



Process Expert - General Purpose Library Classic

Process Supervision Services Reference Manual

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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

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

CAUTION

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.

Qualification of Personnel

A qualified person is one who has the following qualifications:

- Skills and knowledge related to the construction and operation of electrical equipment and the installation.
- Knowledge and experience in industrial control programming.
- Received safety-related training to recognize and avoid the hazards involved.

The qualified person must be able to detect possible hazards that may arise from parameterization, modifying parameter values and generally from mechanical,

electrical, or electronic equipment. The qualified person must be familiar with the standards, provisions, and regulations for the prevention of industrial accidents, which they must observe when designing and implementing the system.

Proper Use

This product is a library to be used together with the automation control systems and is intended solely for the purposes described in the present documentation as applied in the industrial sector.

Always observe the applicable safety-related instructions, the specified conditions, and the technical data.

Perform a risk evaluation concerning the specific use before using the product. Take protective measures according to the result.

Since the product is used as a part of an overall system, you must ensure the safety of the personnel by means of the concept of this overall system (for example, machine concept).

Any other use is not intended and may be hazardous.

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.

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 point-of-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.

⚠ 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:

(In case of divergence or contradiction between any translation and the English original, the original text in the English language will prevail.)

- 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 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 tags, genies, faceplates, and other Supervision components that are the Supervision resources of the EcoStruxure Process Expert process control module templates, providing the Supervision services.

For a list of templates, refer to the user guides mentioned in this document.

This document only covers the functional aspects of Supervision services when engineering a system, using EcoStruxure Process Expert, and describes the dynamic objects visible from the runtime. It does not cover any operational aspects, nor does it provide information on how to use Supervision services to monitor and operate control systems.

Users of Supervision services need to have a good knowledge of EcoStruxure Process Expert, and of the Supervision and Control Participants.

Validity Note

This document has been updated for the release of EcoStruxure™ Process Expert 2023.

Related Documents

The characteristics that are described in the present document, as well as those described in the documents included in the Related Documents section below, can be found online. To access the information online, go to the Schneider Electric home page www.se.com/ww/en/download/.

The characteristics that are described in the present document should be the same as those characteristics that appear online. In line with our policy of constant improvement, we may revise content over time to improve clarity and accuracy. If you see a difference between the document and online information, use the online information as your reference.

Title of Documentation	Reference Number
EcoStruxure™ Process Expert - General Purpose Library Classic Process Templates Reference Manual	EIO0000000987 (eng)
EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual	EIO0000000988 (eng)
EcoStruxure Process Expert User Guide	EIO0000001114 (eng)

Technical Support

Visit <https://www.se.com/myschneider/> for support, software updates, and latest information.

Product Related Information

⚠ WARNING

LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA), or equivalent risk analysis, 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 them.
- Review the implications of communication link interruptions and take actions to mitigate them.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and error conditions) according to your risk assessment, and applicable codes and regulations.
- Apply local accident prevention and safety regulations and guidelines.¹
- Test each implementation of a system for proper operation before placing it into service.

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

¹ 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.

Examples described in this manual are provided for information only.

⚠ WARNING

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.

Terminology Derived from Standards

The technical terms, terminology, symbols and the corresponding descriptions in this manual, or that appear in or on the products themselves, are generally derived from the terms or definitions of international standards.

In the area of functional safety systems, drives and general automation, this may include, but is not limited to, terms such as safety, safety function, safe state, fault, fault reset, malfunction, failure, error, error message, dangerous, etc.

Among others, these standards include:

Standard	Description
IEC 61131-2:2007	Programmable controllers, part 2: Equipment requirements and tests.
ISO 13849-1:2015	Safety of machinery: Safety related parts of control systems. General principles for design.
EN 61496-1:2013	Safety of machinery: Electro-sensitive protective equipment.

Standard	Description
	Part 1: General requirements and tests.
ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction.
EN 60204-1:2006	Safety of machinery - Electrical equipment of machines - Part 1: General requirements.
ISO 14119:2013	Safety of machinery - Interlocking devices associated with guards - Principles for design and selection.
ISO 13850:2015	Safety of machinery - Emergency stop - Principles for design.
IEC 62061:2015	Safety of machinery - Functional safety of safety-related electrical, electronic, and electronic programmable control systems.
IEC 61508-1:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems: General requirements.
IEC 61508-2:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems: Requirements for electrical/electronic/programmable electronic safety-related systems.
IEC 61508-3:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems: Software requirements.
IEC 61784-3:2016	Industrial communication networks - Profiles - Part 3: Functional safety fieldbuses - General rules and profile definitions.
2006/42/EC	Machinery Directive
2014/30/EU	Electromagnetic Compatibility Directive
2014/35/EU	Low Voltage Directive

In addition, terms used in the present document may tangentially be used as they are derived from other standards such as:

Standard	Description
IEC 60034 series	Rotating electrical machines
IEC 61800 series	Adjustable speed electrical power drive systems
IEC 61158 series	Digital data communications for measurement and control – Fieldbus for use in industrial control systems

Finally, the term zone of operation may be used in conjunction with the description of specific hazards, and is defined as it is for a hazard zone or danger zone in the Machinery Directive (2006/42/EC) and ISO 12100:2010.

NOTE: The aforementioned standards may or may not apply to the specific products cited in the present documentation. For more information concerning the individual standards applicable to the products described herein, see the characteristics tables for those product references.

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Supervision Services

What's in This Chapter

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Overview

This chapter describes how the Supervision services of the process control module templates are made available to you through EcoStruxure Process Expert and the embedded Supervision Participant.

Delivering Supervision Services

Introduction

Inside process control module templates, the resources providing Supervision services are organized in composite and facet templates. They are the *elements* of the control module template and its instances.

Interfaces link these elements within the control module and allow making links to instances of other templates.

You can also use Supervision components (genies and faceplates) independently of process control module templates. For example, you have the possibility to use a given genie of the SGC_Include2 project and its associated faceplate to supervise your own control module that you have created for controlling compatible devices.

NOTE: When implemented through control module templates, Supervision services are optional.

Supervision Facet Templates

The facet template is the smallest component of a process template.

It encapsulates the constituents of the Supervision Participant, which are the tags (variable, alarm, trend) and genies described in this document.

During generation (see EcoStruxure™ Process Expert, User Guide), these constituents become part of the Supervision (see EcoStruxure™ Process Expert, User Guide) Participant project that you have created in EcoStruxure Process Expert.

NOTE: Genies and other Supervision resources are deployed through the include project, page 19.

Supervision Composite Templates

The composite template is a container for Supervision elements and/or other composite references.

It helps organizing Supervision services inside the control module template.

Configuring Supervision Services

In process control module templates, Supervision resources that correspond to the selected Control services are activated by default.

To customize the services provided by an instance of a control module template, the **Properties** window of the instance allows you to:

- Deactivate Supervision resources.
- Configure the parameters of selected Supervision resources.

In addition, you can modify the Supervision Participant project and its pages during refinement.

Supervision Resource Structure

Types of Resources

The SGC_Include2 project contains the following Supervision resources grouped in libraries:

Symbols	Static graphical elements are supplied as symbol libraries so that you can easily redefine the appearance of Supervision components.
Genies	Dynamic objects are supplied as Supervision genies (in turn, these can be made up of other genies) to represent the dynamic elements that are commonly used in monitoring flowcharts.
Faceplates	Genies are linked to faceplates that allow you to access parameters such as operation, configuration, or maintenance parameters, depending on the function. Faceplates are implemented by using Supervision pages featuring supergenie syntax (refer to the Supervision Participant help for details).
Templates	Template types with various resolutions featuring the standard EcoStruxure Process Expert format.
Cicode	The functions that allow genies and their faceplates to work properly are implemented by using the proprietary Supervision Participant programming language.

Deploying Supervision Resources

When you edit pages, EcoStruxure Process Expert adds the SGC_Include2 project to the Supervision Participant project so that the resources it contains are deployed with the master project.

List of Supervision Functions

Overview

The Supervision functions described in this document are grouped by family.

The families are the same as the ones used to group the process control module templates (see EcoStruxure™ Process Expert , Process Templates User Guide).

Each function is assigned to the same family as the control module template that references it.

For example, the \$Hvalve control module template belongs to the on/off device control family. Therefore, the hand valve management Supervision functions are also part of the on/off device control family.

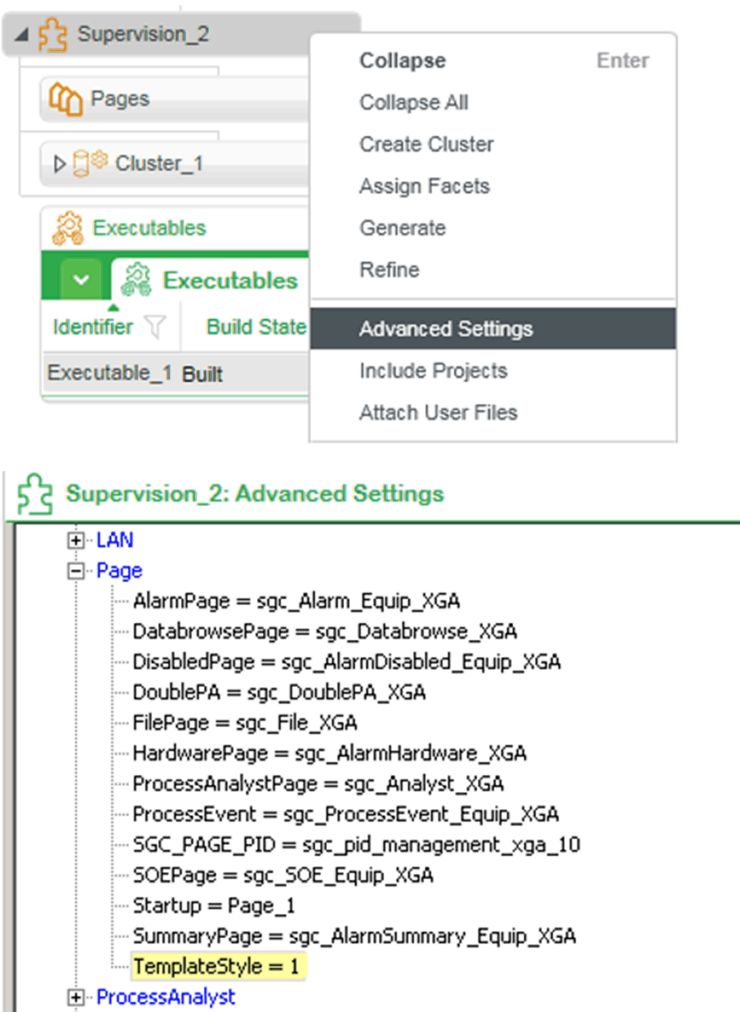
List of Families

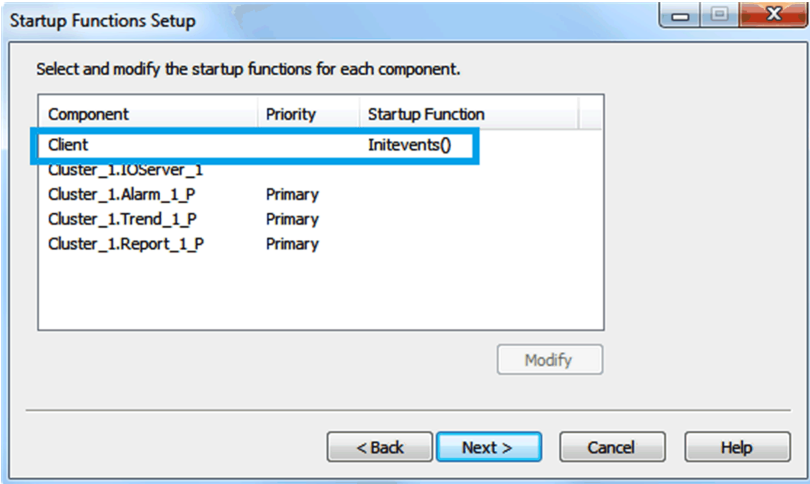
The table lists the Supervision function of each family:

Family name	Supervision Function
Signal processing	Analog input management, page 67
	Analog input with configurable range management, page 72
	Analog output management, page 76
	Digital input management, page 81
	Digital output management, page 86
	Multiple analog input with configurable range management, page 90
	BMXERT1604 16 channel digital input management, page 94
	Time stamping management, page 96
	TOTAL - Totalizing function, page 97
On/Off device control	Hand valve management, page 103
	On/off motor management, page 106
	2 speed/2 rotation direction motor management, page 112
	Discrete motorized valve management, page 119
	On/off valve management, page 125
	On/off valve (2 outputs) management, page 129
Analog device control	Control valve management, page 133
	Motorized valve with position management, page 139
	Motor with variable speed drive management, page 145
Process control	IMC controller with monitoring interface management, page 153
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	Pulse width modulated controller management, page 172
	Ramp management, page 176
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	Split-range controller management, page 188
	3-step controller/positioner management, page 188
Sequential control	Sequential control management, page 194
Batch Phase Manager	InBatch phase control, page 203
Auxiliary functions	Alarm summary management, page 223
	Analog signal selector with monitoring variable management, page 228
	Operator message management, page 232
	Boolean setpoint management, page 235
	Real setpoint management, page 237
	Integer setpoint management, page 239
	Duration setpoint management, page 241

Key Configuration

Description

Step	Action
1	<p>By default, the <code>sgc_style</code> template is used for the pages available in the menu configuration. If you want to use <code>Sg2_sxw_style</code> template, add a user defined parameter TemplateStyle with default value 1 to the page section using the advanced settings available in the supervision project in EcoStruxure Process Expert. Alternatively, this configuration can also be done in Citect SCADA Computer Setup Editor.</p> 
2	<p>You need to set the [Alarm] UseConfigLimits parameter to 1 in citect.ini file of Citect SCADA, if you are using advanced alarm <code>Delay</code> property.</p>
3	<p>The user should keep the default DPI settings at 100 percent for optimum library resolution. It can be changed at the following location: Control Panel\All Control Panel Items\Display \.</p>

Step	Action
4	<p>Select Runtime Project (User Project) in the Citect Studio Explorer and go to Citect Graphics Builder → Tools → Computer Setup Wizard, proceed further and modify the Startup Function for Client as Initevents(), click next and complete the startup function setup.</p> 
5	<p>If descriptions are entered in parameters belonging to the Message category of InitialConditionTags, InterlockTags, or FailureConditionTags in the Instance Editor, then in runtime, opening the faceplate pertaining to this instance for the first time takes considerably longer. This is because the database file containing these descriptions is re-indexed. There is no impact on opening time of the subsequent faceplate.</p>

Environment Preparation

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Environment Preparation

EcoStruxure Process Expert-Specific Settings

For information on the EcoStruxure Process Expert-specific settings in the OPC Factory Server (OFS) configuration file, refer to *Performance Considerations* (see EcoStruxure™ Process Expert, Supervision Participant Services, User Guide).

OFS OPC Driver Configuration

For information on the OFS OPC driver configuration, select **Driver Help** on the menu of the Supervision Participant. In the help, select **OFSOPC Driver** driver.

OFS Server Configuration

For information on the OFS server configuration, refer to the **User Guide** section (**The OFS Configuration Tool** chapter, **The Alias folder** section) of the OPC Factory Server online help, which is accessible by clicking the ? button on the EcoStruxure Process Expert title bar.

Supervision Features

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Overview

This part describes the main features of Supervision services.

Access Control

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Overview

This chapter describes access control functions that are managed by Supervision components.

Privilege Levels and Labels

Overview

Supervision components feature access control so that only users having access to the configured area and the required privilege level can execute actions on dynamic objects and/or faceplates during operation.

You need to assign privilege levels and areas to users to configure their access permissions depending on the specific requirements of each application.

Supervision components use non-hierarchical privilege levels (Supervision default mode) to provide the components with maximum access control flexibility.

Default Privilege Levels

By default, the following general criteria have been defined to assign privilege levels in Supervision components:

Privilege	Use
1	Enables the acknowledgment of alarms associated to Supervision components. NOTE: Alarm acknowledgment is also conditioned by the <i>[Privilege] AckAlarms</i> parameter (set to 1 by default). If a privilege level that is different from that configured in the <i>[Privilege] AckAlarms</i> parameter is configured in the alarm tag, you require both privilege levels to acknowledge the alarm.
2	Operator actions: Operator setpoint changes (including parameters and commands regarding sequences).
3	First-level supervisor actions: <ul style="list-style-type: none"> Changes to alarm setpoints and enabling/disabling first-level alarms (HI, LO, DEV). Adjustments to control parameters.
4	Second-level supervisor actions: Change of owner (Operator/Program)
5	Engineering and/or maintenance personnel actions: <ul style="list-style-type: none"> Set-point changes and enabling/disabling second-level alarms (HIHI, LOLO, digital). Interlock bypassing. Enabling/disabling the simulation mode.
6	Not used.
7	Not used.
8	Not used.

Labels

Supervision labels have been defined in the SGC_Include2 project. These labels define the default privilege level that is required to carry out actions on the different Supervision components. Each action that you can perform on a component is associated to a label.

The syntax of the privilege labels is: SGC_PRIV_<type of component>_<type of action>.

For example, SGC_PRIV_SD_SIM defines the privilege level to enable the simulation mode in the faceplate of a variable speed drive.

You can modify the privilege level that is associated to each label to adapt the behavior of components according to the requirements of the system.

The table lists the values that exist for the <type of component> parameter, the corresponding library, and their description:

<Type of Component>	Library	Component description
AA	Process monitoring	Analog alarms (AALARM)
AI	Process monitoring	Analog inputs (AINPUT)
AI1	Process monitoring	Analog inputs (AINPUT1)
AO	Process monitoring	Analog outputs (AOUTPUT)
AR	Process monitoring	Analog ramps (ARAMP)
AS	Process monitoring	Analog signal selectors (ASELECT1)
B	Control subsystem diagnosis	Battery
BB	Power management	Busbar (BUSBAR)
CPUDIAG	Control subsystem diagnosis	CPU diagnosis
CV	Process monitoring	Control valves (CVALVE)
D	Process monitoring	On-off devices (DEVCTL)
DI	Process monitoring	Digital inputs (DINPUT)
DO	Process monitoring	Digital outputs (DOUTPUT)
DP	Device monitoring	Device publishing (DEVPUB)
EM	Process monitoring	Equipment Module (EMCTL)
FC	Process monitoring	Flow Control (FLOWCTLPATTERN)
G	Power management	Central system (SGU_SYSTEMCONFIG)
GS	Control subsystem diagnosis	Controller status (GENSTS)
GN	Power management	Generators (SGU_ENERGYSOURCE)
HV	Process monitoring	Manual valves (HVALVE)
IM	Process monitoring	IMC controllers (IMCTL)
IN	Power management	Infeeds (INFEED)
LD	Power management	System loads (LOAD)
LL	Process monitoring	Lead-lag controllers (LDLGCTL)
M2	Process monitoring	2-speed/rotation direction motors (MOTOR2)
MB	Process monitoring	Messages for the operator (MSGBOX)
MC	Power management	Masterpact devices (DEVICES)
MD	Process monitoring	Motorized valves without positioner (MVALVED)
MV	Process monitoring	Motorized valves with positioner (MVALVE)

<Type of Component>	Library	Component description
PAR	Uploading and downloading of parameters or recipes	–
PID	Process monitoring	PID controllers (PIDCTL)
PM	Process monitoring	PIDMUX configurators (PIDMUX)
PS	Process monitoring	Pump Set Pattern management (PUMPSETPATTERN)
PW	Process monitoring	PWM controllers (PWMCTL)
RST	Supervision System diagnosis	–
RT	Process monitoring	Ratio controllers (RATIOCTL)
SC	Process monitoring	Sequential control (SEQCTL1)
SD	Process monitoring	Variable speed drives (SDDEVCTL)
SP	Process monitoring	Setpoint management
SPL	Process monitoring	Split range controllers (SPLRGCTL)
SR	Power management	Power supply (SOURCE)
STEP3	Process monitoring	Three-step controllers (STEP3CTL)
TR	Power management	Transformers (SGU_ENERGYSOURCE)
TL	Process Monitoring	Total function (TOTAL)

NOTE: The names that appear in brackets in the *Component description* column are the names of the Control blocks that provide the data to the Supervision resources.

Example

The **SGC_PRIV_AA_ENL** label in the SGC_Include2 project defines the privilege required to enable/disable monitoring of the low-level alarm in resources for analog alarm management.

By default, the privilege level for the label is 3. This action is categorized as an action that should be accessible to users of type first-level supervisor.

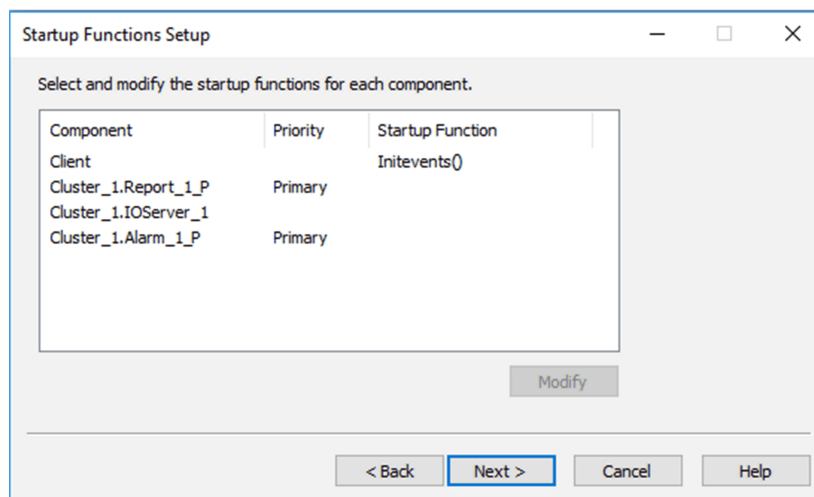
Row	Label Name	Expression	Comment	Project
84	SGC_PRIV_AA_ENL	3	Privilege to change Enable/Disable LO	SGC_Include2

System Access Traceability

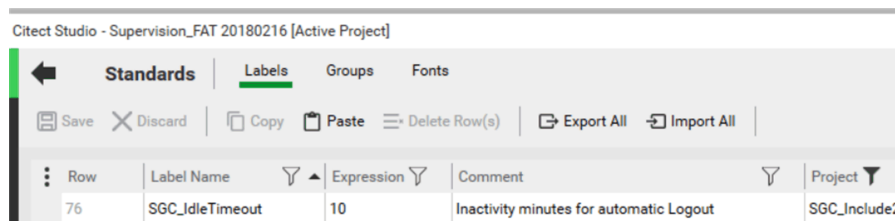
Configuration Aspects

The configuration aspects are listed below.

The Supervision project needs to call the `InitEvents` function. Normally, include this call in the Supervision node configuration.



When necessary, modify the **SGC_IdleTimeout** Supervision label (Labels) in the **SGC_include2** project to define the period (in minutes) of inactivity after which you are automatically logged off from Citect SCADA. It is set to 10 (minutes) by default.



Alarm Functions

What's in This Chapter

Alarm Category Labels and Numbers.....	29
Process Alarms.....	30
Process Events.....	30

Overview

This chapter describes alarm functions that are managed by Supervision components.

Alarm Category Labels and Numbers

Overview

Labels are defined in the SGC_Include2 project to associate an alarm category to each alarm function. These labels also include a number.

You can change the label that is associated to an alarm function to adapt its behavior to the specific requirements of your project.

Refer to *Advanced Alarm Properties* in the help of the Supervision Participant for details on the alarm category property.

Alarm Category Numbers

By default, the following general criteria is applied to assign category numbers to alarms:

Number	Use
1	Device and input/output detected failures; high-level (HIHI) and low-level (LOLO) alarms.
2	Digital alarms; high-level (HI) and low-level (LO) alarms.
3	Deviation alarms regarding setpoints.
253	Process Events, page 30.

Alarm Category Labels

The syntax for alarm category labels is: SGC_CAT_<type of component>_<type of alarm>.

NOTE: Refer to *Privilege Levels and Labels*, page 26 for a list of abbreviations used for <type of component>. It allows you to identify the type of Control block from which data used by alarm functions is originating when you implement Supervision, using control module templates of the General Purpose library.

Process Alarms

Description

Supervision components are preconfigured to manage advanced alarm tags.

During operation, you can view alarms at one or more of the following levels:

- Genie
- Faceplate
- Supervision pages (for example, **Active Alarms**, **Alarm Summary**, **Sequence of Events**)

Alarms need to be acknowledged.

For a list of advanced alarm tags, refer to the chapter describing the Supervision function.

Process Events

Supervision components are preconfigured to manage process events, which are regular process conditions that may need to be traced.

Process events are optional and implemented like alarms although they are auto-acknowledged by the system. They are managed with the help of advanced alarm tags and are assigned a specific *alarm category*, page 29.

Process events allow you to trace, for example, equipment status and status changes, interlock conditions, asynchronous changes. Certain operator actions (for example, setpoint changes) can also be traced as process events in addition to being logged as activity.

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Process events allow you to trace, for example, equipment status and status changes, interlock conditions, asynchronous changes. Certain operator actions (for example, setpoint changes) can also be traced as process events in addition to being logged as activity.

Viewing Process Events

A record of process events is kept on the following pages during operation:

- **Sequence of Events** (SOE) page: Provides a list in chronological order of occurrence, which also includes other events such as alarms or operator actions.
- Alarm pages.

NOTE: To view **Process Events** in **Sequence of Events** page, user has to use advance filter with category 253 in **Action** menu. The triggered process event will be seen as an **Event Message - Alarm Raised** and cleared process event will be seen as an **Event Message - Alarm Cleared** in the **Sequence of Events** page.

Process Events by Supervision Function

For a list of process events, refer to the chapter describing the Supervision function.

Multilanguage Support

What's in This Chapter

Multilanguage Support.....	32
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Multilanguage Support

Overview

Supervision components support multiple languages. The native language used is English but a translation into Spanish is also provided.

Representation of Supervision Data

What's in This Chapter

Color Codes.....	33
Genies	34
Faceplates.....	38

Overview

Genies 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, color is used to distinguish between types of information or to highlight changes or situations that require action.








This chapter describes the user interface of Supervision components and the color code that is used to represent Supervision data.





Color Codes

Dynamic Variable Status

Description

This table describes the possible statuses of dynamic variables and the colors that are used to represent them in elements of Supervision components:

Function	Color	Status	Example of use
Digital indicators: <ul style="list-style-type: none"> Status (PV) Setpoint (SP) Control (OP) 	Green 	Active	Active running order. Active running confirmation. Open active valve order. Open valve.
	Black 	Idle	Idle running order. Idle running confirmation. Active close valve order. Closed valve.
	Yellow 	Inconsistency	Open-valve and closed-valve limit switches are active simultaneously.
	Blue 	Transition	Open-valve and closed-valve limit switches are idle at the same time.
Information	Yellow 	Active	Active bypass for an interlock.
	—	Idle	—
Alarms	Red and yellow alternating 	Active, not acknowledged	High level alarm. Detection of not confirmed operation.
	Red 	Active and acknowledged	

Function	Color	Status	Example of use
	Black and yellow alternating 	Inactive, pending acknowledgement	Thermal overload alarm was generated and the condition was cleared. The alarm has not been acknowledged yet.
	—	Normal	No alarm.
Numeric indicators	Blue on gray background 	Current value (PV)	Current temperature value.
	Green on gray background 	Setpoint value (SP)	Target temperature value.
	Yellow on gray background 	Control output (OP)	Control valve position.

Genies

Overview

This section provides general information about the representation of genies that are part of the SGC_Include2 project.

Using Genies

Genie Availability

The SGC_Include2 resource contains a number of genies grouped in libraries that correspond to Supervision functions. For example, the `sgc_devctl_motors` library contains six genies for on/off motor management.

These genies allow monitoring and interacting with control modules during operation.

Genies become visible in runtime once you assign them to a Supervision page.

Assigning Genies

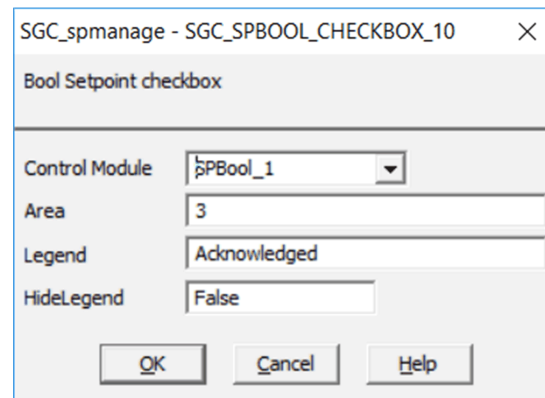
You can assign the genies that are referenced a template to a Supervision page by editing the page, using the **Edit** command.

Genie Properties

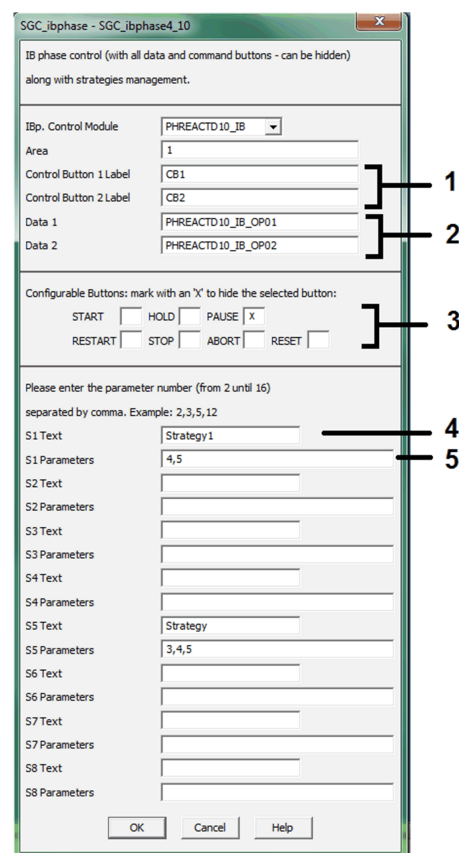
Once you have assigned a genie to a page, double-click it to display its properties.

Genies of the SGC_Include2 project have the **Control Module** and **Area** properties but may also feature additional properties.

The following figure shows an example of the properties dialog box of the `SPBool_Checkbox_10` genie, featuring the additional **Legend** and **HideLegend** properties:



The following figure shows an example of the properties dialog box of the `sgc_ibphase4_10` genie, featuring the additional properties:



1 Name for the control buttons available in Genie and faceplate. If name is not given, the corresponding button will not be available for operation.

2 You can configure any tag name which is available in the project. The tag description and its value will be shown.

3 Option to hide the command buttons in runtime window. Mark **X** to hide the selected button.

4 Strategy name. You can configure eight different strategies. The tag **Parameter 1** will be occupied for strategies if user writes the strategy name in genie form. So you cannot use it as a normal input parameter.

5 The parameters required in the corresponding strategy. The configured parameters only available for the user in run time.

The following figure shows an example of the properties dialog box of the `sgc_empanelalldata4_10` genie, featuring the additional properties:

1 You can configure any tag name which is available in the project. The tag description and its value will be shown.

2 Option to hide the command buttons in runtime window. Mark **X** to hide the selected button.

Genie Equipment Module Name

The name that appears in the **Control Module** field of the genie properties window is used to generate expressions referencing tags.








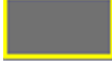













For example, a genie of the `sgc_emctl_10` library with `EMCTL1` as a **Equipment Module (EM)** name generates connections with the following tags: `EMCTL1_EMCTL_STW` and `EMCTL1_EMCTL_CFGW`.









Genie Icons

Description

The table describes the icons that are part of genies representing control modules and that may be displayed during operation:

Function	Icon	Color animation	Meaning	Examples of use	Comments
Owner selection		N/A	Operator	Valve in operator mode (the operator sets the setpoint).	–
			Program	Valve in program mode (the program sets the setpoint).	
Operating mode	AUTO	N/A	Automatic	Closed-loop PID controller.	–
	MAN		Manual		
	CASC		Cascade	Closed-loop PID controller with an externally set set-point. Valve that is controlled remotely according to an externally set set-point.	
Interlocking	Green	N/A	Active	A motor is interlocked because of an interlock condition.	–

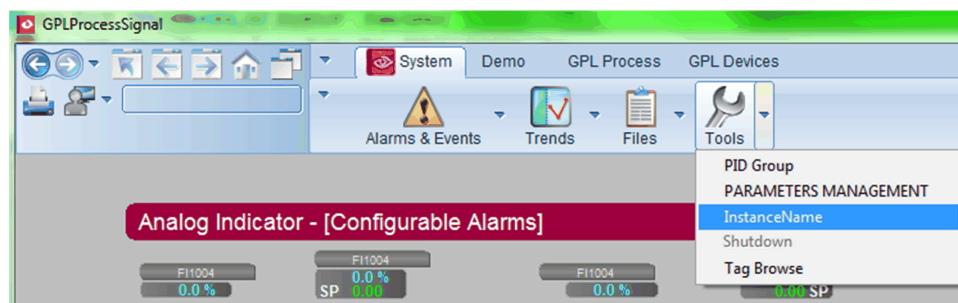
Function	Icon	Color animation	Meaning	Examples of use	Comments
					
	Yellow 	Flashing	Active (waiting for manual resetting)	At least 1 interlock requires manual resetting.	
		N/A	Idle	–	
Bypass		N/A	Global bypass is activated	Global bypass of the interlocks for a valve.	Represented on the element that is bypassed.
			Partial bypass	Bypass of an interlock that appears on the interlocks tab of the faceplate, but not a global bypass.	
	(Invisible)		Idle	–	–
External control / Canceled output "power removal"		N/A	Active	Pump controlled with electrical switching from machine push-button panel.	Represented on the symbol representing the output (OP).
	(Invisible)		Idle	–	–
Resetting required		Flashing	Awaiting resetting	Motor awaiting resetting after thermal trip.	Displayed if mandatory manual resetting is enabled in the resource controlling the device.
	(invisible)	N/A	Does not require resetting	–	–
Simulation	Yellow outline 	N/A	Active	Simulation of limit switches for an on/off valve.	Represented by placing the control module in simulation mode.
	(Invisible)		Not active	–	–
Detection of communication interruption		Alarm standard	Communication interruption	Communication interruption between analog input channel and device	Enables acknowledgment of the alarm.
Detection of alarm/ not confirmed operation		Alarm standard	Alarm raised/not confirmed operation	Level alarm. Position of on/off valve not confirmed (ZSH).	Enables acknowledgment of the alarm.
Detection of non-operational device		Alarm standard	Inoperable device	Thermal motor overload.	–
Detection of non-operational I/O channel		Alarm standard	Non-operational I/O channel	Analog input channel problem.	–
Level alarms		Alarm standard	Very high	Very high temperature.	Enables acknowledgment of the alarm.
			High	High temperature.	
			Deviation	Temperature outside of setpoint.	
			Low	Low temperature.	
			Very low	Very low temperature.	
Alarm level setpoints	Red 	Black fill 	Very high	Very high temperature.	–
	Red 	Red fill 	High	High temperature.	

