- Discrete data, page 63
- Alarms, page 64

#### **Operation Tab**

CpactHW Hardwired compact circuit breaker control	٢
Off	
Communication disabled	
Communication failure	
Unknown status	
Not ready	
Failure	
Warning -	
Owner: Program - Reset	
Device [??: Unknown status	

**NOTE:** This tab features the control module **Reset** button. By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect. Refer to Parameters, page 345 in this chapter for description of the Param. FailureRearmConfirmation parameter, which allows you to configure the reset confirmation. For Reset Confirmation refer, page 58.

## **Digital Protection Relays**

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### **Overview**

This chapter describes the master templates that provide the supervision functions for the digital protection relay family.

# \$Sepam80ECE and \$Sepam80MBCE: Sepam80 Digital Protection Relays

#### **Overview**

This section describes the supervision resources and runtime services that are available for the management of the \$Sepam80ECE and \$Sepam80MBCE protection relay.

#### **Supervision Functions**

#### **Description**

The supervision resources provide device status monitoring, communication status, owner selection, resetting, current commands, and device data.

These functions are implemented in runtime through symbols and their associated faceplate.

#### **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The table describes the parameters that are defined as part of the *\$Sepam80ECE* master template attributes.

Parameter	Data type	Initial value	Description
Param.ModeNormal	String	Ρ	Specifies the normal owner modes (separated by a comma):         O: Operator         P: Program For example, P, O.

Name	Data type	lnitial value	Description
Param. FailureRearmCon- firmation	Boolean	True	<i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.
			<i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i> .

#### **Overview**

In the *\$Sepam80ECE* master template, alarms related to core supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

#### **State Alarms for Sepam 80**

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

#### **Additional Namur Alarm Conditions for Sepam 80**

The table indicates for which bits an alarm is configured in the *\$Sepam80ECE* master template and provides the associated Namur status.

Word structure	Bit	Description	Namur status
SEPAM_CFG.DataStatus	0	Detected fault	Failure
	3	Trip	Failure
	9	Loss of synchronization	Failure
	10	Loss of event 1 data	Failure
	12 Detected partial fault		Failure
	13	Detected major fault	Failure
	14	Loss of event 2 data	Failure

**NOTE:** You can modify the configuration from the **Discrete 1** page.

#### **Graphic Representation**

#### Representation

The table describes the symbols that are included in the *\$Sepam80ECE* master template to display data of Sepam 80 digital protection relays during operation

Name	Graphic symbol	Description
Sepam80C	MBSEPAM80C	Sepam 80C symbol

### Faceplates

#### **Overview**

During operation, clicking a Sepam 80 graphic symbol opens a faceplate with the following tabs:

- Operation
- Analog Data, page 62
- Discrete Data, page 63
- Alarms, page 64

#### **Operation Tab**

The figure shows an example of the operation tab.

RL1001 Digital p	rotection relay for D10	۲
Off		
Communicat	ion disabled	
Communicat	ion failure	
Unknown st	atus	
Not ready		
Failure	???: Unknown error	
Warning	-	
Owner	Program v	Reset
Devi In	ce fo: ???; Unknown status	

NOTE: This tab features the control module Reset button.

When the control module is reset, the current setpoint that is shown in this tab is effective.

By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect.

Refer to *Parameters* in this chapter for a description of the *Param*. *FailureRearmConfirmation* parameter, which allows you to configure the reset confirmation.

The figure shows the confirmation dialog box which is model in nature.

AG1001 - I	Reset	(april a	×
<u> </u>	Resetting the failure ma Are you sure you want t	y start the device i o reset?	immediately.
		ОК	Cancel

Resetting the control module by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

When the reset confirmation dialog box is enabled, the security classification that normally applies when you click **Reset** is not effective.

### \$EasergyP3EMCE: Digital Protection Relays

#### **Overview**

This section describes the Supervision resources and runtime services that are available for the management of \$EasergyP3EMCE

#### **Supervision Functions**

#### **Description**

The supervision resources provide device status monitoring, communication status, owner selection, resetting, current commands, and device data.

These functions are implemented in runtime through symbols and their associated faceplate.

#### **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The table describes the parameters that are defined as part of the *\$EasergyP3EMCE* master template attributes.

Parameter	Data type	Initial value	Description
Param.ModeNormal	String	P	Specifies the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> </ul> <li>For example, P, O.</li>

Name	Data type	Initial value	Description
Param. FailureRearmCon- firmation	Boolean	True	False = After you click the Reset button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.         True = After you click the Reset button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking OK and validating the command according to the configured security classification. By default, the security classification is secured write.

#### Overview

In the *\$EasergyP3MCE* master template, alarms related to core supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

#### State Alarms for EasergyP3

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

#### Additional Namur Alarm Conditions for EasergyP3

The table indicates for which bits an alarm is configured in the *\$EasergyP3MCE* master template and provides the associated Namur status.

Word structure	Bit	Description	Namur status
EasergyP3_CFG.DataStatus	0	Detected fault	Failure
	3	Trip	Failure
	9	Loss of synchronization	Failure
	10	Loss of event 1 data	Failure
	12	Detected partial fault	Failure
	13	Detected major fault	Failure
	14	Loss of event 2 data	Failure

**NOTE:** You can modify the configuration from the **Discrete 1** page.

#### **Graphic Representation**

#### Representation

The table describes the symbols that are included in the *\$EasergyP3MCE* master template to display data of EasergyP3 digital protection relays during operation

Name	Graphic symbol	Description
EasergyP3EMCE	EasergyP3EMCE	EasergyP3 symbol.

#### **Faceplates**

#### **Overview**

During operation, clicking a *EasergyP3* graphic symbol opens a faceplate with the following tabs:

- Operation
- Analog Data, page 62
- Discrete Data, page 63
- Alarms, page 64

#### **Operation Tab**

The figure shows an example of the operation tab.

EasergyP3_300 EasergyP3	۲
Off	
Communication disabled	
Communication failure	
Unknown status	
Failure     ???: Unknown error       Warning     -	
Owner: Program ~ Reset	
Device Info: ???: Unknown status	

#### **Extended Operator Tab**

The figure shows an example of the extended operator tab.

$\square$	####	Л	$\triangle$	
Co	ontrol (	Object	1: Cl	ose
Co	ontrol (	Object	2: Cl	ose
Co	ontrol (	Object	3: Cl	ose
Co	ontrol (	Object	4: Cl	ose
Co	ontrol (	Object	5: Cl	ose
Co	ontrol (	Object	6: Cl	ose
Co	ontrol (	Object	7: Cl	ose
Co	ontrol (	Object	8: Cl	ose

### \$EasergyP5EMCE: Digital Protection Relays

#### **Overview**

This section describes the Supervision resources and runtime services that are available for the management of SEasergyP5EMCE

#### **Supervision Functions**

#### **Description**

The supervision resources provide device status monitoring, communication status, owner selection, resetting, current commands, and device data.

These functions are implemented in runtime through symbols and their associated faceplate.

#### **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The table describes the parameters that are defined as part of the *\$EasergyP5EMCE* master template attributes.

Parameter	Data type	Initial value	Description
Param.ModeNormal	String	P	Specifies the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> </ul> <li>For example, P, O.</li>
Name	Data type	Initial value	Description
Param.	Boolean	True	False = After you click the <b>Reset</b> button on the

Param. FailureRearmCon- firmation	Boolean	True	False = After you click the Reset button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.         True = After you click the Reset button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking OK and validating the command according to the configured security classification.         By default the security classification is secured
			By default, the security classification is secured write.

#### Overview

In the *\$EasergyP5EMCE* master template, alarms related to core supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

#### State Alarms for EasergyP5

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

#### Additional Namur Alarm Conditions for EasergyP5

The table indicates for which bits an alarm is configured in the *\$EasergyP5EMCE* master template and provides the associated Namur status.

Word structure	Bit	Description	Namur status
EasergyP5_CFG.DataStatus	0	Detected fault	Failure
	3	Trip	Failure
	9	Loss of synchronization	Failure
	10	Loss of event 1 data	Failure
	12	Detected partial fault	Failure
	13	Detected major fault	Failure
	14	Loss of event 2 data	Failure

**NOTE:** You can modify the configuration from the **Discrete 1** page.

#### **Graphic Representation**

#### Representation

The table describes the symbols that are included in the *\$EasergyP5EMCE* master template to display data of EasergyP5 digital protection relays during operation

Name	Graphic symbol	Description
EasergyP5		EasergyP5 symbol.
	EasergyP5EMCE_2	

#### **Faceplates**

#### **Overview**

During operation, clicking a *EasergyP5* graphic symbol opens a faceplate with the following tabs:

- Operation
- Analog Data, page 62
- Discrete Data, page 63
- Alarms, page 64

#### **Operation Tab**

The figure shows an example of the operation tab.

EasergyF Digital Pr	P5EMCE_2 rotection Rela	ıy Easergy P	5 on Modb
Off			
Communical Communical Unknown st Not ready	tion disabled tion failure atus	8	
Failure Warning			
Owner	Program	v	Reset
Device In	fo: 2??: Unknow	n status	

#### **Extended Operator Tab**

The figure shows an example of the extended operator tab.

$\square$	****	Л	À					
Co	ontrol C	Object	1:	cl	ose			]
Co	ontrol C	Object	<b>2</b> :	cl	ose			]
Co	ontrol C	Object	3:	cl	ose			]
Co	ontrol C	Object	<b>4</b> :	cl	ose			]
Co	ontrol C	Object	<b>5</b> :	cl	ose			]
Co	ontrol C	Object	<b>6</b> :	cl	ose			]
# **Motor Controllers and Starters**

## What's in This Chapter

\$TesysT: TeSys T Motor Controllers and Starters	361
\$TesysU: TeSys U Motor Controllers and Starters	365

## **Overview**

This chapter describes the master templates that provide the supervision functions for the motor controller and starter family.

