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For Information

For Review

For Approval

For Construction

AS BUILT

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NUR ENERGY SERVICES SDN BHD

Jacobs

JACOBS ENGINEERING GROUP SDN BHD



TNB REPAIR AND MAINTENANCE SDN BHD

EPC CONSORTIUM:



JURONG ENGINEERING LIMITED



EQUATOR ENGINEERING SDN. BHD.

PROJECT:

130MW COMBINED CYCLE GAS TURBINE IN KULIM HI TECH PARK ("PROJECT AURORA")

TITLE:

DCS HMI GRAPHICS SPECIFICATION

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ABBREVIATIONS

Abbreviations	Meaning
ALMS	Alarms
AFC	Approved for Construction
ASM	Abnormal Situation Management
BPCS	Basic Process Control System
CDA	Control Data Access
CSS	Cascading Style Sheet
C&E	Cause & Effect
DCS	Distributed Control System
ENGR	Engineer
EPKS	Experion Process Knowledge System
ESD	Emergency Shutdown
EU	Engineering Units
FAT	Factory Acceptance Test
FGS	Fire and Gas System
GA	General Arrangement
HH	High High
HIPPS	High Integrity Pressure Protection System
HMI	Human Machine Interface
IFR	Issued For Review
IO	Input Output
LL	Low Low
MNGR	Manager
MOS	Maintenance Override Switch
NaN	Not a Number
OP	Output
OPER	Operator
OS	Operating System
OWS	Operator Workstations
PCS	Process Control System
P&ID	Piping & Instrument Diagram
PID	Proportional Integral Derivative
PKS	Process Knowledge System
PLC	Programmable Logic Controller
PV	Process Variable
SIS	Safety Integrated System
SCADA	Supervisory Control and Data Acquisition
SP	Set point
SOV	Solenoid Operated Valve
SUPV	Supervisor
SUO	Start-Up Override
VB	Visual Basic

TABLE OF CONTENT

1.0	INTRODUCTION	7
1.1	Experion® Process Knowledge System (PKS) C300 System Overview	7
2.0	PURPOSE OF DOCUMENT.....	8
2.1	Ownership/Intellectual Property Rights of Document.....	8
2.2	HOLDS.....	8
2.3	HMI Implementation Lifecycle.....	8
3.0	SCOPE OF SUPPLY & RESPONSIBILITIES.....	10
3.1	Scope of Supply.....	10
3.1.1	Honeywell.....	10
3.1.2	Contractor	10
3.2	Responsibilities	10
3.2.1	Honeywell.....	10
3.2.2	Reference Documents and Drawings	10
3.2.3	Contractor	11
4.0	DEFINITIONS	11
5.0	GRAPHIC DISPLAY IMPLEMENTATION	12
5.1	HMIWeb Display Builder.....	12
5.2	Abnormal Situation Management (ASM) Guideline – If applicable	12
5.3	HMIWeb Solution Pack.....	13
5.4	Display Categories.....	14
5.4.1	Standard System Displays	14
5.4.2	Custom Displays	16
5.5	Display Hierarchy.....	17
5.5.1	Level-0 - Plant Index.....	17
5.5.2	Level-1 – Process Area Overview Displays (If Using ORION Console).....	18
5.5.3	Level-2 – Process Unit Overview Displays	19
5.5.4	Level-3 – Process Unit Detail Displays.....	20
5.5.5	Level 4 - Point Manipulation	21
5.6	HMI Display Properties and Settings.....	24
5.6.1	Display Properties.....	24
5.6.2	Display Builder Setting	25
5.6.3	Station.....	25
5.7	HMI Display Implementation Guideline	31
5.7.1	Colors	32
5.7.2	Font.....	33
5.7.3	Labelling	34
5.7.4	Static (Non-Acting) Element.....	34
5.7.5	Process Line & Piping Color.....	35
5.7.6	Vessel Color	36

6.0	HMIWEB CONTROLS AND NAVIGATION	37
6.1	Navigation using keyboard	37
6.2	Navigation using Display Menu	37
6.3	Navigation within Process Displays.....	37
7.0	COMMON BEHAVIOR.....	39
7.1	Normal Indication	39
7.1.1	Status Indication.....	39
7.1.2	Analog Indication	40
7.1.3	Mode Indication	40
7.1.4	Off- Mode Indication	41
7.1.5	PV Source Indication.....	41
7.2	Abnormal Indication	41
7.2.1	Alarm Indication	41
7.2.2	Secondary Alarm Object.....	43
7.2.3	Inactive Indication	43
7.2.4	Bad PV Indication	44
7.2.5	Alarm Shelving Indication	44
7.2.6	Alarm Disabled / Inhibited Indication.....	45
7.2.7	Error Indication	45
7.3	Additional Information	46
7.3.1	Tag name and Tool Tip.....	46
7.3.2	Point Description.....	47
7.3.3	Engineering Units.....	47
7.3.4	Selection Box.....	47
7.3.5	Target Box.....	48
7.4	Menu Options.....	48
7.4.1	Shortcut Menu	48
7.4.2	Trending	49
7.4.3	Group Display.....	52
8.0	ALARM MANAGEMENT FUNCTIONALITIES.....	53
8.1	Alarm Representation	53
8.2	Alarm Navigation	53
9.0	INPUT DEVICE.....	55
10.0	SAMPLE FACEPLATES AND CONFIRMATION POPUP.....	55
10.1	Faceplate	55
10.2	Confirmation Popup	55
11.0	SHAPES.....	57
11.1	HMIWeb SP C300 / CDA / PCS Shapes	57
11.1.1	PCS Controller (PV-SP).....	57
11.1.2	PCS Level Bar	65

11.1.3	PCS Control Valve.....	70
11.1.4	PCS Analog Indicator.....	76
11.1.5	PCS Digital.....	84
11.1.6	PCS Totalizer	86
11.1.7	PCS Automan – Standard Automatic Controller (Operator Control).....	89
11.1.8	PCS ON OFF Valve.....	94
11.1.9	PCS Pump / Drive.....	100
11.1.10	PCS Motor.....	105
11.1.11	PCS FAN.....	110
11.1.12	MOV	117
11.1.13	FlowComp.....	118
11.2	HMIWeb ESD Shapes	122
11.2.1	ESD ON OFF Valve (SDV).....	122
11.2.2	ESD Analog Indicator.....	123
11.2.3	ESD ON OFF Valve (BDV).....	124
11.2.4	Flame Detector.....	125
11.2.5	Gas Detector.....	126
11.2.6	Hydrogen Detector.....	127
11.2.7	Manual Alarm Call Point	128
11.2.8	MOS.....	129
11.2.9	SUO	130
11.3	HMIWeb Static Shapes.....	131
11.3.1	Switch	131
11.3.2	Earthing Switch	131
11.3.3	Transformer	131
11.3.4	Generator.....	132
11.4	HMIWeb SP Navigation Shapes.....	133
11.4.1	Navigation Arrow.....	133
12.0	FOLDER LOCATIONS AND DISTRIBUTIONS:.....	134

1.0 INTRODUCTION

1.1 Experion® Process Knowledge System (PKS) C300 System Overview

The Process Control System (PCS) is built using Honeywell Series C C300 Controllers. Integrated Control & Safety System For the fully detailed communication architecture drawing, refer to the document MYP-000311-JEL-INC-DWG-0001 for Overall Control System Architecture Drawing.

2.0 PURPOSE OF DOCUMENT

The purpose of this document is to provide engineering guideline when designing displays using Honeywell's HMIWeb Display Builder for Experion PKS R520.2 (and above) releases, making use of the HMIWeb Solution Pack R520.2.

This document provides a set of philosophy guidelines that should be followed when developing displays with the HMIWeb display builder. The contents of this document are based on experience developing the HMIWeb Solution Package and other applications, such as GUS displays, conventional Experion PKS displays, and VB applications. This document Includes modern HMI design techniques such as those published by the Abnormal Situation Management (ASM) consortium.

It is not the intent of this document to describe standard system features related to HMI. Good reference documents which describe standard HMI related system features are:

- R520 Experion Operators Guide (EPDOC-XX80-en-500A)
- R520.2 HMIWeb Display Building Guide (EPDOC-XX54-en-500A)
- Procedure and Sequence Custom Display Building Guide (PDOC-XX86-en-510A)

2.1 Ownership/Intellectual Property Rights of Document

The property, copyright, design rights and all other intellectual property rights in this document are governed by the Honeywell-JEL Purchase Agreement.

2.2 HOLDS

The word HOLD will be found throughout this document. This is used because the information for the HOLD was not available at release of the DCS HMI Graphics Specification or is pending further investigation. All HOLD's will be cleared as more of the system is configured and as more internal and third-party information becomes available. All 'HOLDS' will be removed before the DCS HMI Graphics Specification is issued as 'As Built'.

2.3 HMI Implementation Lifecycle

In this section will be show the details HMI implementation lifecycle design

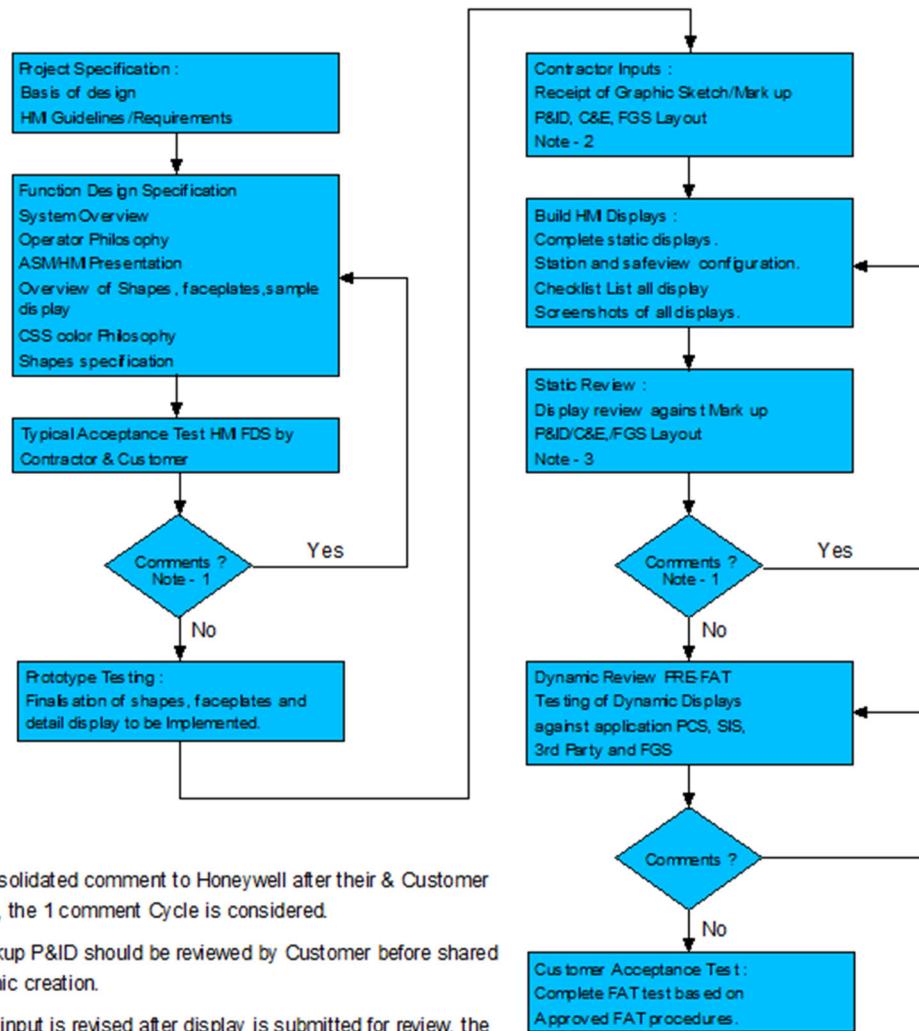


Figure 2.4. 1 HMI Project Lifecycle

3.0 SCOPE OF SUPPLY & RESPONSIBILITIES

3.1 Scope of Supply

3.1.1 Honeywell

Honeywell shall supply the following major items. Refer to the Bill of Materials, document number: MYP-00031-JEL-INC-BOM-0001 Bill of Materials for full detailed list of materials supply for AURORA project.

- Experion PKS (EPKS) Server
- Experion PKS (EPKS) Workstations
- PCS Marshalling Cabinet
- Network and Server Cabinet
- Third party Integration

3.1.2 Contractor

Contractor is to provide all the design information as listed below:

- Cause and Effect
- Piping and Instrumentation Diagram (P&ID)
- IO Database
- Field Junction Box Wiring Diagram
- 3rd Party Equipment Modbus List

3.2 Responsibilities

3.2.1 Honeywell

Honeywell is responsible for the implementation of the Process Control System (PCS) in AURORA project. This understanding has partly come from formal transfer of design documents from the purchaser and partly from classification discussions with the purchaser.

Honeywell's design responsibilities are:

- To build Distributed Control System (DCS) and Emergency Shutdown (ESD), which meets the design specified in the DCS Software Functional Design Specification (Doc. No. MYP-000311-JEL-INC-SPC-0002).
- To ensure that DCS and ESD logical actions are correctly implemented as per Control Narrative issued by the Contractor prior to the Factory Acceptance test (FAT).
- System Commissioning.
- To implement design changes only when such changes have been properly analysed and approved by both Honeywell and Contractor.

3.2.2 Reference Documents and Drawings

Document to be issued for Process Control System as below. Please refer to Vendor Deliverable List (Doc No.: MYP-000311-JEL-PMG-MDR-0001)

- **Vendor Document**

Reference Documents No.	Description
MYP-000311-JEL-INC-DWG-0001	SYSTEM ARCHITECTURE
MYP-000311-JEL-INC-BOM-0001	BILL OF MATERIALS
MYP-000311-JEL-INC-SPC-0002	DCS SOFTWARE FUNCTIONAL DESIGN SPECIFICATION
MYP-000311-JEL-INC-LST-0001	DCS IO ASSIGNMENT
MYP-000311-JEL-QAC-PRC-0001	DCS FACTORY ACCEPTANCE TEST PROCEDURE
MYP-000311-JEL-QAC-PRC-0006	DCS SITE ACCEPTANCE TEST PROCEDURE

- **Owner Document**

1. DCS HMI Graphics Display Existing
2. P & ID

3.2.3 Contractor

The Contractor's responsibilities are:

- To design the Control Narrative to ensure that Process Control System (PCS) operates correctly.
- To review and approve documents.
- To witness the Factory Acceptance Test (FAT) performed by Honeywell and sign off the FAT.
- To witness the Site Acceptance Test (SAT) performed by Honeywell and sign off the SAT.

4.0 DEFINITIONS

Within this specification, the following definitions apply.

Supplier	- Honeywell Engineering SDN BHD
Others	- Scope not within Honeywell's supply
Purchaser	- Jurong Engineering Limited
Field	- Equipment which is external to the C300 cabinets
Vendor	- Third Party Suppliers of equipment/packages
End User	- NUR Generation SDN BHD

5.0 GRAPHIC DISPLAY IMPLEMENTATION

5.1 HMIWeb Display Builder

Experion PKS R520 provides a new display builder, known as the “HMIWeb Display Builder”, which is an engineering tool used to develop graphics in HTML format. A number of standard displays are available, of which the most important are listed below:

- Point Detail Displays
- Alarm/Event Summaries
- Group Displays
- Trend Displays
- System Status Displays
- Communication Displays
- Event Displays

5.2 Abnormal Situation Management (ASM) Guideline – If applicable

Abnormal Situation Management (ASM)-The term refers to a series of methods and tools by which abnormal situations can be prevented, mitigated, and addressed during plant operations. Abnormal Situation Management is U.S. trademarks of Honeywell International.

During normal operations, the operator’s primary task is routine process surveillance, while process control elements and algorithms maintain satisfactory control of the plant. The graphic display reflects this task. In the case of abnormal situation, the same graphic Display must also meet a different set of needs in which the operator must actively return the process to a safe condition or normal operations via the graphic display.

Common Problems

A large majority of graphic displays have the following non-ASM obstacles.

Visual Noise

Graphical displays often contain visual noise, too much information, animation, or several colors. Visual noise provides distraction for the operator. Therefore, any unnecessary details should be removed from the graphical displays.

Non-interlinking Displays

Although, graphical displays are considered as stand-alone entities they are an inter-linking system. Display usage is a dynamic process; therefore, navigation between displays should be easy and intuitive.

Non-task Orientated Displays

Different tasks are often shown on a single display, resulting in confusion and a difficult display to use.

Wrong Audience

Primary users of the graphical displays are the console operators. Therefore, graphical displays should not be a substitute for P&IDs, whose audience are mainly engineers and field operators.

Please refer figures mentioned below. As shown in below Figure Alarms can be easily identified by operator, if standard ASM philosophy is used.