Function	Icon	Color animation	Meaning	Examples of use	Comments
	Green 	Black fill 	Valid signal range	Temperature outside of setpoint.	
	Red 	Black fill 	Low	Low temperature.	
	Red 	Black fill 	Very low	Very low temperature.	
Next step enable		Blink 	Proceed to next step	Semi-manual operation of process.	Refer to sequence object for more information.

Displaying Genies

Overview

The label that identifies each dynamic object inserted into a synoptic can be shown or hidden at will during runtime.



NOTE: To hide or show the label, click **InstanceName** available under **System > Tools**.

Faceplates

Overview

This section provides general information about the representation of faceplates linked to genies.

You can access a faceplate by clicking the genie during operation.

This faceplate allows interacting with the corresponding Control block.

Genie-Faceplate Link

Description

Genies included in the SGC_Include2 project are already linked to a faceplate without the need for further configuration.

The genie-faceplate link is established by the function `sgc_call_faceplate`, which uses the following parameters:

- *GenieType*: Name of the genie type.

- **Parameters:** Function that is called by the *Call Faceplate* function, which opens the faceplate.

For this purpose, a default parameter set is defined in the *sgc_faceplate_ass* table in the *sgc_faceplates.ci* file of the *SGC_Include2* project.

The genie passes the parameters to the function that is defined. These are the parameters that you configure either in the **Properties** window of the instance and/or in the properties window of the genie when assigning it to a page.

You can find the standard code for the functions that have been supplied in the *sgc_faceplates.ci* file of the *SGC_Include2* project.

Changing the Genie-Faceplate Link

You can link to a genie to a different faceplate. To do so, you need to define the `<GenieType>` parameter and the corresponding function in the *SGC_CALL_FACEPLATE* section of the *sgc_faceplates.ci* file.

When the program detects that `<GenieType>` is defined in this section, it calls the function that you have defined with this parameter; otherwise it calls to the default function defined in the *sgc_faceplate_ass* table

You can define this parameter set directly in this file or, preferably, using the **Cicode Editor**, which you can access from the Supervision Participant.

In this example, the parameter set is configured so that genies belonging to the *sgc_ainput* library call the *my_ainput_faceplate* function, which opens the corresponding faceplate:

Parameter	Description
<i>GenieType</i>	For example, <i>AINPUT</i> . NOTE: The name of the genie type corresponds to the root of the library name that the genie belongs to. The library name is indicated in the <i>Genies</i> topic of every chapter describing a Supervision function. For example, for <i>Analog Input Management</i> , the genies belong to the <i>sgc_ainput</i> library. The <code><GenieType></code> is therefore <i>AINPUT</i> .
<i>Parameters</i>	For example, <i>my_ainput_faceplate</i> .

Faceplate Icons

Overview



Faceplates consist of tabs that regroup by category the functionalities provided by the associated Control block during operation.





Each category is represented by an icon that you can click to display its tab.

Certain tabs are *optional*, [page 43](#) and become available only if the control module features the corresponding element and the element is selected.

Description

The table describes the functions that are available in each category:

Category/Tab	Icon	Functions	Examples of use
Operation		<ul style="list-style-type: none"> Owner change Operating mode change Setpoint (<i>SP</i>) change Resetting 	<ul style="list-style-type: none"> Operator/ program Manual/Auto PID controller setpoint (<i>SP</i>) change in auto mode and output change in manual mode
Interlocks / start conditions		<ul style="list-style-type: none"> Interlock status 	Interlocks associated with an on-off valve

Category/Tab	Icon	Functions	Examples of use
		<ul style="list-style-type: none"> Bypassing and/or resetting of interlocks 	
Diagnostic information		<ul style="list-style-type: none"> Status of abnormal conditions Bypassing of conditions 	High-level alarm
Information		Access to component data in the system	<ul style="list-style-type: none"> Component name and version Addresses used to access controllers
Sequence Tab		<ul style="list-style-type: none"> Current state and strategy are displayed Step that is being executed and its number Elapsed time after the start of sequence 	<ul style="list-style-type: none"> Equipment state and strategy Strategy sequence Three modes of operation - Automatic, Semi-Automatic and Manual Sequence steps
State Machine Tab		Allows the operator to see the current state and the possible next states.	Label of states appear in white while the current state appears in the same color as its frame. Only, names of transient states will be blinking when it is active.

Faceplate Buttons






Overview












Buttons are shown as pressed if their function is activated.

They are shown as disabled if the operator does not have the rights to operate them, or if the function is not available due to the Control block configuration (for example, button to open the valve if the program is configured as the owner).

Description

The table describes the buttons that may appear on the different tabs of a faceplate:

Function	Button	Action	Examples of use	Comment
Change owner		Operator becomes the owner	Placing a motor in operator mode to be able to set its set-point from the Supervision.	–
		Program becomes the owner	Placing a motor in program mode so that the program sets the desired setpoint (SP) depending on the programmed strategies.	–
Set the discrete setpoint (SP)	Green 	Activate	Starting a motor or opening a valve.	–
	Red 	Deactivate	Stopping a motor or closing a valve.	–
Control module reset		Reset	Manually resetting a motor following a thermal overload after the overload condition is cleared.	<p>Available on the Operation tab. The button is enabled when manual resetting of the Control block controlling the device is mandatory after the abnormal condition is cleared.</p> <p>To enable this button, you may need to click the partial reset buttons that appear on the Diagnostic Information tab if the</p>

Function	Button	Action	Examples of use	Comment
				function is enabled in the corresponding Control block.
Simulation		Activate	Entering the simulation mode to operate an on-off valve, using the open/close buttons of the faceplate.	Displayed on the Configuration tab
		Deactivate	Returning to normal operation mode where the valve is controlled by the program.	
Global bypass of interlocks		Activate	Activating the global bypass of interlocks for a valve (the valve is not interlocked anymore).	Available on the Configuration tab
		Deactivate	Deactivating the global bypass of interlocks of a motor (the motor becomes interlocked if applicable).	
Resetting a counter		Set to 0	Resetting the hours-of-operation counter for a device.	The icon on the button is only shown if the counter has exceeded its maximum value (it has started over).
Rotation direction		Forward	Selecting a forward rotation direction on a motor.	–
		Reverse	Selecting a reverse rotation direction on a motor.	–
Enabling		Enable	Activating detection of alarms or deactivate bypass of the interlock (from the list of bypassed interlock conditions).	Available on the Interlocks and Diagnostic Information tabs. The alarm button can be displayed on the Configuration tab also.
			Activating bypass of the interlock (from the list of active interlock conditions).	
Partial reset		Reset	Manually resetting the input of the respective Control block after an interlock condition or a detected failure condition is cleared.	Available on the Interlocks and Diagnostic Information tabs. The button is enabled when manual resetting the corresponding input of the Control block that detects the condition is mandatory after the condition is cleared. NOTE: For detected failure conditions, may require additional, manual reset of the equipment by using the control module reset button that is located on the Operation tab if the function is enabled.
Close faceplate		Exit	–	–

Process Monitoring Services

What's in This Part

Common Faceplate Tabs	43
Tags of Commonly Used Blocks	52

Overview

This part describes the Supervision resources that are specific to process monitoring services.

⚠ WARNING
UNEXPECTED SYSTEM BEHAVIOR The Control application must pass on the relevant validations before being used in the process. Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING
UNEXPECTED SYSTEM BEHAVIOR The Supervision has to be used with special caution and always by qualified personnel. Failure to follow these instructions can result in death, serious injury, or equipment damage.

Common Faceplate Tabs

What's in This Chapter

Local Panel Section.....	43
Interlocks Tab.....	44
Diagnostic Information Tab.....	46
Maintenance Tab.....	49
Information Tab	51

Overview

This chapter describes the different optional tabs that are common to the faceplates, page 38 for process monitoring.

Local Panel Section

Overview

The Operation tab may feature the optional local panel section.

For information on the availability of the tab, refer to the topic describing each Supervision function.

Local Panel Representation

The following figure shows an example of the local panel section:



Function Description

The local panel section is composed of a rotary switch and status lights.

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

Item	State	Description
Rotary switch	CS	You have the choice to control the device through the PROGRAM or the OPERATOR (OWNER) section of the Operation tab).
	0	You cannot operate the device though the faceplate controls nor from the field.
	LP	You can operate the device from the field only. The faceplate controls are disabled. The status lights provide information on the status of the device that is operated from the field.
Status lights	black	The function that is indicated by the label is not activated.
	green	The function that is indicated by the label is activated.

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 block, the tab allows bypassing each condition. You can also make manual resetting of each input of the corresponding Control block mandatory after the interlock condition is cleared.

For information on the availability of the tab, refer to the topic describing each Supervision function.

NOTE:

- This tab is also used to display initial conditions for sequential control management and `IBPHASE` component.
- The bypass button is available only when the configured length of the description of conditions is more than one character.

Tab Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data.
- The buttons, page 40 that appear on the tab.

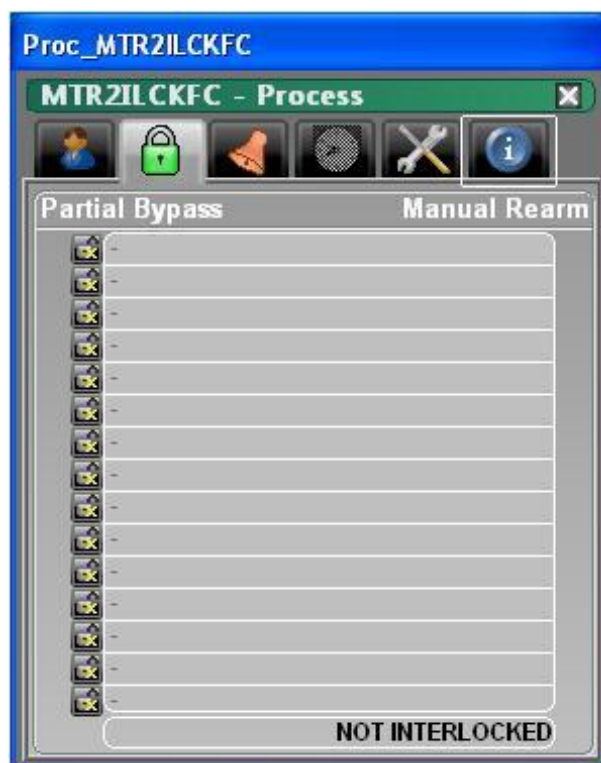
User Interface Messages

The tab displays the messages contained in the *UIMessag.dbf* database to describe interlocking or initial conditions.

Optional Rearm Confirmation

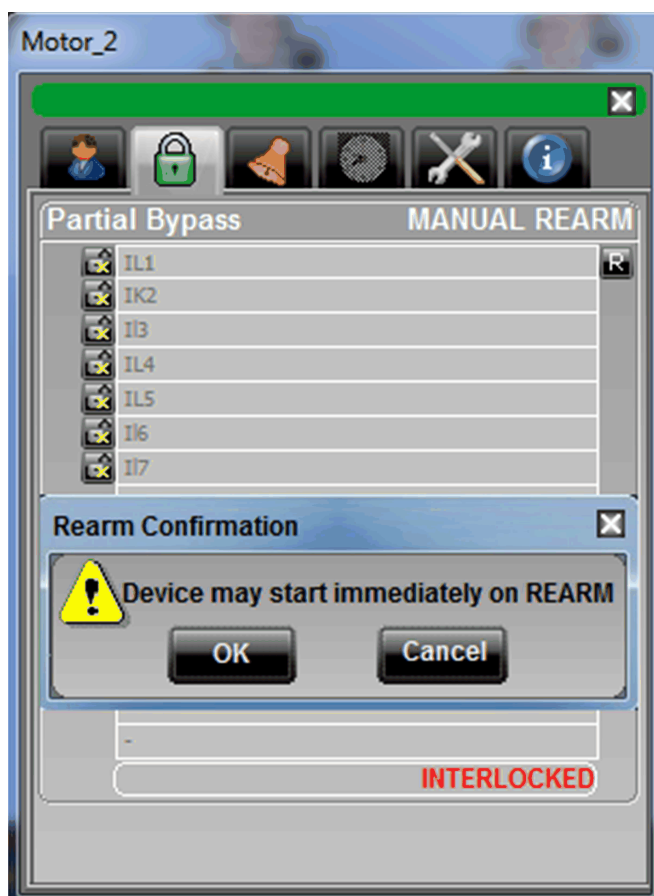
Certain Supervision functions that use the Interlocks tab allow displaying an optional [dialog box, page 45]. It is displayed after clicking any partial reset button (when enabled) that appears on the Interlocks tab. This message can serve as an additional confirmation, informing the operator that upon clicking **OK**, the equipment controlled by the genie may start immediately.

Interlocks Tab Representation



Reset Confirmation Dialog Box

The following figures show an example of the optional reset confirmation dialog box:



OK	Resets the respective input of the corresponding Control block after the interlock condition is cleared.
Cancel	Closes the dialog box without resetting.

For more information refer to (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual) .

Diagnostic Information Tab

Overview

The optional Diagnostic Information tab is available on certain faceplates, allowing you to view and interact with detected failure conditions at the control module level.

Depending on the configuration of the related Control block, the tab allows bypassing each condition. You can also make manual resetting of each input of the corresponding Control block mandatory after the abnormal condition is cleared.

For information on the availability of the tab, refer to the topic describing each Supervision function.

NOTE:

- This tab is also used to display alarm conditions for alarm summary management.
- The bypass button is available only when the configured length of the description of conditions is more than one character.

Tab Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data.
- The buttons, page 40 that appear on the tab.

User Interface Messages

The tab displays the messages contained in the *UIMessag.dbf* database to describe abnormal conditions.



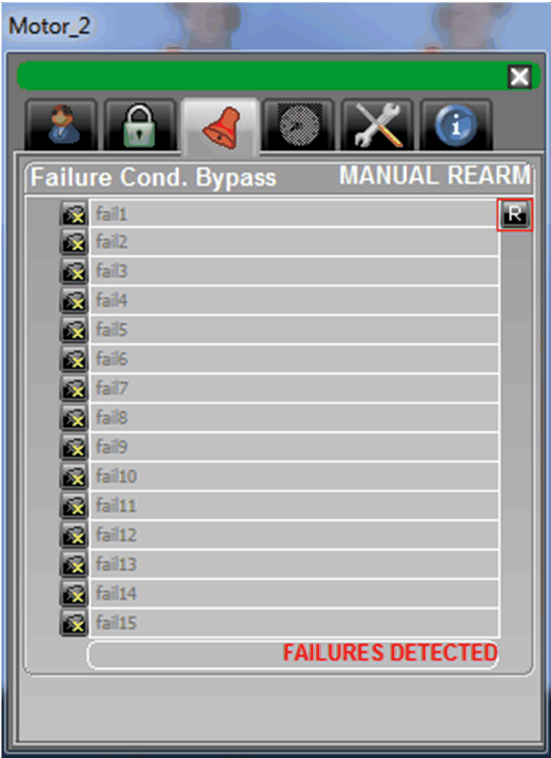

Optional Rearm Confirmation

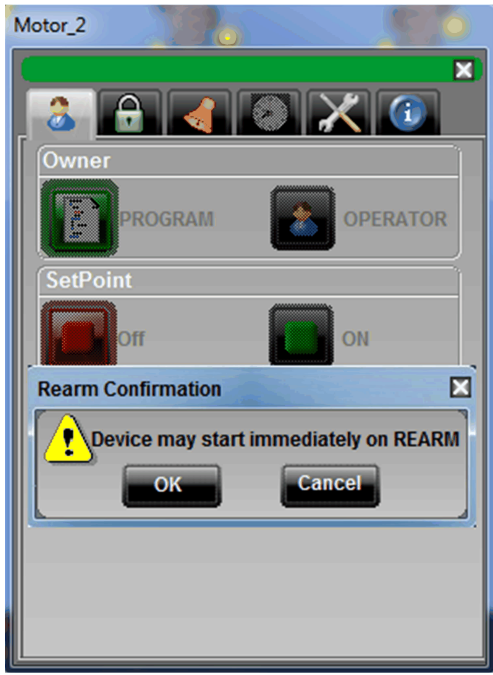
Certain Supervision functions that use the Diagnostic Information tab allow displaying an optional [dialog box]. It is displayed after clicking the reset button (when enabled) that is located on the Operation tab. This message can serve as an additional confirmation, informing the operator that upon clicking **OK**, the equipment controlled by the genie may start immediately.

Diagnostic Information Tab Representation



Reset Confirmation Dialog Box

Step	Action
1	<p>Once the detected failure condition goes away the  button is enabled. Click  button to enable the Global Rearm button in the Operator tab shown in step 2.</p> 
2	<p>Click Rearm button. Rearm Confirmation dialog box appears as shown in step 3.</p> 
3	<p>Click OK to reset the input of the corresponding Control block after the abnormal condition is cleared.</p> <p>Click Cancel to close the dialog box without resetting.</p>

Step	Action
	

For more information refer to (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual) .

Maintenance Tab

Overview

The Maintenance tab is an optional tab that:

- Displays accumulated data concerning the operation of the control module.
- Allows resetting the counters.

For information on the availability of the tab, refer to the topic describing each Supervision function.

Tab Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data.
- The buttons, page 40 that appear on the tab.

Maintenance Tab Representation

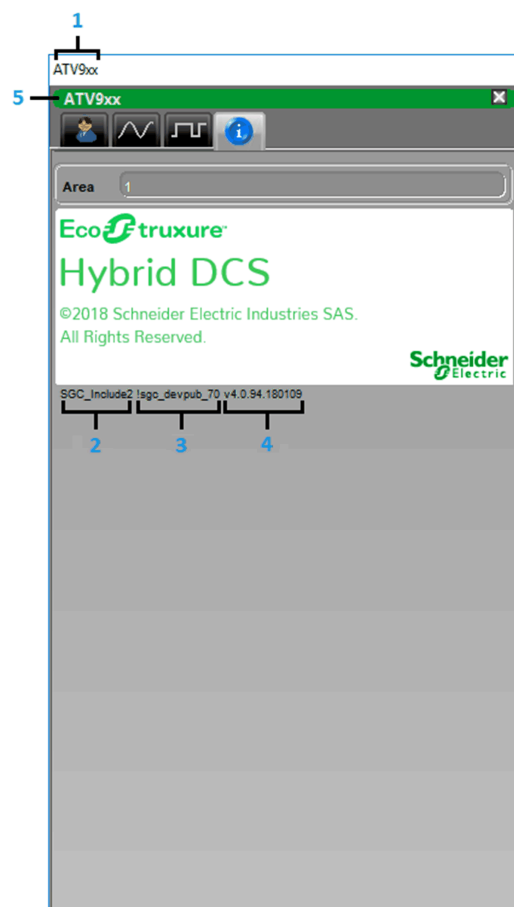
The figure shows an example of the Maintenance tab:



Information Tab

Representation

The following figure shows an example of the information tab that is available for each faceplate:



- 1 Default identifier of the instance using the faceplate
- 2 Name of the include project that contains the faceplate
- 3 Name of the faceplate file
- 4 Version of the include project that contains the faceplate
- 5 Description of the object

Tags of Commonly Used Blocks

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Tags of Commonly Used Blocks

AALARM Variable Tags

The table describes the variable tags that are managed by Supervision components for *AALARM*:

Name	Description
<i>CM name_AALARM_CFGW</i>	Device configuration data.

DEVCTL Variable Tags

The table describes the variable tags that are managed by Supervision components *DEVCTL*:

Name	Description
<i>CM name_DEVCTL_CFGW</i>	Device configuration data.
<i>CM name_DEVCTL_STW</i>	Device status information.

DEVMNT Variable Tags

The table describes the variable tags that are managed by Supervision components for *DEVMNT*:

Name	Description
<i>CM name_DEVMNT_STW</i>	Device maintenance status information.
<i>CM name_DEVMNT_CFGW</i>	Device maintenance configuration data.
<i>CM name_DEVMNT_RHCNT</i>	Maintenance hours of operation data
<i>CM name_DEVMNT_MCNT</i>	Maintenance switching operations data

CONDSUM1 Variable Tags

The table describes the variable tags that are managed by Supervision components for *CONDSUM*:

Name	Description
<i>CM name_CONDSUM_CONDW</i>	Interlock condition data word.
<i>CM name_CONDSUM_BYPASSW</i>	Interlock condition bypass word.
<i>CM name_CONDSUM_REARMREQW</i>	Resetting signals for interlock conditions.

CONDSUM Variable Tags

The table describes the variable tags that are managed by Supervision components for *CONDSUM*:

Name	Description
<i>CM name_FC_CONDSUM_CONDW</i>	Detected failure condition data word.
<i>CM name_FC_CONDSUM_BYPASSW</i>	Detected failure condition bypass word.
<i>CM name_FC_CONDSUM_REARMREQW</i>	Resetting signals for detected failure conditions.

DEVLP Variable Tags

The table describes the variable tags that are managed by Supervision components for *DEVLP*:

Name	Description
<i>CM name_DEVLP_STW</i>	Local panel status information

AALARM Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components and the expression that is configured in the Supervision component to read or write the corresponding bit of the status or configuration word:

Name	Description	Expression	Process event, page 30
<i>CM name_AALARM_HIHI</i>	Very high level alarm	<i>CM Name_AALARM_STW BitAND 0x0100</i>	No
<i>CM name_AALARM_HI</i>	High level alarm	<i>CM Name_AALARM_STW BitAND 0x0200</i>	
<i>CM name_AALARM_D</i>	Deviation alarm	<i>CM Name_AALARM_STW BitAND 0x0400</i>	
<i>CM name_AALARM_LO</i>	Low level alarm	<i>CM Name_AALARM_STW BitAND 0x0800</i>	
<i>CM name_AALARM_LOLO</i>	Very low level alarm	<i>CM Name_AALARM_STW BitAND 0x1000</i>	

DEVMNT Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components and the expression that is configured in the Supervision component to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
<i>CM name_DEVMNT_HOV</i>	Activate hours of operation counter	<i>CM name_DEVMNT_STW BitAND 0x0001</i>	Yes
<i>CM name_DEVMNT_MOV</i>	Activate switching operations counter	<i>CM name_DEVMNT_STW BitAND 0x0002</i>	

DEVCTL Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is

configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
CM name_DEVCTL_FAIL	Inoperable device	CM name_DEVCTL_STW BitAND 0x0020	No
CM name_DEVCTL_ALARM	Detection of not confirmed operation	CM name_DEVCTL_STW BitAND 0x0010	
Optional tags			
CM name_DEVCTL_ZSHPOS	ZSH position reached	CM name_DEVCTL_STW BitAND 0x0001	Yes
CM name_DEVCTL_ZSLPOS	ZSL position reached	CM name_DEVCTL_STW BitAND 0x0002	
CM name_DEVCTL_OP	Device output	CM name_DEVCTL_STW BitAND 0x0008	
CM name_DEVCTL_REM	Device controlled remotely	CM name_DEVCTL_STW BitAND 0x0040	
CM name_DEVCTL_ILCK	Device interlocked	CM name_DEVCTL_STW BitAND 0x0080	
CM name_DEVCTL_EXTCTLD	Device externally controlled	CM name_DEVCTL_STW BitAND 0x0200	
CM name_DEVCTL_LSP	Local setpoint	CM name_DEVCTL_CFGW BitAND 0x0010	

DEVLP Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
CM name_DEVLP_LPmode	Local panel mode active	CM name_DEVLP_STW BitAND 0x0001	Yes
CM name_DEVLP_ZEROMODE	Local panel zero mode active	CM name_DEVLP_STW BitAND 0x0002	
CM name_DEVLP_CSMODE	Control system mode active	CM name_DEVLP_STW BitAND 0x0004	

Supervision Components to Upload and Download Parameters and Recipes

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Assigning the Genie	60
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Definition of Tables	63

Overview

This part describes the components that allow you to upload and download parameters and recipes.

These components do not reflect any specific installation.

⚠ WARNING

LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA), or equivalent risk analysis, 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 them.
- Review the implications of communication link interruptions and take actions to mitigate them.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and error conditions) according to your risk assessment, and applicable codes and regulations.
- Apply local accident prevention and safety regulations and guidelines.¹
- Test each implementation of a system for proper operation before placing it into service.

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

The **Parameters Management** faceplate allows you to:

- Download data from the database to a controller or I/O device.
- Upload data from a controller or I/O device to the database.

As a database, you can use an ODBC data source that consists of three tables.

You can access the faceplate through the **Tools** menu of the navigation bar of Supervision pages during operation.

Prerequisites

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Prerequisites

Creating the Data Source

The component can use any data server that can be configured as an ODBC data source, such as SQL Server, Oracle, or Microsoft® Access®.

The procedure describes how to use a Microsoft® Access® database that the faceplate uses as data source. In this example, the database is the blank `parameters.mdb` file that is located inside the `SGC_Include2.ctz` include project file.

NOTE: To access the `SGC_Include2.ctz` file, build the Supervision and use the **Download** command from the executable. Extract the file and go to the `$UserFiles` folder. Refer to Building the Supervision Project (see EcoStruxure™ Process Expert, User Guide).

To create an ODBC data source by using the `parameters.mdb` file, proceed as follows:

Step	Action
1	Double-click the <code>odbcad32.exe</code> file, which is located at the following path: <code>C:\Windows\SysWOW64</code> . Result: The ODBC Data Source Administrator window opens. NOTE: Do not open the ODBC Data Source Administrator through the Microsoft® Windows® Control Panel.
2	Select the System DSN tab.
3	Select the Citect_Dbf entry and click Add... . Result: The Create New Data Source window opens.
4	Select the Driver do Microsoft Access (*.mdb) entry and click Finish . Result: The ODBC Microsoft Access Setup window opens.
5	In the Data Source Name field, enter <code>DSNParams</code> .
6	Click Select database...
7	Browse to the <code>parameters.mdb</code> file and click OK .
8	Unselect the Read Only attribute.
9	Click OK to close the ODBC Microsoft Access Setup window. Result: The data source is created.
10	Click OK to close the ODBC Data Source Administrator window.

Considerations When Using a Microsoft® Excel® Data Source

Using a Microsoft® Excel® spreadsheet as data source does not allow you to use the delete command of the **Parameters Management** faceplate.

Considerations When Using OPC Factory Server (OFS)

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Considerations When Using OPC Factory Server

Description

When OPC Factory Server (OFS) is used as a communication driver for Citect SCADA, the *[OPC] LeaveTagsActive* parameter is set to 0 to optimize the volume of data involved in communication with the controllers. This allows the deactivation of items created at a certain time when Citect SCADA does not need them anymore. This reduces the network traffic and the communication load of the processors.

Collateral Effects

Although, this is the ideal configuration, it can have some collateral effects that the operator should bear in mind. These are:

- For each new tag that is not active at the moment and that has to be processed from cicode at a given moment with blocking functions such as *TagRead*, Citect SCADA has to add the tag in the OPC server and activate it.
- The OPC server, according to its configured *ScanRate*, has to obtain the value of the corresponding variable in the controller and communicate it to Citect SCADA.

This process can be considered as slow if the tags are added in the OPC one by one.

This is done due to the internal way in which Citect SCADA manages parameter uploads from the controller and to confirm that value is the last-known valid value. Read the tags in an organized, synchronous method so that a tag is not read before its previous one.

This means that the process is repeated as many times as the number of tags uploaded to Citect SCADA from the controller. This can result in a parameter list that is not necessarily long.

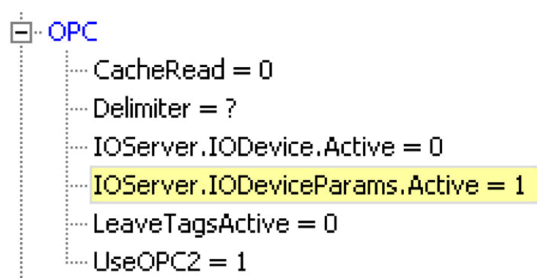
To solve this, it is suggested to create an I/O device that only has the tags needed to manage the list of parameters or recipe while, keeping the parameter *[OPC] LeaveTagsActive = 0*.

The operator can have the tags of this I/O device be the only ones that stay active (those corresponding to parameter and recipe management). The other I/O device that manages the rest of the application tags works by the activation and deactivation of the items, according to the screens being displayed, to optimize communication.

Configuring the *LeaveTagsActive* Parameter

To configure the *LeaveTagsActive* functionality for an I/O device, add the following parameter in the *citect.ini* file: *[OPC]<IOServerName>.<IODeviceName>.Active*.

This figure shows an I/O server named **IOServer**, an I/O device named **IODeviceParams**, and the **LeaveTagsActive** parameter:



Libraries

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Libraries

Required Software Components

Genies and faceplates implemented for parameter management use Microsoft® Forms 2.0 ActiveX® controls.

Verify that the corresponding Microsoft® ActiveX® control resources are installed on PCs on which you want to use the library components during operation.

Contents

The main resources for the management of parameters through Supervision components are grouped as follows:

Symbol libraries

- *sgc_icons*: Basic icons used by many objects.
- *sgc_citect*: Various icons for system diagnosis.

Dynamic object libraries (genies)

- *sgc_param*: Provides access to the **Parameters Management** faceplate.

Faceplates

- *!sgc_changingBaseNumber*: Form for modifying the size of the recipe being downloaded.
- *!sgc_parameter*: **Parameters Management** faceplate.

Cicode archives (auxiliary code to manage animations)

- *sgc_citect*: Functions that allow you to determine the status of the Supervision processes.
- *sgc_parameter*: Functions that manage the parameter window and parameter uploading/downloading.
- *sgc_general*: Common primitives used by many animation objects.

Assigning the Genie

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Assigning the Genie 60

Assigning the Genie

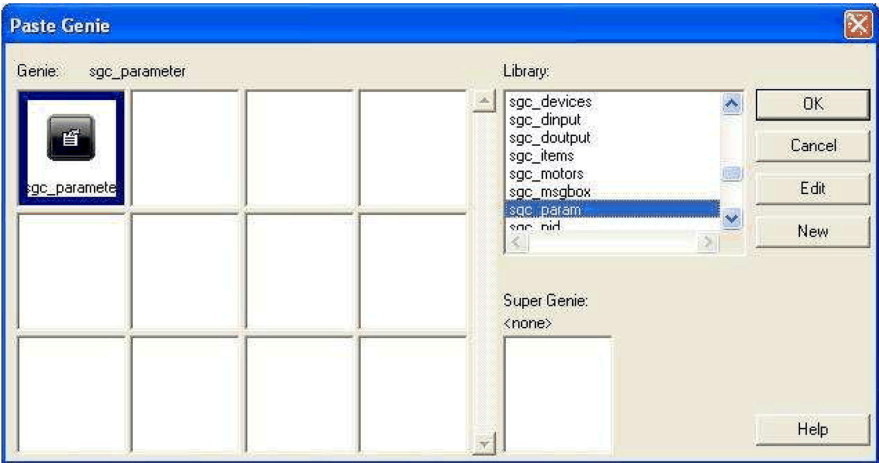
Overview

The `sgc_parameter_30` genie calls a function that displays the **Parameters Management** faceplate during operation.

You can assign this genie to a Supervision page by selecting the `sgc_param` library.

Genie Selection

Select the `sgc_parameter_30` genie from the `sgc_param` library:



Genie Properties

Refer to Using Genies (see EcoStruxure™ Process Expert - General Purpose Library Classic Device Supervision Services Reference Manual).