# *\$TesysT*: TeSys T Motor Controllers and Starters

## **Overview**

This section describes the master templates that contain supervision resources to monitor and operate TeSys T motor controllers and starters.

The tal	ole indica	tes the re	elationship	between	master	templates	and	TeSys	Т
device	S.								

Master template	TeSys T device
\$TesysTAllDataCE	<ul> <li>Communicating by using either:</li> <li>Ethernet Modbus TCP implicit messaging (normal I/O scanning)</li> <li>Ethernet Modbus TCP explicit messaging</li> <li>Modbus serial</li> </ul>
\$TesysTEFastCE	<ul> <li>Communicating by using either:</li> <li>Ethernet Modbus TCP implicit messaging (fast I/O scanning)</li> <li>CANopen (device connected to an STB island)</li> </ul>
\$TesysTPBCE	Communicating by using Profibus network.

## **Supervision Functions**

#### **Description**

The *\$TesysTAllDataCE*, *\$TesysTEFastCE* and *\$TesysTPBCE* master templates provide the following monitoring and operation functions:

- · Device status and data monitoring.
- Monitoring of abnormal conditions.
- Device logic resetting.
- · Owner selection.
- Alarm signal management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

## **Parameters**

## **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

## **Parameter Description**

The tables describe the parameters that are defined as part of the \$TesysTAllDataCE, \$TesysTEFastCE and \$TesysTPBCE master template attributes.

Parameter	Data type	Initial value	Description
Param. HiAvgCurrent	Float	100.0	Defines the high limit of the present value to scale the Y axis for trending.
Param. LoAvgCurrent	Float	0.0	Defines the low limit of the present value to scale the Y axis for trending.
Param.ModeNormal	String	P	Specifies the normal owner modes (separated by a comma):
AO. ResetFaultVisi- bility	BOOL	False	Visible reset fault auth on \$TesysTPBCE.
		True	Visible reset fault auth on <i>\$TesysTAllDataCE</i> and <i>\$TesysTEFastCE</i> .

Name	Data type	Initial value	Description
Param. FailureRearmCon- firmation	Boolean	True	<i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.
			<i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i> .

## **Default State Alarms and Additional Alarm Conditions**

## Overview

In the *\$TesysTAllDataCE*, *\$TesysTEFastCE* and *\$TesysTPBCE* master templates, alarms related to core supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

## State Alarms for TeSys T Motor Controllers and Starters

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

## Additional Namur Alarm Conditions for TeSys T Motor Controllers and Starters

The table indicates for which bits an alarm is configured in the *\$TesysTAllDataCE*, *\$TesysTEFastCE* and *\$TesysTPBCE* master templates and provides the associated Namur status.

Word structure	Bit	Description	Namur status
TESYST_CFG.DataStatus	2	Device fault state	Failure
	3	Detected alarm	Failure
	4	Trip	Failure
	11	Detected fault	Function Check
	14	HMI communication lost	Failure

NOTE: You can modify the configuration from the Discrete 1 page.

## **Graphic Representation**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

## Representation

The table describes the symbols that are included in the *\$TesysTAllDataCE*, *\$TesysTEFastCE* and *\$TesysTPBCE* master templates to display data of TeSysT motor controllers and starters during operation.

Name	Graphic symbol	Description
TesysT	EMESTESYST	TeSys T device symbol and icons.
TesysT_Amp	EMESTESYST %FLC 0.0 ~	<ul> <li>In addition to icons, the symbol displays (from top to bottom):</li> <li>The label.</li> <li>Engineering units.</li> <li>The average current value in engineering units.</li> </ul>

## **Faceplates**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

## **Available Tabs**

During operation, clicking a TeSys T motor controller and starter symbol opens a faceplate with the following tabs:

- Operation
- Analog Data, page 62
- Discrete Data, page 63
- Alarms, page 64

## **Operation Tab**

The figure shows an example of the operation tab.

TesysTE TesysT on ethernet IO sca	mning
Off	
Communication disabled	]
Communication failure	
Unknown status	
Not ready	
Failure Communication error	
Warning -	
Owner: Program	✓ Reset
Module ready	
Trip	
Reset authorized detected error	
Average Current:	0.0 %FLC

NOTE: FaultResetAuth is not available for \$TesysTPBCE.

NOTE: This tab features the control module Reset button.

When the control module is reset, the current setpoint that is shown in this tab is effective.

By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect.

Refer to *Parameters* in this chapter for a description of the *Param. FailureRearmConfirmation* parameter, which allows you to configure the reset confirmation.

The figure shows the confirmation dialog box which is model in nature.

AG10	001 - Reset	X
	Resetting the failure matrix Are you sure you want	ay start the device immediately. to reset?
		OK Cancel

Resetting the control module by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

When the reset confirmation dialog box is enabled, the security classification that normally applies when you click **Reset** is not effective.

# *\$TesysU*: TeSys U Motor Controllers and Starters

## **Overview**

This section describes the following master templates that contain supervision resources to monitor and operate TeSys U motor controllers and starters, which use various protocols for communication..

Template	Communication protocol used by the device
\$TesysUIOCE	Either of: <ul> <li>Modbus serial.</li> <li>CANopen.</li> </ul>
\$TesysUMainDataCE	Either of: <ul> <li>Modbus serial.</li> <li>CANopen.</li> </ul>
\$TesysUMECCE	Modbus serial.

## **Supervision Functions**

## **Description**

The *\$TesysUIOCE*, *\$TesysUMainDataCE*, and *\$TesysUMECCE* master templates provide the following monitoring and operation functions:

- Device status and data monitoring.
- Monitoring of abnormal conditions such as communication interruption.
- Device logic resetting.
- · Owner selection.
- Alarm signal management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

## **Parameters**

## Parameter Configuration

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

## **Parameter Description**

The tables describe the parameters that are defined as part of the *\$TesysUIOCE*, *\$TesysUMainDataCE*, and *\$TesysUMECCE* master template attributes.

Parameter	Data type	Initial value	Description
Param. HiAvgCurrent	Float	100.0	Defines the high limit of the present value to scale the Y axis for trending.
Param. LoAvgCurrent	Float	0.0	Defines the low limit of the present value to scale the Y axis for trending.
Param.ModeNormal	String	P	Specifies the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> </ul> <li>For example, P, O.</li>

Name	Data type	Initial value	Description
Param. FailureRearmCon- firmation	Boolean	True	<i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.
			<i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i> .

## **Default State Alarms and Additional Alarm Conditions**

#### **Overview**

In the *\$TesysUIOCE*, *\$TesysUMainDataCE*, and *\$TesysUMECCE* master templates, alarms related to core supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

## State Alarms for TeSys U Motor Controllers and Starters

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

## Additional Namur Alarm Conditions for TeSys U Motor Controllers and Starters

The table indicates for which bits an alarm is configured in the *\$TesysUIOCE*, *\$TesysUMainDataCE*, and *\$TesysUMECCE* master templates and provides the associated Namur status.

Word structure	Bit	Description	Namur status
TESYSU_CFG.DataStatus	2	Device in fault state	Failure
	3	Detected alarm	Failure
	4	Trip	Failure

**NOTE:** You can modify the configuration from the **Discrete 1** page.

## **Graphic Representation**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

## Representation

The table describes the symbols that are included in the *\$TesysUIOCE*, *\$TesysUMainDataCE*, and *\$TesysUMECCE* master templates to display data of TeSys U motor controllers and starters during operation.

Name	Graphic symbol	Description
TesysU	MBTE SY SUC	TeSys U device symbol and icons.
TesysU_Amp	MBTE SY SUC	<ul> <li>In addition to icons, the symbol displays (from top to bottom):</li> <li>The label.</li> <li>Engineering units.</li> <li>The average current value in engineering units.</li> </ul>

## **Faceplates**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

## **Available Tabs**

During operation, clicking a TeSys U motor controller and starter symbol opens a faceplate with the following tabs:

- Operation
- Analog Data, page 62
- Discrete Data, page 63
- Alarms, page 64

## **Operation Tab**

The figure shows an example of the operation tab.

TesysU TesysU Advanced Controller on Modbus	۲
Off	
Communication disabled	
Communication failure	
Unknown status	
Not ready	
Failure ???: Unknown error	
Warning -	
Owner: Program v Reset	
Device Info: Communication interruption	
Module ready	
Trip	
Reset authorized detected error	
OA1	
OA3	
L01	
Average Current: 0.0 %FLA	

NOTE: This tab features the control module Reset button.

When the control module is reset, the current setpoint that is shown in this tab is effective.

By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect.

Refer to *Parameters* in this chapter for a description of the *Param. FailureRearmConfirmation* parameter, which allows you to configure the reset confirmation.

The figure shows the confirmation dialog box which is model in nature.

AG1001 -	Reset	(Reported	×
<b></b>	Resetting the failure may s Are you sure you want to r	start the device in reset?	mmediately.
	[	ОК	Cancel

Resetting the control module by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

When the reset confirmation dialog box is enabled, the security classification that normally applies when you click **Reset** is not effective.

# **Power Measurement**

## What's in This Chapter

<i>PM5350MBCE</i> and <i>PM53xxEMCE</i> : PM5350 and PM53xx Power	
Meters	
\$PM82xxEMCE: PM82xx Power Meter	

## **Overview**

This chapter describes the master templates that provide the supervision functions for the power meter family.