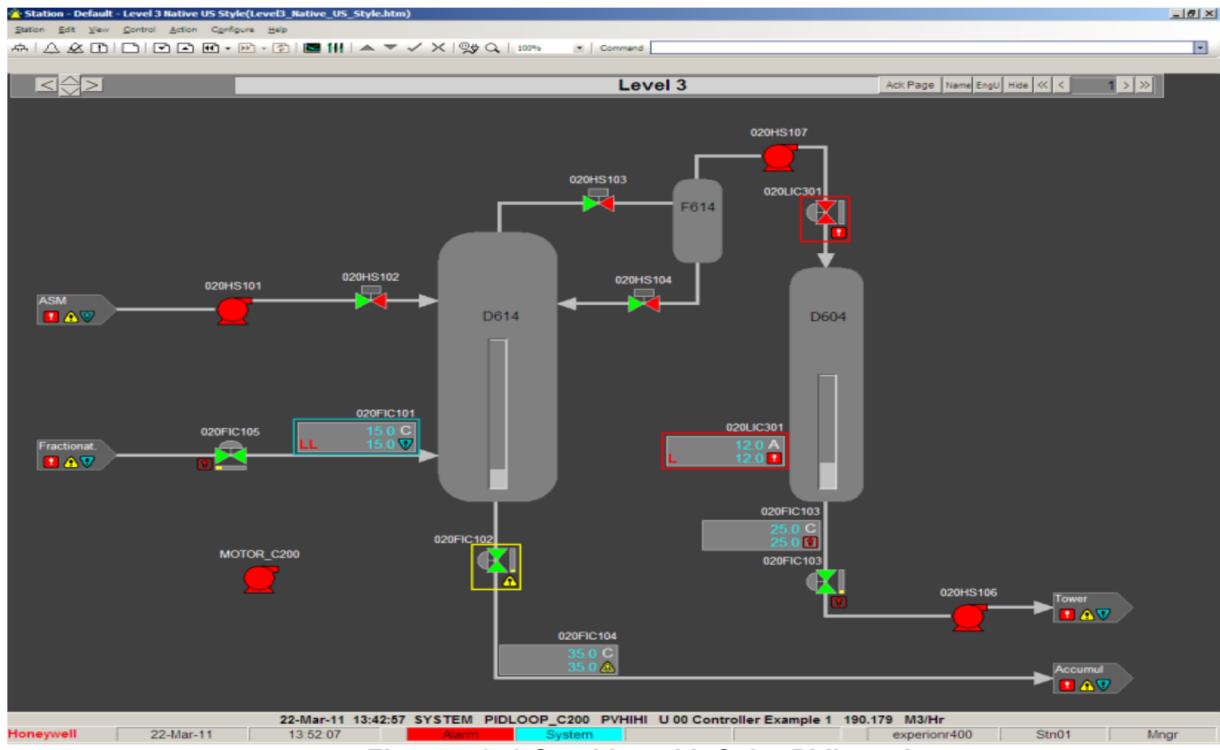


Figure 5.2. 1 Graphics with Color Philosophy

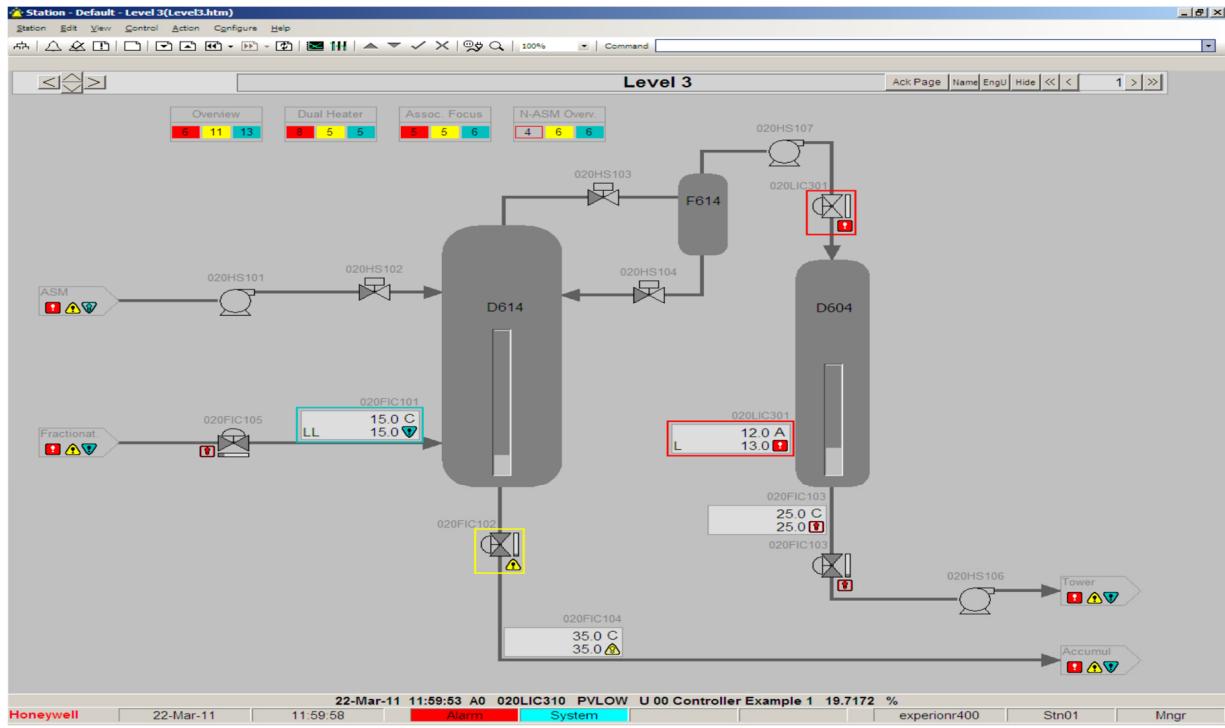


Figure 5.2. 2 Graphics with Abnormal Situation Management (ASM) philosophy

5.3 HMIWeb Solution Pack

Honeywell “HMIWeb Solution Pack” is a foundational Human-Machine Interface solution that is focused upon the principles of safe and effective operations. HMIWeb Solution Pack shapes are in compliance with Abnormal Situation Management (ASM).

The HMIWeb Solution Pack complements the standard functionality provided with Experion PKS and the HMIWeb Display Builder.

HMIWeb Display Builder is supplied with a library of pre-built shapes that shall be included in displays. The HMIWeb Solution Pack is a comprehensive advanced shapes library that shall be used to implement custom displays.

Honeywell HMIWeb Solution Pack-The main objective of this standard solution is to provide: Integrated solution offering with Honeywell Experion PKS software.

- Quick project start.
- Minimized project risk.
- Standardization.
- Consistent HMI concept.
- Effective plant operations.

For this project Standard HMIWeb Solution Pack shapes shall be used.

5.4 Display Categories

HMIWeb displays are mainly categorized into 2 types, based upon their functionality, which are as follows:

- Standard System Display.
- Custom Display.

5.4.1 Standard System Displays

Experion PKS is delivered with a number of standard displays, of which the most important have been listed below.

- Point Detail
- Alarm/Event Summary
- Group Displays
- Trend Displays
- System Status Displays

Point Detail: Provides detailed information about a particular point. This information includes current values, scanning, and history and so on as shown in Figure below.

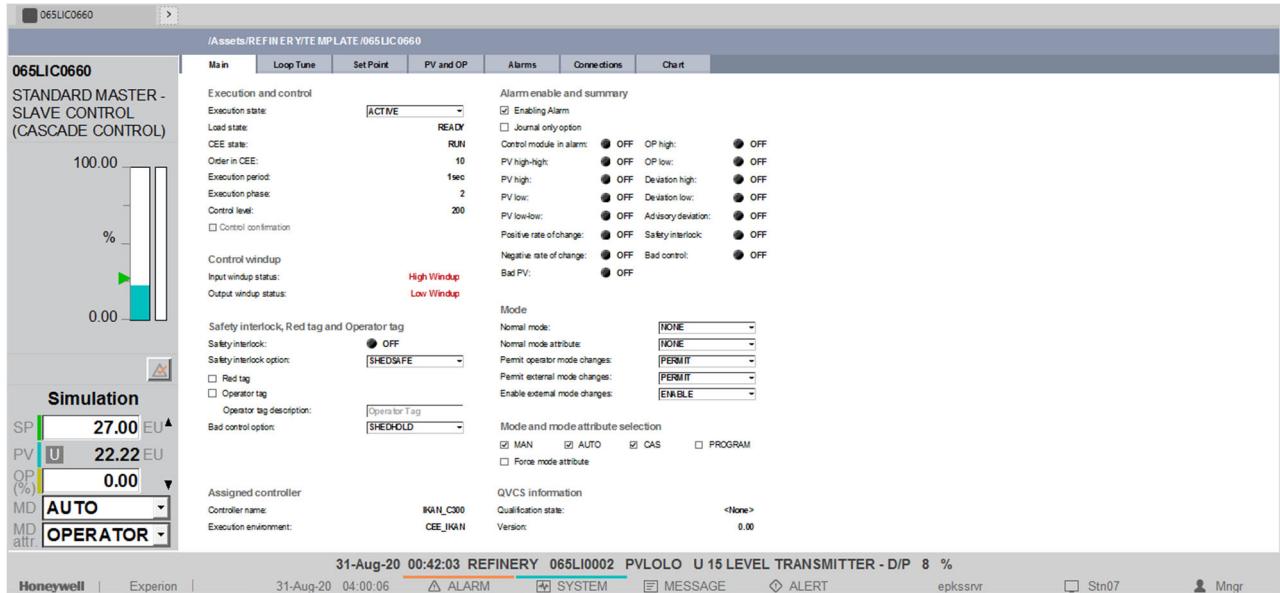


Figure 5.4.1. 1 Point Detail Display

Alarm/Event Summary: Displays information, such as alarms and events, in list form as shown in Figure below.

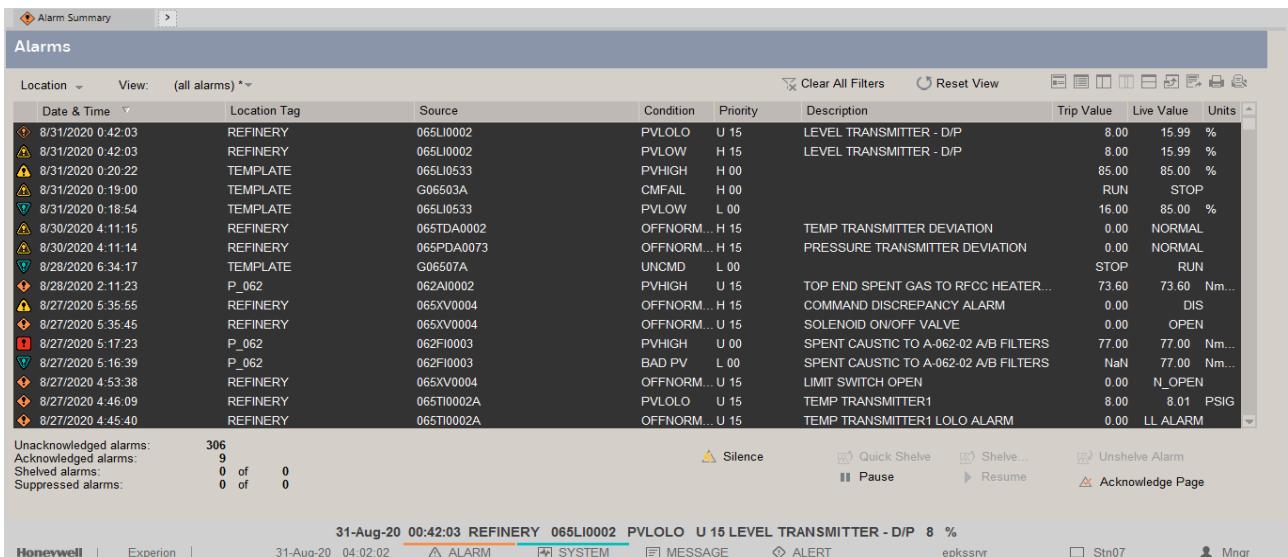


Figure 5.4.1. 2 Alarm Summary

Group Displays: Displays major parameter values for up to eight related points. Maximum 8 points can be configured in one group. Group display shall be accessible from process unit detail level as shown in Figure below.

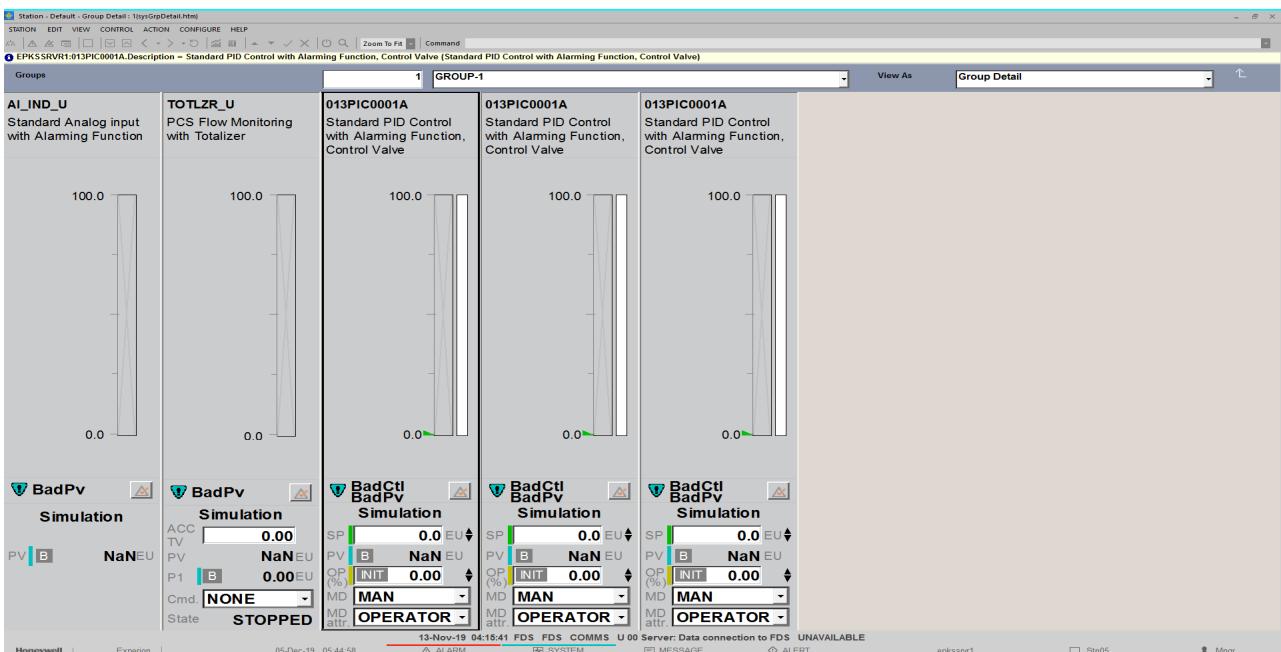


Figure 5.4.1. 3 Group Display

Trend Displays: Displays historical process values in a graphical manner. The data can be displayed in several ways such as lines and bar charts and can track several variables as shown in Figure below.

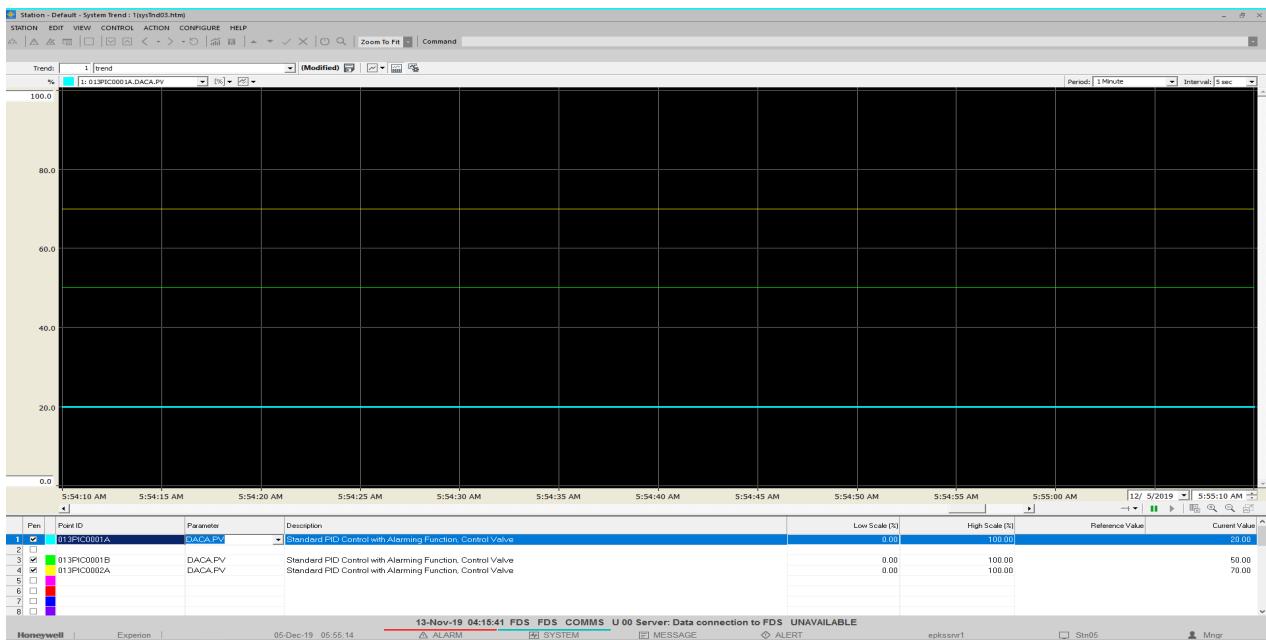


Figure 5.4.1.4 Trend Display

System Status Displays: Displays detailed status information about system equipment, such as controllers, IO Module and so on as shown in Figure below.