Faceplate Description

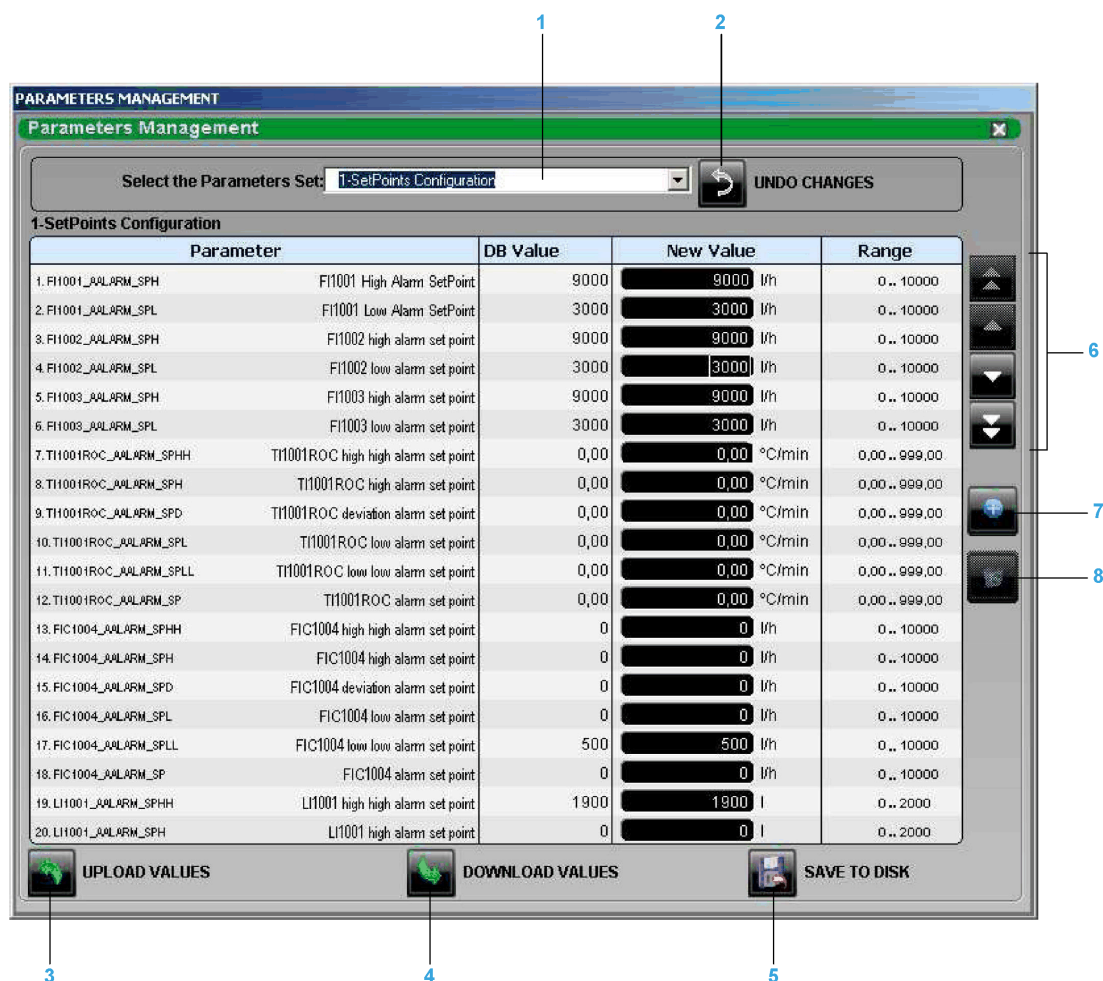
What's in This Chapter

Faceplate Description61

Faceplate Description

Representation

The following figure shows an example of the **Parameters Management** faceplate.



- 1 List to select a parameter set.
- 2 Undo changes button. Reloads the information stored in the database.
- 3 Upload the values from the controller to Citect SCADA.
- 4 Download the values from Citect SCADA to the controller.
- 5 Allows you to save the modifications in the database.
- 6 Scrolling buttons. Record by record or page by page.
- 7 Button that allows you to duplicate the current set of parameters.
- 8 Button that allows you to delete a duplicate set of parameters.

When you click the list, the system shows the available parameter sets. The data is loaded to the window after you select one.

Data Model

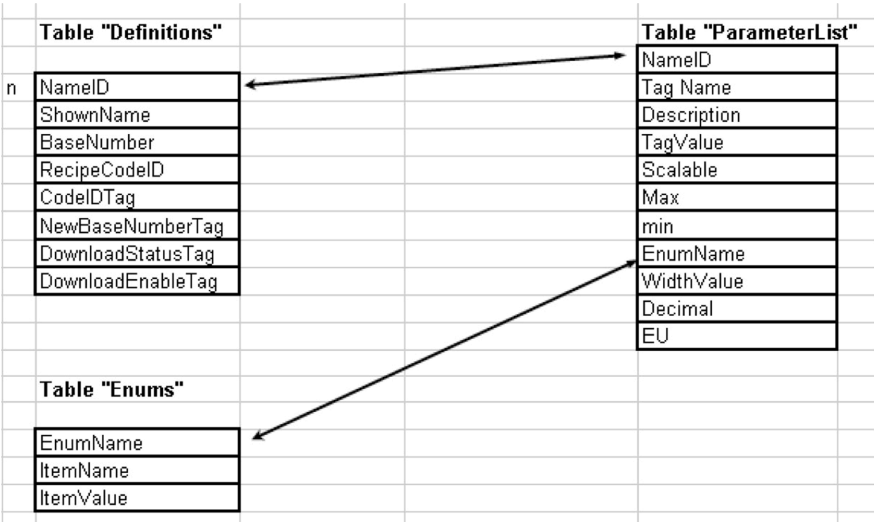
What’s in This Chapter

Data Model 62

Data Model

Description

The data model consists of 3 tables with the following relationship:



Definition of Tables

What's in This Chapter

<i>Definitions</i> Table.....	63
<i>Enums</i> Table.....	64
<i>ParameterList</i> Table	65

Overview

This chapter describes the definition that is required for the tables of the data source.

Definitions Table

Overview

The *Definitions* table consists of mandatory and null value fields.

Description of Mandatory Fields

The mandatory fields are:

- **NameID**: A unique identifier that distinguishes one recipe from another or identifies a set of parameters.
- **ShownName**: The name shown in the list of the **Parameters Management** faceplate.
- **BaseNumber**: Base on which the parameters are standardized. That is, given a certain recipe, the quantity required per type of ingredient to make *BaseNumber* Kilogram.

Description of Null Value Fields

The null value fields are:

- **RecipeCodeID**: Identifier or code, for the recipe or parameters, that is used in the controller. When data is transferred from the SCADA to the controller, this value is written in the *CodeIDTag*. This code is also checked when the values are uploaded from the PLC or controller to the SCADA. Its function, from the point of view of the SCADA, is to avoid the values of a recipe in the controller from replacing another one that is loaded in the SCADA.
- **CodeIDTag**: Tag in which the *RecipeCodeID* value is stored. Write/Read tag.
- **NewBaseNumberTag**: Tag in which the total quantity of the product to be made is stored.
- **DownloadStatusTag**: The tag in which the download process status of the recipe is stored. When the download process ends, the tag is set to 1. Write tag.
- **DownloadEnableTag**: Tag that Citect SCADA checks to find out if parameter downloading from Citect SCADA to the controller is enabled. It is set to 1 to enable downloading. This tag is a read tag for Citect SCADA, and the controller sets its value.

- **cCodeIDTag**: Tag to which Citect SCADA writes the value in the *RecipeCodeID* field every time that the recipe is selected from the parameter management window. This allows the controller to load the variables that the tags read with values of the recipe stored in a different memory area of the controller (for demultiplexing functions).

Enums Table

Overview

The database model is designed to work with enumeration fields.

For example:

- The operator has to assign three possible values for a certain field in the recipe or parameter.
- The operator has to represent the stirring speed of a certain process as fast, normal, and slow for the end user. In this case, assign a value to each one that is the value that you actually load onto the speed driver the value can be for example, 20, 40, and 60 Hz.

Description of Fields

The *Enums* table contains the following fields:

- **EnumName**: Identifier name for the enumeration field.
- **ItemName**: Name of the different items of the enumeration field.
- **ItemValue**: Value assigned to the enumeration field.

The figure shows the **Parameters Management** faceplate:

The screenshot shows the 'PARAMETERS MANAGEMENT' window with a 'Parameters Management' tab. At the top, there is a dropdown menu for 'Select the Parameters Set:' set to '3-Enumeration Sample' and an 'UNDO CHANGES' button. Below this, the '3-Enumeration Sample' section contains a table with the following data:

Parameter	DB Value	New Value	Range
1. PREACT1_D10_IP01 Water to charge (l)	*30	30	0 .. 5000
2. PREACT1_D10_IP02 Water flow SetPoint (l/h)	Normal <5000>	c) Normal	0 .. 10000
3. PREACT1_D10_IP03 Reactive to charge (Kg)	*25	a) Very Slow b) Slow c) Normal d) Fast e) Very Fast	0 .. 200

At the bottom of the window, there are three buttons: 'UPLOAD VALUES', 'DOWNLOAD VALUES', and 'SAVE TO DISK'.

In order to associate an *EnumName* to a parameter, the tables are implemented as follows in the database:

NameID	TagName	Description	TagValue	Scalable	Max	Min	EnumName	WidthValue	Decimal	EU
Receipe2	Input5		100	1	1000	%				
Receipe2	Input6	Value Range	66	1	100	%	Range	15		gr
Receipe2	Input7		333	1	1000	%				gr
Receipe2	Input8		150	0	300	%				degC
Receipe2	Input9	Velocity of Agitator	66	0	100	%	SpeedMotor	15		Hz

Enums Table

EnumName	ItemName	ItemValue
SpeedMotor	High	1700
SpeedMotor	Normal	1300
SpeedMotor	Slow	200

EnumName	ItemName	ItemValue
Range	High	100
Range	Medium	50
Range	Low	0

Table "ParameterList"	
NameID	Mandatory
TagName	Mandatory
Description	Optional
TagValue	Mandatory
Scalable	Mandatory
Max	Mandatory
Min	Mandatory
EnumName	Optional
WidthValue	Optional
Decimal	Optional
EU	Optional

ParameterList Table

Description of Fields

The *ParameterList* table contains the following fields:

- **NameID:** Unique identifier for the set of parameters. Parameters corresponding to duplicate parameter sets are identified by adding the string *# at the end of the identifier. In this string, # is the number of the copy, which is increased automatically.
- **TagName:** Name of the Citect SCADA tag to which this parameter is applied.
- **TagValue:** Value that is applied to tag name while uploading and downloading or not.
- **Description:** Description for this parameter.
- **Scalable:** Indicates whether the value is scaled in the uploading and downloading process. The scaling ratio is $NewBaseNumber/BaseNumber$. 0 = Not scalable. 1 = Scalable.
- **Max:** Maximum value that the parameter can take on.
- **Min:** Minimum value that the parameter can take on.
- **EnumName:** Identifier for enumeration type (if applicable).
- **WidthValue:** Width applied to the display layout on the screen. Number of characters.
- **Decimal:** Number of decimal places that is shown when the display format is applied. If no value is defined, the number of decimal places defined in the format field of the tag definition form is applied.
- **EU:** Engineering units that is shown when the display format is applied. If no engineering unit is indicated, the units defined in the Citect SCADA tag database is applied.

Signal Processing


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Overview

This part describes the components that provide the Supervision functions for the signal processing family.

These components do not reflect any specific installation.

 **WARNING**

LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA), or equivalent risk analysis, 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 them.
- Review the implications of communication link interruptions and take actions to mitigate them.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and error conditions) according to your risk assessment, and applicable codes and regulations.
- Apply local accident prevention and safety regulations and guidelines.¹
- Test each implementation of a system for proper operation before placing it into service.

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

¹ 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.

Analog Input Management

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Overview

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

Supervision Functions

Description

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

- Main core functions encompass analog input monitoring, and simulation mode.
- Optional alarm function allows you to monitor level setpoints (very-high, high, low and very-low) in engineering units, a set-point 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 genies and their associated faceplate.

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_ainput` library when implemented through the `$AnalogInput control` module template:

Control resources	Description	Resource status				
AINPUT	Analog input logic	X				
AALARM	Alarm summary	O				
<table><tr><td>X</td><td>Mandatory resource</td></tr><tr><td>O</td><td>Optional resource</td></tr></table>			X	Mandatory resource	O	Optional resource
X	Mandatory resource					
O	Optional resource					

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources and Auxiliary Functions (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag	Description
CM name_AINPUT_STW	Device status information
CM name_AINPUT_CFGW	Device configuration data
Optional tags	
AALARM	Refer to Commonly Used Blocks, page 52.

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components and the expression that is configured in the Supervision component to read or write the corresponding bit of the status or configuration word:

Name	Description	Expression	Process event, page 30
CM name_AINPUT_BADST	Inoperable channel	CMName_AINPUT_STW BitAND 0x0001	No
Optional tags			
AALARM	Refer to Commonly Used Blocks, page 53.		

Trend Tags

The table describes the trend tags managed by Supervision components:

Tag	Description	Expression
CM name_AINPUT_PV	Present value	CM name_AINPUT_PV

Genies

Genie Properties





Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The table describes the genies of the `sgc_ainput` library:

Graphic symbol	Genies name	Facet template identifier	Description
	aiipva_10	\$AIIPVA_CG	Shows the current value (PV) left-justified.
	aipva_10	\$AIIPVA_CG	Shows the current value (PV) right-justified.
	aiipvspa_10	\$AIIPVSPA_CG	Shows the current value (PV) and the set-point (SP) in left-justified (requires the optional analog alarm service to be activated).
	aipvspa_10	\$AIIPVSPA_CG	Shows the current value (PV) and the set-point (SP) in right-justified (requires the optional analog alarm service to be activated).

Faceplates

Overview

During operation, clicking a genie of the `sgc_ainput` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation with optional analog level alarm section
 - Configuration
 - Information

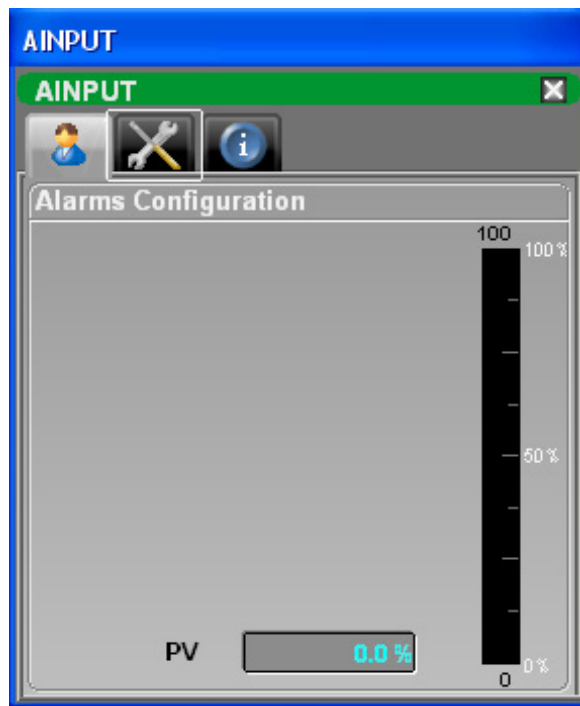
Faceplate Description

At the beginning of this manual, you can find the description of:

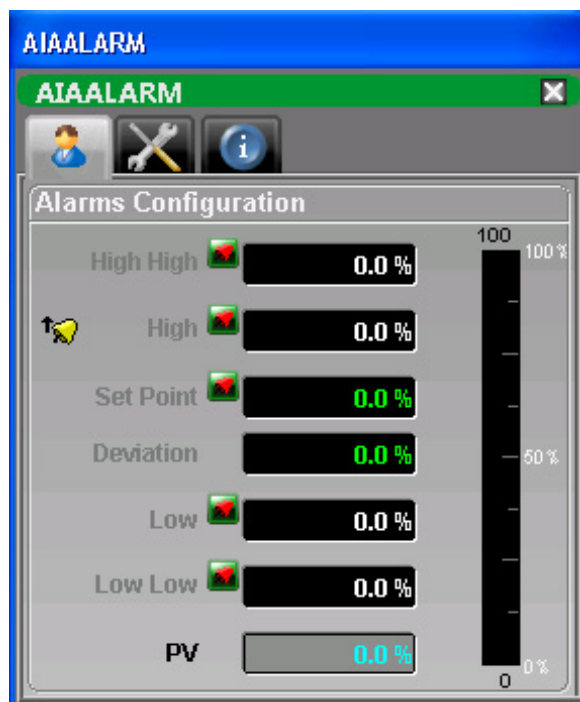
- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Operation Tab

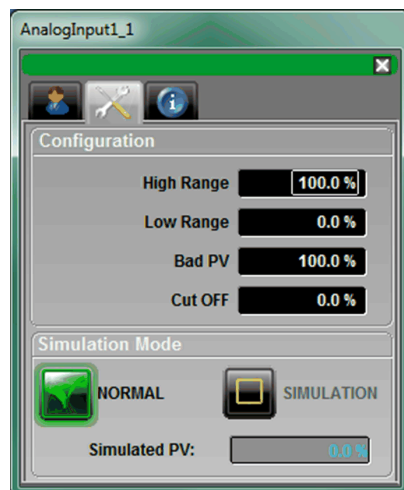
The figure shows an example of the Operation tab without the optional analog level alarm section:



The figure shows an example of the Operation tab with the optional analog level alarm section:



Configuration Tab



Analog Input With Configurable Range Management

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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, simulation 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 set-point 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 genies and their associated faceplate.

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_ainput1` library when implemented through the `$AnalogInput1` control module template:

Control resources	Description	Resource status
AINPUT1	Analog input with configurable range logic	X
AALARM	Alarm summary	O
X	Mandatory resource	
O	Optional resource	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Signal Processing and Auxiliary Functions (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual)

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag	Description
CM name_AINPUT1_STW	Device status information
CM name_AINPUT1_CFGW	Device configuration data
Optional tags	
AALARM	Refer to Commonly Used Blocks, page 52.

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Name	Description	Expression	Process event, page 30
CM name_AINPUT1_BADST	Inoperable channel	\$CMName_AINPUT1_STW BitAND 0x0001	No
AALARM	Refer to Commonly Used Blocks, page 53.		

Trend Tags

The table describes the trend tags that are managed by Supervision components and their expression:

Tag	Description	Expression
\$CMName_AINPUT1_PV	Present value	CM name_AINPUT1_PV

Genies

Genie Properties





Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genres.

Representation

The table describes the genres of the `sgc_ainput1` library:

Graphic symbol	Genie name	Facet template identifier	Description
	<code>sgc_ai1lpva_10</code>	<i>AI1LPVA_CG</i>	The current value of the measurement is shown left-aligned in the foreground. The icons are associated with the configured alarms.
	<code>sgc_ai1lpvspa_xy</code>	<i>AI1LPVSPA_CG</i>	The current value of the measurement and the configured setpoint are shown left-aligned in the foreground. The icons are associated with the configured alarms. Requires the optional analog alarm service to be activated.
	<code>sgc_ai1rpva_10</code>	<i>AI1LRPVA_CG</i>	The current value of the measurement is shown right-aligned in the foreground. The icons are associated with the configured alarms.
	<code>sgc_ai1rpvspa_xy</code>	<i>AI1LRPVSPA_CG</i>	The current value of the measurement and the configured setpoint are shown right-aligned in the foreground. The icons are associated with the configured alarms. Requires the optional analog alarm service to be activated.

Faceplates

Overview

During operation, clicking a genie of the `sgc_ainput1` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation with optional analog level alarm section
 - Configuration
 - Information

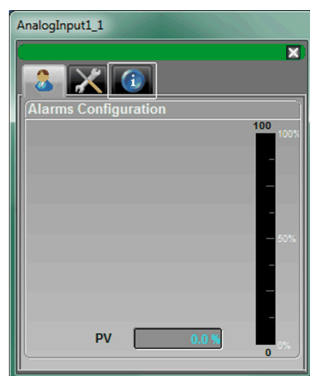
Faceplate Description

At the beginning of this manual, you can find the description of:

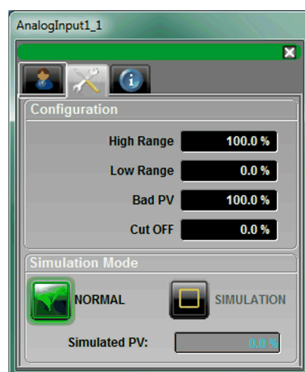
- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Operation Tab

The figure shows an example of the Operation tab with the optional analog level alarm section:



Configuration Tab



Analog Output Management

What's in This Chapter

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Control/Supervision Relationship	76
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Faceplates	78

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 genies and their associated faceplate.

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_aoutput` library when implemented through the `$AnalogOutput` control module template:

Control resources	Description	Resource status				
AOUTPUT	Analog output logic	X				
AOUTPUTLP	Local panel for analog outputs	O				
ASELECT1	Analog signal selector					
<table><tr><td>X</td><td>Mandatory resource</td></tr><tr><td>O</td><td>Optional resource</td></tr></table>			X	Mandatory resource	O	Optional resource
X	Mandatory resource					
O	Optional resource					

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Signal Processing and Auxiliary Functions (see *EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual*).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag name	Description
CM name_AOUTPUT_STW	Device status information
CM name_AOUTPUT_CFGW	Device configuration data
Optional tags	
CONDSUM	Refer to Commonly Used Blocks, page 53.
CM name_AOUTPUTLP__STW	Local panel status information

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
CM name_AOUTPUT_BADST	Inoperable channel	CM name_AOUTPUT_STW BitAND 0x0001	No
Optional tags			
CM name_AOUTPUT_ILCK	Device interlocked	CM name_AOUTPUT_STW BitAND 0x0002	Yes
CM name_AOUTPUT_REM	Device controlled remotely	CM name_AOUTPUT_STW BitAND 0x0004	
CM name_AOUTPUTLP_LPMODE	Local panel mode active	CM name_AOUTPUTLP_STW BitAND 0x0001	
CM name_AOUTPUTLP_ZEROMODE	Local panel zero mode active	CM name_AOUTPUTLP_STW BitAND 0x0002	
CM name_AOUTPUTLP_CSMODE	Control system mode active	CM name_AOUTPUTLP_STW BitAND 0x0004	

Trend Tags

The table describes the trend tags managed by the Supervision components and their expression:

Tag name	Description	Expression
CM name_AOUTPUT_OP	Device output	CM name_AOUTPUT_OP
CM name_AOUTPUT_LSP	Local setpoint	CM name_AOUTPUT_LSP

Genies

Genie Properties


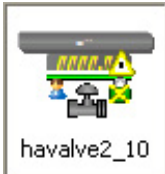


Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The table describes the genies of the `sgc_aoutput` library:

Graphic symbol	Genie name	Facet template identifier	Description
	<i>harightdownvalve3_10</i>	<i>harightdown-valve3_10_CG</i>	3-way control valve shown horizontally.
	<i>havalve2_10</i>	<i>havalve2_10_CG</i>	2-way control valve shown horizontally.
	<i>vauprightvalve3_10</i>	<i>vauprightvalve3_10_CG</i>	3-way control valve shown vertically.
	<i>vavalve2_10</i>	<i>vavalve2_10_CG</i>	2-way control valve shown vertically.

Faceplates

Overview

During operation, clicking a genie of the `sgc_aoutput` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation with optional local panel
 - Configuration
 - Information
- Optional tab:
 - Interlocks, page 44

Faceplate Description

At the beginning of this manual, you can find the description of:

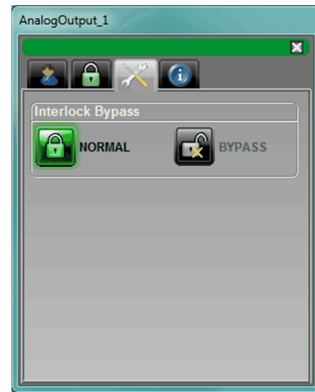
- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Operation Tab

The figure shows an example of the Operation tab with the optional local panel section:



Configuration Tab



NOTE: This tab features the global bypass button. The partial bypass buttons are available on the Interlocks tab.

Digital Input Management

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 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 genies and their associated faceplate.

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_dinput` library when implemented through the `$DigitalInput` control module template:

Control resources	Description	Service status
DINPUT	Digital input	X
X	Mandatory resource	
O	Optional resource	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Signal Processing (see *EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual*).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag	Description
CM name_DINPUT_STW	Device status information
CM name_DINPUT_CFGW	Device configuration data
Optional tags	
DEVMNT	Refer to Commonly Used Blocks, page 52.

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components and the expression that is configured in the Supervision component to read or write the corresponding bit of the status or configuration word:

Name	Description	Expression	Process event, page 30
CM name_DINPUT_ALARM	Alarm evaluated based on criteria	CM name_DINPUT_STW BitAND 0x0002	—
CM name_DINPUT_BADST	Inoperable channel	CM name_DINPUT_STW BitAND 0x0004	
Optional tags ⁽¹⁾			
CM name_DINPUT_PV	Present value	CM name_DINPUT_STW BitAND 0x0001	Yes
DEVMNT	Refer to Commonly Used Blocks, page 53.		

Trend Tags

No trend tags are managed by Supervision components for digital input management.

Genies

Genie Properties







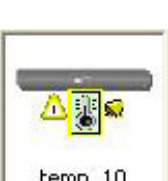
Refer to Using Genies, page 34.





Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The table describes the genies of the `sgc_dinput` library:

Graphic symbol	Genie name	Facet template identifier	Description
 arrow_10	<i>arrow_10</i>	<i>ARROW_CG</i>	Flow detector.
 hhvalve2_10	<i>hhvalve2_10</i>	<i>HHVALVE2_CG</i>	Manual 2-way valve represented horizontally (open valve detector).
 hhvalve3_10	<i>hhvalve3_10</i>	<i>HHVALVE3_CG</i>	Manual 3-way valve represented horizontally (open valve detector).
 pe_10	<i>pe_10</i>	<i>PE_CG</i>	Emergency stop detector.
 pres_10	<i>pres_10</i>	<i>PRES_CG</i>	Pressure detector.
 swith_10	<i>swith_10</i>	<i>SWITH_CG</i>	Position of a switch.
 temp_10	<i>temp_10</i>	<i>TEMP_CG</i>	Pressure switch.

Graphic symbol	Genie name	Facet template identifier	Description
	<i>vhvalve2_10</i>	<i>VHVALVE2_CG</i>	Manual 2-way valve, represented vertically (open valve detector).
	<i>vhvalve3_10</i>	<i>VHVALVE3_CG</i>	Manual 3-way valve represented vertically (open valve detector)
	<i>xs_10</i>		Position detector represented horizontally.
	<i>xs2_10</i>	<i>XS2_CG</i>	Position detector represented vertically.

Faceplates

Overview

During operation, clicking a genie of the `sgc_dinput` library allows you to display a faceplate with the following tabs:

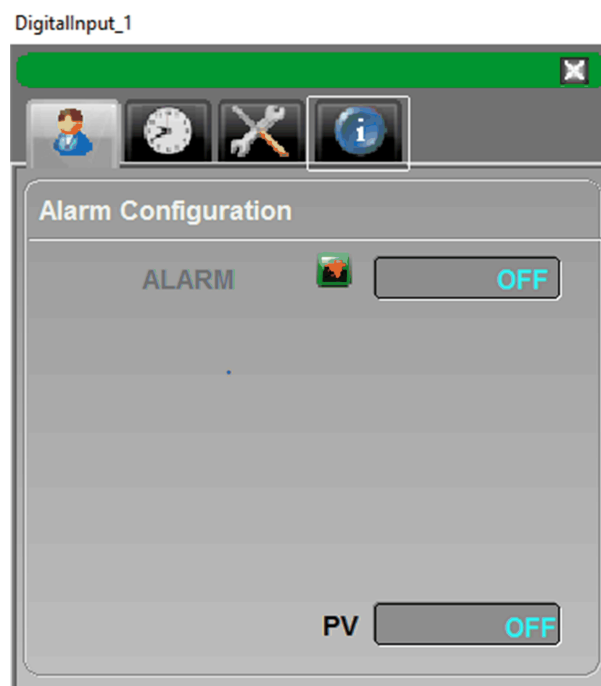
- Standard tabs:
 - Operation
 - Configuration
 - Information
- Optional tab:
 - Maintenance, page 49

Faceplate Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Operation Tab



Configuration Tab



Digital Output Management

What's in This Chapter

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Faceplates	88

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 genies and their associated faceplate.

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_doutput` library when implemented through the `$DigitalOutput` control module template:

Control resources	Description	Service status
DOUTPUT	Digital output	X
CONDSUM/CONDSUM1	Summary of conditions/Interlock condition summary	O
X	Mandatory resource	
O	Optional resource	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Signal Processing and Auxiliary Functions (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag name	Description
CM name_DOUTPUT_STW	Device status information
CM name_DOUTPUT_CFGW	Device configuration data
Optional tags	
CONDSUM	Refer to Commonly Used Blocks, page 53.
DEVMNT	Refer to Commonly Used Blocks, page 52.

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components and the expression that is configured in the Supervision component to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
CM name_DOUTPUT_BADST	Inoperable channel	CM name_DOUTPUT_STW BitAND 0x0001	No
Optional tags ⁽¹⁾			
CM name_DOUTPUT_ILCK	Device interlocked	CM name_DOUTPUT_STW BitAND 0x0002	Yes
CM name_DOUTPUT_REM	Device controlled remotely	CM name_DOUTPUT_STW BitAND 0x0004	
CM name_DOUTPUT_OP	Device output	CM name_DOUTPUT_STW BitAND 0x0008	
CM name_DOUTPUT_LSP	Local setpoint	CM name_DOUTPUT_CFGW BitAND 0x0004	
DEVMNT	Refer to Commonly Used Blocks, page 53.		

Trend Tags

No trend tags are managed by Supervision components for digital output management.

Genies

Genie Properties


Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genres.

Representation

The table describes the genres of the `sgc_doutput` library:

Graphic symbol	Genie name	Facet template identifier	Description
	<i>dout_10</i>	<i>DOutput_CG</i>	Original control

Faceplates

Overview

During operation, clicking a genie of the `sgc_dinput` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation
 - Configuration
 - Information
- Optional tabs:
 - Interlocks, page 44
 - Maintenance, page 49

Faceplate Description

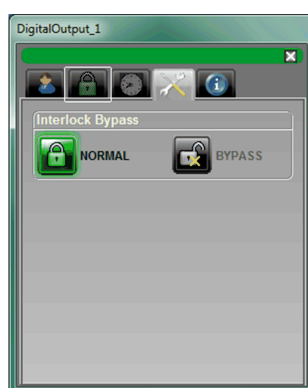
At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Operation Tab



Configuration Tab



NOTE: This tab features the global bypass button. The partial bypass buttons are available on the Interlocks tab.

Multiple Analog Input Management

What's in This Chapter

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Control/Supervision Relationship	90
Tags	91
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Faceplates	92

Overview

This chapter describes the Supervision resources and runtime services that are available for the management of multiple analog inputs 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* value.
- Selection of one input signal based on one of these predefined criteria:
 - Priority
 - Direct selection
 - Median
 - Average
 - Minimum
 - Maximum

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

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_mainput1` library when implemented through the `$MAnalogInput1` control module template:

Control resources		Description	Service status
MAINPUT1		Multiple analog inputs	X
X	Mandatory resource		
O	Optional resource		

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Signal Processing (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag	Description
CM name_MAINPUT1_STW	Device status information
CM name_MAINPUT1_CFGW	Device configuration data

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components and the expression that is configured in the Supervision component to read or write the corresponding bit of the status or configuration word:

Name	Description	Expression	Process event, page 30
CM name_MAINPUT1_BADST	Inoperable channel	CM name_MAINPUT1_STW BitAND 0x0001	—
CM name_MAINPUT1_CHFAIL	Detected error in channels being used	CM name_MAINPUT1_STW BitAND 0x0002	
CM name_MAINPUT1_DEVALM	Deviation alarm	CM name_MAINPUT1_STW BitAND 0x0004	

Trend Tags

The table describes the trend tags managed by Supervision components:

Tag	Description	Expression
CM name_MAINPUT1_PV	Present value	CM name_MAINPUT1_PV

Genies

Genie Properties


Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The table describes the genies of the `sgc_mainput1` library:

Graphic symbol	Genie name	Facet template identifier	Description
	<code>sgc_mai1rpva_10</code>	<code>\$MAI1RPVA_CG</code>	The current value of the measurement is shown right-aligned in the foreground, and the icons are associated with the configured alarms.

Faceplates

Overview

During operation, clicking a genie of the `sgc_mainput1` library allows you to display a faceplate with the following tabs:

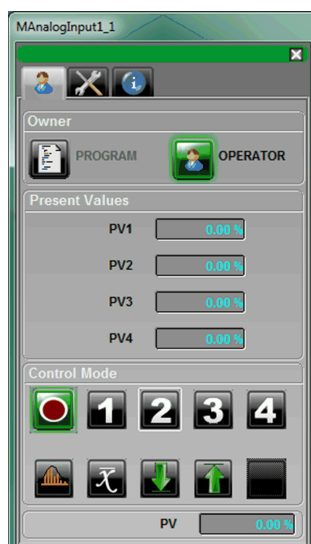
- Standard tabs:
 - Operation
 - Configuration
 - Information

Faceplate Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

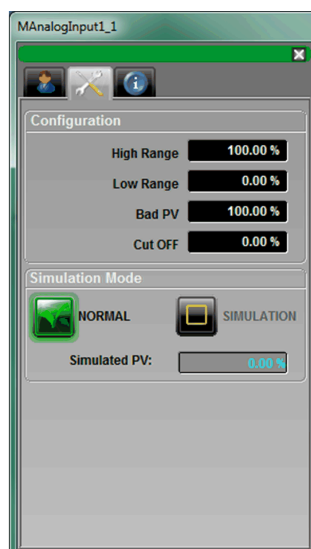
Operation Tab



The table describes the input signal selection buttons in the order they appear on the Operation tab:

Buttons				
Priority	Direct selection of input signal 1	Direct selection of input signal 2	Direct selection of input signal 3	Direct selection of input signal 4
Median	Average	Minimum	Maximum	—

Configuration Tab



BMXERT 16 channel Digital Input Management

What's in This Chapter

Tags	94
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Overview

This chapter describes the Supervision resources and runtime services that are available for the management of data for BMXERT 16 channel digital input management.

Tags

Template

Refer to Special Cards chapter of *EcoStruxure Process Expert Foundation Library Application Template User guide*.