# *\$PM5350MBCE* and *\$PM53xxEMCE* : PM5350 and PM53xx Power Meters

## **Overview**

This section describes the *\$PM5350MBCE* and *\$PM53xxEMCE* master templates, which contains supervision resources to monitor and operate PM5350 power meter by using Modbus serial communication and PM53xx power meter by using Ethernet explicit communication.

## **Supervision Functions**

## **Description**

The *\$PM5350MBCE* and *\$PM53xxEMCE* master templates provide the following monitoring and operation functions:

- Device status and data monitoring.
- Monitoring of abnormal conditions such as communication interruption.
- · Device logic resetting.
- Owner selection.
- Alarm signal management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

## **Parameters**

## **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

## **Parameter Description**

The table describes the parameters that are defined as part of the *\$PM5350MBCE* and *\$PM53xxEMCE* master templates attributes.

Name	Data type	Initial value	Description
Param.HiEnergy	Float	10000000.0	Defines the high limit of the present value to scale the Y axis for trending.
Param.LoEnergy	Float	0.0	Defines the low limit of the present value to scale the Y axis for trending.
Param.HiPower	Float	100.0	Defines the high limit of the present value to scale the Y axis for trending.
Param.LoPower	Float	0.0	Defines the low limit of the present value to scale the Y axis for trending.
Param.ModeNormal	String	P	<ul> <li>Specifies the normal owner modes (separated by a comma):</li> <li>O: Operator</li> <li>P: Program</li> <li>For example P,O.</li> </ul>

## **Default State Alarms and Additional Alarm Conditions**

#### **Overview**

In the *\$PM5350MBCE* and *\$PM53xxEMCE* master templates, alarms related to core supervision functions are managed through attributes, which have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

## State Alarms for PM5350 and PM53xx Power Meters

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

## Additional Namur Alarm Conditions for PM5350 and PM53xx Power Meters

In the *PM5350MBCE* and *PM53xxEMCE* master templates, there are no bits for which additional alarm conditions are configured.

**NOTE:** You can modify the configuration from the **Main** page.

## **Graphic Representation**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

## **Symbol Description**

The table describes the symbols that are included in the *PM5350MBCE* master template to display data of PM5350 power meters during operation.

Name	Graphic symbol	Description
PM5350	MBPM5350	PM5350 power meter symbol and icons.
PM5350_Power	MBPM5350 0.0 kVAh 0.0 kVA PF 0.00 ~	<ul> <li>In addition to icons, the symbol displays (from top to bottom):</li> <li>The label.</li> <li>Apparent energy consumption with engineering units.</li> <li>Total apparent power with engineering units.</li> <li>Total power factor.</li> </ul>

The table describes the symbols that are included in the *\$PM53xxEMCE* master template to display data of PM53xx power meters during operation.

Name	Graphic symbol	Description
PM53xx	EMPM53xx	PM53xx power meter symbol and icons.
PM53xx_Power	EMPM53xx 0.0 kVAh 0.0 kVA PF 0.00 ~ •	<ul> <li>In addition to icons, the symbol displays (from top to bottom):</li> <li>The label.</li> <li>Apparent energy consumption with engineering units.</li> <li>Total apparent power with engineering units.</li> <li>Total power factor.</li> </ul>

## **Faceplates**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

## **Available Tabs**

During operation, clicking a PM5350/PM53xx power meter symbol opens a faceplate with the following tabs:

- Operation
- Analog data, page 62
- Alarms, page 64

**NOTE:** The master template also features the trends faceplate.

## **Operation Tab**

The figure shows the operation tab of MBPM5350.

AG1001MEA AG1001 Power meter		۲
On		
Communication disabled		
Communication failure		
Unknown status Not ready	-	
Failure		
Warning		
Owner: Operator	×	Reset
	Energy:	Power:
Active:	0.0 kWh	0.0 kW
Apparent:	0.0 kVAh	0.0 kVA
Reactive:	0.0 kVARh	0.0 kVAR
Avg V L-L:	0.0 V	
Avg V L-N:	0.0 V	
Avg I:	0.00 A	and the second second
Power Factor:	0.00	

The figure shows the operation tab of EMPM53xx.

PM53xxEM (C) Power meter 53xx on modbus ethernet			
Off			
Communication disabled			
Communication failure	_		
Unknown status Not ready			
Failure Communication e	rror		
Warning -			
Owner: Program	~	Reset	
	Energy:	Power:	
Active:	0.0 kWh	0.0 kW	
Apparent:	0.0 kVAh	0.0 KVA	
Reactive:	0.0 kVARh	0.0 kvar	
Avg V L-L:	0.0 V		
Avg V L-N:	0.0 V		
Avg I:	0.00 A		
Power Factor:	0.00		

NOTE: This tab features the control module Reset button.

# *\$PM82xxEMCE*: PM82xx Power Meter

## **Overview**

This section describes the *\$PM82xxEMCE* master template, which contains supervision resources to monitor and operate PM82xx power meter by using Ethernet explicit communication.

## **Supervision Functions**

## Description

The *\$PM82xxEMCE* master template provide the following monitoring and operation functions:

- Device status and data monitoring.
- Monitoring of abnormal conditions such as communication interruption.
- Device logic resetting.
- Owner selection.
- Alarm signal management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

## **Parameters**

## **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

## **Parameter Description**

The table describes the parameters that are defined as part of the *\$PM82xxEMCE* master templates attributes.

Name	Data type	Initial value	Description
Param.HiEnergy	Float	10000000.0	Defines the high limit of the present value to scale the Y axis for trending.
Param.LoEnergy	Float	0.0	Defines the low limit of the present value to scale the Y axis for trending.
Param.HiPower	Float	100.0	Defines the high limit of the present value to scale the Y axis for trending.
Param.LoPower	Float	0.0	Defines the low limit of the present value to scale the Y axis for trending.
Param.ModeNormal	String	P	Specifies the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> </ul> For example P,O.

## **Default State Alarms and Additional Alarm Conditions**

#### **Overview**

In the *\$PM82xxEMCE* master template, alarms related to core supervision functions are managed through attributes, which have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

## State Alarms for PM82xx Power Meters

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

## Additional Namur Alarm Conditions for PM82xx Power Meters

In the *\$PM82xxEMCE* master template, there are no bits for which additional alarm conditions are configured.

**NOTE:** You can modify the configuration from the **Main** page.

#### **Graphic Representation**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

## **Symbol Description**

The table describes the symbols that are included in the *\$PM82xxEMCE* master template to display data of PM82xx power meters during operation.

Name	Graphic symbol	Description
PM82xx	EMPM82xx	PM82xx power meter symbol and icons.
PM82xx_Power	EMPM82xx 0.0 kVAh 0.0 kVA PF_0.00 √ 1 ⊗₩	<ul> <li>In addition to icons, the symbol displays (from top to bottom):</li> <li>The label.</li> <li>Apparent energy consumption with engineering units.</li> <li>Total apparent power with engineering units.</li> <li>Total power factor.</li> </ul>

## **Faceplates**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

## **Available Tabs**

During operation, clicking a PM82xx power meter symbol opens a faceplate with the following tabs:

- Operation
- Analog data, page 62
- Alarms, page 64

NOTE: The master template also features the trends faceplate.

# **Operation Tab**

The figure shows the operation tab of EMPM82xx.

AG1001MEA AG1001 Power meter		۲
On		
Communication disabled		
Communication failure	_	
Unknown status	-	
Esilura		
Warning		
Owner: Operator	×	Reset
	Energy:	Power:
Active:	0.0 kWh	0.0 kW
Active: Apparent:	0.0 kWh 0.0 kVAh	0.0 kW 0.0 kVA
Active: Apparent: Reactive:	0.0 kWh 0.0 kVAh 0.0 kVARh	0.0 kW 0.0 kVA 0.0 kVAR
Active: Apparent: Reactive: Avg V L-L:	0.0 kWh 0.0 kVAh 0.0 kVARh 0.0 V	0.0 kW 0.0 kVA 0.0 kVAR
Active: Apparent: Reactive: Avg V L-L: Avg V L-N:	0.0 kWh 0.0 kVAh 0.0 kVARh 0.0 V 0.0 V	0.0 kW 0.0 kVA 0.0 kVAR
Active: Apparent: Reactive: Avg V L-L: Avg V L-N: Avg I:	0.0 kWh 0.0 kVAh 0.0 kVARh 0.0 V 0.0 V 0.0 V	0.0 kW 0.0 kVA 0.0 kVAR

NOTE: This tab features the control module Reset button.

# **Soft Starters**

## What's in This Chapter

\$ATS22MBCE: Altistart 22 Soft Starters	
\$ATS48MBCE: Altistart 48 Soft Starters	
MBTCPATS480 - ATS480 (Modbus TCP/IP) and EIPATS480 - ATS480	
(Ethernet IP): Progressive Starters	

# **Overview**

This chapter describes the master templates that provide the supervision functions for the soft starter family.

# \$ATS22MBCE: Altistart 22 Soft Starters

## **Overview**

This section describes the *\$ATS22MBCE* master template, which contains supervision resources to monitor and operate Altistart 22 soft starters.

## **Supervision Functions**

## **Description**

The *\$ATS22MBCE* master template provides the following monitoring and operation functions:

- Device status and data monitoring.
- · Monitoring of abnormal conditions.
- Device logic resetting.
- Owner selection.
- Alarm signal management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

## **Parameters**

## **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

## **Parameter Description**

The tables describe the parameters that are defined as part of the *\$ATS22MBCE* master template attributes.