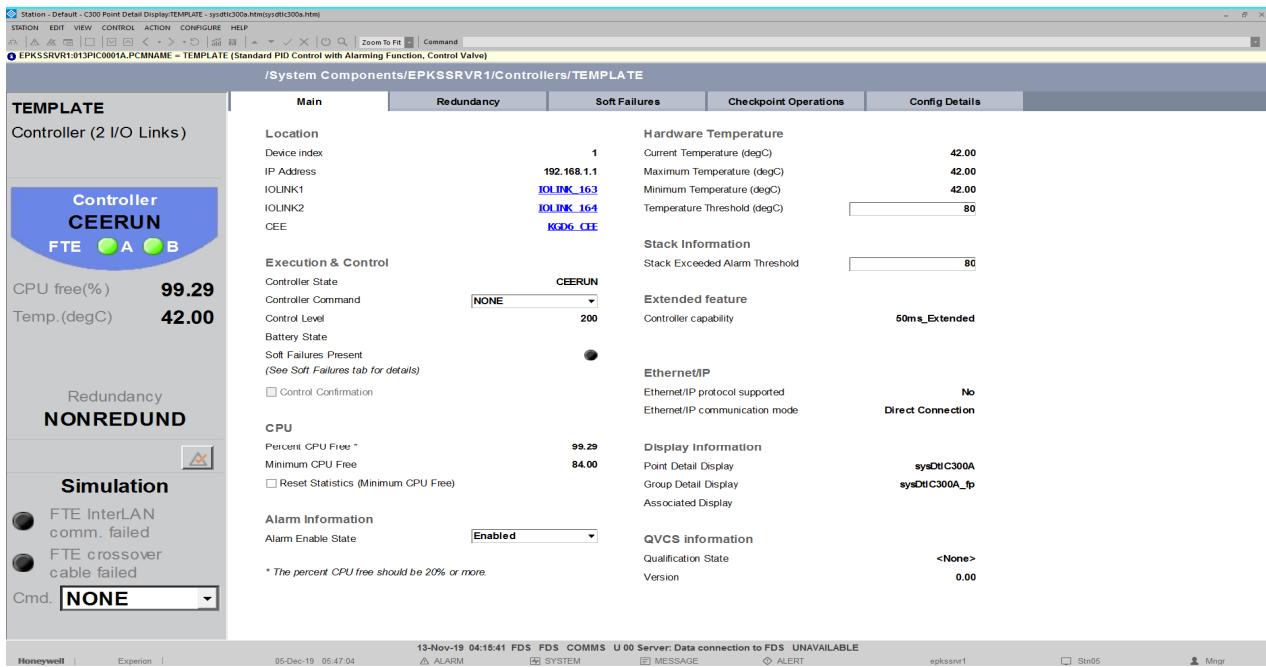


Figure 5.4.1.5 System Status Display

5.4.2 Custom Displays

Display that developed in the project shall be as per project requirement in order to meet the requirement of operation and maintenance engineers. These displays are available in HTML format and shall be developed using HMIWeb Display Builder. Below are the types of custom displays planned to be used for this project.

- Plant Index display.
- Process Area Overview displays.
- Process Unit Overview displays.
- Process Unit Detail displays.

- SIS / HIPPS Cause and Effect display.
- FGS Layout display.
- MOS / POS display for SIS and HIPPS.
- Third Party Package Display
- Electric Single Line Diagram
- Fire Fighting Equipment Display
- POP-UP Display for specific equipment
- Customized Faceplate display
- Diagnostic display.
- System Architecture display. (Communication System status display / Module status display)
- Shape legends.

5.5 Display Hierarchy

Based on ASM guidelines and best practices, process operation graphical displays are segregated into different levels of detailed information and complexity. Display Hierarchy is a organized structure of displays which helps operator to move between the “big picture” of process plant status to the “details” around individual equipment areas, controllers as the task or situation requires. A concept of “levels” should be used when constructing the displays for HMIWeb. These levels are referred to as Level-0, Level-1, Level-2, Level-3 and Level-4.

The hierarchical structure is illustrated in Figure 5.5.1.

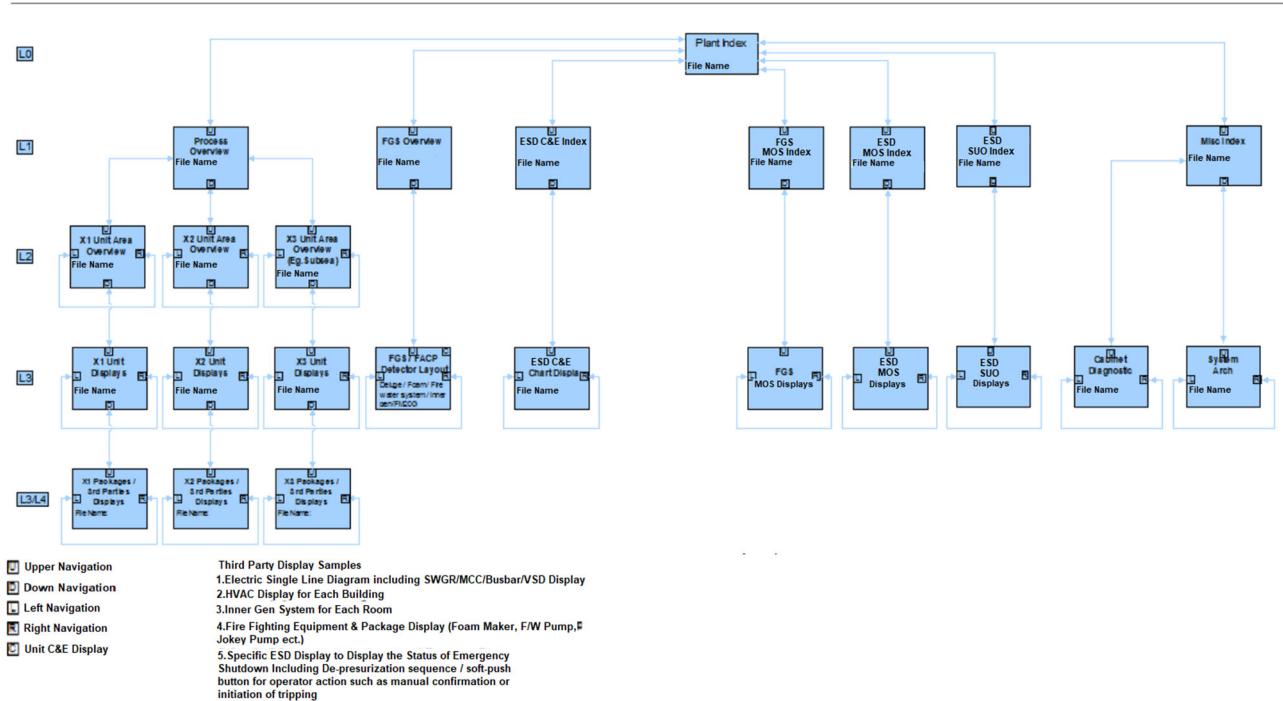


Figure 5.5.1 Display Hierarchy and links

5.5.1 Level-0 - Plant Index

This display is used to navigate to different categories of displays in project and is developed based on project scope and customer inputs. Generally, this contains a Project Master Index.

Navigates to Process, C&E and FGS Overview displays. All displays shall be accessible from menu during detail engineering.

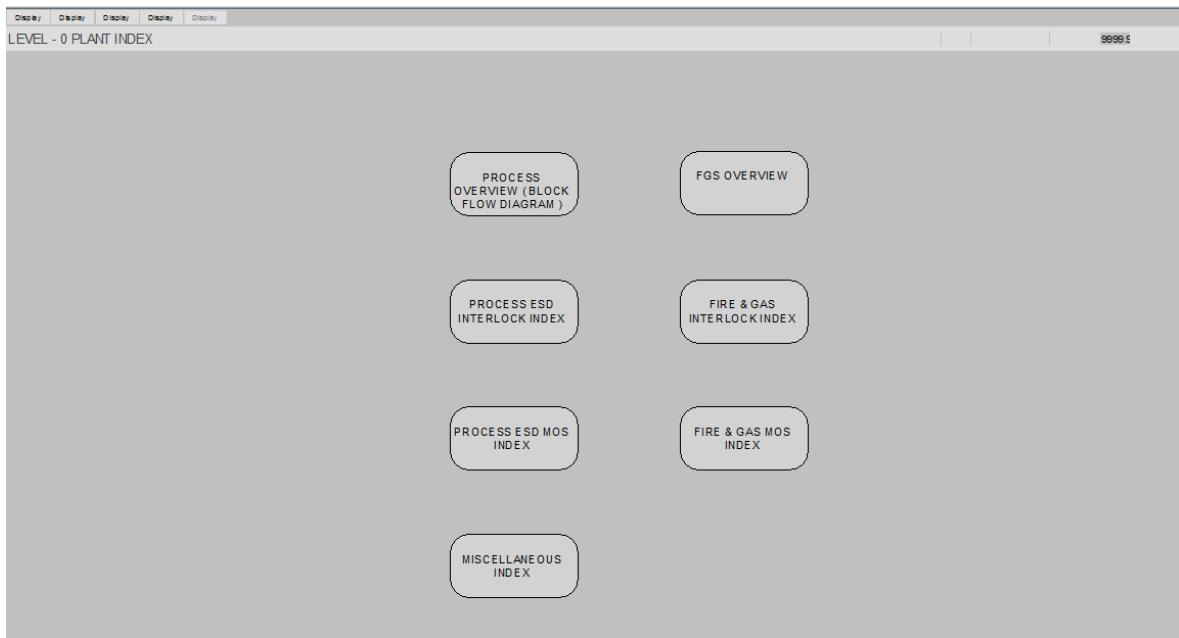


Figure 5.5.1. 1 Example Level-0 Plant Index

5.5.2 Level-1 – Process Area Overview Displays (If Using ORION Console)

The process area overview (or Level-1) display's primary purpose is to provide a view of key elements of the plant, as summarized on a limited number of displays. Level-1 graphics show the broadest available view of the facilities under the operator's control. The variables displayed on the Level-1 graphic shall have been selected and deemed most important by operations personnel. A Level-1 graphic contains multiple units, with the process values or safety signals being read-only from a control perspective. The operator is not allowed to execute any control from this display. The targets defined in this display will lead to the specific process overview displays (Level-2).

The process area overview displays shall be in the form of rectangular blocks or simplified process flow diagrams of a whole plant area. The overview display also shows alarm summary information and can contain other information, if available, on related plant facilities. These include the downstream and upstream areas, as well as utilities that can affect the health of the process in the span of control of the operator.

It is recommended that Level-1 displays be visible or readily accessible at all times. SafeView can be configured to ensure that critical Level-1 displays are always visible (i.e., other windows or applications cannot obscure them) if Experion PKS is used in a multi-windowed / multi-screen environment.

Within the Level-1 displays, the Level-2 display areas are clearly separated from each other by spaces or lines. Alignment, font size, separation, and color ensure visibility, and care shall be taken to ensure visual noise on the display is not a distraction. Illustrations of Level-1 displays are shown in Figure below.

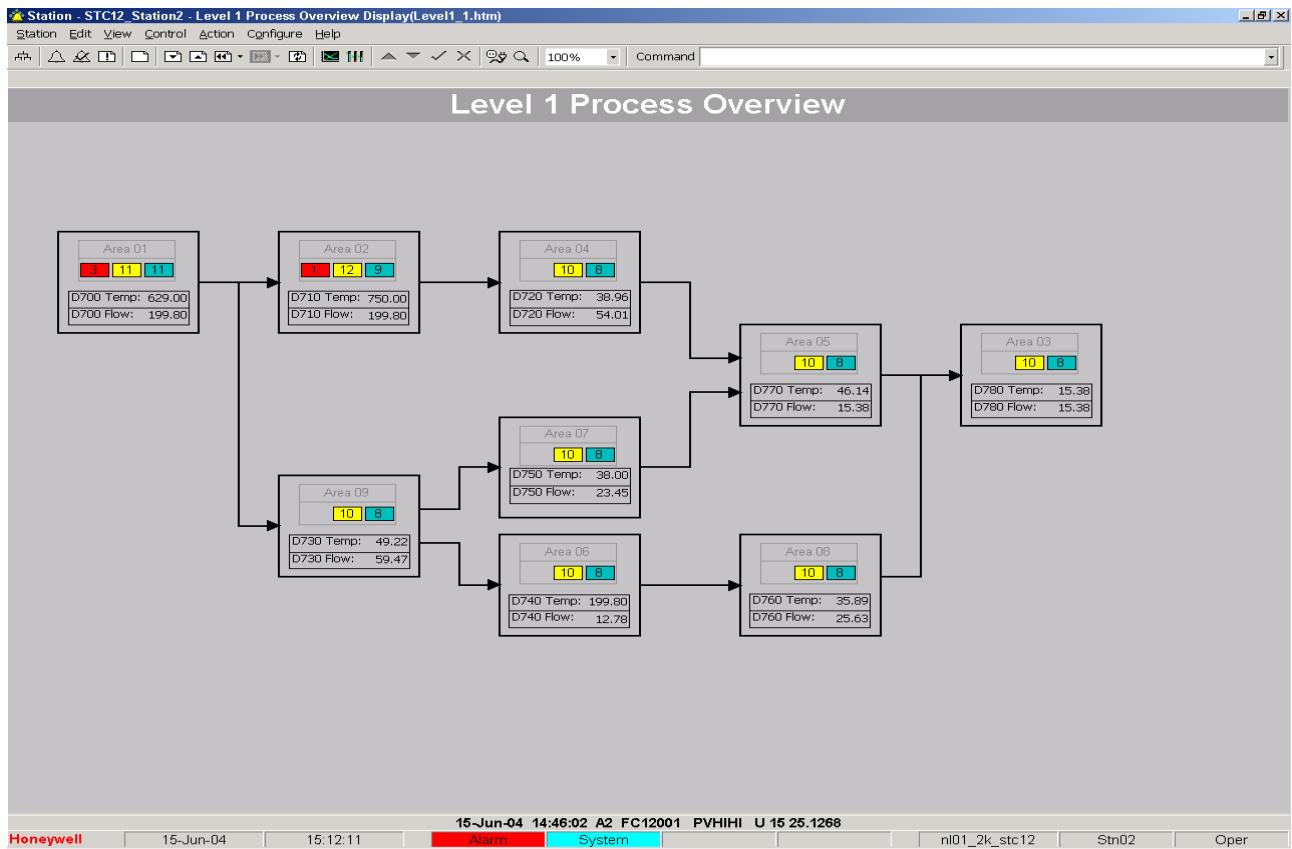


Figure 5.5.2. 1 Example Level-1 Process Area Overview Display

Above Figure shows an example process area overview on which an operator can select which display he wants to invoke: A Level-2 display by selecting the large rectangles or a Level-3 display by selecting the small rectangles. This display also shows alarm information for both levels, making use of the aggregate alarm functionality.

The example displays in Figure is mainly alarm driven. It primarily shows alarm information of process units on a high level plus some additional high-level process unit information such as feed, temperature, quality, etc.

5.5.3 Level-2 – Process Unit Overview Displays

Level-2 graphic displays provide information about key elements of the plant unit. Often, variables from several locations in the process need to be accessed to allow the operator to properly intervene and then monitor the results of that intervention. Level-2 displays have this information gathered in one place. An example is shown in Figure 5.5.3.1.

Conceptually, the Level-2 graphic contains all the information to do most operator tasks from a single graphic and only contains information relevant to the task. When all relevant process information is on a single display in front of the operator, abnormal situations are more likely to be resolved quickly and efficiently. e.g. Index Type detail display for packages, C&E, POS, Inhibit Overview etc. shall be Level 2 graphics.