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The following table describes the variable tags managed by the Supervision components:

Tag Name	Description
<i>CM name_BMXERT_Var1</i>	Channel value

Time Stamped Digital Alarm Tags

The following table describes the time stamped digital alarm tags managed by the Supervision components. It also indicates the corresponding variable tag for the digital alarms such that the alarm is activated based on the state of single or multiple digital variable tags:

Alarm Tag	Description	Variable Tag A
<i>CM name_BMXERT_TSDAlm</i>	Time stamped alarm	<i>CM name_BMXERT_Var1</i>

NOTE: This time stamped digital alarm tag is created only when the channel is configured as a time stamping type channel.

Advanced Alarm Tags

The following table describes the advanced alarm tags managed by the Supervision components. It also indicates the expression that is configured in the

Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm Tag	Description	Expression
<i>CM name_BMXERT_AAAlm</i>	Advanced alarm	<i>CM name_BMXERT_Var1</i>

NOTE: This advanced alarm tag is created only when the channel is configured as a discrete input type channel.

Trend Tags

No trend tags are managed by the Supervision components of BMXERT management.

Time Stamping Management

What's in This Chapter

Tags	96
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Overview

This chapter describes the Supervision resources and runtime services that are available for the management of Time Stamping data.

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by the Supervision components.

Tag Name	Description
<i>CM_TSVar1</i>	Time stamping value.

Time Stamped Digital Alarm Tags

The table describes the time stamped digital alarm tags that are managed by the Supervision components. It also indicates the corresponding variable tag for the digital alarms such that the alarm is activated based on the state of single or multiple digital variable tags:

Alarm Tag	Description	Variable Tag A
<i>CM_TSDAlm</i>	Time stamping alarm.	<i>CM_TSVar1</i>

TOTAL - Totalizing Function

What's in This Chapter

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Control/Supervision Relationship	97
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Genies	98
Faceplates	100

Overview

This chapter describes the Supervision resources and runtime services that are used to perform totalizing calculations.

Supervision Functions

Description

Core and optional resources provide 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.

Control/Supervision Relationship

Overview

The table describes which Control blocks provide data to the Supervision components of the `sgc_total` library:

Control blocks	Description	Block status
TOTAL	Totalizer function is based on three inputs: <ul style="list-style-type: none">• Flow• Pulses• Counters	X
CONDSUM	Diagnostic information	O
X	Mandatory block	
O	Optional block	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Signal Processing and Auxiliary Functions (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Variable Tags

The table describes the variable tags that are managed by Supervision components

Name	Type	Description
<i>CM name_TOTAL_CFG_LASTTOTAL</i>	REAL	Displays the last value of PV.
<i>CM name_TOTAL_ST_STW</i>	WORD	Status word with all bit information.
<i>CM name_TOTAL_ST_CFGW</i>	WORD	HMI configured information.
<i>CM name_TOTAL_ST_STATE</i>	INT	State of process.
<i>CM name_TOTAL_ST_COMMAND</i>	INT	Command for process.
<i>CM name_TOTAL_ST_TOTAL</i>	REAL	Current totalized value.
<i>CM name_TOTAL_ST_SP</i>	REAL	Current setpoint. NOTE: The range of setpoint is 0 to 999999999
<i>CONDSUM</i>	Refer to Variable Tags of Commonly Used Blocks, page 53	

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components and the expression that is configured in the Supervision component to read or write the corresponding bit of the status or configuration word:

Name	Expression	Description
<i>CM name_ST_STW_HELDFORError</i>	<i>CM name_TOTAL_STW BitAND 0x0004</i>	Detected failure condition is triggered while totalizing.

Trend Tags

The table describes the trend tags managed by Supervision components:

Name	Expression	Description
<i>CM name_TOTAL_ST_TOTAL</i>	<i>CM name_TOTAL_ST_TOTAL</i>	Current totalized value.
<i>CM name_TOTAL_ST_SP</i>	<i>CM name_TOTAL_ST_SP</i>	Current Setpoint

Genies

Genie Properties

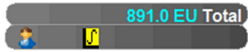

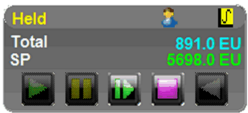

Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The table describes the genies of the `sgc_total` library:






Graphic symbol	Genies name	Facet template identifier	Description
	total_10	\$TOTAL_CG	Total value with trend.
	sptotal_10	\$TOTALSP_CG	Total value and setpoint with trend.
	sptotalwithbuttons_10	\$TOTALSPCTL_CG	Total value, setpoint and buttons.
	totalwithbuttons_10	\$TOTALCTL_CG	Total value and buttons.

NOTE:


- When *AUTOSTART* input pin is high in Control Expert, the start button disappears and the other four buttons (hold, restart, stop and reset) will shift by one space towards left.
- When *AUTORESET* input pin is high in Control Expert, the reset button disappears.

This is applicable for **Operator** tab faceplate also.

Representation of States in Genie:

Graphic Symbol	Description
	<i>IDLE/ STOPPED</i> state
	<i>RUNNING</i> state
	<i>HELD</i> state
	<i>HELDFORERROR</i> state
	<i>DONE</i> state

Representation of Rollover Flag in Genie

Graphic Symbol	Description
	<p>Graphic symbol indicates that the <i>TOTAL</i> value has reached 999999999.9999999 and this value rolls over automatically from 0.</p> <p>The user can acknowledge the rollover function by clicking on the Acknowledge button (see Modicon Libraries General Purpose for Citect SCADA , Process Supervision Services User Guide).</p>

Faceplates

Overview

During operation, clicking a genie of the `sgc_total` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation tab
 - Failure tab
 - Information tab

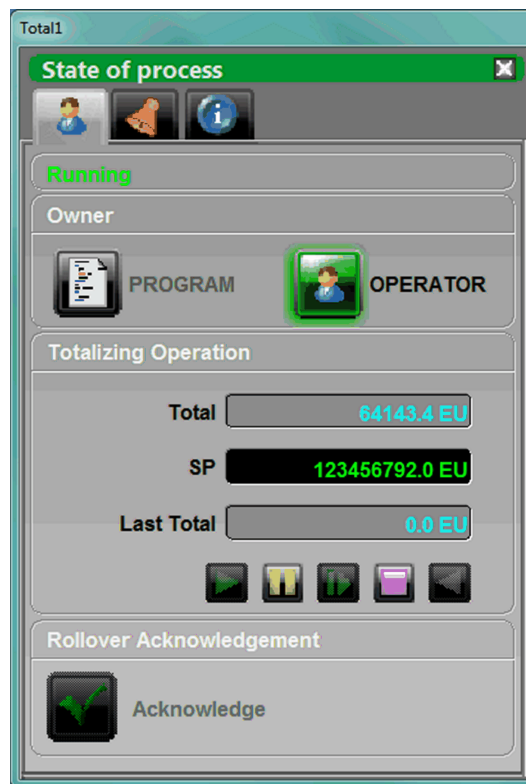
Faceplate Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

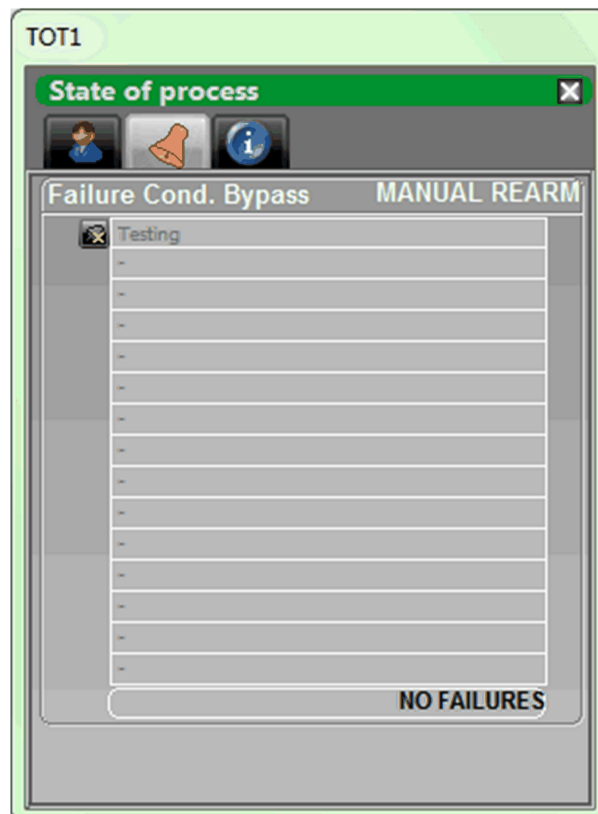
Operation Tab

The figure shows an example of the Operation tab.



Failure Tab

The figure shows an example of the Failure tab.



On/Off Device Control


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Overview

This part describes the components that provide the Supervision functions for the on/off device control family.

These components do not reflect any specific installation.

 **WARNING**

LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA), or equivalent risk analysis, 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 them.
- Review the implications of communication link interruptions and take actions to mitigate them.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and error conditions) according to your risk assessment, and applicable codes and regulations.
- Apply local accident prevention and safety regulations and guidelines.¹
- Test each implementation of a system for proper operation before placing it into service.

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

¹ 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.

Hand Valve Management

What's in This Chapter

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Control/Supervision Relationship	103
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Faceplates	105

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 genies and their associated faceplate.

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_hvalve` library when implemented through the `$HandValve` control module template:

Control resources	Description	Resource status
HVALVE	Hand valve logic	X
X	Mandatory resource	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to On/Off device control (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag	Description
CM name_HVALVE_STW	Device status information
CM name_HVALVE_CFGW	Device configuration data

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Name	Description	Expression	Process event, page 30
CM name_HVALVE_FAIL	Inoperable device	CM name_HVALVE_STW BitAND 0x0004	No
Optional tags			
CM name_HVALVE_ZSHPOS	ZSH position reached	CM name_HVALVE_STW BitAND 0x0001	Yes
CM name_HVALVE_ZSLPOS	ZSL position reached	CM name_HVALVE_STW BitAND 0x0002	

Trend Tags

No trend tags are managed by Supervision components for hand valve management.

Genies

Genie Properties



Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The table describes the genies of the `sgc_hvalve` library:

Graphic symbol	Genie name	Facet template identifier	Description
	sgc_hhvalve2_10	\$HValveHHVALVE2_G	Representation with horizontal 2-way valve symbols.
	sgc_vhvalve2_10	\$HValveVHVALVE2_CG	Representation with vertical 2-way valve symbols.

Faceplates

Overview

During operation, clicking a genie of the `sgc_hvalve` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Configuration
 - Information

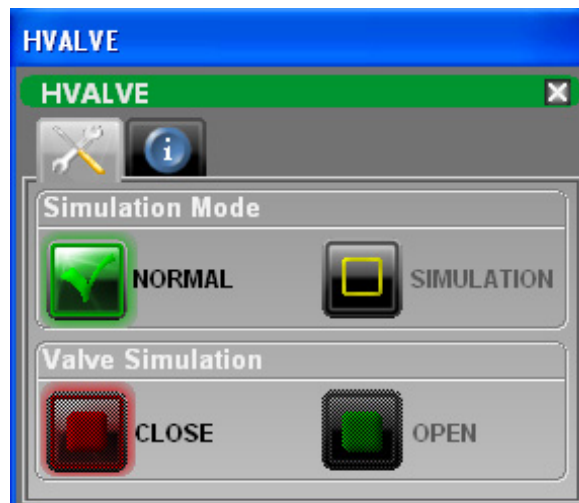
Faceplate Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Configuration Tab

This figure shows an example of the Configuration tab:



On/Off Motor Management

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Faceplates	109

Overview

This chapter describes the Supervision resources and runtime services that are available for the management of 1-speed/1-rotation direction on/off 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, 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 genies and their associated faceplate.

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_devctl_motors` library when implemented through the `$Motor` control module template:

Control Resources		Description	Resource status
DEVCTL		On/off device logic	X
DEVMNT		On/off device maintenance	O
DEVL P		Local panel for on/off devices	
CONDSUM		Diagnostic information	
CONDSUM1		Interlock condition summary	
X		Mandatory resource	
O		Optional resource	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to On/Off device control and Auxiliary Functions (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag name	Description
DEVCTL	Refer to Commonly Used Blocks, page 52.
Optional tags	
CONDSUM	Refer to Commonly Used Blocks, page 53.
CONDSUM1	Refer to Commonly Used Blocks, page 52.
DEVMNT	Refer to Commonly Used Blocks, page 52.
DEVLP	Refer to Commonly Used Blocks, page 53.

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
DEVCTL	Refer to Commonly Used Blocks, page 53.		
Optional tags			
DEVMNT	Refer to Commonly Used Blocks, page 53.		
DEVLP	Refer to Commonly Used Blocks, page 54.		

Trend Tags

No trend tags are managed by Supervision components for on/off motor management.

Genies

Genie Properties





Refer to Using Genies, page 34.

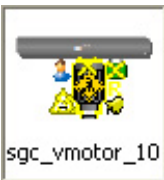

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The table describes the genies of the `sgc_devctl_motors` library:

Graphic symbol	Genie name	Facet template identifier	Description
	<code>sgc_hlmotor_10</code>	<code>\$HLMOTOR_CG</code>	Representation with left horizontal motor symbols.
	<code>sgc_hrmotor_10</code>	<code>\$HRMOTOR_CG</code>	Representation with right horizontal motor symbols.
	<code>sgc_lcpump_10</code>	<code>\$LCPUMP_CG</code>	Representation with left horizontal pump symbols.
	<code>sgc_rcpump_10</code>	<code>\$RCPUMP_CG</code>	Representation with right horizontal pump symbols.

Graphic symbol	Genie name	Facet template identifier	Description
	sgc_vmotor_10	\$VMOTOR_CG	Representation with vertical motor symbols.
	sgc_vumotor_10	\$VUMOTOR_CG	Representation with vertical motor symbols, upper axis.

Faceplates

Overview

During operation, clicking a genie of the `sgc_devctl_motors` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation with optional local panel, page 43
 - Configuration
 - Information
- Optional tabs:
 - Interlocks, page 44
 - Diagnostic Information, page 46
 - Maintenance, page 49

Faceplate Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Operation Tab

The figure shows an example of the Operation tab with the optional local panel:



NOTE: This tab features the control module reset button. The partial reset buttons are available on the Interlocks and Diagnostic Information tabs.

Configuration Tab

The figure shows an example of the Configuration tab:



NOTE: This tab features the global bypass button. The partial bypass buttons are available on the Interlocks tab.

Interlocks Tab

The tab displays the optional rearm confirmation dialog box when enabled.

Diagnostic Information Tab

The tab displays the optional rearm confirmation dialog box when enabled.

2-Speed/2-Rotation Direction Motor Management

What's in This Chapter

Supervision Functions	112
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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 genies and their associated faceplate.

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_motor2` library when implemented through the `$Motor2` control module template:

Control resources	Description	Resource status				
MOTOR2	2 speed/2 rotation direction motor logic	X				
DEVMNT	On/off device maintenance	O				
MOTOR2LP	Local panel for controlling 2-speed/2-rotation direction motors					
CONDSUM	Summary of conditions					
CONDSUM1	Interlock condition summary					
<table><tr><td>X</td><td>Mandatory resource</td></tr><tr><td>O</td><td>Optional resource</td></tr></table>			X	Mandatory resource	O	Optional resource
X	Mandatory resource					
O	Optional resource					

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to On/Off device control (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag name	Description
CM name_MOTOR2_STW	Device status information
CM name_MOTOR2_CFGW	Device configuration data
Optional tags	
CM name_MOTOR2LP__STW	Local panel status information
CONDSUM	Refer to Commonly Used Blocks, page 53.
CONDSUM1	Refer to Commonly Used Blocks, page 52.
DEVMNT	Refer to Commonly Used Blocks, page 52.

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components and the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
CM name_MOTOR2_UNPOS	Active operation is not determined	CM name_MOTOR2_STW BitAND 0x0004	No
CM name_MOTOR2_ALARM1	Detection of not confirmed operation for device 1	CM name_MOTOR2_STW BitAND 0x0400	
CM name_MOTOR2_ALARM2	Detection of not confirmed operation for device 2	CM name_MOTOR2_STW BitAND 0x0800	
CM name_MOTOR2_FAIL1	Detected error forward direction/speed 1	CM name_MOTOR2_STW BitAND 0x1000	
CM name_MOTOR2_FAIL2	Detected error reverse direction/speed 2	CM name_MOTOR2_STW BitAND 0x2000	
Optional tags			
CM name_MOTOR2_ZSH1POS	Switching operation confirmation	CM name_MOTOR2_STW BitAND 0x0001	Yes
CM name_MOTOR2_ZSH2POS	Switching operation confirmation	CM name_MOTOR2_STW BitAND 0x0002	

Alarm tag	Description	Expression	Process event, page 30
CM name_MOTOR2_OP1	Control signal 2 of device connected	CM name_MOTOR2_STW BitAND 0x0010	
CM name_MOTOR2_OP2	Control signal 1 of device connected	CM name_MOTOR2_STW BitAND 0x0020	
CM name_MOTOR2_REM	Device controlled remotely	CM name_MOTOR2_STW BitAND 0x0040	
CM name_MOTOR2_ILCK	Device interlocked	CM name_MOTOR2_STW BitAND 0x0080	
CM name_MOTOR2_EXTCTLD	Device externally controlled	CM name_MOTOR2_STW BitAND 0x0200	
CM name_MOTOR2_LSPSEL	Motor command	CM name_MOTOR2_CFGW BitAND 0x0010	
CM name_MOTOR2_LSP	Motor command	CM name_MOTOR2_CFGW BitAND 0x0020	
CM name_MOTOR2LP_LPmode	Local panel mode active	CM name_MOTOR2LP_STW BitAND 0x0001	
CM name_MOTOR2LP_ZEROMODE	Local panel zero mode active	CM name_MOTOR2LP_STW BitAND 0x0002	
CM name_MOTOR2LP_CSMODE	Control system mode active	CM name_MOTOR2LP_STW BitAND 0x0004	
DEVMNT	Refer to Commonly Used Blocks , page 53.		

Trend Tags

No trend tags are managed by Supervision components for 2-speed/2-direction motor management.

Genies

Genie Properties







Refer to [Using Genies](#), page 34.



Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The table describes the genies of the `sgc_motor2` library:

Graphic symbol	Genie name	Facet template identifier	Description
	sgc_hlmotor2d_10	\$HLMOTOR2D_CG	Representation with symbols corresponding to a left horizontal motor and 2o rotation directions.
	sgc_hlmotor2s_10	\$HLMOTOR2S_CG	Representation with symbols corresponding to a left horizontal motor and 2 speeds.
	sgc_hrmotor2d_10	\$HRMOTOR2D_CG	Representation with symbols corresponding to a right horizontal motor and 2 rotation directions.
	sgc_hrmotor2s_10	\$HRMOTOR2S_CG	Representation with symbols corresponding to a right horizontal motor and 2 speeds.
	sgc_vmotor2d_10	\$VMOTOR2D_CG	Representation with symbols corresponding to a vertical motor and 2 rotation direction.
	sgc_vmotor2s_10	\$VMOTOR2S_CG	Representation with symbols corresponding to a vertical motor and 2 speeds.

Graphic symbol	Genie name	Facet template identifier	Description
	sgc_vumotor2d_10	\$VUMOTOR2D_CG	Representation with symbols corresponding to a vertical motor, upper axis, and 2 rotation directions.
	sgc_vumotor2s_10	\$VUMOTOR2S_CG	Representation with symbols corresponding to a vertical motor, upper axis, and 2 speeds.

Faceplates

Overview

During operation, clicking a genie of the `sgc_motor2` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation with optional local panel, page 43
 - Configuration
 - Information
- Optional tabs:
 - Interlocks, page 44
 - Diagnostic Information, page 46
 - Maintenance, page 49

Faceplate Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Operation Tab

The figure shows an example of the Operation tab with the optional local panel section:



NOTE: This tab features the control module reset button. The partial reset buttons are available on the Interlocks and Diagnostic Information tabs.

Configuration Tab



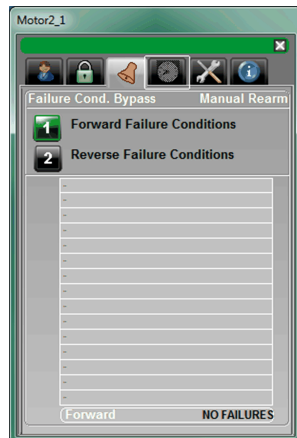
NOTE: This tab features the global bypass button. The partial bypass buttons are available on the Interlocks tab.

Interlocks Tab

The tab displays the optional rearm confirmation dialog box when enabled.

Diagnostic Information Tab

The figure shows an example of the optional Diagnostic Information tab for forward mode:



The tab allows you to view diagnostic information for forward or reverse mode by clicking the corresponding buttons.

The tab displays the optional rearm confirmation dialog box when enabled.

Discrete Motorized Valve Management

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 genies and their associated faceplate.

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_mvalved` library when implemented through the `$MValve` control module template:

Control resources	Description	Resource status
MVALVED	Discrete motorized valve logic	X
MOTOR2	2-speed/2-rotation direction motor logic	
DINPUT	Valve position	
DEVMNT	On/off device maintenance	O
MVALVEDLP	Local panel for controlling discrete motorized valves	
CONDSUM	Summary of conditions	
CONDSUM1	Interlock condition summary	
X	Mandatory resource	
O	Optional resource	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to On/Off Device Control, Signal Processing, and Auxiliary Functions (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag name	Description
CM name_MVALVED_STW	Device status information
CM name_MVALVED_CFGW	Device configuration data
MOTOR2	Refer to <i>MOTOR2</i> .
DINPUT	Refer to <i>DINPUT</i> .
Optional tags	
CONDSUM	Refer to Commonly Used Blocks, page 53.
CONDSUM1	Refer to Commonly Used Blocks, page 52.
DEVMNT	Refer to Commonly Used Blocks, page 52.
DEVLDP	Refer to Commonly Used Blocks, page 53.
CM name_MVALVEDLDP__STW	Local panel status information

Advanced Alarm Tags

The table describes the advanced alarm tags that are managed by Supervision components and the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
CM name_MVALVED_ALARM1	Detection of not confirmed operation for valve opening	CM name_MVALVED_STW BitAND 0x0400	No
CM name_MVALVED_ALARM2	Detection of not confirmed operation for valve closing	CM name_MVALVED_STW BitAND 0x0800	
CM name_MVALVED_FAIL	Detected error forward direction/speed 1	CM name_MVALVED_STW BitAND 0x1000	
MOTOR2	Refer to <i>MOTOR2</i> .		
DINPUT	Refer to <i>DINPUT</i> .		
Optional tags			
CM name_MVALVED_OPEN	Fully open position confirmation	CM name_MVALVED_STW BitAND 0x0001	Yes

Alarm tag	Description	Expression	Process event, page 30
CM name_MVALVED_CLOSED	Closed position confirmation	CM name_MVALVED_STW BitAND 0x0002	
CM name_MVALVED_REM	Device controlled remotely	CM name_MVALVED_STW BitAND 0x0040	
CM name_MVALVED_ILCK	Device interlocked	CM name_MVALVED_STW BitAND 0x0080	
CM name_MVALVED_LSPSEL	Valve command	CM nameD_MVALVED_CFGW BitAND 0x0010	
CM name_MVALVED_LSP	Valve command	CM name_MVALVED_CFGW BitAND 0x0020	
CM name_MVALVED_LPMODE	Local panel mode active	CM name_MVALVEDLP_STW BitAND 0x0001	
CM name_MVALVEDLP_ZEROMODE	Local panel zero mode active	CM name_MVALVEDLP_STW BitAND 0x0002	
CM name_MVALVEDLP_CSMODE	Control system mode active	CM name_MVALVEDLP_STW BitAND 0x0004	
DEVMNT	Refer to Commonly Used Blocks, page 52.		

Trend Tags

No trend tags are managed by Supervision components for discrete motorized valve management.

Genies

Genie Properties



Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The table describes the genies of the `sgc_mvalved` library:

Graphic symbol	Genie name	Facet template identifier	Description
	sgc_mvalved_10	\$MValveD_10_CG	Representation of motorized valve without positioner.
	sgc_mvalved_10	\$MValveD_S_10_CG	Representation of motorized valve without positioner, smaller size.

Faceplates

Overview

During operation, clicking a genie of the `sgc_mvalved` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation with optional local panel, page 43
 - Configuration
 - Information
- Optional tabs:
 - Interlocks, page 44
 - Diagnostic Information, page 46
 - Maintenance, page 49

Faceplate Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Operation Tab

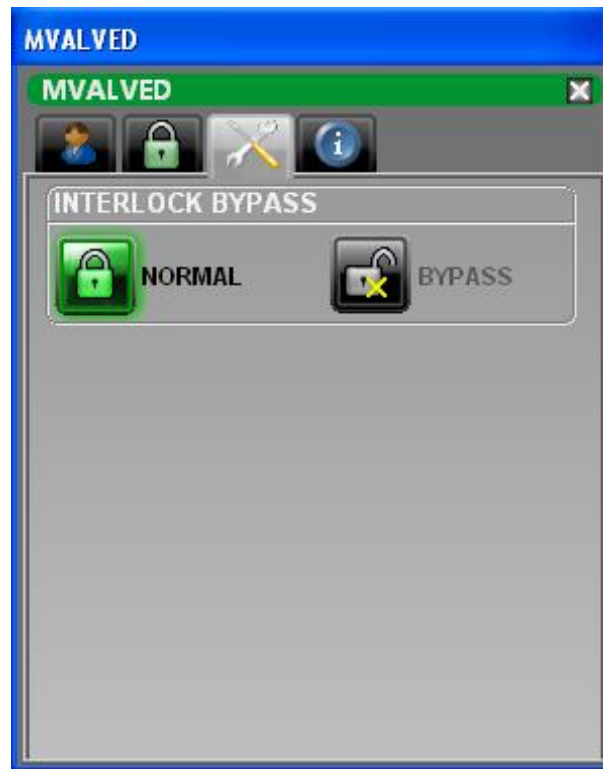
The figure shows an example of the Operation tab with the optional local panel section:



NOTE: This tab features the control module reset button. The partial reset buttons are available on the Interlocks and Diagnostic Information tabs.

Configuration Tab

The figure shows an example of the Configuration tab:



NOTE: This tab features the global bypass button. The partial bypass buttons are available on the Interlocks tab.

Interlocks Tab

The tab displays the optional rearm confirmation dialog box when enabled.

Diagnostic Information Tab

The tab displays the optional rearm confirmation dialog box when enabled.

On/Off Valve Management

What's in This Chapter

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Control/Supervision Relationship	125
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Genies	126
Faceplates	128

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 genies and their associated faceplate.

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_devctl_valves` library when implemented through the `$Valve` control module template:

Control resources		Description	Resource status
DEVCTL		On/off device logic	X
DEVMNT		On/off device maintenance	O
DEVLP		Local panel for on/off valves	
CONDSUM1		Interlock condition summary	
X		Mandatory resource	
O		Optional resource	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to On/Off device control (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag name	Description
DEVCTL	Refer to Commonly Used Blocks, page 52.
Optional tags	
CONDSUM1	Refer to Commonly Used Blocks, page 52.
DEVMNT	Refer to Commonly Used Blocks, page 52.
DEVL	Refer to Commonly Used Blocks, page 53.

Advanced Alarm Tags

The table describes the advanced alarm tags and the process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
DEVCTL	Refer to Commonly Used Blocks, page 53.		
Optional tags			
DEVMNT	Refer to Commonly Used Blocks, page 53.		
DEVL	Refer to Commonly Used Blocks, page 54.		

Trend Tags

No trend tags are managed by Supervision components for on/off valve management.

Genies

Genie Properties







Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The table describes the genies of the `sgc_devctl_valves` library:

Graphic symbol	Genie name	Facet template identifier	Description
	hrightdownvalve3_10	\$hrightdownvalve3_10_CG	3-way valve represented horizontally.
	hdvalve2_10	\$hdvalve2_10_CG	2-way valve represented horizontally.
	vduprightvalve3_10	\$vduprightvalve3_10_CG	3-way valve represented vertically.
	vdvalve2_10	\$vdvalve2_10_CG	2-way valve represented vertically.
	vtdvalve2_10	\$vtdvalve2_10_CG	2-way knife gate valve represented horizontally and with control on the left.
	vtvalve2_10	\$vtvalve2_10_CG	2-way knife gate valve represented horizontally and with control on the right.

Faceplates

Overview

During operation, clicking a genie of the `sgc_devctl_valves` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation with optional local panel, page 43
 - Configuration
 - Information
- Optional tabs:
 - Interlocks, page 44
 - Maintenance, page 49

Faceplate Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Faceplate Representation

For a representation of the faceplate for on/off valve management, refer to the on/off motor management faceplate, page 109.

On/Off Valve With Two Outputs Management

What's in This Chapter

Supervision Functions	129
Control/Supervision Relationship	129
Tags	130
Genies	131
Faceplates	131

Overview

This chapter describes the Supervision resources and runtime services that are available for the management of on/off valves with two outputs.

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 genies and their associated faceplate.

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_devctl_valves` library when implemented through the `$Valve2` control module template:

Control resources		Description	Resource status
DEVCTL		On/off device logic	X
DOUTPUT		Valve position	
DEVMNT		On/off device maintenance	O
DEVLPL		Local panel for controlling on/off devices	
CONDSUM1		Interlock condition summary	
X		Mandatory resource	
O		Optional resource	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to On/Off device control, Signal Processing and Auxiliary Functions (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag name	Description
DEVCTL	Refer to Commonly Used Blocks, page 52.
DOUTPUT	Refer to <i>DOUTPUT</i> .
Optional tags	
CONDSUM1	Refer to Commonly Used Blocks, page 52.
DEVMNT	Refer to Commonly Used Blocks, page 52.
DEVLP	Refer to Commonly Used Blocks, page 53.
DEVCTL	Refer to Commonly Used Blocks, page 52.

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
DEVCTL	Refer to Commonly Used Blocks, page 53.		
DOUTPUT	Refer to <i>DOUTPUT</i> .		
Optional tags			
DEVMNT	Refer to Commonly Used Blocks, page 53.		
DEVLP	Refer to Commonly Used Blocks, page 54.		

Trend Tags

No trend tags are managed by Supervision components for on/off valve with two outputs management.

Genies

Genie Properties

Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The genies for the management of on/off valves with two outputs are a combination of the genies that are available for the following Supervision functions:

- On/off valve management, page 87
- Digital output management, page 87

Faceplates

Overview

During operation, clicking a genie of the `sgc_devctl_valves` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation with optional local panel, page 43
 - Configuration
 - Information
- Optional tabs:
 - Interlocks, page 44
 - Maintenance, page 49

Faceplate Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Faceplate Representation

For a representation of the faceplates for on/off valve with two outputs management, refer to the faceplates for:

- On/off motor management, page 109
- Digital output management, page 88

Analog Device Control


What's in This Part

Control Valve With Position Feedback Management	133
Motorized Valve With Position Management	139
Device with Variable Speed Drive Management	145

Overview

This part describes the components that provide the Supervision functions for the analog device control family.

These components do not reflect any specific installation.

 **WARNING**

LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA), or equivalent risk analysis, 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 them.
- Review the implications of communication link interruptions and take actions to mitigate them.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and error conditions) according to your risk assessment, and applicable codes and regulations.
- Apply local accident prevention and safety regulations and guidelines.¹
- Test each implementation of a system for proper operation before placing it into service.

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

¹ 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.

Control Valve With Position Feedback Management

What's in This Chapter

Supervision Functions	133
Control/Supervision Relationship	133
Tags	134
Genies	135
Faceplates	136

Overview

This chapter describes the Supervision resources and runtime services that are available for the management of control valves with position feedback.

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 genies and their associated faceplate.

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_cvalve` library when implemented through the `$ControlValve` control module template:

Control resources		Description	Resource status
CVALVE		Control valve with position feedback logic	X
CVALVELP		Local panel for controlling control valves	O
CONDSUM1		Interlock condition summary	
X	Mandatory resource		
O	Optional resource		

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Analog Device Control and Auxiliary Functions (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag name	Description
CM name_CVALVE_STW	Device status information
CM name_CVALVE_CFGW	Device configuration data
Optional tags	
CONDSUM1	Refer to Commonly Used Blocks, page 52.
CM name_CVALVELP__STW	Local panel status information

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
CM name_CVALVE_CHINFAILURE	Inoperable input channel	CM name_CVALVE_STW BitAND 0x0001	No
CM name_CVALVE_CHOUTFAILURE	Inoperable output channel	CM name_CVALVE_STW BitAND 0x0010	
CM name_CVALVE_FAIL	Inoperable device	CM name_CVALVE_STW BitAND 0x0200	
CM name_CVALVE_ALARM	Detection of not confirmed operation	CM name_CVALVE_STW BitAND 0x0400	
Optional tags			
CM name_CVALVE_ILCK	Device interlocked	CM name_CVALVE_STW BitAND 0x0002	Yes
CM name_CVALVE_REM	Device controlled remotely	CM name_CVALVE_STW BitAND 0x0004	
CM name_CVALVE_ZSLPOS	Closed valve position reached	CM name_CVALVE_STW BitAND 0x0800	
CM name_CVALVE_ZSHPOS	Open valve position reached	CM name_CVALVE_STW BitAND 0x1000	
CM name_CVALVELP_LPMODE	Local panel mode active	CM name_CVALVELP_STW BitAND 0x0001	
CM name_CVALVELP_ZEROMODE	Local panel zero mode active	CM name_CVALVELP_STW BitAND 0x0002	

Alarm tag	Description	Expression	Process event, page 30
CM name_CVALVELP_CSMODE	Control system mode active	CM name_CVALVELP_STW BitAND 0x0004	

Trend Tags

The table describes the trend tags that are managed by Supervision components and their expression:

Tag name	Description	Expression
CM name_CVALVE_PV	Present value	CM name_CVALVE_PV
CM name_CVALVE_OP	Valve position output	CM name_CVALVE_OP
CM name_CVALVE_LSP	Local setpoint	CM name_CVALVE_LSP

Genies

Genie Properties



Refer to Using Genies, page 34.



Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The table describes the genies of the `sgc_cvalve` library:

Graphic symbol	Genie name	Facet template identifier	Description
	sgc_hcrighdownvalve3_10	\$CValve_HCRightDown_CG	Representation with horizontal 3-way valve symbols (fluid enters through the left and the corresponding outlets are on the right or on the bottom). The current value of the valve position and the state of the limit switches are optionally shown in the foreground.
	sgc_hcvalve2_10	\$CValve_HC_CG	Representation with horizontal 2-way valve symbols. The current value of the valve position and the state of the limit switches are optionally shown in the foreground.

Graphic symbol	Genie name	Facet template identifier	Description
 The graphic symbol shows a vertical 3-way valve with a horizontal handle. The handle has a blue arrow pointing right and a yellow arrow pointing left. The valve body is green and yellow. The text 'sgc_vcup..._10' is at the bottom.	sgc_vcuprightvalve3_10	\$CValve_VCUpright_CG	Representation with vertical 3-way valve symbols (fluid enters through the bottom and the corresponding outlets are on the right or on the top). The current value of the valve position and the state of the limit switches are optionally shown in the foreground.
 The graphic symbol shows a vertical 2-way valve with a horizontal handle. The handle has a blue arrow pointing right and a yellow arrow pointing left. The valve body is green and yellow. The text 'sgc_vcva..._10' is at the bottom.	sgc_vcvalve2_10	\$CValve_VC_CG	Representation with vertical 2-way valve symbols. The current value of the valve position and the state of the limit switches are optionally shown in the foreground.

Faceplates

Overview

During operation, clicking a genie of the `sgc_cvalve` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation with optional local panel, page 43
 - Configuration
 - Information
- Optional tabs:
 - Interlocks, page 44

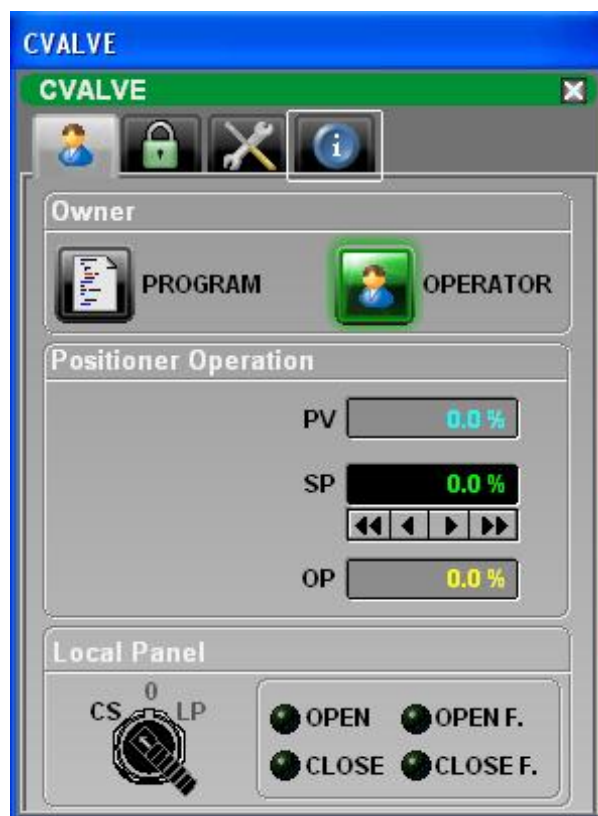
Faceplate Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

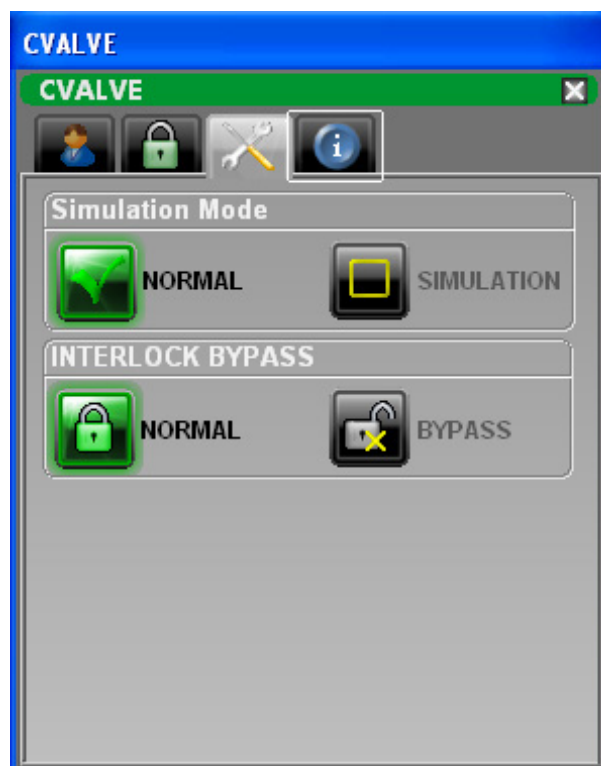
Operation Tab

The figure shows an example of the Operation tab with the optional local panel section:



Configuration Tab

The figure shows an example of the Configuration tab:



NOTE: This tab features the global bypass button. The partial bypass buttons are available on the Interlocks tab.

Interlocks Tab

The tab displays the optional rearm confirmation dialog box when enabled.

Motorized Valve With Position Management

What's in This Chapter

Supervision Functions	139
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Faceplates	142

Overview

This chapter describes the Supervision resources and runtime services that are available for the management of motorized valves with positioner.

Supervision Functions

Description

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

- Main core functions encompass status monitoring, owner selection, three-step 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 genies and their associated faceplate.

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_mvalve` library when implemented through the `$MValveWithPos` control module template:

Control resources	Description	Re-source status
MOTOR2	2-speed/2-rotation direction motor logic	X
MVALVE	Motorized valve with positioner logic	
AINPUT	Device position	
DINPUT	Limit switches	

Control resources	Description	Re- source status
DEVMNT	On/off device maintenance	O
MVALVELP	Local panel for controlling motorized valves	
CONDSUM	Summary of conditions	
CONDSUM1	Interlock condition summary	
X	Mandatory resource	
O	Optional resource	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Analog Device Control and Auxiliary Functions (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag name	Description
CM name_MVALVE_STW	Device status information
CM name_MVALVE_CFGW	Device configuration data
AINPUT	Refer to <i>AINPUT</i> .
MOTOR2	Refer to <i>MOTOR2</i> .
DINPUT	Refer to <i>DINPUT</i> .
Optional tags	
CM name_MVALVELP__STW	Local panel status information
CONDSUM	Refer to <i>Commonly Used Blocks</i> , page 53.
CONDSUM1	Refer to <i>Commonly Used Blocks</i> , page 52.
DEVMNT	Refer to <i>Commonly Used Blocks</i> , page 52.

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
CM name_MVALVE_FAIL	Detected error in auxiliary device	CM name_MVALVE_STW BitAND 0x0200	No
CM name_MVALVE_ALARM	Detection of not confirmed operation	CM name_MVALVE_STW BitAND 0x0400	
CM name_MVALVE_POSMISALARM	Detection of position mismatch	CM name_MVALVE_STW BitAND 0x4000	
MOTOR2	Refer to <i>MOTOR2</i> .		
DINPUT	Refer to <i>DINPUT</i> .		
AINPUT	Refer to <i>AINPUT</i> .		
Optional tags			
CM name_MVALVE_REM	Device controlled remotely	CM name_MVALVE_STW BitAND 0x0001	Yes
CM name_MVALVE_ILCK	Device interlocked	CM name_MVALVE_STW BitAND 0x0004	
CM name_MVALVE_OPEN	Fully open position confirmation	CM name_MVALVE_STW BitAND 0x0040	
CM name_MVALVE_CLOSED	Closed position confirmation	CM name_MVALVE_STW BitAND 0x0080	
CM name_MVALVE_START	Closed position confirmation	CM name_MVALVE_CFGW BitAND 0x0004	
CM name_MVALVELP_LPMODE	Local panel mode active	CM name_MVALVELP_STW BitAND 0x0001	
CM name_MVALVELP_ZEROMODE	Local panel zero mode active	CM name_MVALVELP_STW BitAND 0x0002	
CM name_MVALVELP_CSMODE	Control system mode active	CM name_MVALVELP_STW BitAND 0x0004	
DEV MNT	Refer to Commonly Used Blocks, page 52.		

Trend Tags

The table describes the trend tags managed by Supervision components and their expression:

Tag name	Description	Expression
CM name_MVALVE_PV	Present value	CM name_MVALVE_PV
CM name_MVALVE_SP	Setpoint	CM name_MVALVE_SP
CM name_AINPUT_PV	Present value	CM name_AINPUT_PV

Genies

Genie Properties




Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The table describes the genies of the `sgc_mvalve` library:

Graphic symbol	Genie name	Facet template identifier	Description
	<code>sgc_mvalve_10</code>	<code>\$MVALVE_10_CG</code>	Representation of motorized valve with positioner. Shown in the foreground.
	<code>sgc_mvalve_S_10</code>	<code>\$MVALVE_S_CG</code>	Representation of motorized valve with positioner small size. Shown in the foreground.
	<code>sgc_mvalve_trend_xy</code>	<code>\$MVALVE_TREND_CG</code>	Numerical representation of the setpoint and the current value of the measurement.

Faceplates

Overview

During operation, clicking a genie of the `sgc_mvalve` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation with optional local panel, page 43
 - Configuration
 - Information
- Optional tabs:
 - Interlocks, page 44
 - Diagnostic Information, page 46
 - Maintenance, page 49

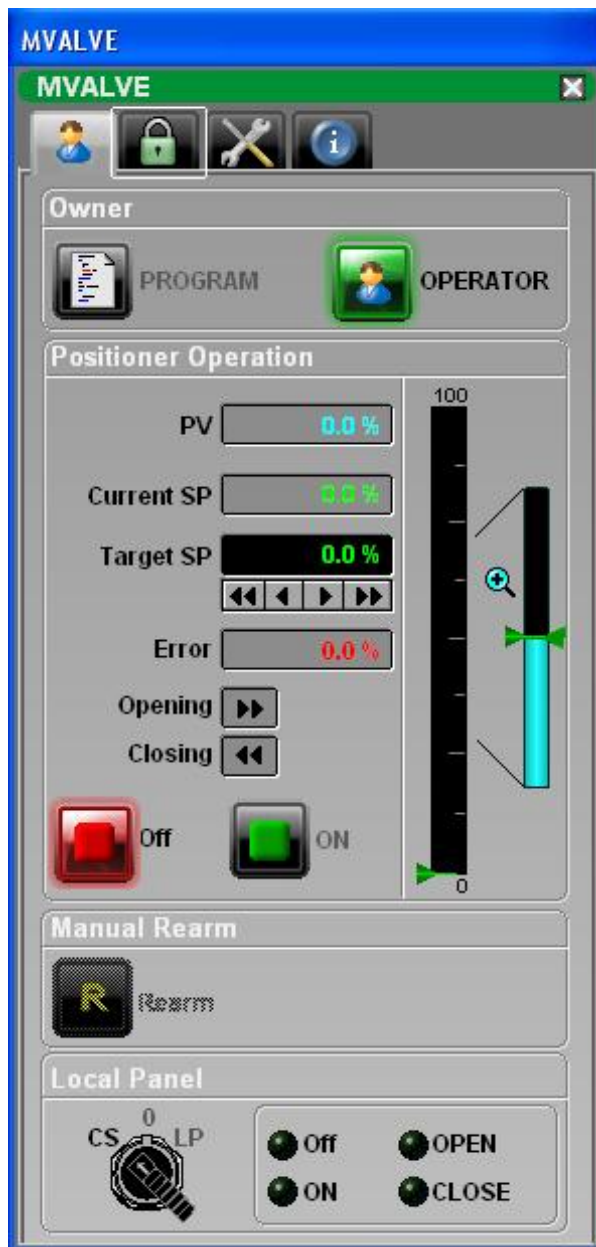
Faceplate Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Operation Tab

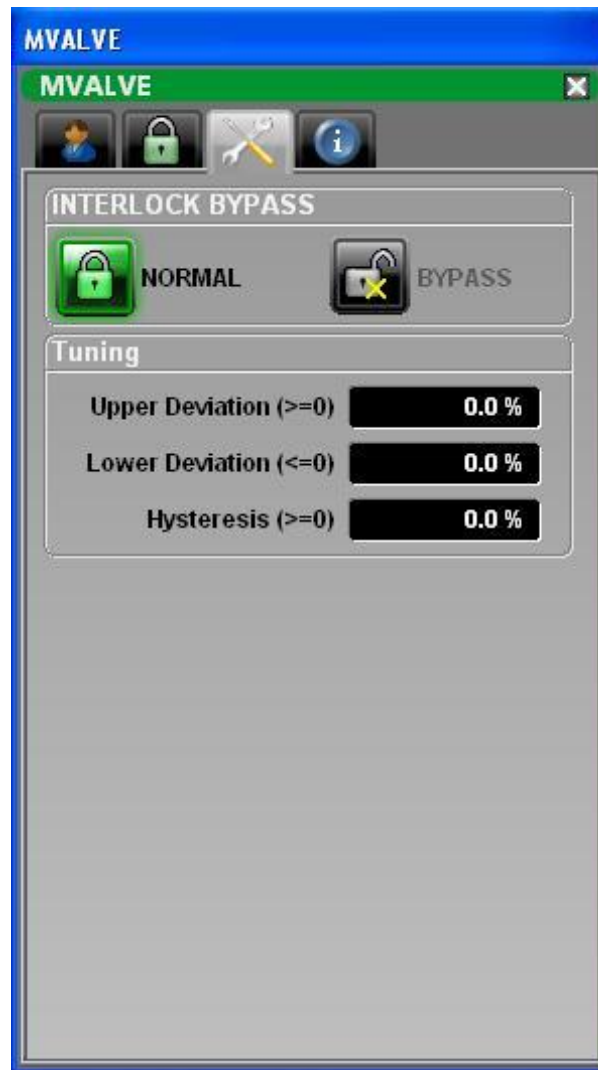
The figure shows an example of the Operation tab with the optional local panel section:



NOTE: This tab features the control module reset button. The partial reset buttons are available on the Interlocks and Diagnostic Information tabs.

Configuration Tab

The figure shows an example of the Configuration tab:



NOTE: This tab features the global bypass button. The partial bypass buttons are available on the Interlocks tab.

Interlocks Tab

The tab displays the optional rearm confirmation dialog box when enabled.

Diagnostic Information Tab

The tab displays the optional rearm confirmation dialog box when enabled.

Device with Variable Speed Drive Management

What's in This Chapter

Supervision Functions	145
Control/Supervision Relationship	145
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Genies	147
Faceplates	149

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 genies and their associated faceplate.

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_sddevctl` library when implemented through the `$MotorVS` control module template:

Control resources	Description	Resource status
SDDEVCTL	Device with variable speed drive logic	X
DEVMNT	On/off device maintenance	O
SDDEVLP	Local panel for controlling devices with variable speed drive	
CONDSUM	Summary of conditions	
CONDSUM1	Interlock condition summary	
X	Mandatory resource	
O	Optional resource	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Analog Devices Control, On/Off Device Control and Auxiliary Functions (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag name	Description
CM name_SDDEVCTL_STW	Device status information
CM name_SDDEVCTL_CFGW	Device configuration data
Optional tags	
CM name_SDDEVLP__STW	Local panel status information
CONDSUM	Refer to Commonly Used Blocks, page 53.
CONDSUM1	Refer to Commonly Used Blocks, page 52.
DEVMNT	Refer to Commonly Used Blocks, page 52.

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
CM name_SDDEVCTL_ALARM	Detection of not confirmed operation	CM name_SDDEVCTL_STW BitAND 0x0010	No
CM name_SDDEVCTL_FAIL	Inoperable device	CM name_SDDEVCTL_STW BitAND 0x0020	
Optional tags			
CM name_SDDEVCTL_RUNNING	Speed drive frequency output	CM name_SDDEVCTL_STW BitAND 0x0001	Yes
CM name_SDDEVCTL_DIRECT	Forward direction signal	CM name_SDDEVCTL_STW BitAND 0x0002	
CM name_SDDEVCTL_REVERSE	Reverse direction signal	CM name_SDDEVCTL_STW BitAND 0x0004	
CM name_SDDEVCTL_REM	Device controlled remotely	CM name_SDDEVCTL_STW BitAND 0x0040	

Alarm tag	Description	Expression	Process event, page 30
CM name_SDDEVCTL_ILCK	Device interlocked	CM name_SDDEVCTL_STW BitAND 0x0080	
CM name_SDDEVCTL_EXTCTLD	Device externally controlled	CM name_SDDEVCTL_STW BitAND 0x0200	
CM name_SDDEVCTL_SPSELD	Analog setpoint input activated	CM name_SDDEVCTL_STW BitAND 0x0400	
CM name_SDDEVCTL_S1SELD	Multispeed activated	CM name_SDDEVCTL_STW BitAND 0x0800	
CM name_SDDEVCTL_S2SELD	Multispeed activated	CM name_SDDEVCTL_STW BitAND 0x1000	
CM name_SDDEVCTL_S3SELD	Multispeed activated	CM name_SDDEVCTL_STW BitAND 0x2000	
CM name_SDDEVCTL_POWERMVL	Speed drive disabled	CM name_SDDEVCTL_STW BitAND 0x8000	
CM name_SDDEVCTL_LSPREV	Rotation direction	CM name_DEVCTL_CFGW BitAND 0x0010	
CM name_SDDEVCTL_LSSTART	Speed drive command	CM name_DEVCTL_CFGW BitAND 0x0020	
CM name_SDDEVLP_LPMODE	Local panel mode active	CM name_SDDEVLP_STW BitAND 0x0001	
CM name_SDDEVLP_ZEROMODE	Local panel zero mode active	CM name_SDDEVLP_STW BitAND 0x0002	
CM name_SDDEVLP_CSMODE	Control system mode active	CM name_SDDEVLP_STW BitAND 0x0004	
DEVMNT	Refer to Commonly Used Blocks, page 52.		

Trend Tags

The table describes the trend tags that are managed by Supervision components and their expression:

Tag name	Description	Expression
CM name_SDDEVCTL_PV	Current speed value	CM name_SDDEVCTL_PV
CM name_SDDEVCTL_SP	Current speed setpoint	CM name_SDDEVCTL_SP
CM name_SDDEVCTL_OP	Current output to speed drive	CM name_SDDEVCTL_OP

Genies

Genie Properties






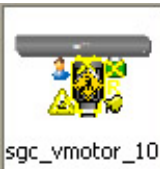
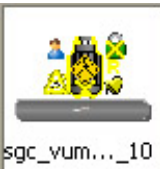
Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The table describes the genres of the `sgc_sddevctl` library:

Graphic symbol	Genie name	Facet template identifier	Description
	<code>sgc_hlmotor_10</code>	<code>\$SDDEVCTLHLMOTOR_CG</code>	Representation with left horizontal motor symbols.
	<code>sgc_hrmotor_10</code>	<code>\$SDDEVCTLHRMOTOR_CG</code>	Representation with right horizontal motor symbols.
	<code>sgc_rcpump_10</code>	<code>\$SDDEVCTLRCPUMP_CG</code>	Representation with right horizontal centrifugal pump symbols.
	<code>sgc_sddevctl_pvsp</code>	<code>\$SDDEVCTLPVSP_CG</code>	Current value (PV) and set-point (SP) of motor with speed driver
	<code>sgc_sddevctl_pvspop</code>	<code>\$SDDEVCTLPVSPOP_CG</code>	Current value (PV), set-point (SP), and output (OP) of motor with speed driver.
	<code>sgc_vmotor_10</code>	<code>\$SDDEVCTLVMOTOR_CG</code>	Representation with vertical motor symbols.
	<code>sgc_vumotor_10</code>	<code>\$SDDEVCTLVUMOTOR_CG</code>	Representation with vertical motor symbols, upper axis.

Faceplates

Overview

During operation, clicking a genie of the `sgc_sddevctl` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation with optional local panel, page 43
 - Configuration
 - Information
- Optional tabs:
 - Interlocks, page 44
 - Diagnostic Information, page 46
 - Maintenance, page 49

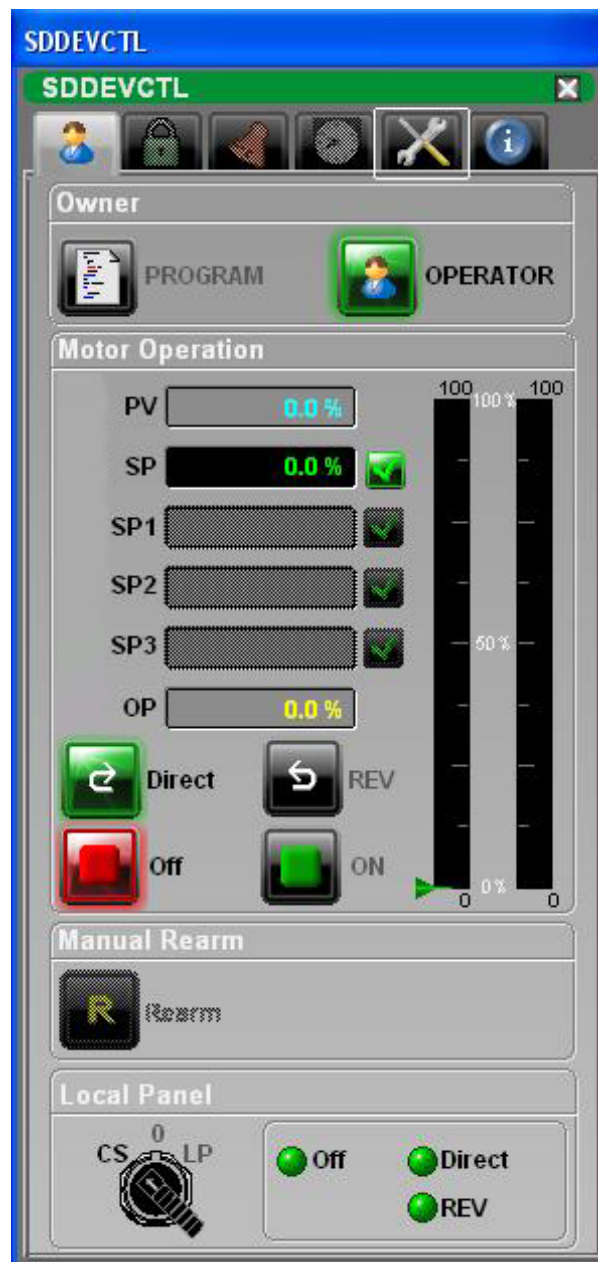
Faceplate Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Operation Tab

The figure shows an example of the Operation tab with the optional local panel section:



NOTE: This tab features the control module reset button. The partial reset buttons are available on the Interlocks and Diagnostic Information tabs.

Configuration Tab

The figure shows an example of the Configuration tab:



NOTE: This tab features the global bypass button. The partial bypass buttons are available on the Interlocks tab.

Interlocks Tab

The tab displays the optional rearm confirmation dialog box when enabled.

Diagnostic Information

The tab displays the optional rearm confirmation dialog box when enabled.


Process Control

What's in This Part

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Overview

This part describes the components that provide the Supervision functions for the process control family.

 **WARNING**

LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA), or equivalent risk analysis, 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 them.
- Review the implications of communication link interruptions and take actions to mitigate them.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and error conditions) according to your risk assessment, and applicable codes and regulations.
- Apply local accident prevention and safety regulations and guidelines.¹
- Test each implementation of a system for proper operation before placing it into service.

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

¹ 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.

IMC Controller Management

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Overview

This chapter describes the Supervision resources and runtime services that are available for the management of IMC controllers.

Supervision Functions

Description

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

- Main core functions encompass status monitoring, owner selection, setpoint management (IMC controller indication, IMC controller tuning, controller action), and global bypassing of interlock conditions.
- Optional functions encompass individual interlock condition management.

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

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_imctl` library when implemented through the `$IMC` control module template:

Control resources		Description	Resource status
IMCTL		IMC controller logic	X
CONDSUM1		Interlock condition summary	O
X		Mandatory resource	
O		Optional resource	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Process Control and Auxiliary Functions (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to [Genie Control Module Name](#), page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag name	Description
CM name_IMCTL_STW	Device status information
CM name_IMCTL_CFGW	Device configuration data
Optional tags	
CONDSUM1	Refer to Commonly Used Blocks , page 52.

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
Optional tags			
CM name_IMCTL_REM	Device controlled remotely	CM name_IMCTL_STW BitAND 0x0001	Yes
CM name_IMCTL_ILCK	Device interlocked	CM name_IMCTL_STW BitAND 0x0004	
CM name_IMCTL_OVERRIDE	Operating with external output	CM name_IMCTL_STW BitAND 0x0008	

Trend Tags

The table describes the trend tags that are managed by Supervision components and their expression:

Tag name	Description	Expression
CM name_IMCTL_SP	Current setpoint	CM name_IMCTL_SP
CM name_IMCTL_PV	Current value	CM name_IMCTL_PV
CM name_IMCTL_OP	Current output	CM name_IMCTL_OP

Genies

Genie Properties





Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The table describes the genies of the `sgc_imctl` library:

Graphic symbol	Genie name	Facet template identifier	Description
	<code>sgc_imctl_pvsp_10</code>	<code>\$IMCTLPVSP_CG</code>	The value of the set-point and the current value of the measurement are shown in the foreground.
	<code>sgc_imctl_pvspop_xy</code>	<code>\$IMCTLPVSPPOP_CG</code>	The value of the set-point, the output calculated by the controller, and the current value of the measurement are shown in the foreground.
	<code>sgc_imctl_sp_10</code>	<code>\$IMCTLSP_CG</code>	Only the value of the set-point is shown in the foreground.
	<code>sgc_imctl_spop_10</code>	<code>\$IMCTLSPPOP_CG</code>	The value of the set-point and the value of the output calculated by the controller are shown in the foreground.

Faceplates

Overview

During operation, clicking a genie of the `sgc_imctl` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation
 - Configuration
 - Information
- Optional tab:
 - Interlocks, page 44

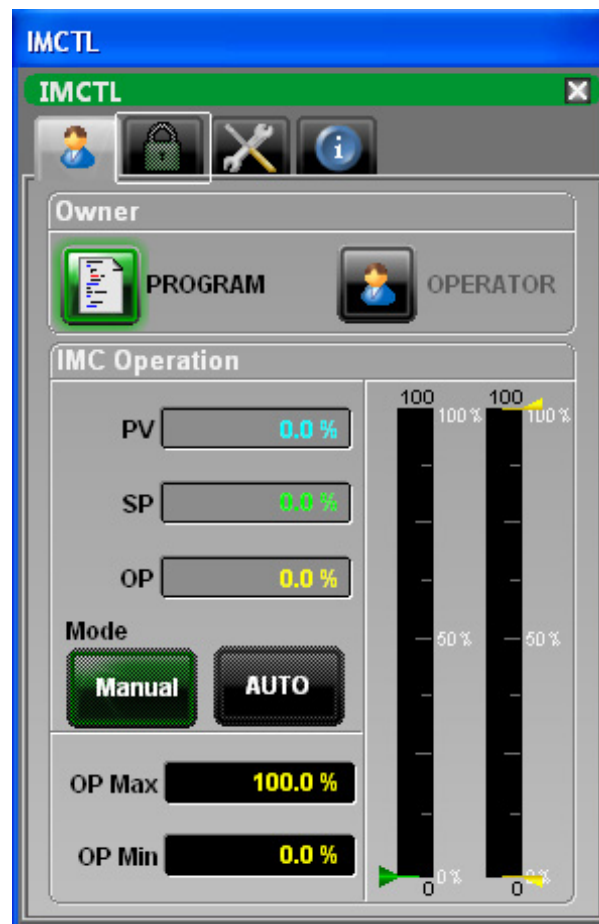
Faceplate Description

At the beginning of this manual, you can find the description of:

- The color conventions, page 33 are used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

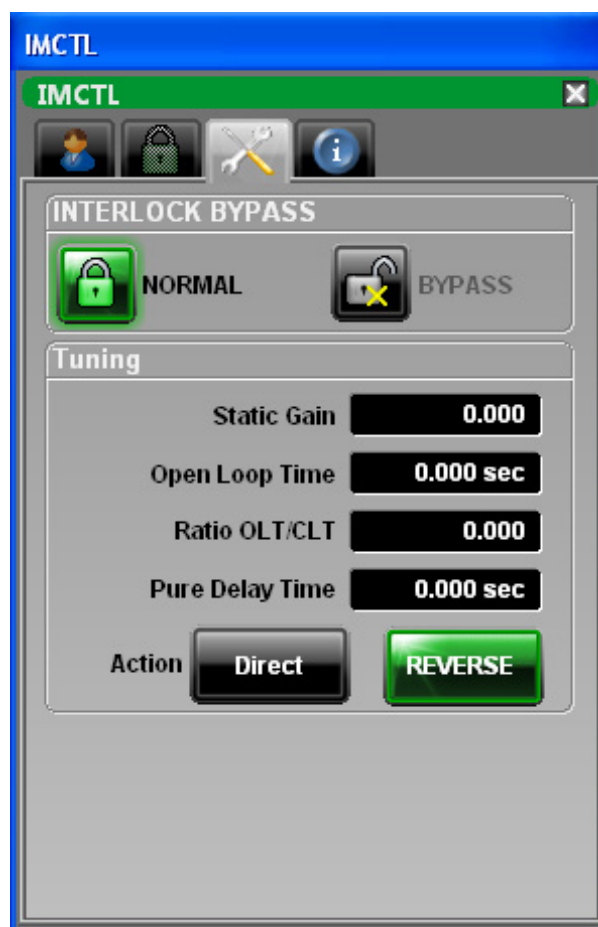
Operation Tab

The figure shows an example of the Operation tab:



Configuration Tab

The figure shows an example of the Configuration tab:



NOTE: This tab features the global bypass button. The partial bypass buttons are available on the Interlocks tab.

Lead-Lag Controller Management

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Overview

This chapter describes the Supervision resources and runtime services that are available for the management of lead-lag controllers.

Supervision Functions

Description

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

- Main core functions encompass status monitoring, owner selection, setpoint management (ramp configuration tuning, lead-lag operation indication), and global bypassing of interlock conditions.
- Optional functions encompass individual interlock condition management.

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

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_ldlgctl` library when implemented through the `$LeadLag` control module template:

Control resources	Description	Resource status
LDLGCTL	Lead lag controller	X
CONDSUM1	Interlock condition summary	O
X	Mandatory resource	
O	Optional resource	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Process Control and Auxiliary Functions (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag name	Description
CM name_LDLGCTL_STW	Device status information
CM name_LDLGCTL_CFGW	Device configuration data
Optional tags	
CONDSUM1	Refer to Commonly Used Blocks, page 52.

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
Optional tags			
CM name_LDLGCTL_REM	Device controlled remotely	CM name_LDLGCTL_STW BitAND 0x0001	Yes
CM name_LDLGCTL_ILCK	Device interlocked	CM name_LDLGCTL_STW BitAND 0x0004	

Trend Tags

The table describes the trend tags that are managed by Supervision components and their expression:

Tag name	Description	Expression
CM name_LDLGCTL_SP	Current setpoint	CM name_LDLGCTL_SP
CM name_LDLGCTL_OP	Current output	CM name_LDLGCTL_OP

Genies

Genie Properties


Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genres.

Representation

The table describes the genres of the `sgc_ldlgctl` library:

Graphic symbol	Genie name	Facet template identifier	Description
	<code>sgc_ldlg_spop_10</code>	<code>\$LDLGCTLSPOP_CG</code>	The value of the setpoint and the value of the output calculated by the controller are shown in the foreground.