Name	Data type	Initial value	Description
Param.HiCurrent	Float	100.0	Defines the high limit of the present value to scale the Y axis for trending.
Param.LoCurrent	Float	0.0	Defines the low limit of the present value to scale the Y axis for trending.
Param.ModeNormal	String	P	Specifies the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> </ul> <li>For example, P, O.</li>

Name	Data type	Initial value	Description
Param. FailureRearmCon- firmation	Boolean	True	<i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.
			<i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i> .

## **Default State Alarms and Additional Alarm Conditions**

#### **Overview**

In the *\$ATS22MBCE* master template, alarms related to core supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

## **State Alarms for Altistart 22**

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

## Additional Namur Alarm Conditions for Altistart 22

The table indicates for which bits an alarm is configured in the *\$ATS22MBCE* master template and provides the associated Namur status.

Word structure	Bit	Description	Namur status
ATS22_CFG.DataStatus	2	Trip	Failure
	3	Detected alarm	Failure

**NOTE:** You can modify the configuration from the **Discrete 1** page.

## **Graphic Representation**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

## **Symbol Description**

The table describes the symbols that are included in the *\$ATS22MBCE* master template to display data of Altistart 22 soft starters during operation.

Name	Graphic symbol	Description
ATS22	MBAT S22	Altistart 22 symbol and icons.
ATS22_Amp	MBAT S22	<ul> <li>In addition to icons, the symbol displays (from top to bottom):</li> <li>The label.</li> <li>Engineering units.</li> <li>Current on starter line 1 in Amperes.</li> <li>Current on starter line 2 in Amperes.</li> <li>Current on starter line 3 in Amperes.</li> </ul>

## **Faceplates**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

## Available Tabs

During operation, clicking an Altistart 22 soft starter symbol opens a faceplate with the following tabs:

- Operation
- Analog data, page 62
- Discrete data, page 63
- Alarms, page 64

NOTE: The master template also features the trends faceplate.

## **Operation Tab**

The figure shows an example of the operation tab.

AT S22MB ATV22 Progressive starte	r on modl	() Sus
Off		
Communication disabled	]	
Communication failure		
Unknown status		
Not ready		
Failure Communication error		
Warning -		
Owner: Program	¥	Reset
Device Info: Communica		
Continued	tion interrup	tion
Current L1:	tion interrup 0.0 A	tion
Current L1: Current L2:	0.0 A 0.0 A 0.0 A	tion
Current L1: Current L2: Current L3:	tion interrup 0.0 A 0.0 A 0.0 A	tion
Current L1: Current L2: Current L3: Voltage:	tion interrup 0.0 A 0.0 A 0.0 A 0.0 V	tion
Current L1: Current L2: Current L3: Voltage: Total Starts:	0.0 A 0.0 A 0.0 A 0.0 A 0 V 0	tion

NOTE: This tab features the control module Reset button.

When the control module is reset, the current setpoint that is shown in this tab is effective.

By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect.

Refer to *Parameters* in this chapter for a description of the *Param. FailureRearmConfirmation* parameter, which allows you to configure the reset confirmation.

The figure shows the confirmation dialog box which is model in nature.



Resetting the control module by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

When the reset confirmation dialog box is enabled, the security classification that normally applies when you click **Reset** is not effective.

# *\$ATS48MBCE*: Altistart 48 Soft Starters

#### **Overview**

This section describes the *\$ATS48MBCE* master template, which contains supervision resources to monitor and operate Altistart 48 soft starters.

## **Supervision Functions**

## Description

The *\$ATS48MBCE* master template provides the following monitoring and operation functions:

- Device status and data monitoring.
- Monitoring of abnormal conditions.
- · Device logic resetting.
- · Owner selection.
- Alarm signal management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

## **Parameters**

## **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

## **Parameter Description**

The tables describe the parameters that are defined as part of the *\$ATS48MBCE* master template attributes.

Name	Data type	Initial value	Description
Param.HiCurrent	Float	100.0	Defines the high limit of the present value to scale the Y axis for trending.
Param.LoCurrent	Float	0.0	Defines the low limit of the present value to scale the Y axis for trending.
Param.ModeNormal	String	Ρ	Specifies the normal owner modes (separated by a comma):

Name	Data type	lnitial value	Description
Param. FailureRearmCon- firmation	Boolean	True	False = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.
			<i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i> .

## **Default State Alarms and Additional Alarm Conditions**

#### Overview

In the *\$ATS48MBCE* master template, alarms related to core supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

## **State Alarms for Altistart 48**

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

## **Additional Namur Alarm Conditions for Altistart 48**

The table indicates for which bits an alarm is configured in the *\$ATS48MBCE* master template and provides the associated Namur status.

Word structure	Bit	Description	Namur status
ATS_CFG.DataStatus	3	Malfunction	Failure
	7	Detected alarm	Failure

**NOTE:** You can modify the configuration from the **Discrete 1** page.

## **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

## **Symbol Description**

The table describes the symbols that are included in the *\$ATS48MBCE* master template to display data of Altistart 48 soft starters during operation.

Name	Graphic symbol	Description
ATS48	MBAT S48	Altistart 48 symbol and icons.
ATS48_Amp	MBAT S48 0.0 ~	<ul> <li>In addition to icons, the symbol displays (from top to bottom):</li> <li>The label.</li> <li>Engineering units.</li> <li>Current on starter line in Amperes.</li> </ul>

## **Faceplates**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

## **Available Tabs**

During operation, clicking an Altistart 48 soft starter symbol opens a faceplate with the following tabs:

- Operation
- Analog data, page 62
- Discrete data, page 63
- Alarms, page 64

NOTE: The master template also features the trends faceplate.

## **Operation Tab**

The figure shows an example of the operation tab.

AT \$48MB ATV48 Progressiv	e starter on m	odbus	٢
Off			
Communication disabled			
Communication failure			
Unknown status			
Not ready			
Failure Communica	ation error		
Warning -			
Owner: Progra	m ~	Reset	
Device Status:	irror in DFB		
Device Info:	Communication inte	erruption	
Current:	0.0	A	
Torque:	0 9	%	•
Thermal Status:	0 :	%	1
Power Consumption:	0 5	κ 📕	
Cos Phi:	0.00	1000	af.

NOTE: This tab features the control module Reset button.

When the control module is reset, the current setpoint that is shown in this tab is effective.

By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect.

Refer to *Parameters* in this chapter for a description of the *Param. FailureRearmConfirmation* parameter, which allows you to configure the reset confirmation.

The figure shows the confirmation dialog box which is model in nature.

AG1001 - Reset	
Resetting the failure ma Are you sure you want t	iy start the device immediately. to reset?
	OK Cancel

Resetting the control module by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

When the reset confirmation dialog box is enabled, the security classification that normally applies when you click **Reset** is not effective.

# MBTCPATS480 - ATS480 (Modbus TCP/IP) and EIPATS480 - ATS480 (Ethernet IP): Progressive Starters

#### **Overview**

This section describes the *\$ATS480MBTCPCE* and *\$ATS480EIPCE* master template, which contains supervision resources to monitor and operate Altistart 480 soft starters.

## **Supervision Functions**

#### Description

The *\$ATS480MBTCPCE* and *\$ATS480EIPCE* master template provides the following monitoring and operation functions:

- Device status and data monitoring.
- Monitoring of abnormal conditions.
- Device logic resetting.
- Owner selection.
- Alarm signal management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

## **Parameters**

## **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived

application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

## **Parameter Description**

The tables describe the parameters that are defined as part of the *\$ATS480MBTCPCE* and *\$ATS480EIPCE* master template attributes.

Name	Data type	Initial value	Description
Param.HiCurrent	Float	1000.0	Defines the high limit of the present value to scale the Y axis for trending.
Param.LoCurrent	Float	0.0	Defines the low limit of the present value to scale the Y axis for trending.
Param.ModeNormal	String	P	Specifies the normal owner modes (separated by a comma):

Name	Data type	lnitial value	Description
Param. FailureRearmCon- firmation	Boolean	True	<ul> <li>False = After you click the Reset button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.</li> <li>True = After you click the Reset button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking OK and validating the command according to the configured security classification. By default, the security classification is secured write.</li> </ul>

## **Default State Alarms and Additional Alarm Conditions**

#### **Overview**

In the *\$ATS480MBTCPCE* and *\$ATS480EIPCE* master template, alarms related to core supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

## **State Alarms for Altistart 480**

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

## Additional Namur Alarm Conditions for Altistart 480

The table indicates for which bits an alarm is configured in the \$ATS480MBTCPCE and \$ATS480EIPCE master template and provides the associated Namur status.

Word structure	Bit	Description	Namur status
ATS_CFG.DataStatus	3	Malfunction	Failure
	7	Detected alarm	Failure

**NOTE:** You can modify the configuration from the **Discrete 1** page.

## **Graphic Representation**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

## **Symbol Description**

The table describes the symbols that are included in the *\$ATS480MBTCPCE* and *\$ATS480EIPCE* master template to display data of Altistart 480 soft starters during operation.

Name	Graphic symbol	Description
ATS480	ATS480MBTCPCE_1	Altistart 480 symbol and icons.
ATS48_Amp	ATS480MBTCPCE_1 40.1	In addition to icons, the symbol displays (from top to bottom): <ul> <li>The label.</li> <li>Engineering units.</li> <li>Current on starter line in Amperes.</li> </ul>

## **Faceplates**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

## Available Tabs

During operation, clicking an Altistart 480 soft starter symbol opens a faceplate with the following tabs:

- Operation
- Analog data, page 62
- Discrete data, page 63
- Alarms, page 64

**NOTE:** The master template also features the trends faceplate.

## **Operation Tab**

The figure shows an example of the operation tab.