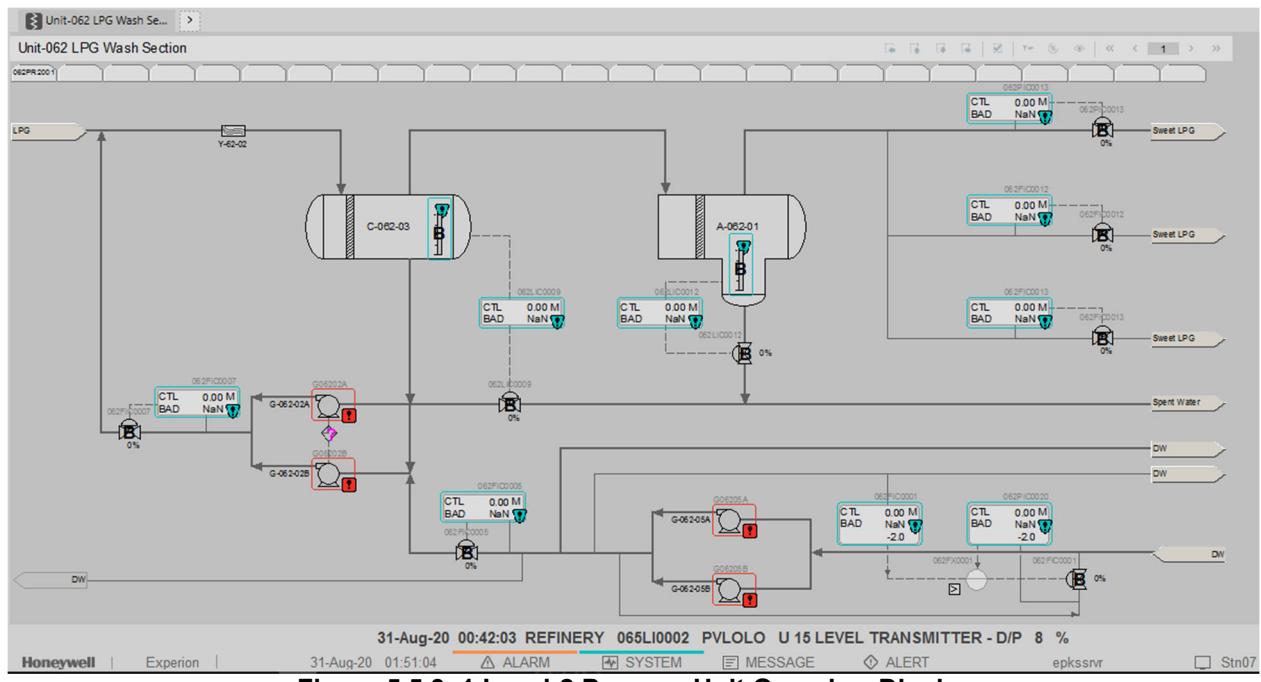


Figure 5.5.3. 1 Level-2 Process Unit Overview Display

5.5.4 Level-3 – Process Unit Detail Displays

Level-3 graphic displays are exhaustive in their detail and contain all available information about smaller pieces of the process unit. While the objective of the Level-2 display is to provide only the handles and tools necessary to intervene in a particular section of the process, Level-3 displays provide the operator with a complete and detailed view of the entire facility.

All control loops are shown on the Level-3 displays. The displays are used for routine tasks such as operating pumps, starting blowers, opening valves, etc. They are also used for detailed investigations and interventions that are not time-critical.

An example of a Level-3 display is shown below.

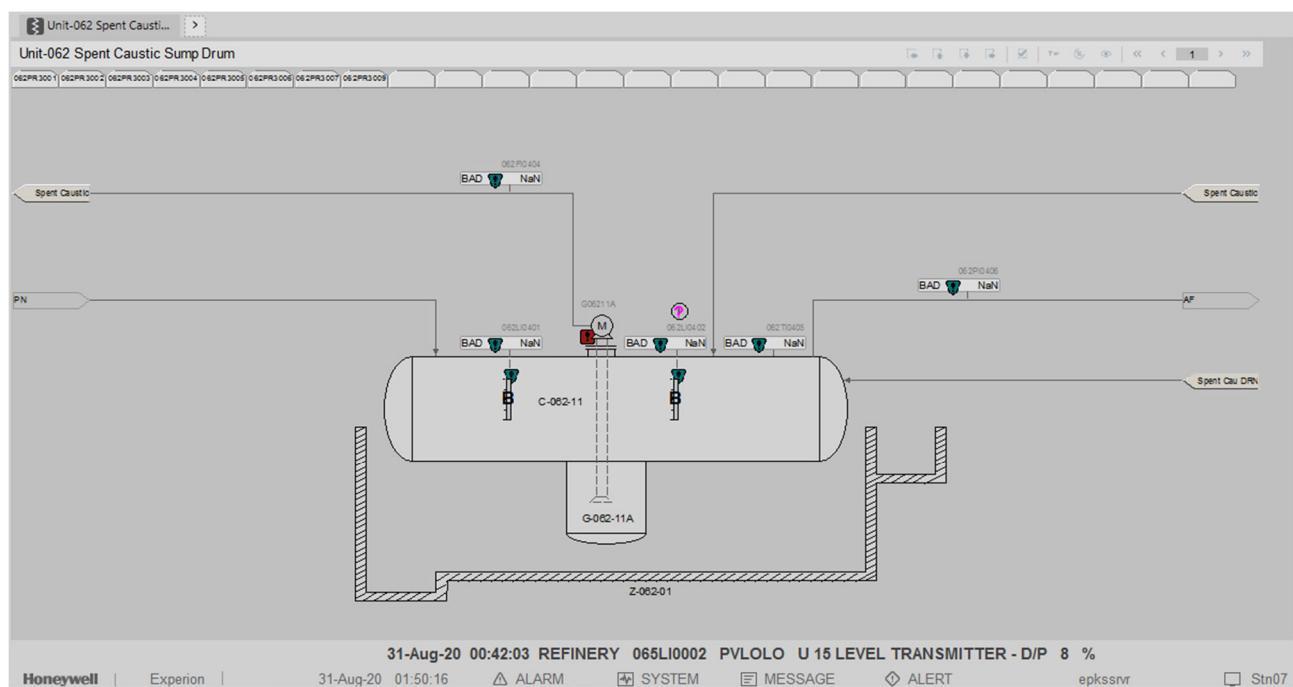


Figure 5.5.4. 1 Level-3 Process Unit Detail Displays

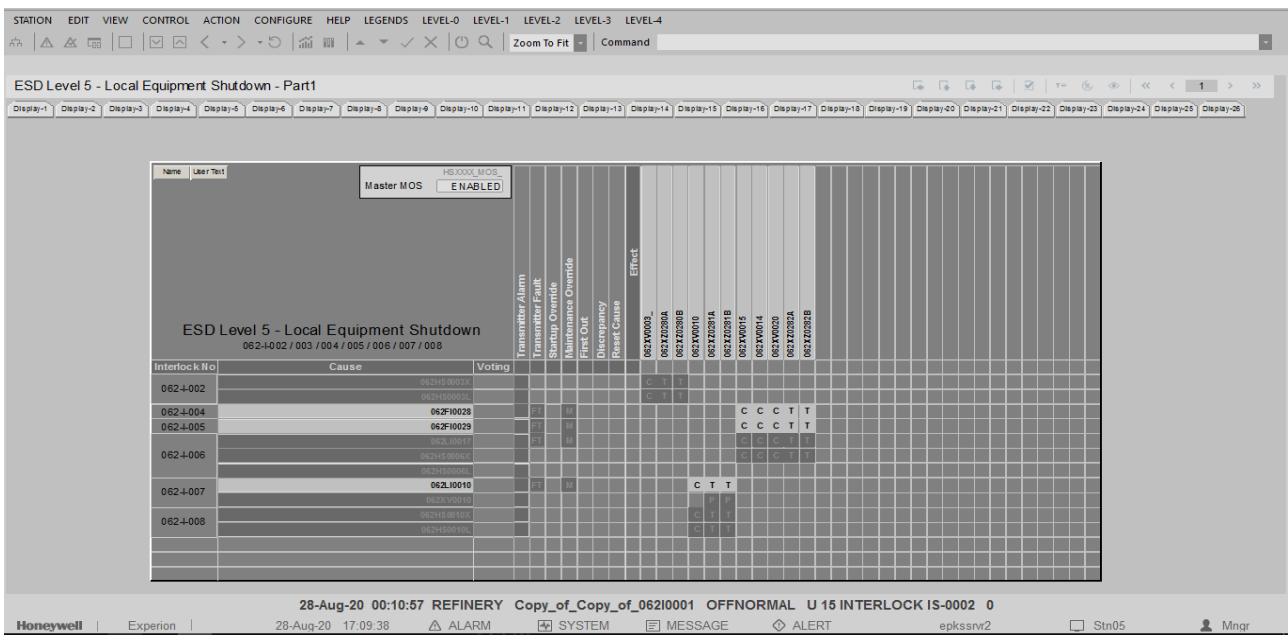


Figure 5.5.4. 2 SIS / HIPPS Cause & Effect Display

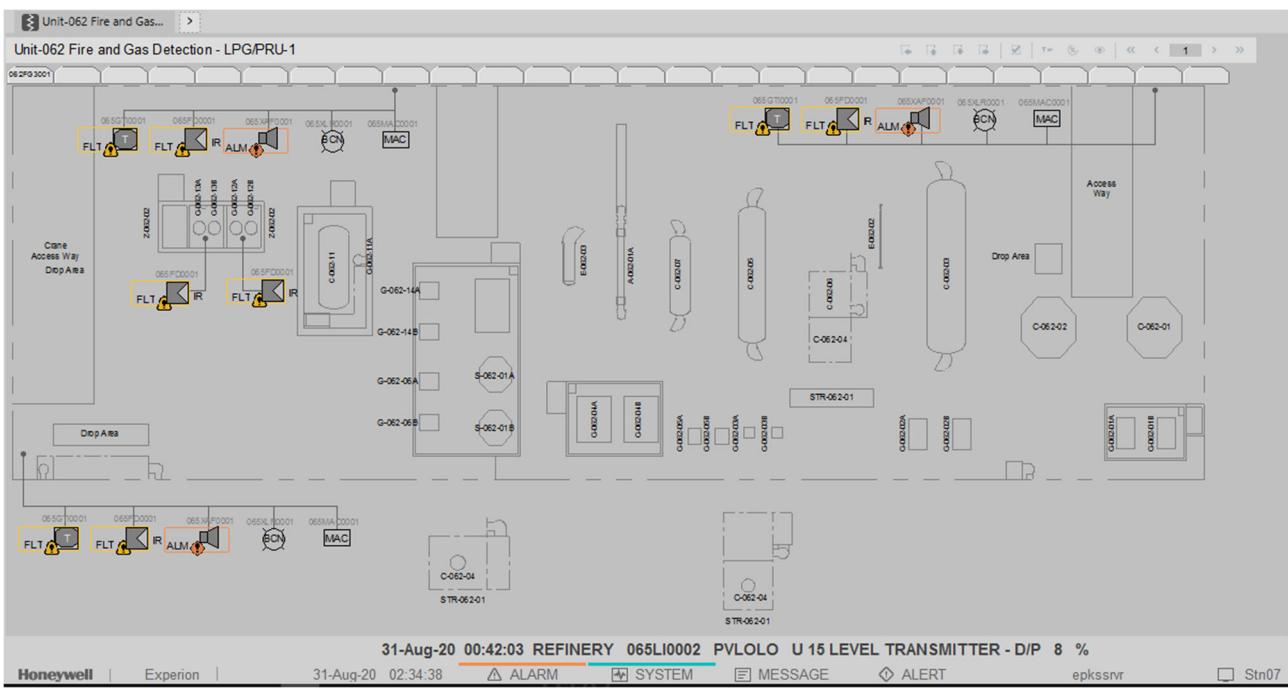


Figure 5.5.4. 3 Fire & Gas Display

5.5.5 Level 4 - Point Manipulation

Level 4 graphics are Equipment Detail, Point detail displays ,Third party package displays and faceplates etc.

5.5.5.1 Faceplate

Within Experion PKS there are several places where operators can manipulate points (e.g. detail displays, group displays, faceplates or custom displays). The standard HMIWeb Solution Package object use faceplates as the primary interface for point manipulation. To provide a consistent operator interface, the HMIWeb Solution Pack does not provide objects that allow data entry directly from a display without invoking faceplate or detail displays.

Faceplates are delivered as part of the Experion PKS product. It is strongly recommended to use these standard faceplates as much as possible. Faceplates are an important means for operators and should always work without any problem.
Following is the basic layout of faceplate:

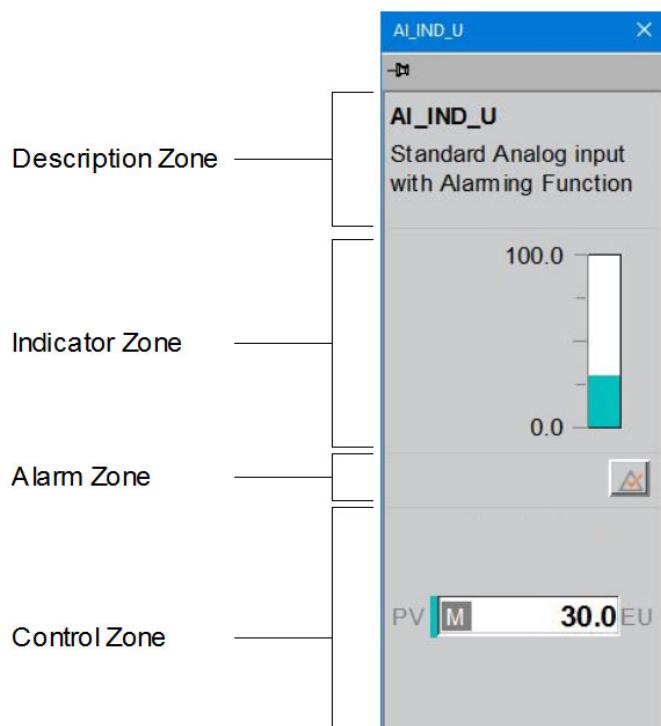


Figure 5.5.5.1. 1 Basic layout of Faceplate

5.5.5.2 Shortcut Menu

Shortcut menus or Context menus, as they are normally known, are available in all Solution Pack shapes. They are activated by a right button click action on the station pointing device. The menus will contain general and object dependable functional menu items. The shortcut menu will disappear when we:

- Select outside shortcut menu
- Cancel
- Press Escape (keyboard)
- After a timeout, defined in the registry

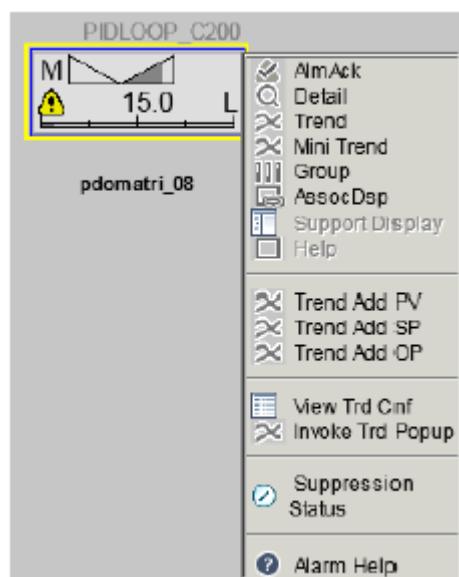


Figure 5.5.5.2. 1 Example Shortcut Menu for Regulatory Control Point

The default HMIWeb SP shortcut menu provides the following options:

- **AlmAck:** This option allows acknowledgment of all alarms in the related point. Please note that for shapes with multiple tags (like e.g. the F&G shapes), only the Most important alarm will be acknowledged. After that, the next important alarm can be acknowledged and so on until all alarms for that shape are acknowledged.
- **Detail:** This option will invoke the point detail display for the point link to the selected shape.
- **Trend:** This option works in conjunction with a custom property on the shape that defines trend information (see shapes custom properties). This custom property is cp_custrrnd. If this property is left as default (no entry) this action will invoke the first trend group where the current selected point appears. Now, if the point is not configured in a trend group, the system will ask the operator for a trend group number.
- **Mini Trend:** This option will invoke a trend popup window showing up to 3 traces for the point in the related shape. These traces will be representative of PV, SP and OP. This option is only available for analog points only. The availability of all 3 traces will depend on the custom properties of the shape.
- **Group:** This option works in conjunction with a custom property on the shape that defines group information. If this property is left as default (no entry) this action will invoke the first group where the current selected point appears. Now, if the point is not configured in a group, the system will ask the operator for a group number.
- **AssocDsp:** This option invokes the associated display for the current selected point. If no associated display has been configured, a warning will appear in the message zone "No associated display".
- **Support Display:** This option allows an operator to open a supporting display related to the tag name presented by that shape. To make this option available, two actions must be taken during display building. First, the label that the shortcut menu uses for this selection and the corresponding link to the display need to be defined. If no filename is specified, the label will still be shown but the choice in the shortcut menu will be disabled (greyed out).
- **Help:** This option allows an operator to open a help document related to or about the tag name presented by that shape. To make this option available, two actions must be taken during display building. First the label to be shown in the shortcut menu, as well the link to the file to be opened must be defined. The shortcut menu will use windows explorer's file type association to determine what application will be used to open the help file (e.g. MS Word for *.doc documents, PDF reader for *.PDF files etc.). If no filename is specified, the label will still be shown but the choice in the shortcut menu will be disabled (greyed out).
- **Trend Add PV / SP / OP:** These options allow an operator to quickly add the PV, SP and OP of the tag name presented by the shape into a trend group. If no trend group is defined, the operator will be asked for a group number. If a trend group is full or protected, he will get a warning.
- **View TrdConf:** This option shall show the trend configuration for the current selected trend group as indicated by the trend selector shape. A table with this info will be shown on top of the process display. By clicking "Hide" button the HMIWeb SP R51x trend configuration table shall disappear.