Faceplates

Overview

During operation, clicking a genie of the `sgc_ldlgctl` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation
 - Configuration
 - Information
- Optional tab:
 - Interlocks, page 44

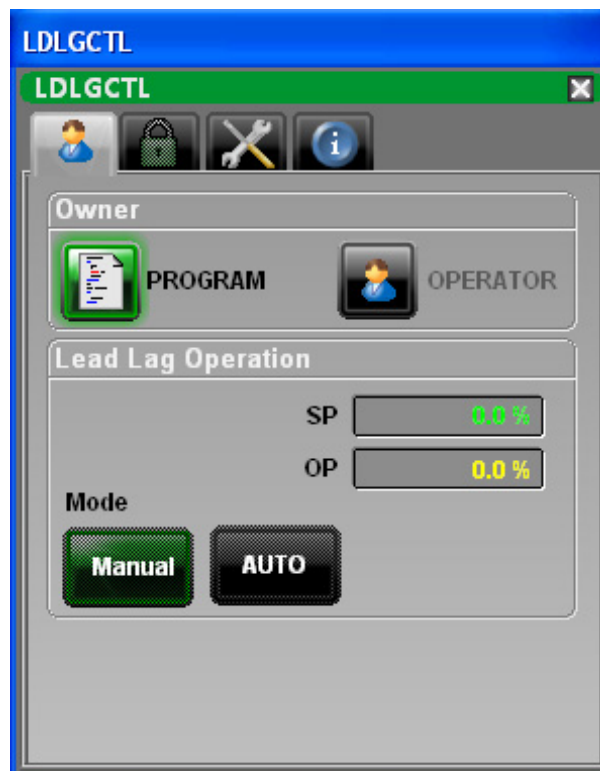
Faceplate Description

At the beginning of this manual, you can find the description of:

- The color conventions, page 33 are used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

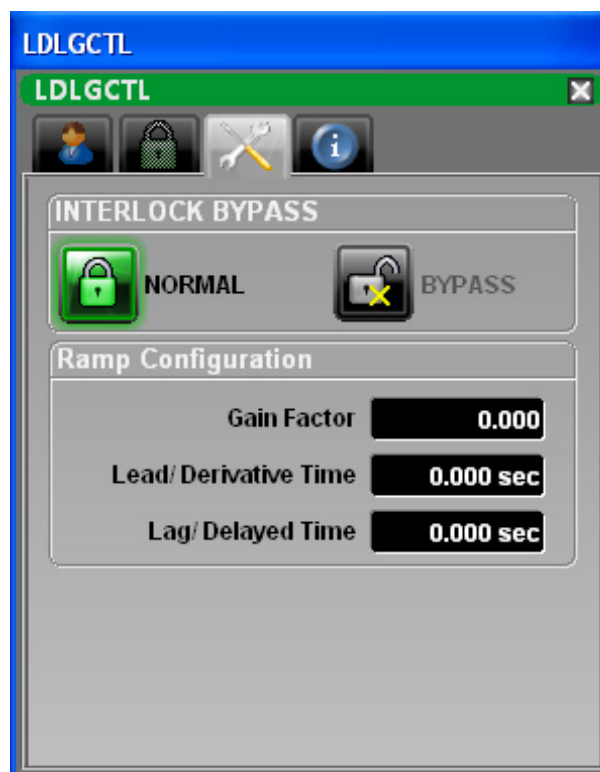
Operation Tab

The figure shows an example of the Operation tab:



Configuration Tab

The figure shows an example of the Configuration tab:



NOTE: This tab features the global bypass button. The partial bypass buttons are available on the Interlocks tab.

PID Controller Management

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Overview

This chapter describes the Supervision resources and runtime services that are available for the management of PIDFF regulators with monitoring interface.

Supervision Functions

Description

The PID controller Supervision functions help you to monitor and control a PIDFF-type controller, providing the operating modes used in the rest of the process Control resources.

The optional multiplexer service is used to multiplex two different parameter configurations that affect a single PID controller. This way, you can use one PID controller with different configurations (for example, split-range PID for cooling or heating).

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

- Main core functions encompass:
 - Owner selection
 - PID operation monitoring
 - PID mode selection
 - Tuning
 - Forward/reverse action
 - Formula management
 - Global bypassing of interlock conditions
- Optional functions encompass:
 - Multiplexer function of two different parameter configurations
 - Individual interlock condition management

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

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_pid` library when implemented through the `$PID` control module template:

Control resources		Description	Resource status
PIDCTL		PID controller logic	X
PIDMUX		PID multiplexer	O
CONDSUM1		Interlock condition summary	
X	Mandatory resource		
O	Optional resource		

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Process Control and Auxiliary Functions (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag name	Description
CM name_PIDCTL_STW	Device status information
CM name_PIDCTL_CFGW	Device configuration data
Optional tags	
CM name_PIDMUX_STW	Device status information
CM name_PIDMUX_CFGW	Device configuration data
CONDSUM1	Refer to Commonly Used Blocks, page 52.

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
Optional tags			
CM name_PIDCTL_REM	Device controlled remotely	CM name_PIDCTL_STW BitAND 0x0001	Yes
CM name_PIDCTL_ILCK	Device interlocked	CM name_PIDCTL_STW BitAND 0x0004	
CM name_PIDCTL_OVRIDE	Operating with external output	CM name_PIDCTL_STW BitAND 0x0008	

Alarm tag	Description	Expression	Process event, page 30
CM name_PIDMUX_REM	Device controlled remotely	CM name_PIDMUX_STW BitAND 0x0001	

Trend Tags

The table describes the trend tags that are managed by Supervision components and their expression:

Tag name	Description	Expression
CM name_PIDCTL_SP	Current setpoint	CM name_PIDCTL_SP
CM name_PIDCTL_PV	Current measurement	CM name_PIDCTL_PV
CM name_PIDCTL_OP	Current output	CM name_PIDCTL_OP

Genies

Genie Properties



Refer to Using Genies, page 34.



Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.


Representation

The table describes the genies of the `sgc_pidctl` library:

Graphic symbol	Genie name	Facet template identifier	Description
	sgc_pid_pvsp	\$PIDPVSP_CG	Represents the current value (PV) and the setpoint (SP).
	sgc_pid_pvspop	\$PIDPVSPOP_CG	Represents the current value (PV), the setpoint (SP), and the output (OP).

Graphic symbol	Genie name	Facet template identifier	Description
	sgc_pid_sp	\$PIDSP_CG	Represents the value of the setpoint (SP).
	sgc_pid_spop	\$PIDSPOP_CG	Represents the value of the setpoint (SP) and the output (OP).

The table describes the genie of the `sgc_pidmux` library:

Graphic symbol	Symbol name	Facet template identifier	Description
	sgc_pidmux_10	\$PIDmultiplexer_CG	The description of the selected parameter configuration is shown in the foreground.

Faceplates

Overview

During operation, clicking a genie of the `sgc_pidctl` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation
 - Configuration
 - Information
- Optional tabs:
 - Interlock, page 44

PID Multiplexer Faceplate

During operation, clicking the `sgc_pidmux_10` genie allows you to display the PID multiplexer faceplate.

Faceplate Description

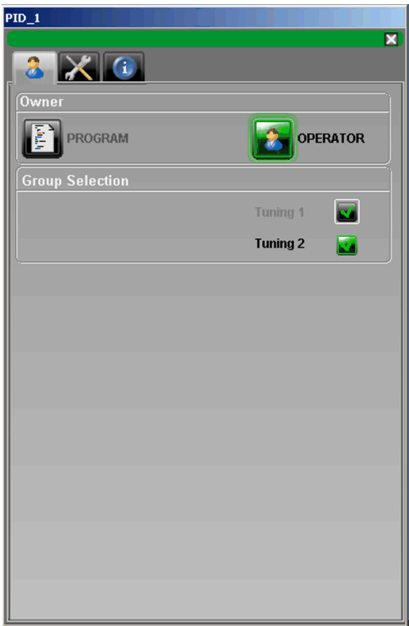
At the beginning of this manual, you can find the description of:

- The color conventions, page 33 are used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Operation Tab



Operation Tab (PID Multiplexer)



Configuration Tab

The screenshot shows the PIDCTL Configuration Tab. At the top, there's a title bar 'PIDCTL' with a close button. Below it, a toolbar contains icons for user, lock, tools, and help. The main area is divided into three sections: 'INTERLOCK BYPASS', 'Tuning', and 'Formula'.

INTERLOCK BYPASS: Contains two buttons: 'NORMAL' (with a green padlock icon) and 'BYPASS' (with a grey padlock icon and a yellow 'X').

Tuning: Contains four input fields for PID parameters, all set to 0.000:

- Proportional Gain: 0.000
- Integral Time: 0.000 sec
- Derivative Time: 0.000 sec
- Derivative Gain: 0.000

 Below these is an 'Action' section with two buttons: 'Direct' and 'REVERSE' (highlighted in green).

Formula: Contains two rows of buttons:

- Derivative applied to: 'Error' and 'PV' (highlighted in green).
- Gain applied to: 'P' and 'P-I-D' (highlighted in green).

NOTE: This tab features the global bypass button. The partial bypass buttons are available on the Interlocks tab.

Configuration Tab (PID Multiplexer)

The screenshot shows the PID_1 Configuration Tab (PID Multiplexer). It has a title bar 'PID_1' with a close button. Below it, a toolbar contains icons for user, tools, and help. The main area is divided into two columns, 'Tuning 1' and 'Tuning 2', and a 'Formula' section at the bottom.

Tuning 1:

- Proportional Gain: 3.000
- Integral Time: 5.000 sec
- Derivative Time: 3.000 sec
- Derivative Gain: 1.000
- OP HI: 100.000
- OP LO: 0.000
- Action: 'Reverse' (highlighted in green) and 'Direct'.

Tuning 2:

- Proportional Gain: 2.000
- Integral Time: 10.000 sec
- Derivative Time: 6.000 sec
- Derivative Gain: 2.000
- OP HI: 100.000
- OP LO: 0.000
- Action: 'Reverse' (highlighted in green) and 'Direct'.

Formula: Contains two rows of buttons for each tuning column:

- Derivative applied to: 'Error' and 'PV' (highlighted in green).
- Gain applied to: 'P' and 'P-I-D' (highlighted in green).

PID Group Management

Overview

EcoStruxure Process Expert Supervision services provide the **PID Management** faceplate that allows you to monitor up to eight PIDs at once as a group.

You can create your own groups and define, which PIDs are included in a group, using an ODBC data source that consists of two tables.

You select the PID group to be displayed through a menu on the faceplate itself.

Each PID faceplate features the same information and allows you to perform the same tasks as the .

During operation, you can access the **PID Management** faceplate through the **Tools** menu of the navigation bar of Supervision pages.

Faceplate Representation



Assigning Genies

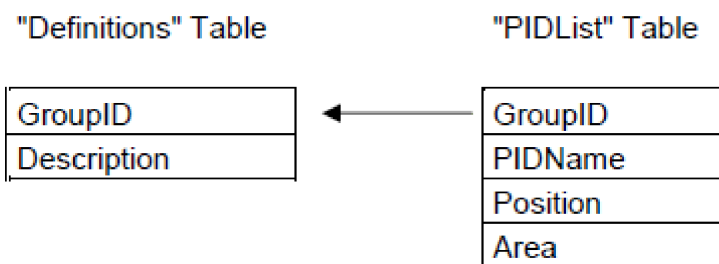
The `sgc_pid_xy` genie (where *x* represents the version and *y* the revision of the genie) calls a function that displays the **PID Management** faceplate during operation.

You can assign this genie to a Supervision page, using the **Edit** command. In the Supervision Participant, select the `sgc_pidctl` library. Refer to *Refinement Stage*, Supervision Project Refinement Stage (see EcoStruxure™ Process Expert, User Guide).

Data Model Description

The data model that the faceplate requires to work consists of two tables.

The figure shows the relationship between the two tables:



The data model consists of two worksheets when the data source is a Microsoft® Excel® spreadsheet. Each worksheet represents a table:

- The *Definitions* table contains the list of PID groups that you want the **PID Management** faceplate to display.
- The *PIDList* table contains, for each PID group, the PIDs that are displayed and their position on the faceplate.

The table describes the mandatory definition of the *Definitions* table:

Field	Definition
<i>GroupID</i>	Unique identifier, which distinguishes one group from another.
<i>Description</i>	Name of the PID group that is displayed in the Select PID Group field.

The table describes the mandatory definition of the *PIDList* table:

Field	Definition
<i>GroupID</i>	Unique identifier, which distinguishes one group from another.
<i>PIDName</i>	Name of the PID. You need to define the tags associated to the PID in the Supervision project
<i>Position</i>	Position of the PID on the PID Management faceplate. Range: 1...8
<i>Area</i>	Area to which the PID is assigned.

PID Position

The table shows the position of PIDs on the **PID Management** faceplate and the corresponding *Position* value:

1	2	3	4
5	6	7	8

Creating the Data Source

The component can use any data server that can be configured as an ODBC data source, such as SQL Server, Oracle, Microsoft Access, or Microsoft® Excel®.

The procedure describes how to use a Microsoft® Excel® spreadsheet that the faceplate uses as database with the Microsoft® ODBC controller. In this example, the file is the blank `PIDGroups.xls` file that is located inside the `SGCInclude2.ctz` include project.

NOTE: To access the `SGCInclude2.ctz` file, build the Supervision and use the **Download** command from the executable. Extract the file and go to the `$UserFiles` folder. Refer to Building the Supervision Project (see EcoStruxure™ Process Expert, User Guide).

To create an ODBC data source, using the PIDGroups.xls file, proceed as follows:

Step	Action
1	Double-click the odbcad32.exe file, which is located at the following path: C:\Windows\SysWOW64. Result: The ODBC Data Source Administrator window opens. NOTE: Do not open the ODBC Data Source Administrator through the Windows Control Panel.
2	Select the System DSN tab.
3	Select the Citect_Dbf entry and click Add.... Result: The Create New Data Source window opens.
4	Select the Driver do Microsoft Excel(*.xls) entry and click Finish . Result: The ODBC Microsoft Excel Setup window opens.
5	In the Data Source Name field, enter DSNPID .
6	Click Select Workbook...
7	Browse to the PIDGroups.xls file and click OK .
8	Unselect the Read Only attribute.
9	Click OK to close the ODBC Microsoft Excel Setup window. Result: The data source is created.
10	Click OK to close the ODBC Data Source Administrator window.

Creating PID Groups

To create PID groups, using the blank PIDGroups.xls file, proceed as follows:

Step	Action
1	Open the PIDGroups.xls file.
2	In the <i>Definitions</i> worksheet, enter the identifiers of the PID groups that you want to create in the <i>GroupID</i> column.
3	Enter a description for each PID group in the <i>Description</i> column.
4	In the <i>PIDList</i> worksheet, in the <i>GroupID</i> column, enter the same PID group identifiers as you have defined previously in the <i>Definitions</i> worksheet. Do not type the identifiers but create a reference to the <i>Definitions</i> worksheet by typing <code>=Sheet1!Ax</code> where <i>x</i> represents the row number of the PID group in the <i>Definitions</i> worksheet.
5	In the <i>PIDList</i> worksheet, for each PID group, enter a name, position, and area in the respective fields.
6	Define the data name and range of each worksheet by clicking Insert > Name > Define . NOTE: Refer also to <i>Defining Names Under Microsoft® Excel® 2007</i> , page 171.
7	In the Define Name dialog box, select the <i>definitions</i> worksheet from the list.
8	Select or enter the range of this worksheet, which defines the first and last columns, and the first and last rows of the table containing data. NOTE: The range can be larger and encompass cells that contain no data.
9	Click Add .
10	Repeat steps 7 to 9 for the <i>PIDList</i> worksheet.
11	Close the dialog box.
12	Save the file.

Example

The following figure shows the PIDGroups.xls file configured to display two PID groups containing three and four PIDs respectively:

	A	B
1	GroupID	Description
2	PIDGroup1	Reactor1
3	PIDGroup2	Reactor2
4		
5		
6		
7		

	A	B	C	D
1	GroupID	PIDName	Position	Area
2	PIDGroup1	Temperature1	1	1
3	PIDGroup1	Temperature2	2	1
4	PIDGroup1	Concentration	5	1
5	PIDGroup2	Temperature1	1	2
6	PIDGroup2	Temperature2	2	2
7	PIDGroup2	Saturation	3	2
8	PIDGroup2	Pressure	7	2
9				
10				

Defining Names Under Microsoft® Excel® 2007

The table describes the steps to define names in both worksheets when using Microsoft® Excel® 2007:

Step	Action
1	Enter data in the <i>Definitions</i> and <i>PIDList</i> worksheets, page 170.
2	Select the <i>Definitions</i> worksheet and in the menu, click Formulas > Name Manager .
3	In the Name Manager dialog box, click New...
4	In the New Name dialog box: <ul style="list-style-type: none"> Enter <i>Definitions</i> in the Name: field. Select Definitions from the Scope: menu. Enter the applicable data range in the Refers to: field (for example, =Def!\$A\$1:\$D\$10 where A1 are the first and D10 the last rows and columns defining the worksheet range). NOTE: The range can be larger and encompass cells that contain no data.
5	Click OK .
6	Repeat from step 2 for the <i>PIDList</i> worksheet, adapting the information entered and selected in the New Name dialog box accordingly.
7	Click Close in the Name Manager dialog box.

Pulse Width Modulation Controller Management

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 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 genies and their associated faceplate.

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_pwmctl` library when implemented through the `$PWMController` control module template:

Control resources	Description	Resource status
PWMCTL	Pulse-width modulation controller logic	X
CONDSUM1	Interlock condition summary	O
X	Mandatory resource	
O	Optional resource	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Process Control and Auxiliary Functions (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag name	Description
CM name_PWMCTL_STW	Device status information
CM name_PWMCTL_CFGW	Device configuration data
Optional tags	
CONDSUM1	Refer to Commonly Used Blocks, page 52.

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
Optional tags			
CM name_PWMCTL_REM	Device controlled remotely	CM name_PWMCTL_STW BitAND 0x0001	Yes
CM name_PWMCTL_ILCK	Device interlocked	CM name_PWMCTL_STW BitAND 0x0004	
CM name_PWMCTL_START	Device in operation	CM name_PWMCTL_CFGW BitAND 0x0004	

Trend Tags

The table describes the trend tags that are managed by Supervision components and their expression:

Tag name	Description	Expression
CM name_PWMCTL_SP	Current setpoint	CM name_PWMCTL_SP

Genies

Genie Properties


Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genres.

Representation

The table describes the genres of the `sgc_pwmctl` library:

Graphic symbol	Genie name	Facet template identifier	Description
	<code>sgc_pwmctl_sg_10</code>	<code>\$PWMCTL_CG</code>	Single representation for the PWM controller. The value of the set-point is shown in the foreground.

Faceplates

Overview

During operation, clicking a genie of the `sgc_pwmctl` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation
 - Configuration
 - Information
- Optional tab:
 - Interlocks, page 44

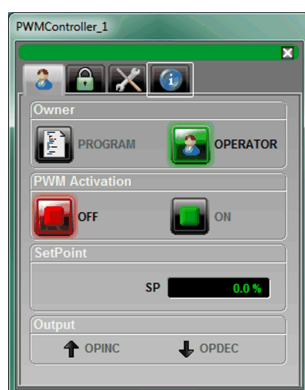
Faceplate Description

At the beginning of this manual, you can find the description of:

- The color conventions, page 33 are used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Operation Tab

The figure shows an example of the Operation tab:



Configuration Tab

The figure shows an example of the Configuration tab:



NOTE: This tab features the global bypass button. The partial bypass buttons are available on the Interlocks tab.

Ramp Management

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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 genies and their associated faceplate.

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_aramp` library when implemented through the `$Ramp` control module template:

Control resources		Description	Resource status
ARAMP		Ramp logic	X
X	Mandatory resource		

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Process Control (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag	Description
CM name_ARAMP_STW	Device status information
CM name_ARAMP_CFGW	Device configuration data

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Name	Description	Expression	Process event, page 30
Optional tags			
CM name_ARAMP_REM	Device controlled remotely	CM name_ARAMP_STW BitAND 0x0001	Yes
CM name_ARAMP_HELD	Ramp is help	CM name_ARAMP_STW BitAND 0x0002	
CM name_ARAMP_DONE	Target setpoint reached	CM name_ARAMP_STW BitAND 0x0004	
CM name_ARAMP_RUNNING	Ramp is active	CM name_ARAMP_STW BitAND 0x0008	
CM name_ARAMP_LSTART	Ramp command	CM name_ARAMP_CFGW BitAND 0x0002	

Trend Tags

The table describes the trend tags that are managed by Supervision components and their expression:

Tag	Description	Expression
CM name_ARAMP_SP	Current setpoint	CM name_ARAMP_SP

Genies

Genie Properties



Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The table describes the genies of the `sgc_aramp` library:

Graphic symbol	Genie name	Facet template identifier	Description
	arampsp_10	\$ARAMPSP_CG	Analog ramp representing the current setpoint (SP) is right-justified.
	arampisp_10	\$ARAMPISP_CG	Analog ramp representing the current setpoint (SP) is left-justified.

Faceplates

Overview

During operation, clicking a genie of the `sgc_aramp` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation
 - Configuration
 - Information

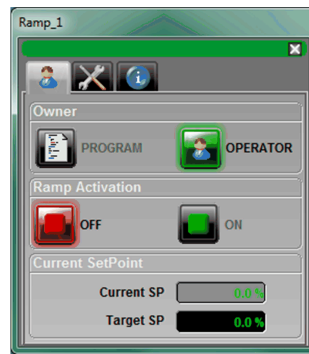
Faceplate Description

At the beginning of this manual, you can find the description of:

- The color conventions, page 33 are used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

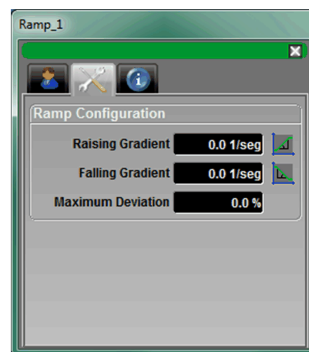
Operation Tab

The figure shows an example of the Operation tab:



Configuration Tab

The figure shows an example of the Configuration tab:



Ratio Controller Management

What's in This Chapter

Supervision Functions	180
Control/Supervision Relationship	180
Tags	181
Genies	181
Faceplates	182

Overview

This chapter describes the Supervision resources and runtime services that are available for the management of ratio controllers.

Supervision Functions

Description

Core and optional resources provide the following monitoring and operation functions: status monitoring, owner selection, ratio operation indication, and setpoint management (ratio configuration).

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

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_ratioctl` library when implemented through the `$RatioCtl` control module template:

Control resources		Description	Resource status
RATIOCTL		Ratio controller logic	X
X	Mandatory resource		

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Process Control (see *EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual*).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag	Description
CM name_RATIOCTL_STW	Device status information
CM name_RATIOCTL_CFGW	Device configuration data

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Name	Description	Expression	Process event, page 30
Optional tags			
CM name_RATIOCTL_REM	Device controlled remotely	CM name_RATIOCTL_STW BitAND 0x0001	Yes

Trend Tags

The table describes the trend tags that are managed by Supervision components and their expression:

Tag	Description	Expression
CM name_RATIOCTL_PV	Current value	CM name_RATIOCTL_PV
CM name_RATIOCTL_OP	Current output	CM name_RATIOCTL_OP
CM name_RATIOCTL_PV_TRACK	Current value of reference variable	CM name_RATIOCTL_PV_TRACK

Genies

Genie Properties


Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genres.

Representation

The table describes the genres of the `sgc_ratioctl` library:

Graphic symbol	Genie name	Facet template identifier	Description
	<code>sgc_ratioctl_pvpvtop_10</code>	<code>\$RATIOCTL_PVPVTOP_CG</code>	Single representation for the RATIO controller. The value of the variable that is being controlled, the value of the reference variable, and the value of the calculated output are shown in the foreground.

Faceplates

Overview

During operation, clicking a genie of the `sgc_ratioctl` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation
 - Configuration
 - Information

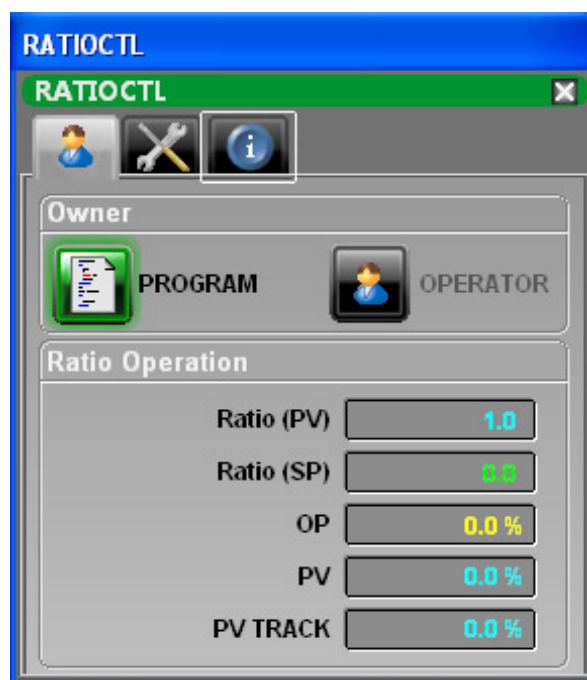
Faceplate Description

At the beginning of this manual, you can find the description of:

- The color conventions, page 33 are used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Operation

The figure shows an example of the Operation tab:



Configuration

The figure shows an example of the Configuration tab:



Split-Range Controller Management

What's in This Chapter

Supervision Functions	184
Control/Supervision Relationship	184
Tags	185
Genies	185
Faceplates	186

Overview

This chapter describes the Supervision resources and runtime services that are available for the management of split-range controllers.

Supervision Functions

Description

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

- Main core functions encompass status monitoring, owner selection, split-range operation indication, setpoint management (split-range configuration), and global bypassing of interlock conditions.
- Optional functions encompass individual interlock condition management.

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

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_splrgctl` library when implemented through the `$SplitRange` control module template:

Control resources	Description	Resource status
SPLRGCTL	Split-range controller logic	X
CONDSUM1	Interlock condition summary	O
X	Mandatory resource	
O	Optional resource	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Process Control and Auxiliary Functions (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag name	Description
CM name_SPLRGCTL_STW	Device status information
CM name_SPLRGCTL_CFGW	Device configuration data
Optional tags	
CONDSUM1	Refer to Commonly Used Blocks, page 52.

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
Optional tags			
CM name_SPLRGCTL_REM	Device controlled remotely	CM name_SPLRGCTL_STW BitAND 0x0001	Yes
CM name_SPLRGCTL_ILCK	Device interlocked	CM name_SPLRGCTL_STW BitAND 0x0004	

Trend Tags

The table describes the trend tags that are managed by Supervision components and their expression:

Tag name	Description	Expression
CM name_SPLRGCTL_SP	Current setpoint	CM name_SPLRGCTL_SP
CM name_SPLRGCTL_OP1	Output 1	CM name_SPLRGCTL_OP1
CM name_SPLRGCTL_OP2	Output 2	CM name_SPLRGCTL_OP2

Genies

Genie Properties


Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genres.

Representation

The table describes the genres of the `sgc_splrgctl` library:

Graphic symbol	Genie name	Facet template identifier	Description
	<code>sgc_splrgctl_pvop_xy</code>	<code>\$SPLRGCTL_PVOP_CG</code>	Only representation for the SPLRG controller. The value of the set-point and the value of the outputs calculated by the controller are shown in the foreground.

Faceplates

Overview

During operation, clicking a genie of the `sgc_splrgctl` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation
 - Configuration
 - Information
- Optional tab:
 - Interlocks, page 44

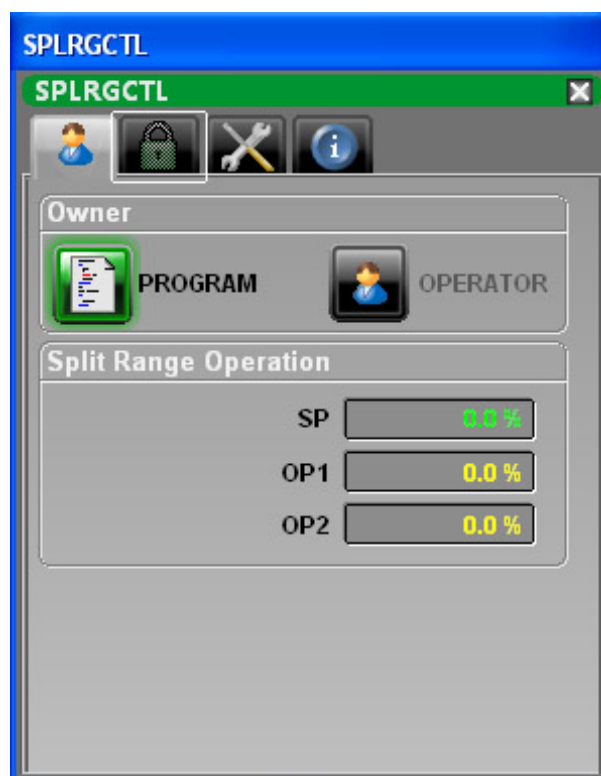
Faceplate Description

At the beginning of this manual, you can find the description of:

- The color conventions, page 33 are used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

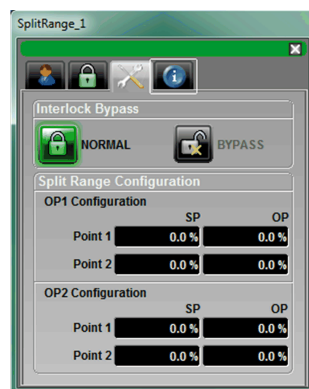
Operation Tab

The figure shows an example of the Operation tab:



Configuration Tab

The figure shows an example of the Configuration tab:



NOTE: This tab features the global bypass button. The partial bypass buttons are available on the Interlocks tab.

Three Step Controller/Positioner Management

What's in This Chapter

Supervision Functions	188
Control/Supervision Relationship	188
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Faceplates	190

Overview

This chapter describes the Supervision resources and runtime services that are available for the management of three-step controllers/positioners.

Supervision Functions

Description

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

- Main core functions encompass status monitoring, owner selection, controller operation indication, setpoint management (controller tuning), and global bypassing of interlock conditions.
- Optional functions encompass individual interlock condition management.

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

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_step3ctl` library when implemented through the `$Step3Ctl` control module template:

Control resources	Description	Resource status
STEP3CTL	Three-step controller logic	X
CONDSUM1	Interlock condition summary	O
X	Mandatory resource	
O	Optional resource	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Process Control and Auxiliary Functions (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag name	Description
CM name_STEP3CTL_STW	Device status information
CM name_STEP3CTL_CFGW	Device configuration data
Optional tags	
CONDSUM1	Refer to Commonly Used Blocks, page 52.

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
Optional tags			
CM name_STEP3CTL_REM	Device controlled remotely	CM name_STEP3CTL_STW BitAND 0x0001	Yes
CM name_STEP3CTL_ILCK	Device interlocked	CM name_STEP3CTL_STW BitAND 0x0004	
CM name_STEP3CTL_OPINC	Negative deviation	CM name_STEP3CTL_STW BitAND 0x0008	
CM name_STEP3CTL_OPDEC	Positive deviation	CM name_STEP3CTL_STW BitAND 0x0010	
CM name_STEP3CTL_START	Device command	CM name_STEP3CTL_CFGW BitAND 0x0004	

Trend Tags

The table describes the trend tags that are managed by Supervision components and their expression:

Tag name	Description	Expression
CM name_STEP3CTL_SP	Current setpoint	CM name_STEP3CTL_SP
CM name_STEP3CTL_PV	Current measurement	CM name_STEP3CTL_PV

Genies

Genie Properties



Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The table describes the genies of the `sgc_step3ctl` library:

Graphic symbol	Genie name	Facet template identifier	Description
	<code>sgc_step3ctl_pvsp</code>	<code>\$STEP3CTLPVSP_CG</code>	Shows the current value (PV) and the setpoint (SP).
	<code>sgc_step3ctl_sp</code>	<code>\$STEP3CTLSP_CG</code>	Shows the setpoint (SP).

Faceplates

Overview

During operation, clicking a genie of the `sgc_step3ctl` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation
 - Configuration
 - Information
- Optional tab:
 - Interlocks, page 44

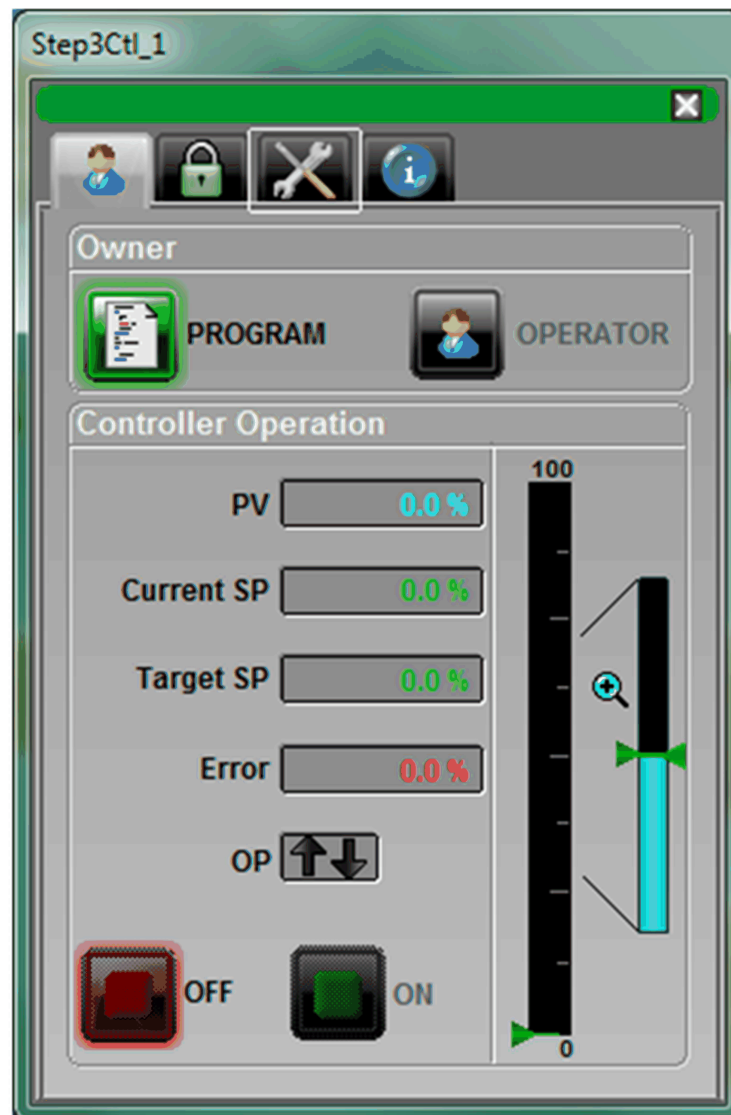
Faceplate Description

At the beginning of this manual, you can find the description of:

- The color conventions, page 33 are used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

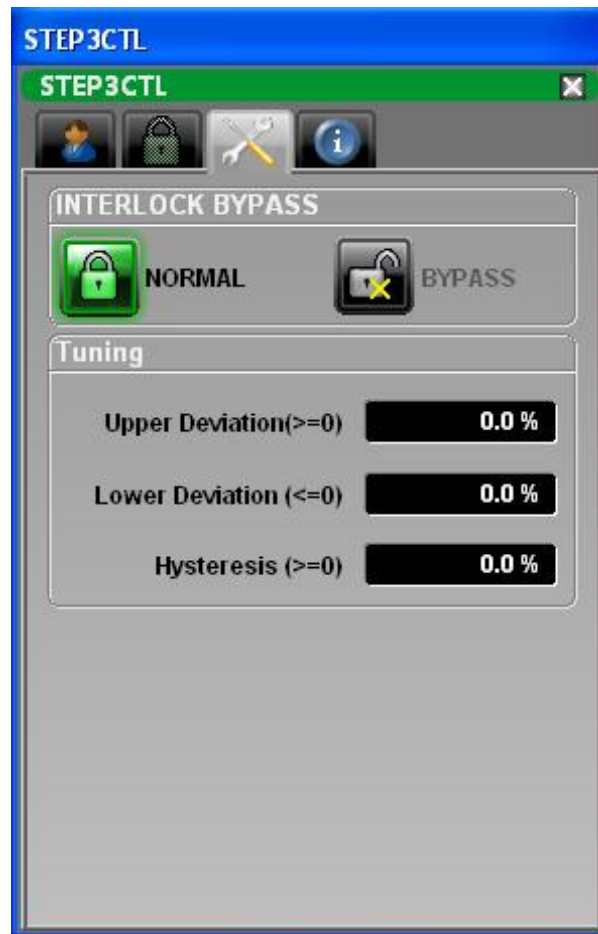
Operation Tab

The figure shows an example of the Operation tab:



Configuration Tab

The figure shows an example of the Configuration tab:



NOTE: This tab features the global bypass button. The partial bypass buttons are available on the Interlocks tab.