ATS480MBTCPC ATS 480 Soft St	CE_1 arter		۲
On Failure NOF: Ol Warning Current	< limit alarm.		
Owner: Prog	gram ~		Reset
Device Status:	rUn: Operation er	abled	
Device Info:	Running		
Current:	40.1	А	
Torque:	17	%	
Thermal Status:	0	%	
Power Consumption:	1719	kWh	
Cos Phi:	0.63		

NOTE: This tab features the control module Reset button.

When the control module is reset, the current setpoint that is shown in this tab is effective.

By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect.

Refer to *Parameters* in this chapter for a description of the *Param. FailureRearmConfirmation* parameter, which allows you to configure the reset confirmation.

The figure shows the confirmation dialog box which is model in nature.



Resetting the control module by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

When the reset confirmation dialog box is enabled, the security classification that normally applies when you click **Reset** is not effective.

# **Speed Drives**

## What's in This Chapter

\$ATV6xxECE: Altivar 6xx Series Variable Speed Drives	
\$ATV9xxECE: Altivar 9xx Series Variable Speed Drives	
\$ATV6xxxECE: Altivar 6xxx Series Variable Speed Drives	
\$ATV320EMCE: Altivar 320 Series Variable Speed Drives	
\$ATV340CF <sup>-</sup> Altivar 340 Series Variable Speed Drives	402

# **Overview**

This chapter describes the master templates that provide the supervision functions for the speed drive family.

# **\$ATV6xxECE:** Altivar 6xx Series Variable Speed Drives

#### **Overview**

This section describes the \$ATV6xxECE master template, which contains supervision resources to monitor and operate Altivar 6xx series variable speed drives (6xx represents the device model number).

## **Supervision Functions**

## **Description**

The *\$ATV6xxECE* master template provides the following monitoring and operation functions:

- Device status and data monitoring.
- Setting of speed setpoint and direction of rotation.
- Monitoring of abnormal conditions.
- Device logic resetting.
- Owner selection.
- Alarm signal management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

## **Parameters**

## **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The tables describe the parameters that are defined as part of the *\$ATV6xxECE* master template attributes.

Name	Data type	Initial value	Description
Param.HiPV	Float	100.0	Defines the high limit of the present value to scale the Y axis for trending.
Param.LoPV	Float	0.0	Defines the low limit of the present value to scale the Y axis for trending.
Param.ModeNormal	String	Ρ	Defines the normal owner modes (separated by a comma): <ul> <li>O: Operator</li> <li>P: Program</li> </ul> For example, P, O.

Name	Data type	Initial value	Description
Param. FailureRearmCon- firmation	Boolean	True	<i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required. <i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by click the <b>Control Control Set Set</b> of the control logic is reset only by
			according to the configured security classification. By default, the security classification is <i>secured</i> <i>write</i> .

## **Default State Alarms and Additional Alarm Conditions**

#### **Overview**

In the \$ATV6xxECE master template, alarms related to core supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

## State Alarms for Altivar 6xx Series Speed Drives

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

## Additional Namur Alarm Conditions for Altivar 6xx Series Speed Drives

The table indicates for which bits an alarm is configured in the *\$ATV6xxECE* master template and provides the associated Namur status.

Word structure	Bit	Description	Namur status
ATV_CFG.DataStatus	3	Malfunction	Failure
	7	Detected alarm	Failure
	10	Speed setpoint outside of limit	Out Of Specs

**NOTE:** You can modify the configuration from the **Discrete 1** page.

## **Graphic Representation**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

## **Symbol Description**

The table describes the symbols that are included in the *\$ATV6xxECE* master template to display data of Altivar 6xx series variable speed drives during operation.

Name	Graphic symbol	Description
ATV6xx	ATV6xx	Altivar 600 symbol and icons.
ATV6xx_PV	ATV6xx ♀ 0.00 ♥	<ul> <li>In addition to icons, the symbol displays (from top to bottom):</li> <li>The label.</li> <li>Engineering units.</li> <li>Direction of rotation.</li> <li>Present motor speed.</li> </ul>
ATV6xx_PVSP	ATV6xx	In addition to icons, the symbol displays (from top to bottom): • The label. • Engineering units. • Direction of rotation. • Present motor speed. • Direction of rotation setpoint. • Motor speed setpoint.

## **Faceplates**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

## **Available Tabs**

During operation, clicking an Altivar 6xx series variable speed drive symbol opens a faceplate with the following tabs:

- Operation
- Analog data, page 62
- Discrete data, page 63
- Alarms, page 64

NOTE: The master template also features the trends faceplate.

## **Operation Tab**

The figure shows an example of the operation tab.

ATV6xxE ATV6xx I	Drive with IO so	anning	۲
Off			
Communicat	ion disabled		
Communicat	ion failure		
Unknown sta	atus	_	
Not ready			
Failure	Communication erro	or	
Warning	-		
Owner	Program	~	Reset
Device	Status: Error in	DFB	
Devi	ce Info: Commun	ication interru	ption
ç	0.00		-
(	Current:	0.00 A	
	Torque:	0 %	
	Power:	0.00 kW	

**NOTE:** This tab features the control module **Reset** button.

When the control module is reset, the current setpoint that is shown in this tab is effective.

By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect.

Refer to *Parameters* in this chapter for a description of the *Param. FailureRearmConfirmation* parameter, which allows you to configure the reset confirmation.

The figure shows the confirmation dialog box which is model in nature.



Resetting the control module by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

When the reset confirmation dialog box is enabled, the security classification that normally applies when you click **Reset** is not effective.

# *\$ATV9xxECE*: Altivar 9xx Series Variable Speed Drives

#### **Overview**

This section describes the *\$ATV9xxECE* master template, which contains supervision resources to monitor and operate Altivar 9xx series variable speed drives (*9xx* represents the device model number).

## **Supervision Functions**

## Description

The *\$ATV9xxECE* master template provides the following monitoring and operation functions:

- Device status and data monitoring.
- Setting of speed setpoint and direction of rotation.
- Setting of torque setpoint.
- Monitoring of abnormal conditions.
- Device logic resetting.
- Owner selection.
- Alarm signal management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

## **Parameters**

## **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

## **Parameter Description**

The tables describe the parameters that are defined as part of the *\$ATV9xxECE* master template attributes.

Name	Data type	Initial value	Description
Param.HiPV	Float	100.0	Defines the high limit of the speed present value to scale the Y axis for trending.
Param.LoPV	Float	0.0	Defines the low limit of the speed present value to scale the Y axis for trending.
Param.TorqueHiPV	Float	100.0	Defines the high limit of the torque present value to scale the Y axis for trending.
Param.TorqueLoPV	Float	0.0	Defines the low limit of the torque present value to scale the Y axis for trending.
Param.ModeNormal	String	P	<ul> <li>Defines the normal owner modes (separated by a comma):</li> <li>• O: Operator</li> <li>• P: Program</li> <li>For example, P, O.</li> </ul>

Name	Data type	lnitial value	Description
Param. FailureRearmCon- firmation	Boolean	True	<i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.
			<i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i> .

## **Default State Alarms and Additional Alarm Conditions**

#### **Overview**

In the \$ATV9xxECE master template, alarms related to core supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

## **State Alarms for Altivar 9xx Series Speed Drives**

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

## Additional Namur Alarm Conditions for Altivar 9xx Series Speed Drives

The table indicates for which bits an alarm is configured in the *\$ATV9xxECE* master template and provides the associated Namur status.

Word structure	Bit	Description	Namur status
ATV_CFG.DataStatus	3	Malfunction	Failure
	7	Detected alarm	Failure
	10	Speed setpoint outside of limit	Out Of Specs

**NOTE:** You can modify the configuration from the **Discrete 1** page.

## **Graphic Representation**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

## **Symbol Description**

The table describes the symbols that are included in the *\$ATV9xxECE* master template to display data of Altivar 9xx series variable speed drives during operation.

Name	Graphic symbol	Description	
ATV9xx	ATV9xx	Altivar 900 symbol and icons.	
ATV9xx_PV	ATV9xx C 0.000 C 0.000	In addition to icons, the symbol displays (from top to bottom): • The label. • Engineering units. • Direction of rotation. • Present motor speed.	
ATV9xx_PVSP	ATV9xx 0.000 0.000 0.000	In addition to icons, the symbol displays (from top to bottom): • The label. • Engineering units. • Direction of rotation. • Present motor speed. • Direction of rotation setpoint. • Motor speed setpoint.	

## **Faceplates**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

## **Available Tabs**

During operation, clicking an Altivar 9xx series variable speed drive symbol opens a faceplate with the following tabs:

- Operation, page 394
- Analog data, page 62
- Discrete data, page 63

**NOTE:** The master template also features the trends faceplate.

## **Operation Tab**

The figure shows an example of the operation tab.

ATV9xxE ATV9xx Drive with IO scanning				
Off				
Communication disat	led			
Communication failur	e	_		
Unknown status		_		
Not ready				
Failure Commu	nication err	or		
Warning -				
Owner: Pro	gram	~	Reset	
Device Status	Error in	DFB		
Device Info	Commu	nication interru	ption	
	EU I			
င့ Speed: ငိ Torque:	0.00 0.00 0.00 0.00			

NOTE: This tab features the control module Reset button.

When the control module is reset, the current setpoint that is shown in this tab is effective.

By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect.

Refer to *Parameters* in this chapter for a description of the *Param. FailureRearmConfirmation* parameter, which allows you to configure the reset confirmation.

The figure shows the confirmation dialog box which is model in nature.



Resetting the control module by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

When the reset confirmation dialog box is enabled, the security classification that normally applies when you click **Reset** is not effective.

# *\$ATV6xxxECE*: Altivar 6xxx Series Variable Speed Drives

#### **Overview**

This section describes the \$ATV6xxxECE master template, which contains supervision resources to monitor and operate Altivar 6xxx series variable speed drives (6xxx represents the device model number).