PointName	Parameter	Hide
020LIC301	pida.PV	
020LIC301	pida.OP	
OVERRIDE_SC	PV	
HH_ALARM_SC	PV	
FAULT_SC	PV	

Figure 5.5.5.2. 2 Trend Group Configuration Table

The "Trend Add PV", "Trend Add SP" and "Trend Add OP" options are only enabled when the tagname related to the shape has custom properties for the PV (cp_PV), SP (cp_SP) and for the OP (cp_OP). If these custom properties do not exist, the options to add the PV SP and/or OP to a trend will be disabled and the choice will be grayed out in the shortcut menu.

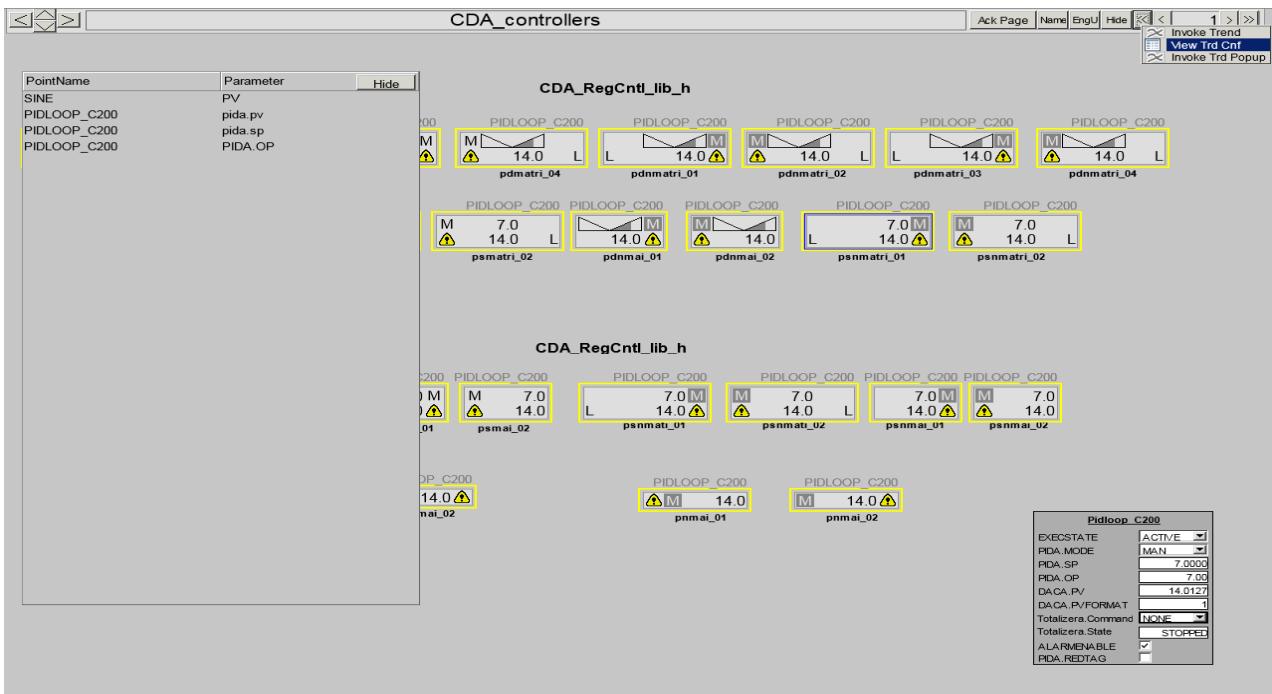


Figure 5.5.5.2. 3 Trend Group Configuration Table in Display

- **Invoke Trd Popup:** This shall invoke a trend popup window for the current selected trend group
- **Suppression status:** This option navigates the operator to a dedicated Alarm suppression display where all dynamic suppressions are shown.
- **Alarm Help:** this option works in conjunction with Alarm manager system (ALMS). It shall open a separate faceplate to show information from ALMS system.

5.6 HMI Display Properties and Settings

The HMI shall be designed to satisfy the individual requirements of the following types of user:

- Panel / Field Operators
- Shift Supervisors
- Shift Manager
- Process Control Engineers
- Instrument Engineers

A mix of stations may be used, depending on the requirements of its user.

Consoles stations are normally provided for the use of Panel / Field Operators, while flex stations are often used for Process Control and Instrument Engineers.

5.6.1 Display Properties

The table below will be shown the display property settings:

Supported Resolutions of monitor	1920 x 1080
Display template size	1917 x 920
Color palette	True colors (32 bits)
Font size	Small fonts

Table 5.6.1. 1 Display property Resolution

5.6.2 Display Builder Setting

The table below will be shown the grid display builder settings:

Horizontal Spacing	4
Vertical Spacing	4
Grid Line Color	Black (default)

Table 5.6.2. 1 Display Builder Setting

5.6.3 Station

The Station is used to monitor and control the Experion PKS. Following are part of station which makes it user-friendly

Menu bar	Commands may be selected from pull-down menus
Toolbar	Common commands are also located as buttons on the toolbar
Command Zone	Used for typing commands directly into the system
Message Zone	Explanatory messages appear in this zone.
Location Pane	Used for locating & filtering information e.g. viewing Alarm Summary showing assets list
Asset Pane	Show multilevel tree of asset. It is only visible from Equipment Summary
Display	Standard and Custom displays appear in this zone.
Alarm Line	Generally, displays the Most recently highest priority unacknowledged alarm
Status Line	Provides an overview to the system's status

Table 5.6.3. 1 Station file Display.

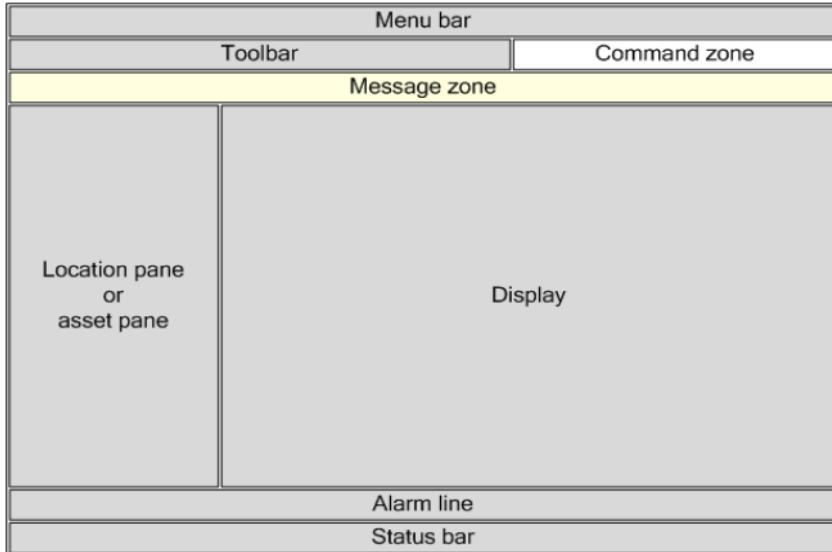


Figure 5.6.3. 1 Station Layout

There are three Themes of EPKS Station Environment Named as Classic, Dark and Light.

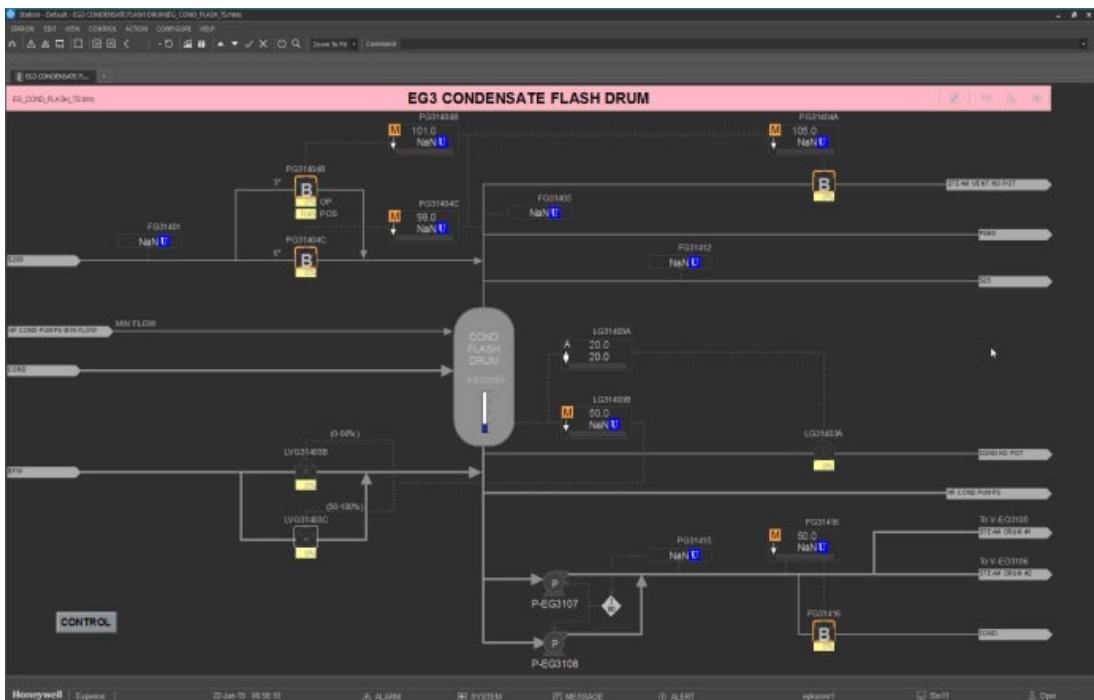


Figure 5.6.3. 2 Dark Theme

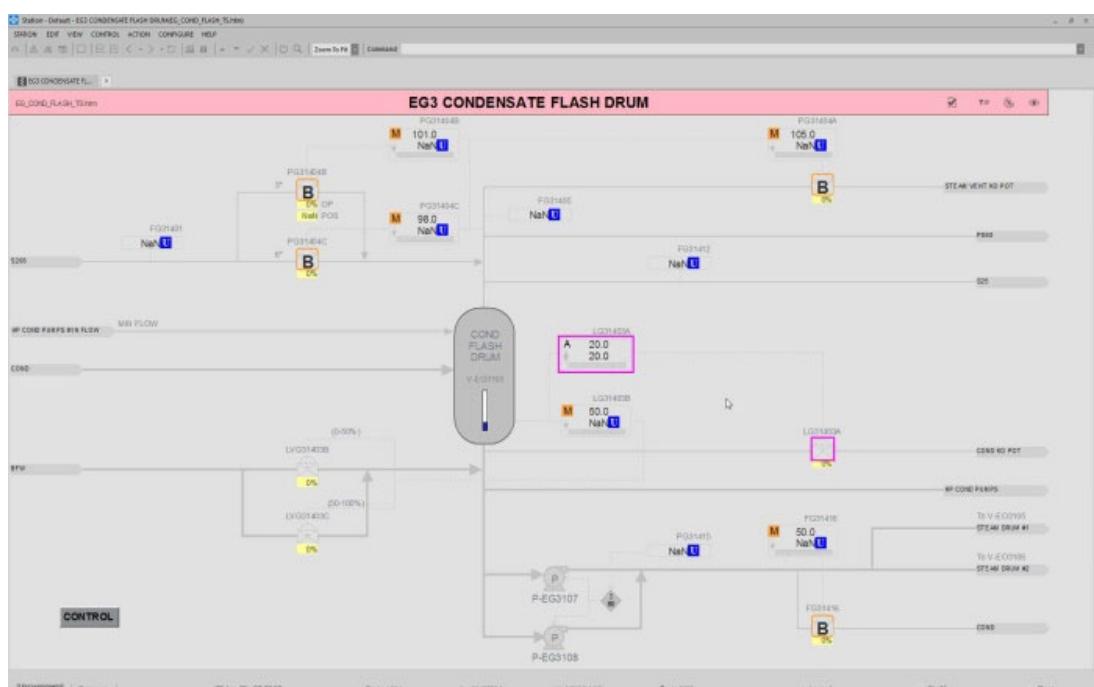


Figure 5.6.3. 3 Light Theme

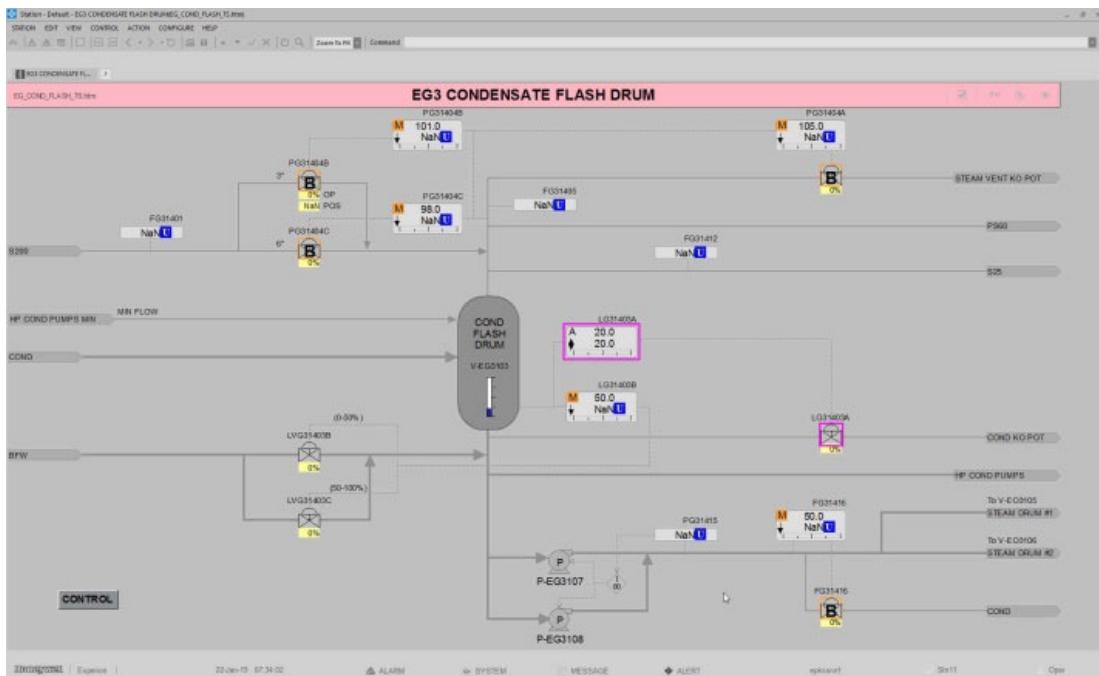


Figure 5.6.3.4 Classic Theme

5.6.3.1 Station View

This figure below shown the Station View:

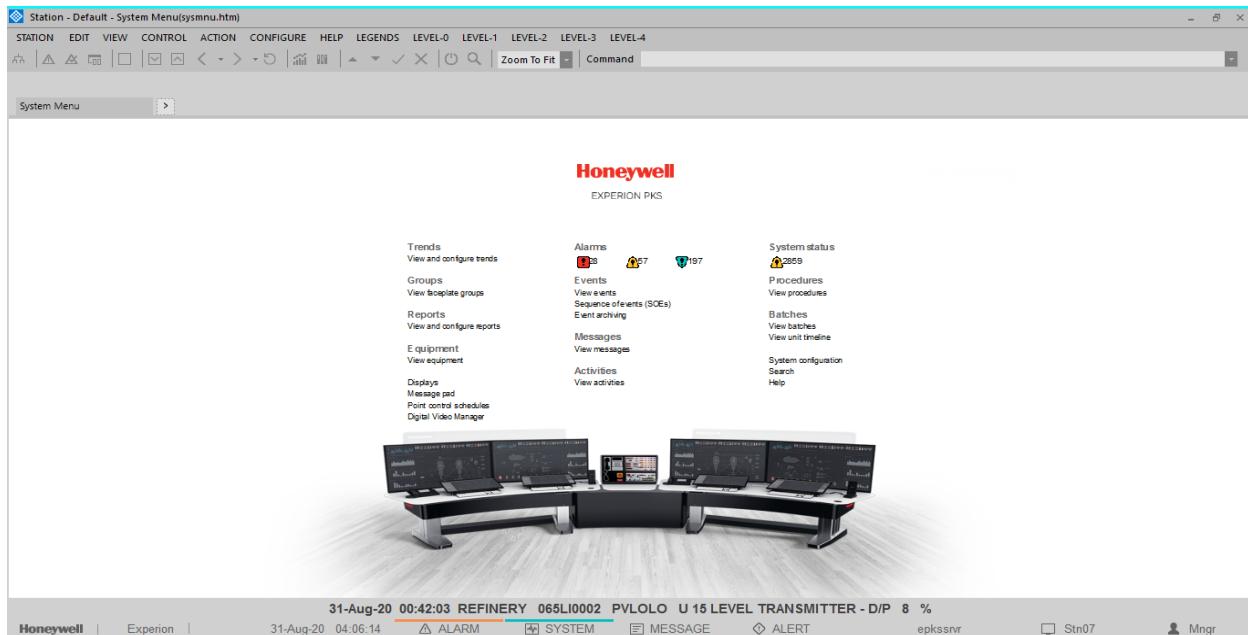


Figure 5.6.3.1 Station View

5.6.3.2 Station Toolbar

The Station toolbar shown provides speedy access to frequently used menu commands.