Sequential Control


What's in This Part

Sequential Control Management 194

Overview

This part describes the components that provide the Supervision functions for the sequential control family.

These components do not reflect any specific installation.

<div><div> WARNING</div><div>LOSS OF CONTROL<ul style="list-style-type: none">• Perform a Failure Mode and Effects Analysis (FMEA), or equivalent risk analysis, 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 them.• Review the implications of communication link interruptions and take actions to mitigate them.• Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and error conditions) according to your risk assessment, and applicable codes and regulations.• Apply local accident prevention and safety regulations and guidelines.¹• Test each implementation of a system for proper operation before placing it into service.<p>Failure to follow these instructions can result in death, serious injury, or equipment damage.</p></div></div>
--

¹ 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.

Sequential Control Management

What’s in This Chapter

Description 194

Control/Supervision Relationship 195

Tags 195

Genies 196

Faceplates 198

Overview

This chapter describes the Supervision resources and runtime services that are available for the management of sequential control.

⚠ 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.

¹ 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

Required Software Components

The faceplate implemented for the sequential control uses a Microsoft® Forms 2.0 ActiveX® control. Verify that the necessary Microsoft® ActiveX® control resources are installed on PCs on which you want to use the faceplate during operation.

Initialization

If the sequence status is unknown, it is initialized as idle regardless of whether the controller has restarted or not. This initialization is done automatically.

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 genies and their associated faceplate.

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_seqctl1` library when implemented through the `$SequenceDFB` control module template:

Control resources		Description	Resource status
SEQCTL1		Sequential control logic	X
SEQPARXX		Sequence parameters	O
CONDSUM		Summary of conditions	
		Initial conditions	
X		Mandatory resource	
O		Optional resource	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Sequential Control and Auxiliary Functions (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag name	Description
CM name_SEQCTL1_STW	Status information
CM name_SEQCTL1_CFGW	Configuration data
CM name_SEQPARxx_STW	Status information
CM name_SEQPARxx_CFGW	Configuration data
Optional tags	
CONDSUM	Refer to Commonly Used Blocks, page 53.
CONDSUM1	Refer to Commonly Used Blocks, page 52.

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
CM name_SEQCTL1_FIRST TRANSITION	First transition	CM name_SEQCTL1_STW BitAND 0x0001	Yes
CM name_SEQCTL1_SECOND TRANSITION	Second transition	CM name_SEQCTL1_STW BitAND 0x0002	
CM name_SEQCTL1_THIRD TRANSITION	Third transition	CM name_SEQCTL1_STW BitAND 0x0004	
CM name_SEQCTL1_FOURTH TRANSITION	Fourth transition	CM name_SEQCTL1_STW BitAND 0x0008	
CM name_SEQCTL1_FIFTH TRANSITION	Fifth transition	CM name_SEQCTL1_STW BitAND 0x0010	
CM name_SEQCTL1_SIXTH TRANSITION	Sixth transition	CM name_SEQCTL1_STW BitAND 0x0020	

Trend Tags

No trend tags are managed by Supervision components for sequential control management.

Genies

Genie Properties

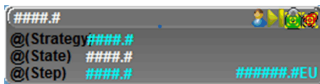
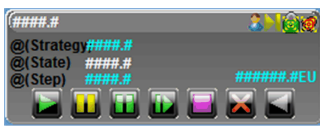
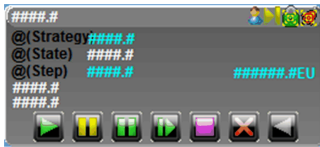
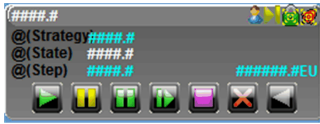
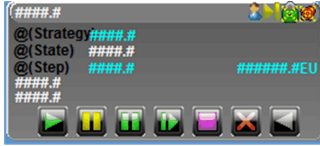


Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The table describes the genies of the `sgc_seqctl1` library:

Graphic symbol	Genie name	Facet template identifier	Description
	<code>sgc_advseqctl_30</code>	<code>\$ADVSEQCTL_30</code>	<p>The genies display:</p> <ul style="list-style-type: none"> The current state of the sequence. The step being executed. The strategy that is applied (if configured and selected). The time elapsed for the current step. <p>Refer to <i>Features</i>, page 197 for additional information.</p>
	<code>sgc_advseqctl1_30</code>	<code>\$ADVSEQCTL1_30</code>	
	<code>sgc_advseqctl2_30</code>	<code>\$ADVSEQCTL2_30</code>	
	<code>sgc_advseqctl3_30</code>	<code>\$ADVSEQCTL3_30</code>	
	<code>sgc_advseqctl4_30</code>	<code>\$ADVSEQCTL4_30</code>	
	<code>sgc_seqbuttons1</code>	These genies are included in the <code>sgc_seqctl1</code> library of the SGC Include2 project are but not encapsulated in a template.	Buttons of this genie cannot be hidden.
	<code>sgc_seqbuttons2</code>	—	Buttons of this genie can be hidden.

Features

The table describes which features each genie supports:

Feature	<code>sgc_advseqctl_30</code> <code>sgc_advseqctl1_30</code>	<code>sgc_advseqctl2_30</code>	<code>sgc_advseqctl3_30</code>	<code>sgc_advseqctl4_30</code>
Manages control sequences with up to eight control strategies	Yes Strategy name and applicable parameters can be provided ⁽¹⁾ .			
Up to two parameters are displayed	No	Yes	No	Yes

Feature	sgc_advseqctl1_30 sgc_advseqctl1_30	sgc_advseqctl2_30	sgc_advseqctl3_30	sgc_advseqctl4_30
Buttons can be hidden	No	No	Yes (Any of <i>Start</i> , <i>Stop</i> , <i>Hold</i> , <i>Restart</i> , <i>Abort</i> , <i>Reset</i> , <i>Pause</i> , or <i>Resume</i>)	
(1) If you leave all text fields S1 to S8 blank, the strategy display mechanism is disabled and parameter 1 becomes a regular parameter.				

Faceplates

Overview

During operation, clicking a genie of the `sgc_seqctl1` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation
 - Input/Output Parameters
 - State Machine
 - Information
- Optional tabs:
 - Initial Conditions, page 44
 - Diagnostic Information, page 46

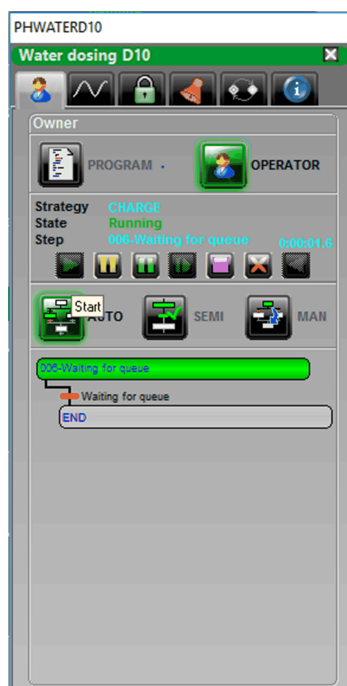
Faceplate Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Operation Tab in Automatic Mode

The figure shows the Operation tab when **OPERATOR** and the **AUTO** mode are selected:










The current state and the strategy, page 201 that is selected are displayed above the buttons.

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:
 - Red: The condition is not yet fulfilled
 - Green: The condition is true.
- The next step to be executed when the current step is completed and the transition is true.

The table shows the command that corresponds to each button on the Operation tab:

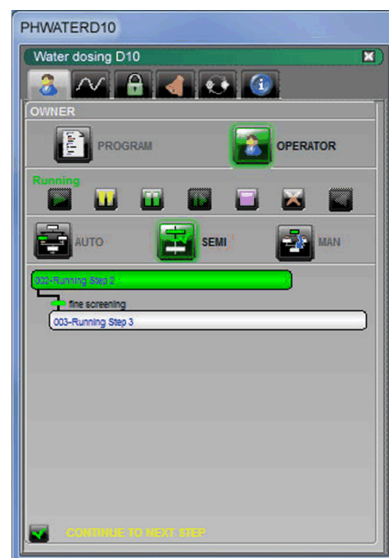
Icon	Command
	<i>Start</i>
	<i>Hold (yellow)</i>
	<i>Pause (green)</i>
	<i>Restart</i>

Icon	Command
	<i>Stop</i>
	<i>Abort</i>
	<i>Reset</i>

NOTE: Only buttons that correspond to available commands are active, according to the state matrix, page 40.

Operation Tab in Semi-Automatic Mode

The figure shows the Operation tab when **OPERATOR** and the **SEMI** mode are selected:

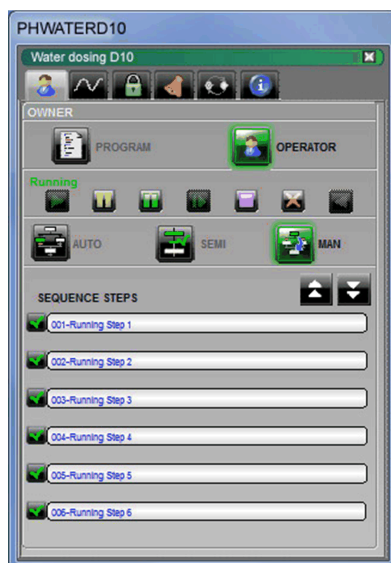


The sequence starts in semi-automatic mode after clicking the *Start* button, and the bottom section of the faceplate displays:

- The step that is being executed and its number.
- The transition to the next step:
 - Red: The condition is not yet fulfilled
 - Green: The condition is true.
- The next step to be executed.
- A check box requiring the operator to confirm the execution of the next step when the current step is completed and the transition is true.

Operation Tab in Manual Mode

The figure shows the Operation tab when **OPERATOR** and the **MAN** mode are selected:



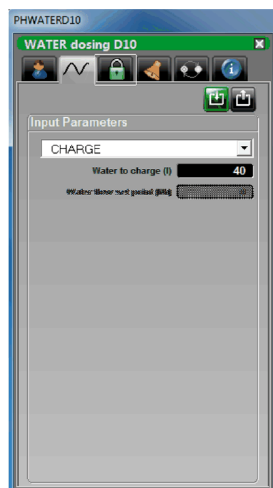
The sequence starts in manual mode after clicking the *Start* button, and the bottom section of the faceplate displays:

- The steps of the sequence that are programmed in the **Running** state.
- A check box next to each step allowing to execute it.

You can scroll up and down through the list of steps by using the two arrow buttons.

Input/Output Parameters Tab

The figure shows the Input/Output Parameters tab when **Input Parameters** is selected:



You can select a strategy from the ones that have been defined and enter the corresponding values for enabled parameters.

Initially, if the strategy is configured for the sequence then the default strategy in the sequence will be shown as **Unknown Strategy (0)**, you have to select the strategy and start the sequence.

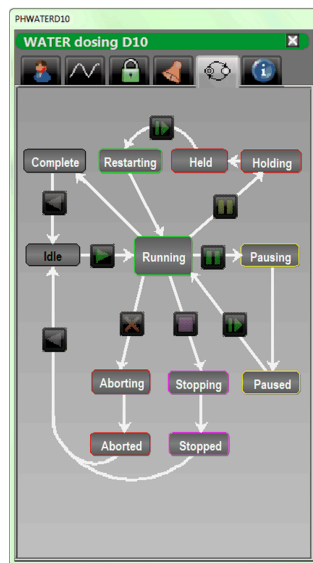
Parameters that do not pertain to the selected strategy are disabled.

The figure shows the Input/Output Parameters tab when **Output Parameters** are selected:



Displays the value of certain parameters, which is calculated while the sequence is carried out.

State Machine Tab



The state diagram allows the operator to execute available commands, using the buttons, page 199.

Names of states appear in white while the current state appears in the same color as its frame.

Batch Phase Manager


What's in This Part

IBPHASE Component	204
Communication configuration in InBatch Tool	217

Overview

This part describes the components that provide the Supervision functions and runtime services that are available for the management of Inbatch phase control.

These components do not reflect any specific installation.

 **WARNING**

LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA), or equivalent risk analysis, 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 them.
- Review the implications of communication link interruptions and take actions to mitigate them.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and error conditions) according to your risk assessment, and applicable codes and regulations.
- Apply local accident prevention and safety regulations and guidelines.¹
- Test each implementation of a system for proper operation before placing it into service.

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

¹ 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.

IBPHASE Component

What's in This Chapter

Description	204
Control/Supervision Relationship	205
Tags	206
Genies	208
Faceplates	210

Overview

This chapter describes the Supervision functions and runtime services that are available for the management of Inbatch phase control.

These components do not reflect any specific installation.

⚠ 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.

¹ 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

Required Software Components

The faceplate implemented for batch phase uses a Microsoft® Forms 2.0 ActiveX® control. Verify that the necessary Microsoft® ActiveX® control resources are installed on PCs on which you want to use the faceplate during operation.

Initialization

If the batch status is unknown, it is initialized as **READY**, regardless of whether the controller has restarted or not. This initialization is done automatically.

Supervision Functions

The table describes the main functions for batch phase control management:

Function	Description
State management	Shows the status of the phase.
Owner selection	Allows you to configure whether the phase commands come from the program or the operator. In program mode the phase is controlled by InBatch software tool.
Operating mode	Allows you to operate the phase 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 phase.
Parameter management	Allows you to select a strategy, enter input parameter values, and monitor output values.
Initial condition management	Optional function. It allows you to manage initial conditions that are not satisfied and it blocks the start of the phase.
Diagnostic information management	Optional function that allows you to manage abnormal conditions detected by the phase.
Control button command management	Optional Function. It allows you to manage control button operation.

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

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_ibphase` library when implemented through the `$IBPHASE` control module template:

Control blocks	Description	Block status
IBPHASE	Batch phase logic	X
IBPARXX	Batch Phase parameters	O
CONDSUM	Summary of conditions	
	Initial conditions and Failure conditions	
X	Mandatory block	
O	Optional block	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For the description of these Control resources, refer to Batch Phase Manager (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags of *IBPHASE*:

Name	Type	Description
<i>CM name_IBPHASE_CFGW</i>	UINT	Configuration Data
<i>CM name_IBPHASE_COMMAND</i>	UINT	Command
<i>CM name_IBPHASE_IBCOMMAND</i>	UINT	InBatch Command
<i>CM name_IBPHASE_CSTEPD</i>	STRING	Current step
<i>CM name_IBPHASE_ETIME</i>	LONG	Elapsed step Time
<i>CM name_IBPHASE_NSTEP</i>	INT	Step to be executed in manual mode
<i>CM name_IBPHASE_STATE</i>	UINT	Current state
<i>CM name_IBPHASE_IBSTATE</i>	UINT	Current InBatch state
<i>CM name_IBPHASE_STEPD</i>	STRING	Description of the current step
<i>CM name_IBPHASE_STW</i>	UINT	Status information.
<i>CM name_IBPHASE_TRANSD</i>	STRING	Description of the next transition
<i>CM name_IBPARXX_CFGW</i>	UINT	Configuration word
<i>CM name_IBPARXX_IPY</i>	REAL	Input parameter Y NOTE: These tags will be available if the description of the tag is configured in an instance.
<i>CM name_IBPARXX_OPY</i>	REAL	Output parameter Y NOTE: These tags will be available if the description of the tag is configured in an instance.
<i>CM name_IBPARXX_STW</i>	UINT	Status word of parameters.
XX: Represents the optional services and its value can be 05, 10 and 16 depending upon the parameter selection. Y: represents the parameter number 01 to 05 for <i>IBPAR05</i> , 01 to 10 for <i>IBPAR10</i> and 01 to 16 for <i>IBPAR16</i> .		

To support the InBatch communication with IBPhase manager through Citect SCADA, new optional tags are created for accessing the bits of UINT variables *IBSTATE* and *IBCOMMAND* from PLC.

The below table shows the list of digital tags required to access *IBSTATE* variable from PLC.

Name	Type	Description
CM name_IBPHASE_IBREADY	DIGITAL	InBatch Ready status
CM name_IBPHASE_IBRUN	DIGITAL	InBatch Run status
CM name_IBPHASE_IBHELD	DIGITAL	InBatch Held status
CM name_IBPHASE_IBABORTED	DIGITAL	InBatch Aborted status
CM name_IBPHASE_IBDONE	DIGITAL	InBatch Done status
CM name_IBPHASE_IBINTERLOCKED	DIGITAL	InBatch Interlocked status

The below table shows the list of digital tags required to access `IBCOMMAND` variable from PLC.

Name	Type	Description
CM name_IBPHASE_IBSTART	DIGITAL	InBatch Start command
CM name_IBPHASE_IBHOLD	DIGITAL	InBatch Hold command
CM name_IBPHASE_IBRESTART	DIGITAL	InBatch Restart command
CM name_IBPHASE_IBRESET	DIGITAL	InBatch Reset command
CM name_IBPHASE_IBABORT	DIGITAL	InBatch Abort command

The below table shows additional parameters along with digital parameters to access `IBSTATE`, `IBCOMMAND` and input/ output variables from PLC

Name	Type	Description
CM name_IBPHASE_IBIPYY	REAL	InBatch input parameter
CM name_IBPHASE_IBOPY	REAL	InBatch output parameter
YY: represents the parameter number 01 to 05 for <code>IBPHASE_DIGITAL_IBPAR05</code> , 01 to 10 for <code>IBPHASE_DIGITAL_IBPAR10</code> and 01 to 16 for <code>IBPHASE_DIGITAL_IBPAR16</code> .		

NOTE:

- The description of these tags will refer to the input parameter. For example, description of `IP01` is Water to charge (1). Then description of `IBIP01` will be Water to charge (1) - IB
- These tags will be available if the description of the subsequent input parameter tag is configured. For example, `IBIP02` will be available only if description is configured for `IP02`.

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
CM name_IBPHASE_FIRST TRANSITION	First transition	CM name_IBPHASE_STW BitAND 0x0001	Yes
CM name_IBPHASE_SECOND TRANSITION	Second transition	CM name_IBPHASE_STW BitAND 0x0002	
CM name_IBPHASE_THIRD TRANSITION	Third transition	CM name_IBPHASE_STW BitAND 0x0004	
CM name_IBPHASE_FOURTH TRANSITION	Fourth transition	CM name_IBPHASE_STW BitAND 0x0008	

Alarm tag	Description	Expression	Process event, page 30
CM name_IBPHASE_FIFTH TRANSITION	Fifth transition	CM name_IBPHASE_STW BitAND 0x0010	
CM name_IBPHASE_SIXTH TRANSITION	Sixth transition	CM name_IBPHASE_STW BitAND 0x0020	

Trend Tags

No trend tags are managed by Supervision components for batch phase control management.

Genies

Genie Properties


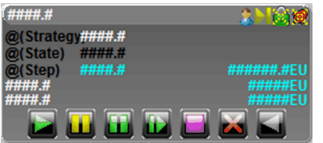

Refer to Using Genies, page 34.

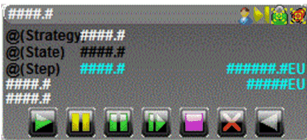
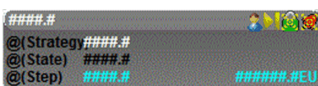
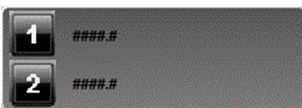
Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The table describes the genies of the `sgc_ibphase` library:

Graphic symbol	Genie name	Facet template identifier	Description
	sgc_ibphase1_10	\$IBPhase1_CG	Panel state with buttons which cannot be hidden. The symbol displays: <ul style="list-style-type: none"> The current state of the phase. The strategy that is applied (if configured and selected). The step being executed. The time elapsed for the current step.
	sgc_ibphase2_10	\$IBPhase2_CG	Panel state all data with buttons which cannot be hidden. The symbol displays: <ul style="list-style-type: none"> The current state of the phase. The strategy that is applied (if configured and selected). The step being executed. The time elapsed for the current step. Two configurable data (Data1 and Data2) Refer, page 34.
	sgc_ibphase3_10	\$IBPhase3_CG	Panel state with buttons which can be hidden. The symbol displays: <ul style="list-style-type: none"> The current state of the phase. The strategy that is applied (if configured and selected).

Graphic symbol	Genie name	Facet template identifier	Description
			<ul style="list-style-type: none"> The step being executed. The time elapsed for the current step.
	sgc_ibphase4_10	\$IBPhase4_CG	<p>Panel state all data with buttons which can be hidden.</p> <p>The symbol displays:</p> <ul style="list-style-type: none"> The current state of the phase. The strategy that is applied (if configured and selected). The step being executed. The time elapsed for the current step. Two configurable data (Data1 and Data2) Refer, page 34.
	sgc_ibphase5_10	\$IBPhase5_CG	<p>Panel state.</p> <p>The symbol displays:</p> <ul style="list-style-type: none"> The current state of the phase. The strategy that is applied (if configured and selected). The step being executed. The time elapsed for the current step.
	sgc_ibphase6_10	\$IBPhase6_CG	<p>Control button genie.</p> <p>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, STOPPED, ABORTED and INTERLOCKED Refer, page 34.</p>

Colour Philosophy for the Phase Text Colour

The colour philosophy for the phase text is given below:

Phase state	Text Color
Ready	Black
Run	Green
Held	Yellow
Held (Held For Error)	Red
Aborted (Stopped)	Dark Pink
Run (Paused)	Yellow
Aborted	Red
Done	White
Run (Holding)	Yellow and Black (Blinking)
Run (Holding for Error)	Red and Yellow (Blinking)
Run (Restarting)	Green and Black (Blinking)
Run (Pausing)	Yellow and Black (Blinking)
Run (Stopping)	Dark Pink and Black (Blinking)
Run (Aborting)	Red and Black (Blinking)
Interlocked	Black

Faceplates

Overview

During operation, clicking a genie of the `sgc_ibphase` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation
 - Input/Output Parameters
 - State Machine
 - Information
- Optional tabs:
 - Initial Conditions, page 44
 - Diagnostic Information, page 46

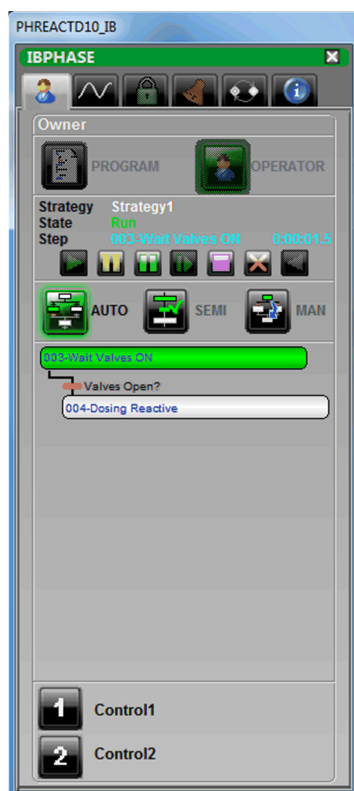
Faceplate Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Operation Tab in Automatic Mode

The figure shows the Operation tab when **OPERATOR** and the **AUTO** mode are selected:








The current state and the strategy, page 214 that is selected are displayed above the buttons.

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 elapsed time after the start of phase
- Control button labels as well as buttons for executing control button commands.
- The transition to the next step:
 - Red: The condition is not yet fulfilled
 - Green: The condition is true.
- The next step to be executed when the current step is completed and the transition is true.
- For text colour of the strategy phase state, refer Colour Philosophy for the Phase Text Colour topic, page 209.

The table shows the command that corresponds to each button on the Operation tab:

Icon	Command
	<i>Start</i>
	<i>Hold (yellow)</i>
	<i>Pause (green)</i>
	<i>Restart</i>
	<i>Stop</i>
	<i>Abort</i>
	<i>Reset</i>

NOTE: Only buttons that correspond to available commands are active, according to the state matrix, page 40.

Operation Tab in Semi-Automatic Mode

The 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:
 - Red: The condition is not yet fulfilled
 - Green: The condition is true.
- The next step to be executed.
- A check box requiring the operator to confirm the execution of the next step when the current step is completed and the transition is true.
- For text colour of the strategy phase state, refer Colour Philosophy for the Phase Text Colour topic, page 209.

Operation Tab in Manual Mode

The figure shows the Operation tab when **OPERATOR** and the **MAN** mode are selected:



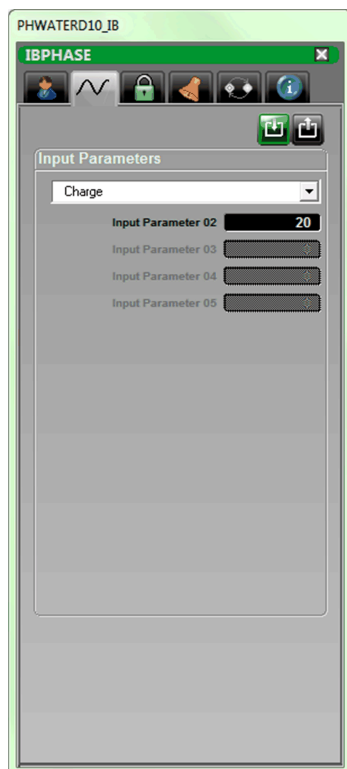
The phase starts in manual mode after clicking the *Start* button, and the bottom section of the faceplate displays:

- The steps of the phase that are programmed in the **Running** state.
- A check box next to each step allowing to execute it.
- For text colour of the strategy phase state, refer Colour Philosophy for the Phase Text Colour topic, page 209.

You can scroll up and down through the list of steps by using the two arrow buttons.

Input/Output Parameters Tab

The figure shows the Input/Output Parameters tab when **Input Parameters** is selected:

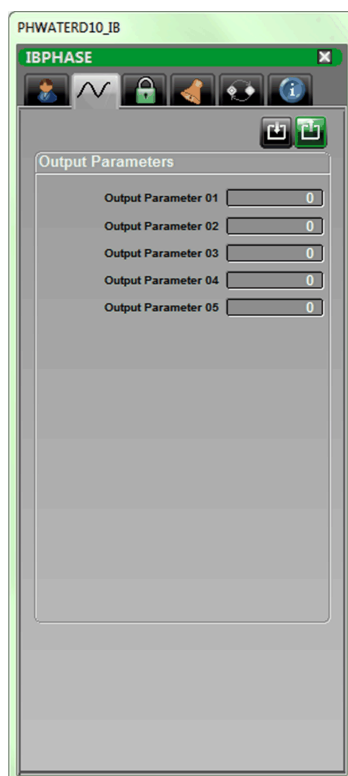


You can select a strategy from the ones that have been defined and enter the corresponding values for enabled parameters.

Initially, if the strategy is configured for the phase then the default strategy in the phase will be shown as **Unknown Strategy (0)**, you have to select the strategy and start the phase.

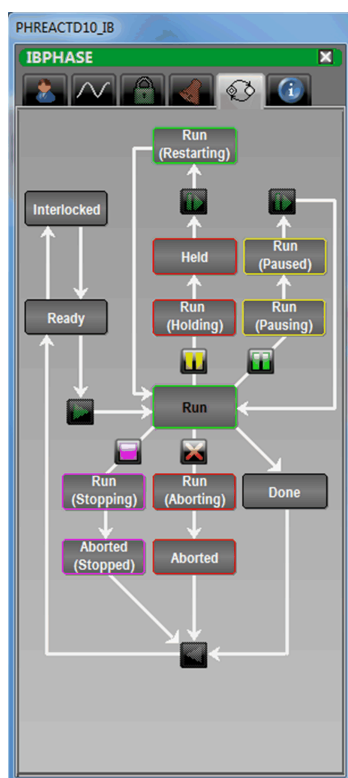
Parameters that do not pertain to the selected strategy are disabled.

The figure shows the Input/Output Parameters tab when **Output Parameters** are selected:



Displays the value of certain parameters, which are calculated while the phase is carried out.

State Machine Tab



The state diagram allows the operator to execute available commands, using the buttons, page 210.

Label of states appear in white while the current state appears in the same color as its frame.

NOTE: Names of transient states only will be blinking when it is active.

Communication configuration in InBatch Tool

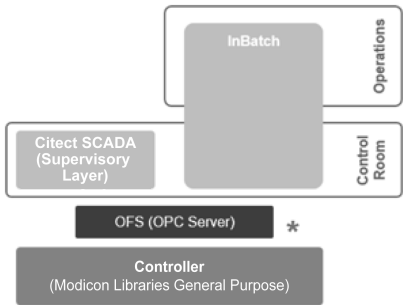
What's in This Chapter

Description 217

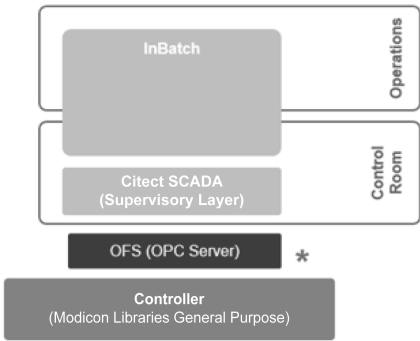
Description

InBatch tool can be configured to communicate with control resource (Batch Phase Manager) by two approaches:

InBatch Communication with IBPhase Manager through OFS - InBatch tool will communicate with OFS directly in parallel with Supervisory layer (Citect SCADA) and OFS is communicating with control resource (Batch Phase Manager).

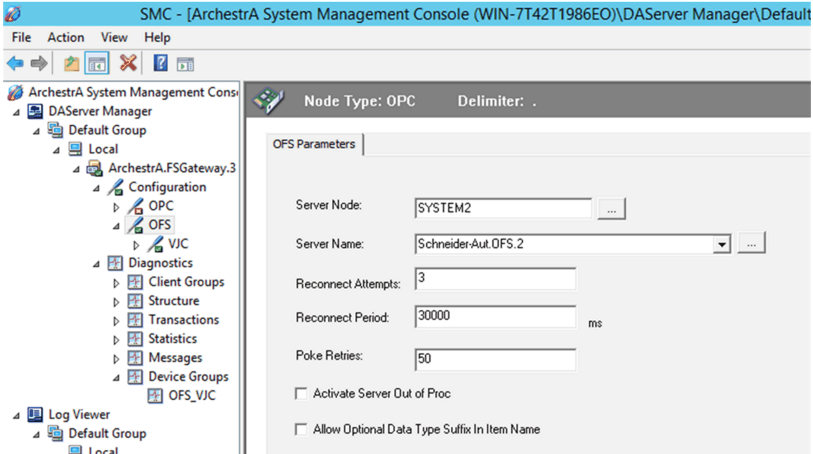
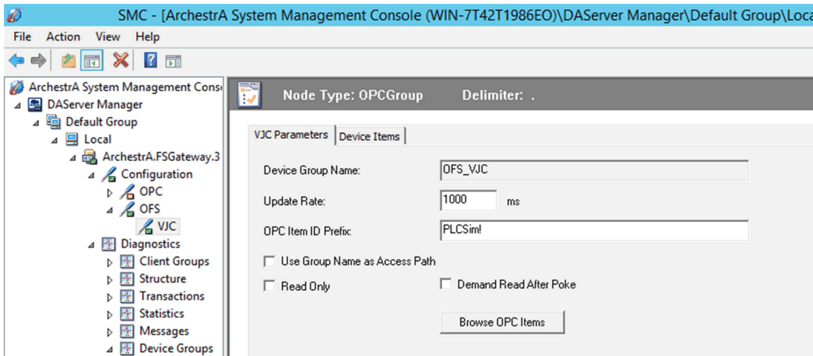
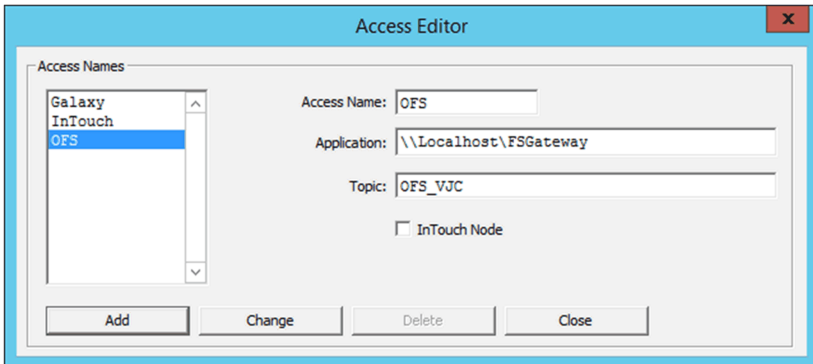


InBatch Communication with IBPhase Manager through Citect SCADA- In this approach InBatch tool will communicate with Citect SCADA and Citect SCADA is communicating with OFS.