## **Supervision Functions**

## Description

The *\$ATV6xxxECE* master template provides the following monitoring and operation functions:

- Device status and data monitoring.
- Setting of speed setpoint and direction of rotation.
- Setting of torque setpoint.
- Monitoring of abnormal conditions.
- Device logic resetting.
- Owner selection.
- Alarm signal management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

## **Parameters**

## **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

## **Parameter Description**

The tables describe the parameters that are defined as part of the *\$ATV6xxxECE* master template attributes.

Name	Data type	Initial value	Description
Param.HiPV	Float	100.0	Defines the high limit of the speed present value to scale the Y axis for trending.
Param.LoPV	Float	0.0	Defines the low limit of the speed present value to scale the Y axis for trending.
Param.TorqueHiPV	Float	100.0	Defines the high limit of the torque present value to scale the Y axis for trending.
Param.TorqueLoPV	Float	0.0	Defines the low limit of the torque present value to scale the Y axis for trending.
Param.ModeNormal	String	P	<ul> <li>Defines the normal owner modes (separated by a comma):</li> <li>O: Operator</li> <li>P: Program</li> <li>For example, P, O.</li> </ul>

Name	Data type	lnitial value	Description
Param. FailureRearmCon- firmation	Boolean	True	<i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfull validated the command according to the configured security classification, resets the control logic with no additional confirmation bein required.
			<i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i> .

## **Default State Alarms and Additional Alarm Conditions**

#### **Overview**

In the *\$ATV6xxxECE* master template, alarms related to core supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

## State Alarms for Altivar 6xxx Series Speed Drives

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

## Additional Namur Alarm Conditions for Altivar 6xxx Series Speed Drives

The table indicates for which bits an alarm is configured in the *\$ATV6xxxECE* master template and provides the associated Namur status.

Word structure	Bit	Description	Namur status
ATV_CFG.DataStatus	3	Malfunction	Failure
	7	Detected alarm	Failure
	10	Speed setpoint outside of limit	Out Of Specs

**NOTE:** You can modify the configuration from the **Discrete 1** page.

## **Graphic Representation**

## **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.
#### **Symbol Description**

The table describes the symbols that are included in the *\$ATV6xxxECE* master template to display data of Altivar 6xxx series variable speed drives during operation.

Name	Graphic symbol	Description
ATV6xxx	ATV6xxxECE_1	Altivar 900 symbol and icons.
ATV6xxx_PV	ATV6xxxECE_1	In addition to icons, the symbol displays (from top to bottom): • The label. • Engineering units. • Direction of rotation. • Present motor speed.
ATV6xxx_PVSP	ATV6xxxECE_1	In addition to icons, the symbol displays (from top to bottom): • The label. • Engineering units. • Direction of rotation. • Present motor speed. • Direction of rotation setpoint. • Motor speed setpoint.

#### **Faceplates**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

#### Available Tabs

During operation, clicking an Altivar 6xxx series variable speed drive symbol opens a faceplate with the following tabs:

- Operation
- Analog data, page 62
- Discrete data, page 63
- · Alarms, page 64

**NOTE:** The master template also features the trends faceplate.

#### **Operation Tab**

The figure shows an example of the operation tab.

ATV6xxxECE_1 ATV6xxx Drive For Test	۲
On	
Communication disabled	
Communication failure	
Unknown status	
Failure Communication error	
Warning -	
Owner: Program ~	Reset
Device Status: run: Operation enabled Device Info: Drive running with refer	rence
C Speed: <b>499.00</b> C 500.00	
Torque: 12.00 0.00	ANN ANN
Current: 2.96 A Powe	r: <b>0.9</b> kW

NOTE: This tab features the control module Reset button.

When the control module is reset, the current setpoint that is shown in this tab is effective.

By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect.

Refer to *Parameters* in this chapter for a description of the *Param. FailureRearmConfirmation* parameter, which allows you to configure the reset confirmation.

The figure shows the confirmation dialog box which is model in nature.



Resetting the control module by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

When the reset confirmation dialog box is enabled, the security classification that normally applies when you click **Reset** is not effective.

### **\$ATV320EMCE:** Altivar 320 Series Variable Speed Drives

#### **Overview**

This section describes the *\$ATV320EMCE* master template, which contains supervision resources to monitor and operate Altivar 320 series variable speed drives (*320* represents the device model number).

#### **Supervision Functions**

#### Description

The *\$ATV320EMCE* master template provides the following monitoring and operation functions:

- Device status and data monitoring.
- Setting of speed setpoint and direction of rotation.
- Monitoring of abnormal conditions.
- Device logic resetting.
- Owner selection.
- Alarm signal management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

#### **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The tables describe the parameters that are defined as part of the *\$ATV320EMCE* master template attributes.

Name	Data type	Initial value	Description
Param.HiPV	Float	100.0	Defines the high limit of the speed present value to scale the Y axis for trending.
Param.LoPV	Float	0.0	Defines the low limit of the speed present value to scale the Y axis for trending.
Param.TorqueHiPV	Float	100.0	Defines the high limit of the torque present value to scale the Y axis for trending.
Param.TorqueLoPV	Float	0.0	Defines the low limit of the torque present value to scale the Y axis for trending.
Param.ModeNormal	String	P	Defines the normal owner modes (separated by a comma):

Name	Data type	lnitial value	Description
Param. FailureRearmCon- firmation	Boolean	True	<i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.
			<i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i> .

#### **Default State Alarms and Additional Alarm Conditions**

#### **Overview**

In the *\$ATV320EMCE* master template, alarms related to core supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

#### State Alarms for Altivar 320 Series Speed Drives

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

#### Additional Namur Alarm Conditions for Altivar 320 Series Speed Drives

The table indicates for which bits an alarm is configured in the *\$ATV320EMCE* master template and provides the associated Namur status.

Word structure	Bit	Description	Namur status
ATV_CFG.DataStatus	3	Malfunction	Failure
	7	Detected alarm	Failure
	10	Speed setpoint outside of limit	Out Of Specs

**NOTE:** You can modify the configuration from the **Discrete 1** page.

#### **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### **Symbol Description**

The table describes the symbols that are included in the *\$ATV320EMCE* master template to display data of Altivar 320 series variable speed drives during operation.

Name	Graphic symbol	Description
ATV320	ATV320	Altivar 320 symbol and icons.
ATV320_PV	ATV320 © 0.00	In addition to icons, the symbol displays (from top to bottom): • The label • Engineering units. • Direction of rotation. • Present motor speed.
ATV320_PVSP	ATV320 EU 0.00 0.00	In addition to icons, the symbol displays (from top to bottom): • The label • Engineering units. • Direction of rotation. • Present motor speed. • Direction of rotation setpoint. • Motor speed setpoint.
ATV320_Item_PV	ATV320 ♀ 0.00 ♥♥	<ul> <li>In addition to icons, the symbol displays (from top to bottom):</li> <li>The label</li> <li>Engineering units of the item selected.</li> <li>Direction of rotation.</li> <li>Value of the item selected.</li> </ul>

#### **Faceplates**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

#### **Available Tabs**

During operation, clicking an Altivar 320 series variable speed drive symbol opens a faceplate with the following tabs:

- Operation
- Analog data, page 62
- Discrete data, page 63
- Alarms, page 64

**NOTE:** The master template also features the trends faceplate.

#### **Operation Tab**

The figure shows an example of the operation tab.

ATV320 Altivar Process Variable	e Speed Drives A	TV320
Off		
Communication disabled		
Communication failure		
Unknowin status		
Not ready		
Failure Communication	error	
Warning -		
Owner: Program	٠	Reset 🛛 😵
Device Status: Error i	n DFB	
Device Info: Comm	unication interruption	n
Current:	0 A	
Torque:	0 %	
Power:	0 %	
Voltage:	0 V	

NOTE: This tab features the control module Reset button.

When the control module is reset, the current setpoint that is shown in this tab is effective.

By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect.

Refer to *Parameters* in this chapter for a description of the *Param. FailureRearmConfirmation* parameter, which allows you to configure the reset confirmation.

The figure shows the confirmation dialog box which is model in nature.



Resetting the control module by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

When the reset confirmation dialog box is enabled, the security classification that normally applies when you click **Reset** is not effective.

### **\$ATV340CE:** Altivar 340 Series Variable Speed Drives

#### **Overview**

This section describes the *\$ATV340CE* master template, which contains supervision resources to monitor and operate Altivar 340 series variable speed drives (*340* represents the device model number).

#### **Supervision Functions**

#### Description

The *\$ATV340CE* master template provides the following monitoring and operation functions:

- Device status and data monitoring.
- Setting of speed setpoint and direction of rotation.
- · Setting of torque setpoint.
- Monitoring of abnormal conditions.
- Device logic resetting.
- Owner selection.
- Alarm signal management.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages, page 77.

#### **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The tables describe the parameters that are defined as part of the *\$ATV340CE* master template attributes.

Name	Data type	Initial value	Description
Param.HiPV	Float	100.0	Defines the high limit of the speed present value to scale the Y axis for trending.
Param.LoPV	Float	0.0	Defines the low limit of the speed present value to scale the Y axis for trending.
Param.TorqueHiPV	Float	100.0	Defines the high limit of the torque present value to scale the Y axis for trending.
Param.TorqueLoPV	Float	0.0	Defines the low limit of the torque present value to scale the Y axis for trending.
Param.ModeNormal	String	P	<ul> <li>Defines the normal owner modes (separated by a comma):</li> <li>O: Operator</li> <li>P: Program</li> <li>For example, P, O.</li> </ul>

Name	Data type	lnitial value	Description
Param. FailureRearmCon- firmation	Boolean	True	<i>False</i> = After you click the <b>Reset</b> button on the faceplate during operation and have successfully validated the command according to the configured security classification, resets the control logic with no additional confirmation being required.
			<i>True</i> = After you click the <b>Reset</b> button on the faceplate during operation, displays a dialog box, which requires that you confirm the reset command. The control logic is reset only by clicking <b>OK</b> and validating the command according to the configured security classification. By default, the security classification is <i>secured write</i> .