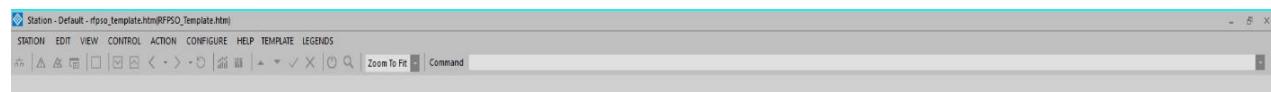


Figure 5.6.3.2.1 Station Toolbar

Icons for navigating to Overviews, Main Index button can also be customized and incorporated on the Display Title Bar. If required station tool bar shall be customized during detail design phase. This table below will describe each the Station Toolbar icons.

Button / Tab	Description and Notes
	SYSTEM MENU. Provides access to many standard displays, such as Alarm Summary, Event Summary, Display Summary, Group Summary, Trend Summary and many others. It shows how displays are organized –it is, in effect, the system's "table of contents".
	ALARM SUMMARY. Calls up the Alarm Summary, which provides a one-line description of every alarm. (Alarm summary based on process unit group associated with that console & by filtering the parameters individual area alarms can also be viewed)
	ACKNOWLEDGE ALARM. Acknowledges the Most recent alarm.
	ASSOCIATED DISPLAY. Invokes the display associated with the current selected object. Associated displays can be invoked from many displays, e.g. alarm displays, in order to quickly jump to the display in which the selected point resides.
	CALL UP DISPLAY. Calls up the specified display. To call up a display: Click the button. Type the display number and press <Enter>.
 	When configuring a system, engineers normally link related displays in a "chain" so that the user can quickly call up the next / previous display. PAGE DOWN. Calls up the next display in the current chain. PAGE UP. Calls up the previous display in the current chain. The PageDown / PageUp feature from custom displays can also be used by configuring the PageDown and PageUp as part of the display properties. In this project this option shall not be used instead we shall use navigation buttons provided as part of graphic template on graphics.
	NAVIGATE BACK AND NAVIGATE FORWARD Allows the user to move backwards and forwards between displays the user have previously called. The arrow pointing down at the right of this button can be used to show a list with display history.
	TREND. Calls up the specified trend display. To call up a trend: Click the button. Type the trend number and press <Enter>. Note: if the user selects this button while a point has been selected, the first trend group will appear in which this point resides.
	GROUP. Calls up the specified group display. To call up a group: Click the button. Type the group number and press <Enter>. Note: if the user selects this button while a point has been selected, the first group will appear in which this point resides.

Button / Tab	Description and Notes
	RAISE. Raises a parameter value. LOWER. Lowers a parameter value.
	ENTER. Accepts the newly entered value. CANCEL. Cancels the newly entered value, and returns it to its original value.
	ENABLE/DISABLE. Enables / disables for the associated point. Points are typically disabled when performing maintenance tasks to prevent misleading alarms being generated.
	DETAIL. Displays more details about the selected object.
	ZOOM TO FIT. This button allows to zoom-in or zoom-out the display
	STATION TAB. This Tab is used for Station Login, Station Configuration.
	EDIT TAB. This Tab is used for Point ID cut, copy, and paste option.
	VIEW TAB This Tab is Mostly used by Operator for view Point Detail, Associated Display. Also from this tab we will get easy access for Alarms, Messages, Displays, and Equipment Summary Pages. System Status display, Group as well as Trend will be accessible from this Tab.
	CONTROL TAB This Tab is used to Select option from Faceplate as Set point, Raise / Lower SP and OP, and Mode.
	ACTION TAB This Tab is used for Acknowledge Alarm. Also used for Print
	CONFIGURE TAB This Tab is rarely used, as all options present in this tab are used for Station configuration as well as Server related files.
	HELP TAB This Tab is providing help for system displays, operator guide files.

Icons for navigating to Overviews, Main Index button can also be customized and incorporated on the Display Title Bar. If required station tool bar shall be customized during detail design phase.

5.6.3.3 Status Line / Alarm Line

The Status Bar provides an overview of system's status. The following table describes each box in the Status Bar, starting from the left.



Figure 5.6.3.3. 1 Station Status Line

	Description
	Indicates whether there are any alarms, as well as their status: <ul style="list-style-type: none">• Blank. There are no alarms.• Flashing red. There is at least one unacknowledged alarm.• Red (not flashing). There is at least one alarm, but they have all been acknowledged. Click the box to call up the Alarm Summary, which lists each alarm.
	If the Station Status bar is not visible, this icon in the Windows Status bar will indicate an alarm.
	Indicates whether there are any system alarms, as well as their status, for example, failed communication links between the Experion server and other devices (such as channels, controllers, and so on): <ul style="list-style-type: none">• Blank. There are no system alarms.• Flashing cyan. There is at least one unacknowledged system alarm.• Cyan (not flashing). There is at least one system alarm, but they have all been acknowledged. Click the box to call up the System Status display, which lists each system alarm.
Experion server ID 	The computer name of the Experion server to which the Flex Station or Console Station is connected. (In some systems, can connect to more than one Experion server.) On a Console Station or Console Extension Station: <ul style="list-style-type: none">• A red LED appears if the Experion server is unavailable.• A yellow LED appears when the Console Station is synchronizing with the Experion server.
Console ID 	The name of the console to which the Station belongs. This is visible only on Console Stations and Console Extensions Stations that belong to a console. A yellow LED appears if one or more Console Stations or Console Extension Stations in the console is unavailable. Click the box to call up the Console Status display.
Station number 	The number of the Station operator are logged on to. (Most systems have more than one Station.) This is visible on Flex Stations, Console Station and Console Extension Stations. For Flex Station, the number is in the format Stnn, for example Stn20. For Console Station or Console Extension Station, the number is in the format CStnn-n, for example CStn04-1 for Console Station and Cstn04-2 for a Console Extension Station.
Security level 	Manager security level.

Table 5.6.3.3. 1 Station status line Description

5.6.3.4 Station Security

Within the Experion PKS system, Station-based security or Operator-based security may be adopted to control access to functions at that Station.

In Station-based security there are security levels which are used to restrict operator authority within Station. A password is required to elevate the user to a higher security level, which is controlled by the Experion PKS server.

There are two aspects to operator-based security; authentication and authorization. Authentication is the process of verifying that a user is known to the system, while authorization controls what a known user can do within the system. Accounts are used to restrict access and authority within Station. Traditional operator accounts or integrated accounts may be used.

For traditional operator accounts, authentication of the user is done by the Experion PKS server against credentials stored in Experion PKS. Authorization is also controlled by Experion PKS using security levels and, if applicable, areas.

For integrated accounts, authentication of the user is done by Windows on the server computer against the Windows user account. Authorization is then controlled by the Experion PKS server using security levels and, if applicable, areas.

There are six different security levels in Experion PKS. The levels are shown in the following table:

View Only	View-only mode
Ack Only	Alarm acknowledgement mode
OPER	Operator mode
SUPV	Supervisor mode
ENGR	Engineer mode
MNGR	Manager mode

Table 5.6.3.4. 1 Different security levels

Below figure shows the Security Level as “Manager”:



Figure 5.6.3.4. 1 Station status bar showing security level as “MNGR”

5.7 HMI Display Implementation Guideline

The conventions as described in the following chapter should be followed when designing custom displays. Before implementing the displays, the display hierarchy should be defined (level1, level2, etc.) together with the names of the displays in this hierarchy (including definition of parent and child displays), to allow the engineers to easily implement the navigation objects in displays.

An HMI library for project will be developed based on Honeywell's HMIWeb Solution Pack .

Standard objects and features from Honeywell's HMIWeb SP Library will be used as much as possible. This approach will facilitate smooth system upgrades in the future by reducing the amount of re-validation tests and potential incompatibility issues faced when custom shapes and functionalities are implemented.

Honeywell's HMIWeb Solution Pack provides over 2200 objects for Honeywell Control Data Access (CDA), SCADA and process applications. The library includes, amongst others, the following functionalities:

- Alarm indications & navigation
- Analogue indicators (with & without SP)
- Counters & totalizers (with & without SP)
- Digital state symbols
- Switches
- Bars
- Buttons
- Motors
- Fans
- Pumps
- Valves (2-way & 3-way)
- Motor Operated Valves
- Numerics & Flags
- Regulatory control indicator (PV, SP & OP)
- Regulatory control indicator (with winding, ramping & initialization indication)
- Regulatory control indicator (with normal mode attribute)
- Regulatory control valves (with bar & value)
- Fire & Gas symbols

- SIS / HIPPS Symbols
- Cause & Effect Tables
- Static symbols

Honeywell HMIWeb Solution Pack objects were developed to comply with the Abnormal Situation Management (ASM) Guidelines for the design of process operator graphical interfaces which will provide the following benefits to the project:

- Promotes visibility and consistency in graphical displays
- Display style – not complex or cluttered and consistent in presentation of similar information.
- Techniques for hiding and showing detailed information such as tag names and EU
- Consistent color usage:
 - The number of color codes is a minimum and consistently applied across display hierarchy levels.
 - Red and yellow colors are used for alarms only.
 - Avoid color combinations that are susceptible to colour-blindness.
 - Color is a redundant visual coding of information.
 - Purposeful use of animation.
 - Numeric format is consistent and enables quick reading, with appropriate level of precision.
 - Easy navigation:
 - Use of a standard display hierarchy
 - Navigation to primary displays is possible without the use of a display
 - General
 - Graphic displays are not intended to duplicate PFD, P&IDs, Fire & Gas Layouts, SIS / HIPPS Cause & Effects, etc., but should be simplistic representations, designed to reduce visual noise and enhance the operator's ability to control and monitor the process.
 - Because our eyes are trained to read from left to right, an effort should be made to lay out the process flow from left to right whenever possible.
 - The operator should be able to reach a control point with a minimum number of mouse clicks or keystrokes.
 - The HMI system should be designed to minimize operator mistakes and provide validation and security measures.
 - An effort should be made to lay out the process flow from left to right whenever possible. Gas should flow up and liquids flow down.
 - An effort should be made to minimize the number of bends in lines.
 - Crossing lines should be avoided whenever possible. If required vertical lines shall have break. Also, it shall depend upon the Type of Process Line.
 - Operator actions should elicit immediate feedback. A selected item should indicate that it has been selected.

5.7.1 Colors

Color schemes can highly impact several tasks inherent to process control.

- They can adversely affect the ability of users to distinguish different types of objects.
- They can seriously impair the ability for operators to recognize important process information.
- They can seriously limit and hinder the capacity of the user to navigate to critical plant conditions represented in the displays.

For these reasons, it is recommended to standardize and limit the number of information bearing colors on process displays.

This is especially critical since colors are used to represent abnormal (alarm) conditions. The correct monitoring of alarm conditions is crucial to maintain the health of the process.

However, for reading text, the best color combinations are:

- White text on a black background.
- Black texts on a grey or white background.

For these reasons, the default HMIWeb Solution Pack color configuration follows the convention where abnormal (alarm) conditions use specific colors reserved only for this purpose:

- All colors indicating normal operating conditions will be presented in gray scale colors
- The display background will be same as Block 1 and Block 2
- Red is reserved for Urgent priority alarms

- Yellow is reserved for high priority alarms
- Cyan is reserved for low priority alarms
- Orange is reserved for Red Tag and Interlock indication (Red Tag use to show that the function block or point is "out of service", freezes the output and mode from operator access)
- Magenta is reserved for error indication
- Black is reserved for static text and dynamic data
- A blue frame is visible when an object is selected
- Very Light grey is reserved for the background of dynamic data
- A CSS defined color is visible in the frame background for Principal and Associated Focus indication

All shapes in the HMIWeb Solution Pack make use of the Cascading Style Sheet feature. As a standard Honeywell engineering practice, all HMIWeb Solution Pack shapes have assigned all the property styles of all their component objects to a style defined in provided Cascaded Style Sheets.

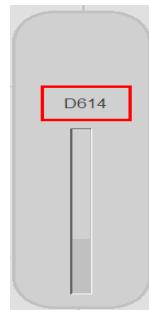
Service Description			RGB value & Color
Display name Navigation Text, Variable Values	e.g. PV, ESD trip condition,Description Equipment name		0,0,0
Tag names & EU		Dark Gray	128, 128, 128
Display Background		Light Gray	192, 192, 192
Dynamic Objects	Includes: Pumps / Compressors SafetyValves, BDV, SDV,Controller valves	Not Active/Stopped/Close	0,255,0
		Active/Running/Open	255, 0, 0
Alarm	Urgent (HH, LL)	Red (Blingking)	255, 0, 0
	High	Yellow (Blingking)	255, 198,39
	Low	Cyan (Blingking)	0,191, 191
Alarm Acknowledge	Urgent	Red (Steady)	255, 0, 0
	High	Yellow (Steady)	255, 198,39
	Low	Cyan (Steady)	0,191, 191
Error Indication		Magenta	255,0,255
Indication of Selected Object	Regtangle	Blue	0,0,255
RedTag Indication	PadLock	Orange	255,159,0

5.7.2 Font

Static texts in the graphic shall have the following default font properties:

Font	Arial
Font style	Regular
Font size	10

Font color	Black
Alignment	Right /Center (As applicable)
Fill color	None
Line color	None



Tagname and engineering unit descriptors (EUDESC) shall have the following font properties:

Font	Arial
Font style	Regular
Font size	10
Font color	Black
Alignment	Right / Center
Fill color	None
Line color	None

5.7.3 Labelling

Upper-case lettering should be used for labels, codes, and abbreviations. Whenever possible, labels should be lined up horizontally and vertically. End of the line text should be lined up with the respective edge of the graphic.

- All graphic displays should have a title.
- All major vessels should be labelled.
- Groups of identical or very similar equipment should be clearly labelled in the middle of the group.
- Abbreviations should only be used if they make the text appreciably shorter or more meaningful.

5.7.4 Static (Non-Acting) Element

This section mainly defines all static object used in all type display. Following should be avoided:

- Flashing or large objects.
- Flashing or changing color of process lines.

The following should not be shown unless needed for clarity:

- Start-up lines, unless they include instrumentation to be displayed.
- Bypass lines having manual valves.
- Block valves, manual valves, check valves, relief valves, etc.
- Interiors of columns and vessels, unless this information directly relates positional information to data objects and or control information outside the vessel.

The following design criteria should be followed for equipment:

- The shape of the equipment to be displayed on the graphics should be shown to represent the actual equipment as much as possible without excessive detail. All major equipment (e.g., vessels, columns, pumps, compressors, and blowers) should be displayed.

5.7.5 Process Line & Piping Color

The following design criteria for process lines shall be followed:

- The source and destination of main incoming and outgoing lines shall be shown with arrows. Lines that vector to and / or from other process display end-points shall be in the form of buttons (targets) within boxes. If the lines do not continue to and/or from another process display, the end-points shall be arrows with no buttons.
- Main process lines shall be shown as a thick line as 4 pixels.
- For Open loop, Single Closed loop, Cascade loop, Feed forward loop, Ratio controller, split controller loop instrument lines will be indicated.
- Crossing of process lines or the use of line jumpers for process lines shall be avoided to the extent practical. If crossing is unavoidable, process utility lines shall break before main process lines. For equal weight lines, the vertical line shall break.
- Process inlet lines shall enter on the left-hand side of the display and process outlet lines shall exit on the right-hand side of the display to the extent practical.
- As a rule, the direction of flow shall be from left to right, except for recycle lines, which shall be right to left.

For the this project, the colors of lines and its behaviours in the HMI display shall be as follows.

Self-line arrows (line where arrow is part of the line & not a separate object) are used to indicate the correct flow direction. Arrows do not enter in the equipment / vessel but the arrow tip may touch it. The following CSS have been used for lines and arrows:

- Major process line: A_ProcessLinesWidth4
- Normal process line: A_ProcessLinesWidth2
- Taping t Lines: A_TapingLinesWidth1
- Instrument Lines: A_InstrumentLines

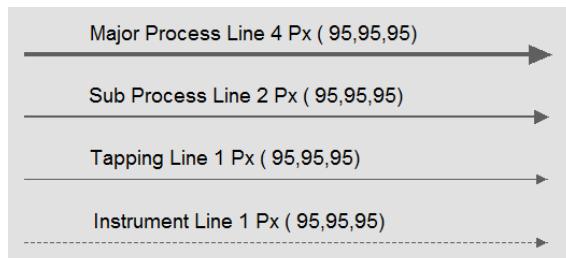


Figure 5.7.5. 1 Line size variation

The color of the bands for various piping services which are presented below :

Service	Band Color	RAL	Color	RGB
Fuel Gas	Yellow	1024		255,255,0
Lube Oil	Ochre Brown	8001		145,82,46
Chemical (PO4/NH3)	Magenta / Fuchsia	7000		255,0,255
Air (Inst/Service)	Blue	1024		0,0,255
Demin/Boiler Feed Water	Green	6038		0,255,0
Steam / Fire Water	Red	3000		255,0,0
Drains	Signal Black	9004		28,28,33
Service Water	Signal Green	6037		41,138,64

The color of the bands for various Electrical services which are presented below :

Service	Band Color	RAL	Color	RGB
6.6 kv / High Voltage	Yellow	1024		255,255,0
415 v / Low Voltage	Gold	1018		255,215,0

5.7.6 Vessel Color

For Vessel fill color following are the settings,

Fill Color	Grey (192, 192, 192)
Line Color	Black



Figure 5.7.6. 1 Vessel

6.0 HMIWEB CONTROLS AND NAVIGATION

The following system navigation options will be available

6.1 Navigation using keyboard

Honeywell Operator Entry Panel (OEP) can be used to provide configurable function keys for alarming and navigation purposes .