InBatch Communication with IBPhase Manager through OFS

To configure the InBatch tool to communicate with OFS, you have to verify that `IBCLI` service is added in the runtime services and its parameter **Access Name** should be added and configured to point to access name defined in tag linker and all the runtime services are stopped. The below table shows InBatch tool to communicate with Batch phase manager.

Step	Action
1	<p>The workstation which is having InBatch tool installed, verify that the FSGateway driver should be available on the same workstation. You can check in SMC under DAServer manager hierarchy. Go to SMC, Expand Archestra.FSGateway, right click on Configuration add OPC object and configure as shown below (e.g. - OFS)</p>  <p>To Configure the OPC object, configure the server node name which is having OPC DA server configured.</p> <p>Click browse button and select the OPC DA server from the list.</p> <p>NOTE: For additional details refer the Citect SCADA help file for the DCOM settings configuration.</p>
2	<p>Go to the DAServer Manager on the left side navigation hierarchy.</p>  <p>To check if DCOM setting is done correctly, click on browse OPC items button, it should show the list of tags available on OFS project without any detected error. No need to add any item in Device Items tab.</p>
3	<p>Go to InBatch tool, Environment Display. Open the Tag Linker. Create the access name. Provide the computer path location where the FSGateway is configured, in this case FSGateway is on local host. Provide the topic name same as Device group name mentioned in FSGateway server.</p> 
4	<p>Go to view in Tag Linker, click on Filter, select the units and tag type to create the link. In the below figure, tag name column shows the tags created by the InBatch and items are IBSTATE and IBCOMMAND variables from Batch phase manager. User will have to configure every tag with respective bit in the IBSTATE and IBCOMMAND as shown below. User will have to change the access to the OFS which is created in step 3.</p>


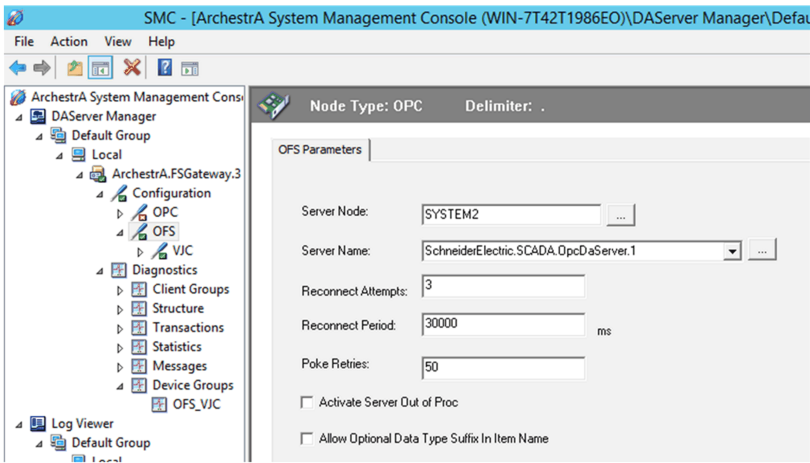
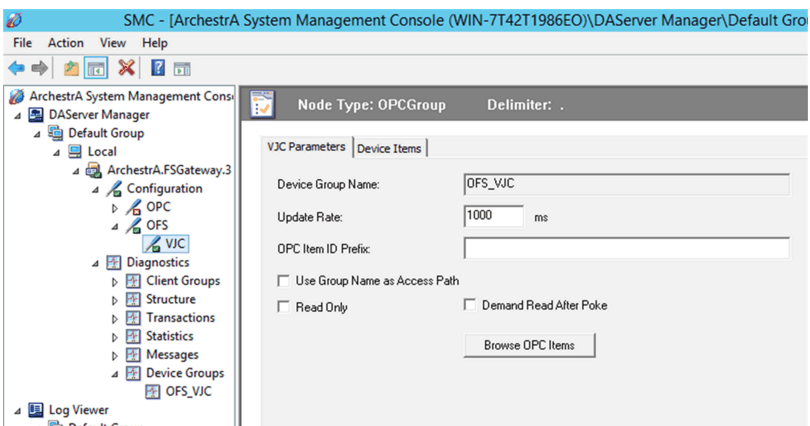
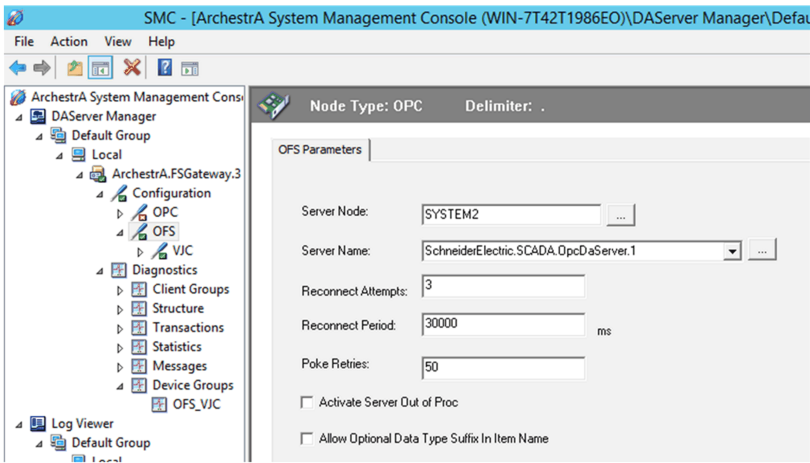
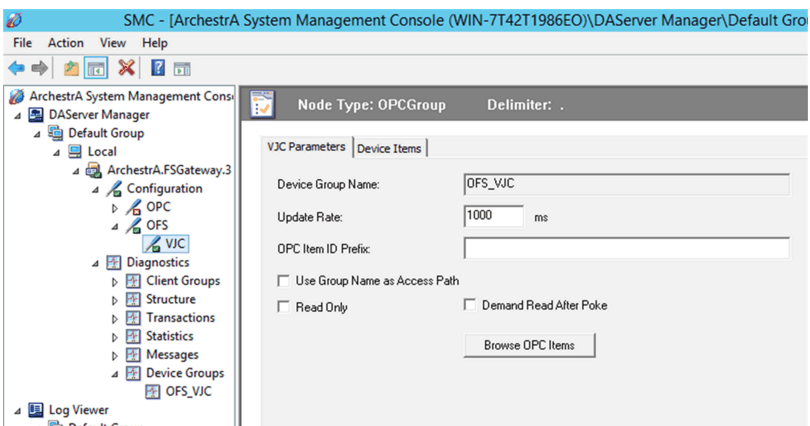
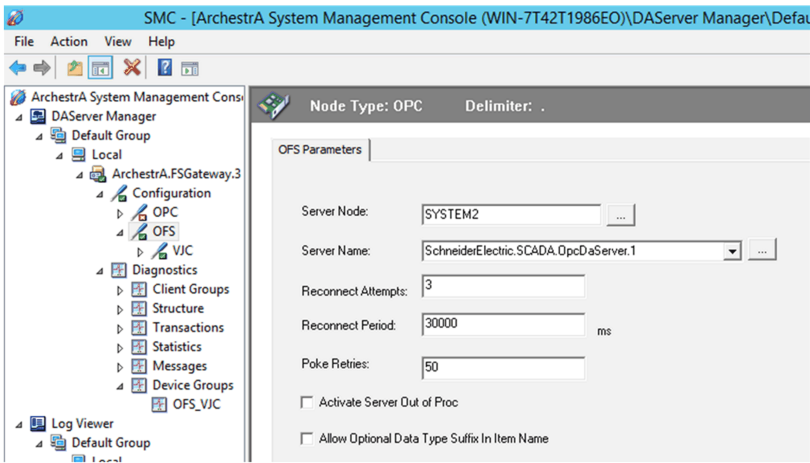
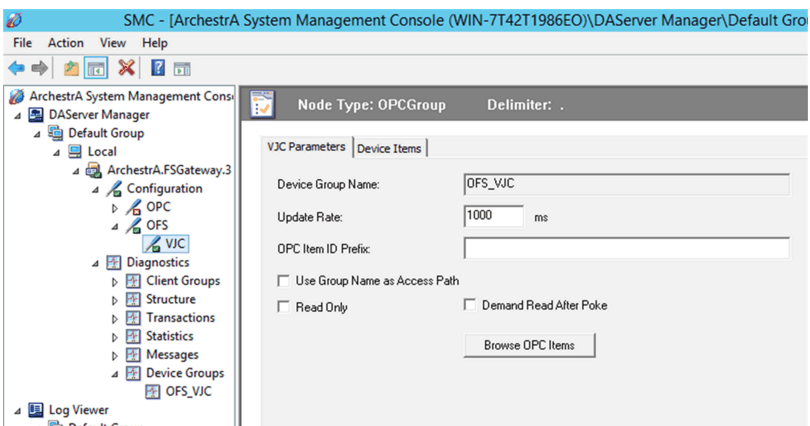
Step	Action
5	After linking all the required tags, update the Environment, Runtime and Configuration in Environment Display.
6	Now activate the FSGateway server in SMC.
7	Start all the services from Runtime in Environment Display. Now the user will be able to communicate InBatch tool with Batch phase manager.

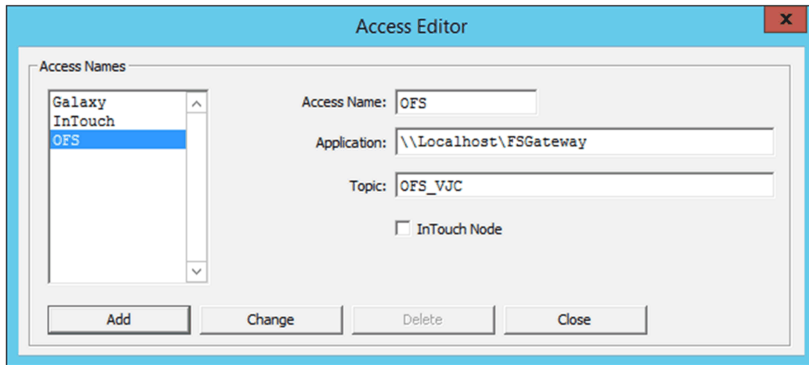
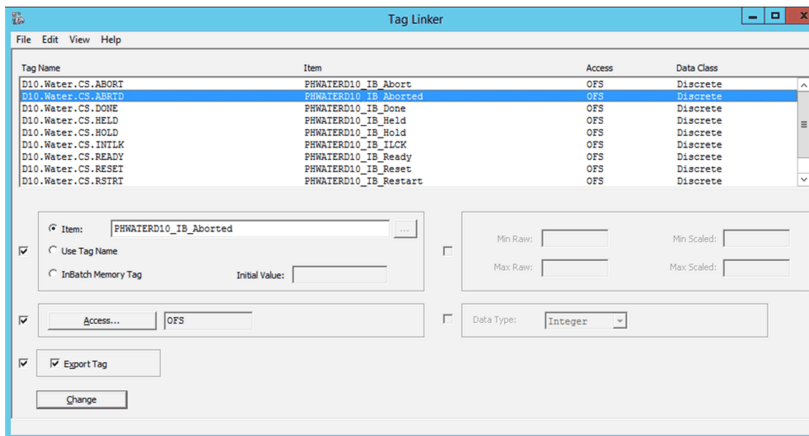
InBatch Communication with IB Phase Manager through Citect SCADA

In this approach, Citect SCADA and InBatch tool are communicating using OPC protocol through **FSGateway**. Here Citect SCADA is acting as OPC DA server and InBatch tool is acting as OPC Client.

To configure the InBatch tool to communicate with Citect SCADA, user has to verify that **IBCLI** service is added in runtime services and its parameter **Access Name** should be added and configured to point to access name defined in **Tag Linker** and all the runtime services are stopped. The below table shows the steps to configure InBatch tool to communicate with Batch phase manager through Citect SCADA.

Step	Action
1	<p>Create a project using the xml IBPHASE_DIGITAL.xml. This xml will generate the additional tags for InBatch to communicate with IBSTATE and IBCOMMAND variables in Control Expert as shown below.</p> <p>For example, CM name_IB_Ready → IODevice_1!CM name_IBPHASE_ST.IBSTATE.0</p>
2	<p>Go to Citect SCADA project editor, Servers tab and add a OPC DA Server.</p> <p>While accessing the run time of project, you have to verify that OPC DA server service is in RUNNING status as shown below it will start the OPCDAServer service as shown below.</p>

Step	Action																																																
	<div><div>Runtime Manager</div><div><div><div>Citect SCADA</div></div><div>Version 8.0 Supervision_FAT 20180216</div></div><table><thead><tr><th>CPU</th><th>Process ID</th><th>Process</th><th>Type</th><th>Status</th><th>Message</th></tr></thead><tbody><tr><td>All</td><td>12896</td><td>Cluster_1.ReportServer_1_P</td><td>Report</td><td>Running</td><td></td></tr><tr><td>All</td><td>14488</td><td>Cluster_1.IOServer_1</td><td>IO Server</td><td>Running</td><td></td></tr><tr><td>All</td><td>16140</td><td>Cluster_1.TrendServer_1_P</td><td>Trend</td><td>Running</td><td></td></tr><tr><td>All</td><td>16388</td><td>Cluster_1.AlarmServer_1_P</td><td>Alarm</td><td>Running</td><td></td></tr><tr><td>All</td><td>16988</td><td>VJCOPC</td><td>OpcDaServer</td><td>Running</td><td></td></tr><tr><td>All</td><td>6584</td><td>Client</td><td>Client</td><td>Running</td><td></td></tr></tbody></table><div><div>Restart All</div><div>Shutdown All</div><div>Hide</div><div>Help</div></div></div> <tr><td>3</td><td><p>The workstation which is having InBatch tool installed, make sure the FSGateway driver should be available on the same workstation. User can check in SMC under DAServer Manager hierarchy.</p><p>Go to SMC, Expand Archestra.FSGateway, right click on Configuration add OPC object and configure as shown below (e.g. - OFS)</p><div></div><p>To Configure the OPC object, configure the server node name which is having OPCDAServer configured. Click browse button and select the OPCDAServer from the list.</p><p>NOTE: For additional details refer the Citect SCADA help file for the DCOM settings configuration.</p></td></tr> <tr><td>4</td><td><p>Create and configure OPC group as shown below (e.g - VJC).</p><div></div><p>To check if DCOM setting is done correctly, click on browse OPC items button, it should show the list of tags available in Citect SCADA project without any detected error. No need to add any item in Device Items tab.</p></td></tr> <tr><td>5</td><td><p>Go to InBatch tool → Environment Display. Open the Tag linker. Create the access name. Provide the computer path location where the FSGateway is configured, in this case FSGateway is on local host. Provide the topic name same as Device group name mentioned in FSGateway server.</p></td></tr>	CPU	Process ID	Process	Type	Status	Message	All	12896	Cluster_1.ReportServer_1_P	Report	Running		All	14488	Cluster_1.IOServer_1	IO Server	Running		All	16140	Cluster_1.TrendServer_1_P	Trend	Running		All	16388	Cluster_1.AlarmServer_1_P	Alarm	Running		All	16988	VJCOPC	OpcDaServer	Running		All	6584	Client	Client	Running		3	<p>The workstation which is having InBatch tool installed, make sure the FSGateway driver should be available on the same workstation. User can check in SMC under DAServer Manager hierarchy.</p> <p>Go to SMC, Expand Archestra.FSGateway, right click on Configuration add OPC object and configure as shown below (e.g. - OFS)</p> <div></div> <p>To Configure the OPC object, configure the server node name which is having OPCDAServer configured. Click browse button and select the OPCDAServer from the list.</p> <p>NOTE: For additional details refer the Citect SCADA help file for the DCOM settings configuration.</p>	4	<p>Create and configure OPC group as shown below (e.g - VJC).</p> <div></div> <p>To check if DCOM setting is done correctly, click on browse OPC items button, it should show the list of tags available in Citect SCADA project without any detected error. No need to add any item in Device Items tab.</p>	5	<p>Go to InBatch tool → Environment Display. Open the Tag linker. Create the access name. Provide the computer path location where the FSGateway is configured, in this case FSGateway is on local host. Provide the topic name same as Device group name mentioned in FSGateway server.</p>
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Step	Action
	
6	<p>Now go to view in Tag Linker → Filter, select the units and tag type to create the link. In the below figure, tag name column shows the tags created by the InBatch and items are IBSTATE and IBCOMMAND variables which are generated in Citect SCADA project as shown in step 1.</p> <p>User will have to configure every tag with respective tag created in Citect SCADA project as shown in below figure. User will have to change the access to the OFS which is created in step 5</p> 
7	After linking all the required tags, update the Environment , Runtime and Configuration in Environment Display .
8	Now activate the FSGateway server in SMC.
9	Start all the services from Runtime in Environment Display . Now the user will be able to communicate InBatch tool with Citect SCADA.

Auxiliary Functions

What's in This Part


Alarm Summary Management	223
Analog Signal Selection Management	228
Operator Message Management	232
Boolean Setpoint Management	235
REAL Setpoint Management	237
INT Setpoint Management	239
Duration Setpoint Management	241

Overview

This part describes the components that provide the Supervision functions for the auxiliary functions family.

You can use these components with components of other families to provide additional services, data, genies and/or faceplates.

These components do not reflect any specific installation.

 **WARNING**

LOSS OF CONTROL

- Perform a Failure Mode and Effects Analysis (FMEA), or equivalent risk analysis, 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 them.
- Review the implications of communication link interruptions and take actions to mitigate them.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and error conditions) according to your risk assessment, and applicable codes and regulations.
- Apply local accident prevention and safety regulations and guidelines.¹
- Test each implementation of a system for proper operation before placing it into service.

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

¹ 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.

Alarm Summary Management

What's in This Chapter

Supervision Functions	223
Control/Supervision Relationship	223
Tags	224
Genies	224
Faceplates	225

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 a genie and its associated faceplate.

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_dinput_dalarm` library when implemented through the `$AlarmSummary` control module template:

Control resources	Description	Service status
DINPUT	Logic	X
CONDSUM	Summary of conditions	
X	Mandatory resource	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Signal Processing and Auxiliary Functions (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag name	Description
DINPUT	Refer to <i>DINPUT</i> .
CONDSUM	Refer to Commonly Used Blocks, page 53.

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Alarm tag	Description	Expression	Process event, page 30
DINPUT	Refer to <i>DINPUT</i> .		

Trend Tags

No trend tags are managed by Supervision components for alarm summary management.

Genies

Genie Properties


Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genie.

Representation

The table describes the genie of the `sgc_dinput_dalarm` library:

Graphic symbol	Genie name	Description
	dalarm_10	Summary of alarm conditions.

Faceplates

Overview

During operation, clicking a genie of the `sgc_dinput_dalarm` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation
 - Configuration
 - Alarm Conditions, page 46
 - Information

Faceplate Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

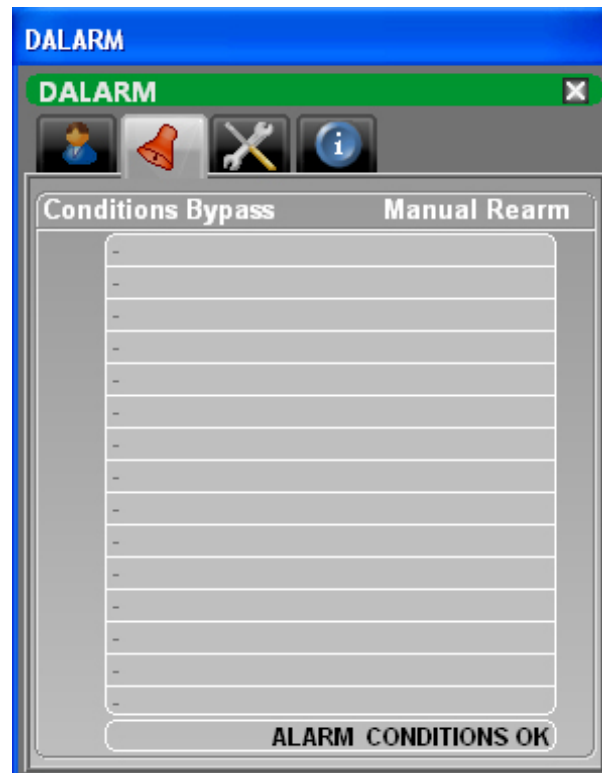
Operation Tab



Configuration Tab



Alarm Conditions Tab



Analog Signal Selection Management

What's in This Chapter

Supervision Functions	228
Control/Supervision Relationship	228
Tags	228
Genies	229
Faceplates	230

Overview

This chapter describes the Supervision resources and runtime services that are available for the management of analog signal selection.

Supervision Functions

Description

Core resources provide the following monitoring and operation functions: Owner selection and selector operation.

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

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_aselect1` library when implemented through the `$AnalogSelect1` control module template:

Control resources	Description	Resource status
ASELECT1	Logic	X
X	Mandatory resource	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Auxiliary Functions (see EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag	Description
CM name_ASELECT1_STW	Status information
CM name_ASELECT1_CFGW	Configuration data

Advanced Alarm Tags

The table describes the advanced alarm tags and process events that are managed by Supervision components. It also indicates the expression that is configured in the Supervision components to read or write the corresponding bit of the status or configuration word:

Name	Description	Expression	Process event, page 30
CM name_ASELECT1_ERROR	Inoperable channel	CM name_ASELECT1_STW BitAND 0x1000	No
Optional tags			
CM name_ASELECT1_MINSELD	Lowest selected input	CM name_ASELECT1_STW BitAND 0x0001	Yes
CM name_ASELECT1_SP1SELD	Input selection	CM name_ASELECT1_STW BitAND 0x0002	
CM name_ASELECT1_SP2SELD	Input selection	CM name_ASELECT1_STW BitAND 0x0004	
CM name_ASELECT1_SP3SELD	Input selection	CM name_ASELECT1_STW BitAND 0x0008	
CM name_ASELECT1_SP4SELD	Input selection	CM name_ASELECT1_STW BitAND 0x0010	
CM name_ASELECT1_MAXSELD	Highest selected input	CM name_ASELECT1_STW BitAND 0x0020	

Trend Tags

The table describes the trend tags that are managed by Supervision components and their expression:

Tag	Description	Expression
CM name_ASELECT1_SP	Current setpoint	CM name_ASELECT1_SP

Genies

Genie Properties


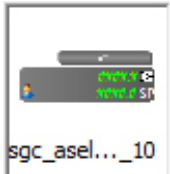
Refer to Using Genies, page 34.

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genres.

Representation

The table describes the genres of the `sgc_aselect1` library:

Graphic symbol	Genie name	Facet template identifier	Description
	<code>sgc_aselect1_10</code>	<code>\$ASELECT1_CG</code>	Only the description of the selected setpoint is shown in the foreground.
	<code>sgc_aselect1_sp_10</code>	<code>\$ASELECT1SP_CG</code>	The description of the selected setpoint and the resulting setpoint value are shown in the foreground.

Faceplates

Overview

During operation, clicking a genie of the `sgc_aselect1` library allows you to display a faceplate with the following tab:

- Standard tabs:
 - Operation
 - Information

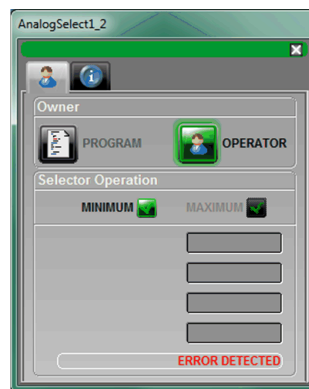
Faceplate Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Operation Tab

The figure shows an example of the Operation tab:



Operator Message Management

What's in This Chapter

Supervision Functions	232
Control/Supervision Relationship	232
Tags	233
Genies	233
Faceplates	234

Overview

This chapter describes the Supervision resources and runtime services that are available for the management of operator messages.

Supervision Functions

Description

Core resources provide the following monitoring and operation functions: message display management (activation/abortion, icon selection, and button selection).

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

Control/Supervision Relationship

Overview

The table describes which Control resources provide data to the Supervision components of the `sgc_msgbox` library when implemented through the `$MessageBox` control module template:

Control resources	Description	Resource status
MSGBOX	Logic	X
X	Mandatory resource	

The data is created from the corresponding Control templates and shared through interfaces. This allows the necessary tags with the appropriate syntax to be generated in the databases of the Supervision Participant.

For a description of these Control resources, refer to Auxiliary Functions (see *EcoStruxure™ Process Expert - General Purpose Library Classic Process Control Services Reference Manual*).

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

The table describes the variable tags that are managed by Supervision components:

Tag	Description
CM name_MSGBOX_STW	Status information
CM name_MSGBOX_CFGW	Configuration data

Advanced Alarm Tags

No advanced alarm tags are managed by Supervision components for the message box management.

Trend Tags

No trend tags are managed by Supervision components for the message box management.




Genies

Genie Icons

At the beginning of the manual, you can find a description of the icons, page 36 that are part of the genies.

Representation

The table describes the genies of the `sgc_msgbox` library:

Graphic symbol	Genie name	Facet template identifier	Description
	sgc_msgbox	\$MSGBOX_CG	Message without icons in normal size.
	sgc_msgbox_large	\$MSGBOXLARGE_CG	Message with icons in large size.
	sgc_msgbox1	\$MSGBOX1_CG	Message with icons in normal size.

Faceplates

Overview

During operation, clicking a genie of the `sgc_msgbox` library allows you to display a faceplate with the following tabs:

- Standard tabs:
 - Operation
 - Information

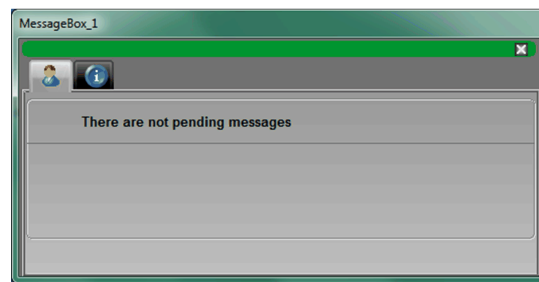
Faceplate Description

At the beginning of this manual, you can find the description of:

- The color convention, page 33 that is used to display data on the faceplate.
- The buttons, page 40 that appear on the different tabs.

Operation Tab

The figure shows an example of the Operation tab:



Boolean Setpoint Management

What's in This Chapter

Tags

Genies

235

235

Overview

This chapter describes the Supervision resources and runtime services that are available for the management of setpoints of BOOL data type.

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

Supervision components manage the variable tag with the following name: `CMname`

Advanced Alarm Tags

No advanced alarm tags are managed by Supervision components for boolean setpoint management.

Trend Tags

No trend tags are managed by Supervision components for boolean setpoint management.

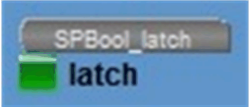
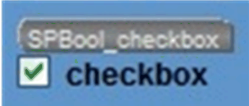
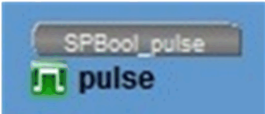
Genies

Genie Properties

Refer to Using Genies, page 34.

Genie Representation

The table describes the genies of the `sgc_spmanage` library:

Graphic symbol	Genie name	Facet template identifier	Description
 The graphic symbol for a latch operation. It features a blue rectangular background. At the top, there is a gray rounded rectangle containing the text 'SPBool_latch'. Below this, there is a green square followed by the word 'latch' in black text.	SPBool_Latch_10	<i>SPBool_Latch_CG</i>	Use for SET (green = 1) and RESET (gray = 0) operation.
 The graphic symbol for a checkbox operation. It features a blue rectangular background. At the top, there is a gray rounded rectangle containing the text 'SPBool_checkbox'. Below this, there is a green square with a white checkmark inside, followed by the word 'checkbox' in black text.	SPBool_Checkbox_10	<i>SPBool_Checkbox_CG</i>	Use for acknowledge/confirmation (selected = 1) operation.
 The graphic symbol for a pulse operation. It features a blue rectangular background. At the top, there is a gray rounded rectangle containing the text 'SPBool_pulse'. Below this, there is a green square with a white pulse waveform inside, followed by the word 'pulse' in black text.	SPBool_Pulse_10	<i>SPBool_Pulse_CG</i>	Use for pulse signal generation (green = 1).

Faceplate

No faceplate is available.

REAL Setpoint Management

What's in This Chapter

Tags	237
Genies	237

Overview

This chapter describes the Supervision resources and runtime services that are available for the management of setpoints of REAL data type.

Tags

Tag Syntax

Refer to Genie Control Module Name, page 36.

Variable Tags

Supervision components manage the variable tag with the following name: `CMname`

Advanced Alarm Tags

No advanced alarm tags are managed by Supervision components for REAL setpoint management.

Trend Tags

No trend tags are managed by Supervision components for REAL setpoint management.


Genies

Genie Properties

Refer to Using Genies, page 34.

Genie Representation

The table describes the genie of the `sgc_spmanage` library:

Graphic symbol	Genie name	Facet template identifier	Description
	SPReal_10	<i>SPReal_10_CG</i>	Shows the value left-justified. (Unit and legend are right-justified.)

Faceplate

No faceplate is available.

INT Setpoint Management

What's in This Chapter

Tags	239
Genies	239

Overview

This chapter describes the Supervision resources and runtime services that are available for the management of setpoints of INT data type.

Tags

Tag Syntax

Refer to *Genie Control Module Name*, page 36.

Variable Tags

Supervision components manage the variable tag with the following name: `CM
name`

Advanced Alarm Tags

No advanced alarm tags are managed by Supervision components for INT setpoint management.

Trend Tags

No trend tags are managed by Supervision components for INT setpoint management.

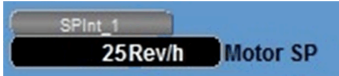
Genies

Genie Properties

Refer to *Using Genies*, page 34.

Genie Representation

The table describes the genie of the *sgc_spmmanage* library:

Graphic symbol	Genie name	Facet template identifier	Description
	SPInt_10	<i>SPInt_10_CG</i>	Shows the value left-justified. (Unit and legend are right-justified.)

Faceplates

No faceplate is available.

Duration Setpoint Management

What's in This Chapter

Supervision Functions	241
Tags	242
Genies	242

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

During operation, the genie representing the control module allows you to enter a duration in various ways, based on the format *DD.HH:MM:SS.MS*.

The duration is displayed by using five time components:

Time component	Description	Maximum value ⁽¹⁾
<i>DD</i>	Days component	24
<i>HH</i>	Hours component	99 ⁽²⁾
<i>MM</i>	Minutes component	59
<i>SS</i>	Seconds component	59
<i>MS</i>	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.

Rules Applicable to Durations

The table describes the rules that apply when you enter durations in the genie during operation:

Object of the rule	Description	Example
Conversion of entries	The genie 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	<p>You cannot enter a value starting with the minutes component.</p> <p>When you enter a value in the format <i>MM:SS</i> or <i>MM:SS.MS</i>, the genie does not accept your entry and the current value that is configured remains.</p> <p>To enter a duration in minutes and seconds, enter the value in the format <i>0:MM:SS</i> or <i>0:MM:SS.MS</i>.</p>	<p>The entry 20:10 (meaning 20 min. and 10 sec.) is not accepted.</p> <p>Enter 0:20:10 to display 20:10.000</p>
Durations expressed in seconds	The genie accepts the entry of durations expressed in seconds in the format <i>#####</i> and converts the value to the <i>DD.HH:MM:SS.MS</i> format.	<p>Entering 119 displays 1:59.000</p> <p>Entering 3 displays 3.000</p>

Object of the rule	Description	Example
	<p>You cannot enter more than 5 digits; otherwise your entry is not accepted and the current value that is configured remains.</p> <p>NOTE: You can enter 99999 seconds maximum.</p>	
Durations expressed in milliseconds	The genie accepts the entry of durations expressed in milliseconds in the format .###.	Entering .200 displays 0.200
Maximum duration	You cannot enter a value that is outside of the range configured in the <i>variable tag</i> , page 242; otherwise your entry is not accepted and the current value that is configured remains.	-

Tags

Tag Syntax

Refer to *Genie Control Module Name*, page 36.

Variable Tags

Supervision components manage the variable tag with the following name: *CM name*

The following variable tag parameters define the range of the setpoint values that you can enter and need to comply with the ULONG data type:

- **Eng Zero Scale:** Low end of the range for the setpoint.
- **Eng Full Scale:** High end of the range for the setpoint.

These parameter values need to be compatible with the ULONG data type that is used by the tag.

Advanced Alarm Tags

No advanced alarm tags are managed by Supervision components for Duration setpoint management.

Trend Tags

No trend tags are managed by Supervision components for Duration setpoint management.


Genies

Genie Properties

Refer to *Using Genies*, page 34.

Genie Representation

The table describes the genie of the *sgc_spmanage* library:

Graphic symbol	Genie name	Facet template identifier	Description
	SPDuration_10	SPDuration_10_CG	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
<p>The genie displays only the time components that you enter (or that is the result of the conversion), if different from 0, in the format <i>DD.HH:MM:SS.MS</i>.</p> <p>NOTE:</p> <ul style="list-style-type: none"> When you enter milliseconds in 3-digit format, the 0 that corresponds to the seconds component is displayed. The leading 0 of the highest time component is not displayed. The millisecond component is displayed with 3 digits. The day component is displayed only if you enter a value for this component. 	.320	0.320
	3.5	3.005
	2:10:5	2:10:05.000
	50:20:10	2.02:20:10.000

Faceplates

No faceplate is available.

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