#### **Default State Alarms and Additional Alarm Conditions**

#### **Overview**

In the \$ATV340CE master template, alarms related to core supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

#### State Alarms for Altivar 340 Series Speed Drives

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

#### Additional Namur Alarm Conditions for Altivar 340 Series Speed Drives

The table indicates for which bits an alarm is configured in the *\$ATV340CE* master template and provides the associated Namur status.

Word structure	Bit	Description	Namur status
ATV_CFG.DataStatus	3	Malfunction	Failure
	7	Detected alarm	Failure
	10	Speed setpoint outside of limit	Out Of Specs

**NOTE:** You can modify the configuration from the **Discrete 1** page.

#### **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### **Symbol Description**

The table describes the symbols that are included in the *\$ATV340CE* master template to display data of Altivar 340 series variable speed drives during operation.

Name	Graphic symbol	Description
ATV340	ATV340E1100	Altivar 900 symbol and icons.
ATV340_PV	ATV340E1100	In addition to icons, the symbol displays (from top to bottom): • The label. • Engineering units. • Direction of rotation. • Present motor speed.
ATV340_PVSP	ATV340E1100 EU 0.00 0.00	<ul> <li>In addition to icons, the symbol displays (from top to bottom):</li> <li>The label.</li> <li>Engineering units.</li> <li>Direction of rotation.</li> <li>Present motor speed.</li> <li>Direction of rotation setpoint.</li> <li>Motor speed setpoint.</li> </ul>

#### **Faceplates**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

#### Available Tabs

During operation, clicking an Altivar 340 series variable speed drive symbol opens a faceplate with the following tabs:

- Operation
- Analog data, page 62
- Discrete data, page 63
- Alarms, page 64

**NOTE:** The master template also features the trends faceplate.

#### **Operation Tab**

The figure shows an example of the operation tab.

ATV340E1100 ATV340 Cyclic			·		·	
Off						
Communication disal Communication failur Unknown status Not ready	oled re		8 8			
Failure Warning						
Owner: Prog	gram		v	R	eset	
Device Status: Device Info:						
Speed:	rpm 0.00 0.00	⊨				
Torque:	0.00 0.00	Þ				
Current:	0 A		Powe	er:	0 %	

NOTE: This tab features the control module Reset button.

When the control module is reset, the current setpoint that is shown in this tab is effective.

By default, when you click **Reset**, a dialog box opens, which requires that you confirm the command for the reset of the control module to take effect.

Refer to *Parameters* in this chapter for a description of the *Param. FailureRearmConfirmation* parameter, which allows you to configure the reset confirmation.

The figure shows the confirmation dialog box which is model in nature.



Resetting the control module by clicking **OK** underlies a security classification, page 79. The default configuration is *secured write*.

When the reset confirmation dialog box is enabled, the security classification that normally applies when you click **Reset** is not effective.

## Diagnosis

#### What's in This Part

#### **Overview**

This section describes the master templates that provide the supervision functions for the diagnosis category.

Schneider Electric provides the templates described in this document. These templates can be used in various applications to minimize engineering efforts but the use, integration, configuration, and validation of the system is the sole responsibility of the user. Said user must ensure the safety of the system as a whole by performing a safety analysis, including the resources provided by Schneider Electric through procedures that the user deems appropriate.

### **A**WARNING

#### LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA) of your application, and apply preventive and detective controls before implementation.
- · Provide a fallback state for undesired control events or sequences.
- Provide separate or redundant control paths wherever required.
- Supply appropriate parameters, particularly for limits.
- Review the implications of transmission delays and take actions to mitigate.
- Review the implications of communication link interruptions and take actions to mitigate.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and fault conditions) according to the safety analysis and applicable codes, and regulations.
- Apply local accident prevention and safety regulations and guidelines.<sup>1</sup>
- Test each implementation of this library for proper operation before placing it into service.

## Failure to follow these instructions can result in death, serious injury, or equipment damage.

<sup>1</sup> For additional information, refer to NEMA ICS 1.1 (latest edition), Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control and to NEMA ICS 7.1 (latest edition), Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems or their equivalent governing your particular location.

## **Controller Diagnosis**

#### What's in This Chapter

\$M340DiagCE and \$M580DiagCE: Modicon Controller Diagnosis ......408

### **Overview**

This section describes the master templates that provides the supervision functions for the controller diagnosis.

### *\$M340DiagCE and \$M580DiagCE*: Modicon Controller Diagnosis

#### **Overview**

This section describes the *\$M340DiagCE* and *\$M580DiagCE* master templates, which contain supervision resources to monitor and update real time clock in the controller.

#### **Supervision Functions**

#### **Description**

Use the master templates for the following controllers:

- \$M340DiagCE for Modicon M340.
- *\$M580DiagCE* for Modicon M580.

These master templates provide the following monitoring and operation functions:

- Viewing CPU-related information.
- Viewing controller status.
- Viewing communication status information.
- Monitoring of abnormal conditions.
- Updating the real-time clock (RTC).
- Alarm signal management.

NOTE:

- AUX task information is not available for CPUs of the M340 platforms.
- Battery status information is not available for CPUs of the M340 and M580 platforms.

During operation, these functions are implemented by instances through symbols and their associated faceplate.

**NOTE:** You can modify the default configuration in the corresponding configuration pages as applicable, page 77.

#### **Parameters**

#### **Parameter Configuration**

The initial value of the parameters described in this topic corresponds to what is considered the normal operating mode. You can modify the values in the derived application template or in its instances. You can access the parameters from the **Attributes** page of the object editor, page 89.

These parameters allow you to configure core functions.

#### **Parameter Description**

The tables describe the parameters that are defined as part of the *\$M340DiagCE* and *\$M580DiagCE* master template attributes.

Name	Data type	Initial value	Description
Param.ModeNormal	String	P	Specifies the normal owner modes (separated by a comma):

#### **Default State Alarms and Additional Alarm Conditions**

#### **Overview**

In the *\$M340DiagCE* and *\$M580DiagCE* master templates, alarms related to core supervision functions are managed in the following ways:

- Certain attributes have associated state alarms. When the condition that is defined in the script, page 89 is satisfied, the alarm becomes active.
- Certain bits of the word structure that the master template manages have associated Namur statuses, page 38. When the bit is set, an alarm with the default priority that is associated to the status becomes active.

You can manage the alarms from the alarms tab of the faceplate during operation.

#### **State Alarms for Modicon Controller Diagnostic**

For a description of the attributes for which a state alarm is configured by default, refer to the topic describing default state alarms for devices, page 327.

# Additional Namur Alarm Conditions for Modicon Controller Diagnostic

The table indicates for which bits an alarm is configured in the *\$M340DiagCE* and *\$M580DiagCE* master templates and provides the associated Namur status.

Customized reference	Bit	Description	Namur status
Me.Diagnostic.AO.DataStatus	0	Controller Stopped	Function Check
	3	Detected Error in I/O	Failure
	4	Watchdog Overflow	Failure

**NOTE:** You can modify the configuration from the **Discrete 1** and/or **Discrete 2** pages of the parent template *\$PSxPACModicon*.

#### **Graphic Representation**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in symbols.

#### **Symbol Description**

The table describes the symbols that are included in the master templates to display data of Modicon controllers during operation.

Master template	Symbol name	Graphic symbol	Description
\$M340DiagCE	PACM340	PSxPACM340	M340 controller symbol and icons.
\$M580DiagCE	PACM580	PSxPACM580	M580 controller symbol and icons.

#### **Faceplates**

#### **Representation of Supervision Data**

At the beginning of this document, you can find a general description, page 43 of the graphic elements and element styles that are used in faceplates.

#### **Available Tabs**

During operation, clicking a Modicon controller diagnostic symbol opens a faceplate with the following tabs:

- Operation
- Analog data, page 62
- Discrete data, page 63
- Alarms, page 64

**NOTE:** Analog Data tab > Operating System and Comm Information tab displays the information of processor patch version and firmware version. The value displayed is in decimal, user has to manually convert this decimal value to hexadecimal value to get the correct processor patch version and firmware version of the controller.

#### **Operation Tab**

The figure shows an example of the operation tab for a M340 controller, which opens when you click a PACM340 symbol.

M340DiagCE_1 CPUDIAG	۲
Stopped	
Failure	
Current Date/time:	00/00/0, 00:00:00
Last Controller Stop:	-
Controller Stop Cause:	Can not define the cause
Update Realtime Clock:	Update RTC

**NOTE:** The tab for M340 and M580 controllers is identical except for the controller graphic, which shows a controller-specific rack.

**NOTE:** In faceplate, **Analog** tab shows controller OS, patch and firmware information. The value displayed on the faceplate will be in decimal value when communicated with PLC simulator.

NOTICE
ERRONEOUS DATA LOGGING
Confirm the input date and time before setting the date and time in

Confirm the input date and time before setting the date and time in the controller.

Failure to follow these instructions can result in data loss.