6.2 Navigation using Display Menu

The Experion PKS Station Menu and Tool Bar configuration is loaded when the Station window is started. It is used to supply quick access to commonly used Experion PKS functions and links that are required from any graphic.

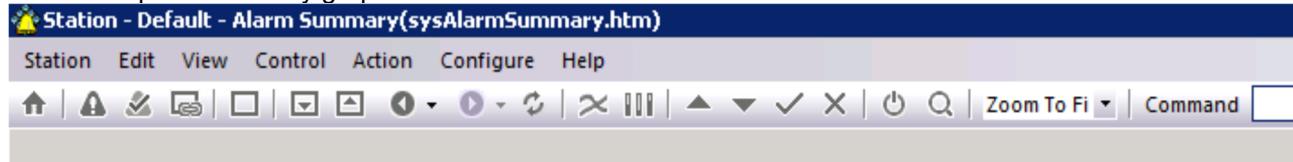


Figure 6.2. 1 Default Station Toolbar

Menu options are displayed in a single item or cascade format. Menu items can be added, extended or deleted by the configuration engineer. Following figure shows a new “Overview” menu item has been added to the standard menus list.

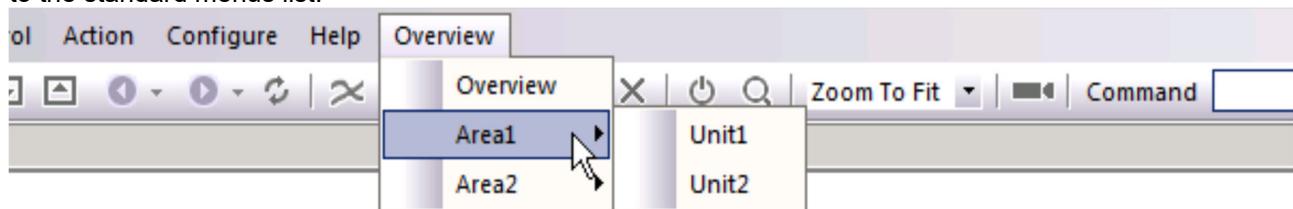
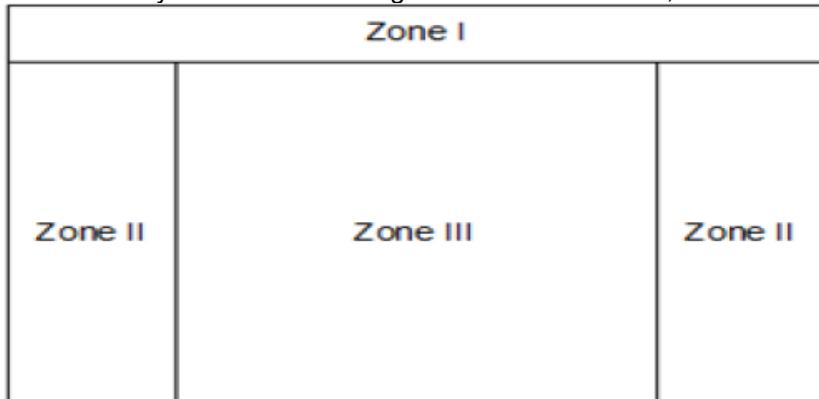


Figure 6.2. 2 Menu Trees

6.3 Navigation within Process Displays

Navigation in Level-2 and Level-3 displays is similar to Level-1 displays, but is extended with upward navigation to parent displays (one level higher). Depending on the size of the process to be visualized, Level-3 displays may be omitted; in which case Level-2 displays will take over their functionality.

The displays are normally divided into 3 navigation zones as follows,



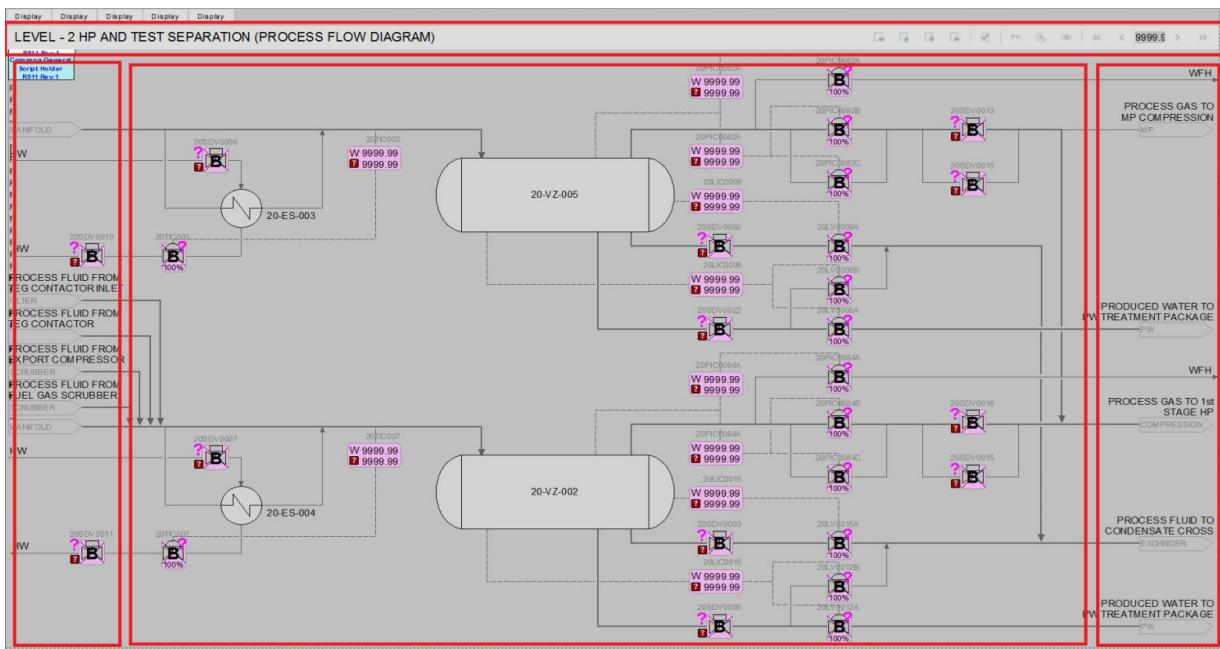


Figure 6.3. 1 Navigation Zones

Zone I: Display navigation to higher level displays (from Level-3 to Level-1/2 or from Level-2 to Level-1) these are usually presented using navigation buttons with alarm indication, as shown below.



Figure 6.3. 2 Navigation shape

Display tabs shall be used for quick navigation between displays. They also provide a visual link to observe the behaviour of the alarm-state and alarm-priority on the tab related display. A Navigation Zone using these “tabs” should be ideally located at the top of the Level 2, Level 3 and if applicable Level 4 displays.

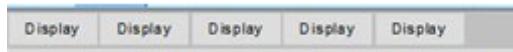


Figure 6.3. 3 Navigation shape without Alarm

Zone II: Sideways navigation to associated level displays (upstream or downstream on same level) is usually achieved by selecting buttons at the right and/or left side of the display. There are various navigation buttons. See examples below. These arrows will change the existing display to the upstream or downstream display. Sometimes, several arrows will be on each side of the display, each arrow leading to one of several upstream or downstream areas.

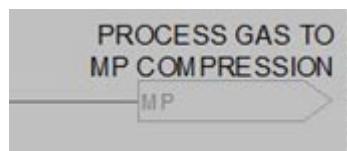


Figure 6.3. 4 Navigation shape

Zone III: The buttons for navigation to one level down (Level 2 to level 3) are usually placed in the near or in the related equipment. See example below.



Figure 6.3. 5 Navigation shape

7.0 COMMON BEHAVIOR

This section shall outline common behaviour applicable to Most shapes.

7.1 Normal Indication

A normal situation is a normal state of operation in a process.

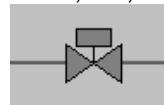
7.1.1 Status Indication

Status information can be shown in either graphical format (for example, a pump consisting of a circle) or in an alphanumerical (textual) format (for example, START/STOP).

7.1.1.1 Graphical Status Information

All shapes which show status information in a graphical format use the following default conventions:

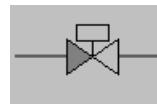
- When a device is in the “transporting” state (for example, an open valve or a running pump), the fill-color of that shape is as below: RGB-128,128,128



- When a device is in the “non-transporting” state (for example, a closed valve or a stopped pump), the fill-color of that shape is as below: RGB-192,192,192



- When the device is in the “moving” state (for example, a moving valve), the shape shall either use 2 different fill-colors (default setting for HMIWeb SP). For example:



- In Case of C&E Normal state shall be as follows Text color RGB (140,140,140). For example:



- In Case of C&E Interlock Active state shall be as follows Text color RGB (0,0,0). For example:



7.1.1.2 Alphanumerical Status Information

Shapes which show status information in a textual format should use one of the following conventions:

- Show the actual status information as different text strings, for example, “CLOSE” and “OPEN”. For example:



If a custom approach is required, the cascading style sheet can be modified to change the text color of the text object depending on the status.

Alternative example:



- Show the actual status information depending on the active / inactive state with different. This applies to shapes that, for instance, show an active / inactive HH pressure alarm. For the default

approach for the inactive state (no alarm), the operator may still want to know that the shape object is related to an HH alarm. This could be presented with a light grey text ("HH") as show.



The active state can then be shown in a different format:

- Highlighting the HH text (typically the case when the point does not have an alarm assigned to the HH value):



- Highlighting the HH text, but in addition also show its related alarm symbol with priority:



7.1.2 Analog Indication

Analog data is not presented as blinking text in an unacknowledged alarm state. A blinking alarm icon is used to show that the point is in alarm unacknowledged. Alternatively, a secondary alarm functionality is available. That shall be assigned to the Analog Value background to make it blink leaving the value always readable.

The numeric representation for analog values (PV and SP) depends on configured PV format parameter of its related point tag. In that latter case the following defaults are advised:

Span (units)	Decimal Format	PV Format
<= 10	X.XXX	D3
<= 100	XX.XX	D2
<= 100C	XXX.X	D1
> 100C	XXXX	D0

For SIS / FGS Analog Tag FLD Block property shall be configured to achieve above display decimal format.

For presenting PV and/or SP values in shapes, a maximum of 7 positions are reserved:

- Negative / positive sign symbol
- Decimal separator
- For data presentation: minimum 5 numbers (E.g.: -0.9876) and maximum 7 numbers (E.g.: 9999876)
- No 100C separator

Note: In all cases, enough space must be reserved for the presentation of the negative symbol.

7.1.3 Mode Indication

The mode object (TxtMode) shall indicate the actual operating mode of regulatory control algorithms.

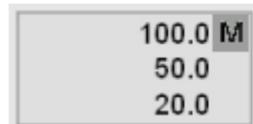
For the various data owners (C300, SCADA) different mode enumerations exist.

Mode: Indication	(Long): Indication	(Short):	Default CSS
Manual	MAN	M	Black
Auto	AUTO	A	Black
Cascade	CAS	C	Black

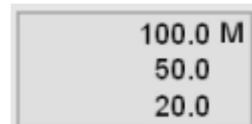
Long Indications such as MAN,AUTO,CAS shall be shown in faceplates and short indications such as M, A,C shall be shown in faceplates.

7.1.4 Off- Mode Indication

The off-normal mode indication is combined with the normal mode indication. When the current mode is not equal the normal mode, a different background color is applied to the mode-object in the shape. The default style for off normal mode is to show the mode indicator with reversed (highlighted) background.



Mode<>Normal Mode



Mode=Normal Mode

7.1.5 PV Source Indication

Process Variable Source - Identifies the source of the PV input:

- Sub: PV value is provided by a user program.
- Man: PV value is provided by the operator
- Auto: PV value is fetched from another function block

The PVSource attribute 'Operator' could be used to manually enter a PV value.

PV Source	Applicable for Experion C300:	Applicable for Experion SCADA:
Sub	✓	NA
Man	✓	NA
Auto	✓	NA

The PV-Source information is available in the Detail- and Faceplate - displays and is not shown in the Solution Pack controller shapes.

7.2 Abnormal Indication

An abnormal situation is a disturbance or series of disturbances in a process that cause plant operations to deviate from their normal operating state. Abnormal indications serve a key role in orienting users to the existence and location of critical plant conditions. The alarm (abnormal) configuration scheme determines whether the alarms orient and guide quick, effective responses to plant disturbances.

Color schemes affect the ability of users to distinguish different abnormal situations. It is important to standardize and limit the number of colors for abnormal situations. An effective and consistent color usage shall improve the ease of use and clarity of display information.

7.2.1 Alarm Indication

The alarm indicator can be used by shapes, which show tag information, for example pumps, valves, deviation view shapes, tank temperatures, and so on. The appearance and behaviour of the alarm-state and alarm-priority indicator is defined in the table below. The layout of the alarm icon is system defined.

Priority	Return to Normal	Acknowledge Status	Active Object (shape)	Behavior
Urgent	No	Unacknowledged		Blinking

Priority	Return to Normal	Acknowledge Status	Active Object (shape)	Behavior
High		Acknowledged		Steady
		Yes		Blinking
	No	Unacknowledged		Blinking
		Acknowledged		Steady
		Yes		Blinking
Low	No	Unacknowledged		Blinking
		Acknowledged		Steady
	Yes	Unacknowledged		Blinking
Disabled	N/A	N/A		Steady
Disabled Unacknowledged	N/A	Unacknowledged		Steady
Shelved	N/A	N / A		Steady
Suppressed	N/A	N / A		Steady

Table 7.2.1. 1 The appearance and behaviour of the alarm-state and alarm-priority

7.2.2 Secondary Alarm Object

HMIWeb Solution Pack incorporates secondary alarm object functionality. All shapes that show alarm using the conventional alarm icon have been changed by adding new custom parameter of type "object" (cp_AlmObjName) and a new "alarm" object (RecAlm). This object is used by default to demonstrate alarm behaviour as the alarm icon does. The RecAlm object is a rectangle object that can be used as a secondary alarm object. The RecAlm object is located between the ScTxtSelectBox and the RecFrame objects.

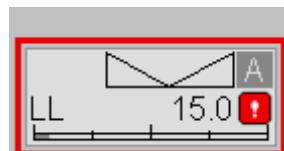


Figure 7.2.2. 1 Shape with RecAlm Object

7.2.3 Inactive Indication

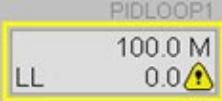
In HMIWeb, the presentation of inactive points depends on the type of point as well the type of parameter. SCADA points use scanned data. In case the scanning stops (point is set inactive or off-scan) the last value is shown. In that case the text color shall change from black (active) to gray (inactive), which is standard system behaviour. The inactive condition occurs because the point is set to be inactive on application program.

All shapes showing discrete points will show a cross on top of the shape. The color of this cross is determined by the cascading style sheet and is by default black. When the 'Indicate off-scan state with color' is enabled the following shape presentation will be shown in operating displays:

Settings for presentation 'NaN':

Font:	Arial
Font style:	Regular
Font size:	12
Font color:	Black
Alignment:	Right
Fill color:	Light gray
Line color:	none
Line Settings for X (Cross):	
Color:	black
Style:	—
Weight:	2 pt.

Point type	Source:	Shape Behavior			
		Active	Example Active	Inactive	Example Inactive
Status point	SCADA	No Cross		Black Cross	
Status point	Process	No Cross		Black Cross	
Analog point	SCADA	Black text value	PIDLOOP_SC A 50.00 	Grey text value	PIDLOOP_SC A 50.00

Analog point	Process	Current value		NaN	
--------------	---------	---------------	--	-----	---

7.2.4 Bad PV Indication

Bad PV- alarms ('Unreasonable Value' alarming for Experion SCADA) Unreasonable Value is, when the value from the field received on dcs is out of range. Are presented in Station by default as:

- Analog: 'NaN'
- Digital: 'Bad'

A Bad PV alarm has its own alarm priority. For discrete device shapes, the BAD PV will be presented in the shape using the abbreviation 'B'. Shapes presenting analog PV's will show the NaN instead of the numeric PV.

Error description	Presentation Analog PV	Presentation Digital PV
Communication	NaN	Bad
Configuration	-----	Bad
Script	no standard defined	no standard defined

The Bad PV is indicated with a large non-blinking red **B**, appearing on top of the presented discrete shape. The **B** is positioned so that:

- The tagname is visible.
- The alarm priority symbol is visible.
- The Redtag indication is visible.