The table indicates which attribute corresponds to the field or menu that appears on the tab.

ltem	Attribute	
Controller status	Statuses are indicated by using the following attributes:	
	Controller status:	
	<ul> <li>Me.Diagnostic.AO.STW.10. When true, Booting is displayed.</li> </ul>	
	<ul> <li>Me.Diagnostic.AO.STW.11. When true, Running is displayed; when false, Stopped.</li> </ul>	
	Abnormal conditions:	
	<ul> <li>Me.Diagnostic.AO.STW.03. When true, Failure is displayed and next to it the description from Me.AO.Lastfailure</li> </ul>	
	<b>NOTE:</b> These fields use the <i>active</i> and <i>passive</i> element styles, page 44.	
Current Date/Time	Me.Diagnostic.AO.ActualClock	
	RTC data.	
	Format: dd/mm/yyyy, hh:mm:ss	

Item	Attribute	
Last Controller	Me.Diagnostic.AO.ActualClock and Me.Diagnostic.AO.CausePLCStop	
Stop	RTC data and reason of last controller stop.	
	RTC data format: <i>dd/mm/yyyy, hh:mm:ss</i>	
Update Real-Time Clock (RTC)	Allows user to update Real-Time Clock on <b>Update RTC</b> button action from the faceplate, Current system date and time are passed to the following attributes individually:	
	Me.Diagnostic.AO.RTC.Cfg.NEWDAY	
	Me.Diagnostic.AO.RTC.Cfg.NEWMONTH	
	Me.Diagnostic.AO.RTC.Cfg.NEWYEAR	
	Me.Diagnostic.AO.RTC.Cfg.NEWHOUR	
	Me.Diagnostic.AO.RTC.Cfg.NEWMIN	
	Me.Diagnostic.AO.RTC.Cfg.NEWSEC	
	The display format is: <i>dd/mm/yyyy hh:mm:ss</i>	
	<b>NOTE:</b> For the M580 controller current UTC date and time are passed to the above mentioned attributes, however for M340 controllers current system date and time are passed.	

## **Control/Supervision Relationship**

#### What's in This Part

## **Control/Supervision Relationship**

#### What's in This Chapter

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### **Control Resources**

In order to provide core and optional supervisory functions, ASP templates are configured to exchange data with the following control resources of the EcoStruxure Process Expert General Purpose Library for AVEVA System Platform.

**NOTE:** The ASP templates mentioned in the table are the application templates, hence prefixed with a.

Family	ASP template	Control Resource name	Pattern name
Signal processing	\$aAnalogInputCE	AINPUTGP	\$aAnalogInputCE
	\$aAnalogOutputCE	AOUTPUTGP	\$aAnalogOutputCE
	\$aDigitalInputCE	DINPUTGP	\$aDigitalInputCE
	\$aDigitalOutputCE	DOUTPUTGP	\$aDigitalOutputCE
	\$aAnalogInMultiCE	MAInputGP	\$aAnalogInMultiCE
	\$aTotalCE	TotalGP	\$aTotalCE
On/Off device control	\$aHandValveCE	HVALVEGP	\$aHandValveCE
	\$aMotorCE	MOTORGP	\$aMotorCE
	\$aMotor2DirCE	MOTOR2GP	\$aMotor2DirCE
	\$aMValveCE	MVALVEDGP	\$aMValveCE
	\$aDualOPValveCE	DVALVEGP	\$aDualOPValveCE
	\$aValveCE	VALVEGP	\$aValveCE
Analog device control	\$aControlValveCE	CVALVEGP	\$aControlValveCE
	\$aMValvewithPosCE	MVALVEGP	\$aMValvewithPosCE
	\$aMotorVSCE	MOTORVSGP	\$aMotorVSCE
Process control	\$aIMCTLCE	IMCTLGP	\$aIMCTLCE
	\$aLeadLagCE	LDLGCTLGP	\$aLeadLagCE
	\$aPIDCE	PIDCTLGP	\$aPIDCE
	\$aPWMCtICE	PWMCTL	\$aPWMCtICE
	\$aRampCE	ARampGP	\$aRampCE
	\$aRatioCtrICE	RATIOCTLGP	\$aRatioCtrlCE
	\$aSplitRangeCE	SPLRGCTLGP	\$aSplitRangeCE
	\$aStep3Ct/CE	STEP3CTLGP	\$aStep3CtlCE
Sequential control	\$aSequenceCE	SEQCTLGP	\$aSequenceCE
Batch Phase Manager	\$aPhaseCE	PHASEGP	\$aPhaseCE
Equipment module	\$aEMPatternCE	EMCTLGP	\$aEMPatternCE
Pump set	\$aPumpSetCtrlCE	PUMPSETPATTERNGP	\$aPumpSetCtrlCE
Flow control	\$aPumpFlowCtrlCE	FLOWCTLPATTERNGP	\$aPumpFlowCtrlCE
Auxiliary functions	\$aAlarmSummaryCE	-	\$aAlarmSummaryCE

Family	ASP template	Control Resource name	Pattern name
	\$aAnalogSelectCE	ASELECTGP	\$aAnalogSelectCE
	\$aSPBoolCE	-	\$aSPBoolCE
	\$aSPRealCE	-	\$aSPRealCE
	\$aSPIntCE	-	\$aSPIntCE
	\$aSPDurationCE	-	\$aSPDurationCE
	\$aMessageBoxCE	MSGBOXGP	\$aMessageBoxCE
	\$aSchedulerCE	SCHEDULERGP	\$aSchedulerCE
Circuit breakers	\$aCompactHWCE	HWCIRCUITBREAKER	\$aCompactHWCE
	\$aCompactNSXMBUCE	MBUCOMPACTNSX	\$aCompactNSXMBUCE
	\$aMasterpactHWCE	HWCIRCUITBREAKER	\$aMasterpactHWCE
	\$aMasterpactMTZCMBUCE	MBUMASTERPACTMTZC	\$aMasterpactMTZCMBUCE
	\$aMasterpactMTZMBUCE	MBUMASTERPACTMTZ	\$aMasterpactMTZMBUCE
	\$aMasterpactNxCMBUCE	MBUMASTERPACTNxC	\$aMasterpactNxCMBUCE
	\$aMasterpactNxMBUCE	MBUMASTERPACTNx	\$aMasterpactNxMBUCE
Digital protection relays	\$aSepam80ECE	MBSEPAM80C	\$aSepam80ECE
	\$aSepam80MBCE	ESEPAM80C	\$aSepam80MBCE
	\$aEassergyP3EMCE	EMEassergyP3	\$aEassergyP3EMCE
	\$aEassergyP5EMCE	EMEassergyP5	\$aEassergyP5EMCE
Motor controllers and	\$aTesysTAIIDataCE	EIOSTESYST	\$aTesysTAllDataCE
starters		EMESTESYST	
		MBTESYST	
	\$aTesysTEFastCE	ETESYST	\$aTesysTEFastCE
	\$aTesysTPBCE	PBTESYST	\$aTesysTPBCE
	\$aTesysUIOCE	MBTESYSUC	\$aTesysUIOCE
		TESYSUC	
	\$aTesysUMainDataCE	TESYSUCTL	\$aTesysUMainDataCE
		MBTESYSUSCST	
		TESYSUSCST	
	\$aTesysUMECCE	MBTESYSUSC	\$aTesysUMECCE
		TESYSUSC	
Power meters	\$aPM5350MBCE	MBPM5350	\$aPM5350MBCE
	\$aPM53xxEMCE	EMPM53xx	\$aPM53xxEMCE
	\$aPM82xxEMCE	EMPM82xx	\$aPM82xxEMCE
Soft starters	\$aATS22MBCE	MBATS22	\$aATS22MBCE
	\$aATS48MBCE	MBATS48	\$aATS48MBCE
	\$aMBTCPATS480	MBATS480	\$aMBTCPATS480
Speed drives	\$aATV6xxECE	ATV6xx	\$aATV6xxECE
	\$aATV9xxECE	ATV9xx	\$aATV9xxECE
	\$aATV6xxxCE	ATV6xxx	\$aATV6xxxCE
	\$aATV320CE	ATV320	\$aATV320CE
	\$aATV340CE	EMESATV340, EIOSATV340	\$aATV340CE
Modicon controllers	\$aM340DiagCE	GENSTS	\$aM340DiagCE
		СОММ	
		OSINFO	

Family	ASP template	Control Resource name	Pattern name
		RTC	
		MASTINFO	
		LASTSTOP	
		FASTINFO	
	\$aM580DiagCE	GENSTS	\$aM580DiagCE
		СОММ	
		OSINFO	
		RTC	
		MASTINFO	
		LASTSTOP	
		FASTINFO	
		AUX1INFO	
		AUX0INFO	

Optional services	Control resource name	Pattern name
Interlock	ILCKOnGP	\$iOpenILockCE
	ILCKOffGP	\$iCloselLockCE
		\$iILCKCE
		\$ilLockOnCE
		\$ilLockOn1CE
		\$iInitCondCE
		\$iForwardILockCE
		\$iReverselLockCE
Failures	CondSumGP	\$iCondsumCE
		\$iCondsum2CE
		\$iCondsum3CE
		\$iCondsum4CE
		\$iFCCondsumCE
		\$iSeqCondsumCE
		\$iSeqInitCondCE
Maintenance	DevMNTGP	\$iMNTCE
	MotorMNTGP	\$iDevmntCE
	ValveMNTGP	\$iDValveDevmntCE
		\$iValveDevmntCE
Local Panel	MotorLPGP	\$iDevlpCE
	Motor2LPGP	\$iMotor2DevIpCE
	ValveLPGP	\$iValveDevlpCE
	MValveLPGP	\$iDValveDevlpCE
	DValveLPGP	\$iMValveDLPCE
	MValveDLPGP	\$iAoutputLPCE
	CValveLPGP	
	AOutputLPGP	

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