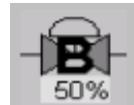


Figure 7.2.4. 1 Shape with BadPV Object

Settings:

Font	Arial
Font style	Bold
Font size	20
Font color	Black
Alignment	Center
Fill color	None
Line color	None

7.2.5 Alarm Shelving Indication

This function allows the operator to store away a nuisance alarm in the alarm system for a determined period of time. This action of storing the nuisance alarm from an active indication is what Honeywell refers to as putting the alarm on a shelf.

Shelving will only affect the individual selected alarm. All others alarm for the same point will remain active and in their proper states. Alarm shelving allows the operator to de-clutter the alarm list to help avoid missing critical abnormal situations defined by alarms.

7.2.6 Alarm Disabled / Inhibited Indication

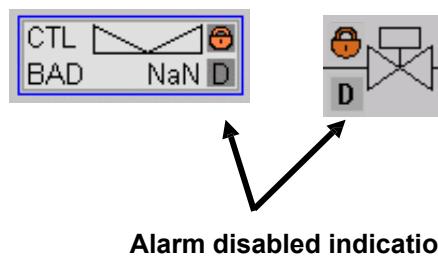
Alarms for all points can be set to ENABLED or DISABLED. It is very important to indicate that when an alarming capability is disabled or inhibited. This indication is necessary in the process displays. Failure to do so can potentially lead to dangerous situations therefore this alarm condition should always be reported to operators. When the alarming is disabled or inhibited the indicators for alarm priority will disappear and will be replaced by a representative icon.

Alarms are disabled to suppress unnecessary alarm behaviour. Disable alarms are showed as a black D for all point types. The letter will be on a gray background as shown below:



Note: The color settings of the alarm symbol cannot be changed.

An example of the disable indication is shown in the following shapes:



Alarm disabled indication

7.2.7 Error Indication

Errors in process points can occur due to several reasons. To quickly find the cause of an error, additional information is required. The default representation of various errors types in Station is shown below:

Several reason occurs the error are below :

- Different tag number between HMI and logic (HMI and logic are not connected)
- The controller is not active
- There is problem of communication between HMI, Logic and controller

Errors in Solution Pack shapes are presented through error codes:

- 'Analog' shapes: Cyan / Red text on a light gray background
- 'Digital' shapes: Magenta question mark "?" without a background color

The following error codes will be presented:

Error description	Presentation Analog PV	Presentation Digital PV
Communication	NaN	?
Configuration	-----	?
Script	-----	?

Settings for Analog Shapes

Font	Arial
Font style	Regular
Font size	12
Font color	Black
Alignment	Right

Fill color	None
Line color	None

Settings for Digital Shapes

Font	Arial
Font style	Bold
Font size	20
Font color	Magenta
Alignment	Center
Fill color	None
Line color	None

An example of the error indication is shown in the following shapes:

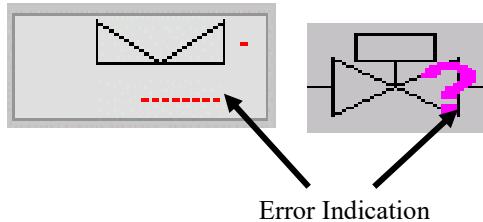
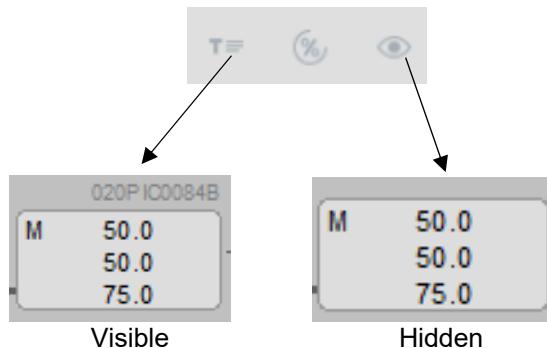


Figure 7.2.7. 1 Shape with BadPV Object

7.3 Additional Information

7.3.1 Tag name and Tool Tip

In operating schematics, tag names are considered detailed information. To reduce the amount of details tag names are not visible by default. The operator can decide to show (or hide) all tag names via a 'Hide and Show' object.

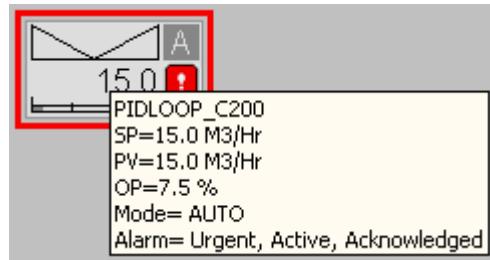


Settings

Font	Arial
Font style	Regular
Font size	10
Font color	Black
Alignment	Right
Fill color	None

Line color	None
------------	------

Individual tag names are visible using the 'Tooltip' mechanism. The tooltip is activated by moving the cursor over a shape for at least 0.5 seconds. When this happens, the tooltip will show some point information (that is, SP, PV, OP, Mode and alarm status and so on). However, only values that are already available (accessed) in the shape can be made visible in the tooltip.



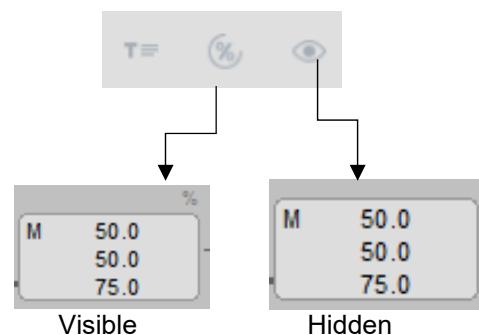
7.3.2 Point Description

Point descriptors are not available in the operating displays but only via:

- Detail display
- Faceplate
- Message zone (e.g. when the shortcut menu is shown)

7.3.3 Engineering Units

In operating schematics, engineering units are considered detailed information. To reduce the amount of details, engineering units are not visible by default. The operator can decide to show (or hide) all tag names via a 'Hide and Show' object. Maximum 15 characters can be displayed.

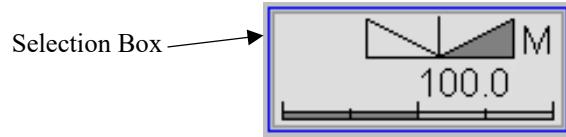


Settings:

Font	Arial
Font style	Regular
Font size	10
Font color	Grey
Alignment	Right / Center
Fill color	None
Line color	None

7.3.4 Selection Box

When the shape is selected with the pointing device (single-left-click event) a selection box will be made visible.

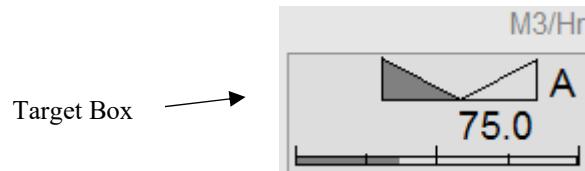


Settings

Fill Color	None
Line Color	Blue
Line Style	—
Line Weight	1 px

7.3.5 Target Box

Regulatory control shapes present many separate parameters. In order to group all these parameters, a rectangle (Grouping box) is presented around all parameters, except the tagname/engineering units. The rectangle is a one pixel smaller than the selection box, indicating the target zone for the shape.



Settings

Fill Color	None
Line Color	Grey
Line Style	—
Line Weight	1 px

The Target box is by default visible for the following shapes:

- Regulatory control
- Data acquisition
- Totalizer
- Some digital state

For all other shapes like valves, pumps motors fans, and so on, the target box is by default not visible.

7.4 Menu Options

7.4.1 Shortcut Menu

Via the Right-Button-Click from the pointing device a shortcut menu is available. The content shall contain general menu items and object dependable menu items. The shortcut menu shall disappear with below actions:

- Select outside shortcut menu
- Cancel
- Press Escape (keyboard)
- After a timeout, defined in the registry

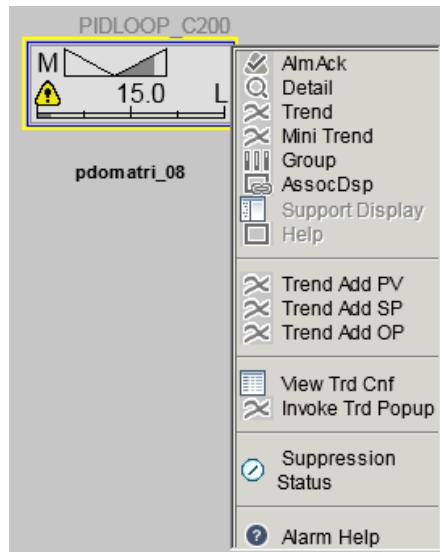


Figure 7.4.1. 1 Example shortcut menu for regulatory control points

7.4.2 Trending

7.4.2.1 Standard Trend Group

The standard trend group can be invoked in several ways, e.g. via the menu bar or via the shortcut menus.

When a trend is invoked via the menu bar and a point is selected it will invoke the first trend group in which that point appears. If a point is not configured in a trend group, the system will ask the operator for a trend group number.

When a trend is invoked via a shortcut menu of one of the shapes, it will invoke the first trend group in which that point appears. If a point is not configured in a trend group, the system will ask the operator for a trend group number. If a custom trend group was defined for the shape (see shapes custom properties), this custom trend group will be invoked.

Trend can also be invoked via OEP key named as 'TREND' by entering Trend Number.

7.4.2.2 Mini Trend

The mini trend (or Point Trend) can be invoked via the shortcut menu of a shape. Availability of all 3 traces depends on the custom properties of the shape. If the shape has a custom property for the PV named "cp_PV" the PV trace shall be shown. Similar for SP (cp_SP) and OP (cp_OP). If this custom property does not exist, the trace shall not be shown in the popup trend.

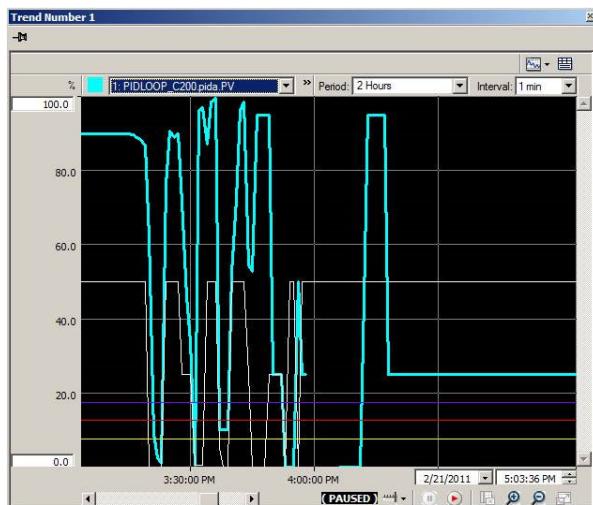


Figure 7.4.2.2. 1 Mini Trend / point trend

Main features of the mini trend:

- 3 traces for SP, OP and PV
- Each trace can be highlighted using a combo box

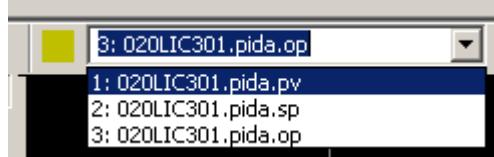


Figure 7.4.2.2. 2 Trace Selector

- Scale can be switched between Engineering Units and Percentage

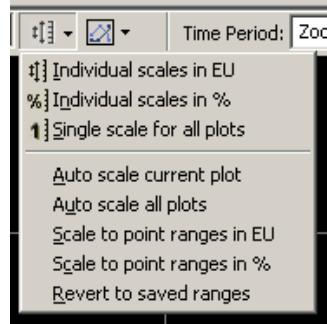


Figure 7.4.2.2. 3 Scaling Selector

- Time Period & Interval as well Scaling can be modified
Interval Period can be configured from 1 minute to 1 Year and Period can be configured as 5 seconds to 24 Hours
- Zoom-in and zoom-out using rubber-band
- Copy-Paste of trend data to other applications
- Scroll forward / backward
- Pause / Play
- Line / Bar chart selection
- Show / hide legend

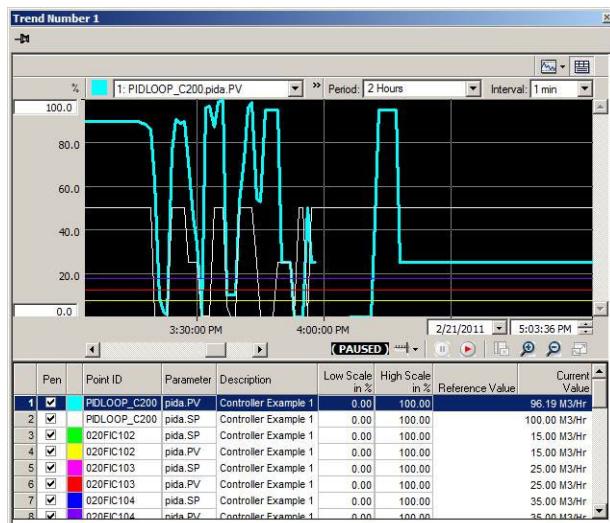


Figure 7.4.2.2. 4 Mini Trend with legend

- Hairline values
- Trend Pen selection (on-off)
- Presentation of events (alarms + operator changes), with or without legend

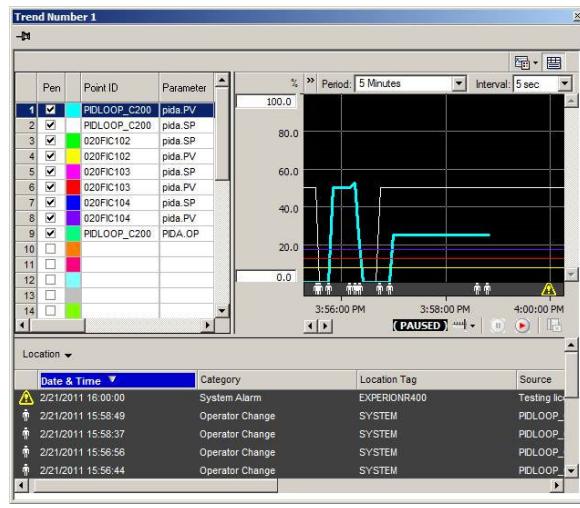


Figure 7.4.2.2. 5 Mini Trend with Events

- The mini trend can be managed by SafeView (using category HW_SP_TrendPopUp) or just appear as a popup (child) window. When the mini trend is shown as a child window, its location is determined by the CSS file
- If all the values of the CSS attributes are left to “default”, the popup object shall behave like standard system popups – round robin shall be available. If top and left positions are specified, the popups shall appear at the specified position and only one popup at a time will be available. If height and width are specified, the popups will not be sizeable. When changing the CSS attributes from specified values back to “default” Reset Faceplate Positions command might be necessary to be executed.

7.4.2.3 Trend Popup

The trend popup provides similar functionality as the “mini trend”. The only difference is the traces used by the trend which are determined by the current selected trend group (as indicated by the trend group selection shape).

The trend popup can be managed by SafeView or just appear as a popup (child) window. When the trend popup is shown as a child window, its location is determined by the CSS file.

If all the values of the CSS attributes are left to “default”, the popup object will behave like standard system popups – round robin shall be available. If top and left positions are specified, the popups shall appear at the specified position and only one popup at a time shall be available. If height and width are specified, the popups will not be sizeable. When changing the CSS attributes from specified values back to “default” Reset Faceplate Positions command might be necessary to be executed.

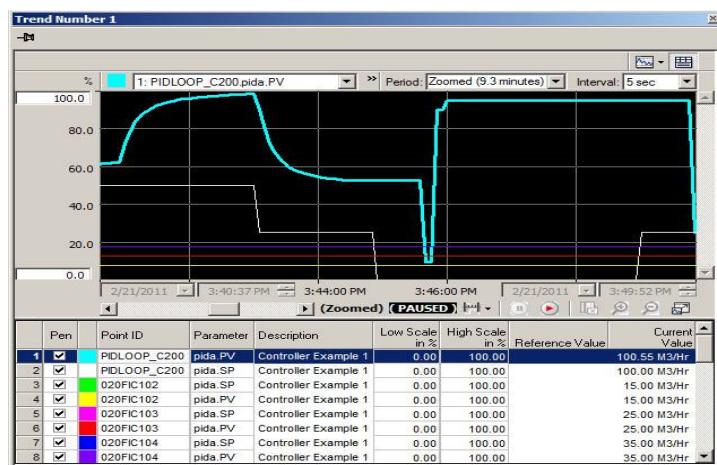


Figure 7.4.2.3. 1 Popup trend with legend

7.4.3 Group Display

Operator can manipulate point using Group display similar to that of using faceplate. However, there is one difference, in Group display operator can manipulate and control group of points which are logically grouped together simultaneously. Maximum 8 points can be configured in one group. Group displays shall be accessible from Process Unit Detail level.

Group name or number shall be based on what process area parameters to be trended (The name of trend and its tags details should be provided by company)

8.0 ALARM MANAGEMENT FUNCTIONALITIES

The following sections provide an overview of the alarm functionalities related to the HMIWeb Graphic displays, Experion Operator Consoles and Experion Stations.

8.1 Alarm Representation

Alarm representation on the operator HMI system will be provided as follows.

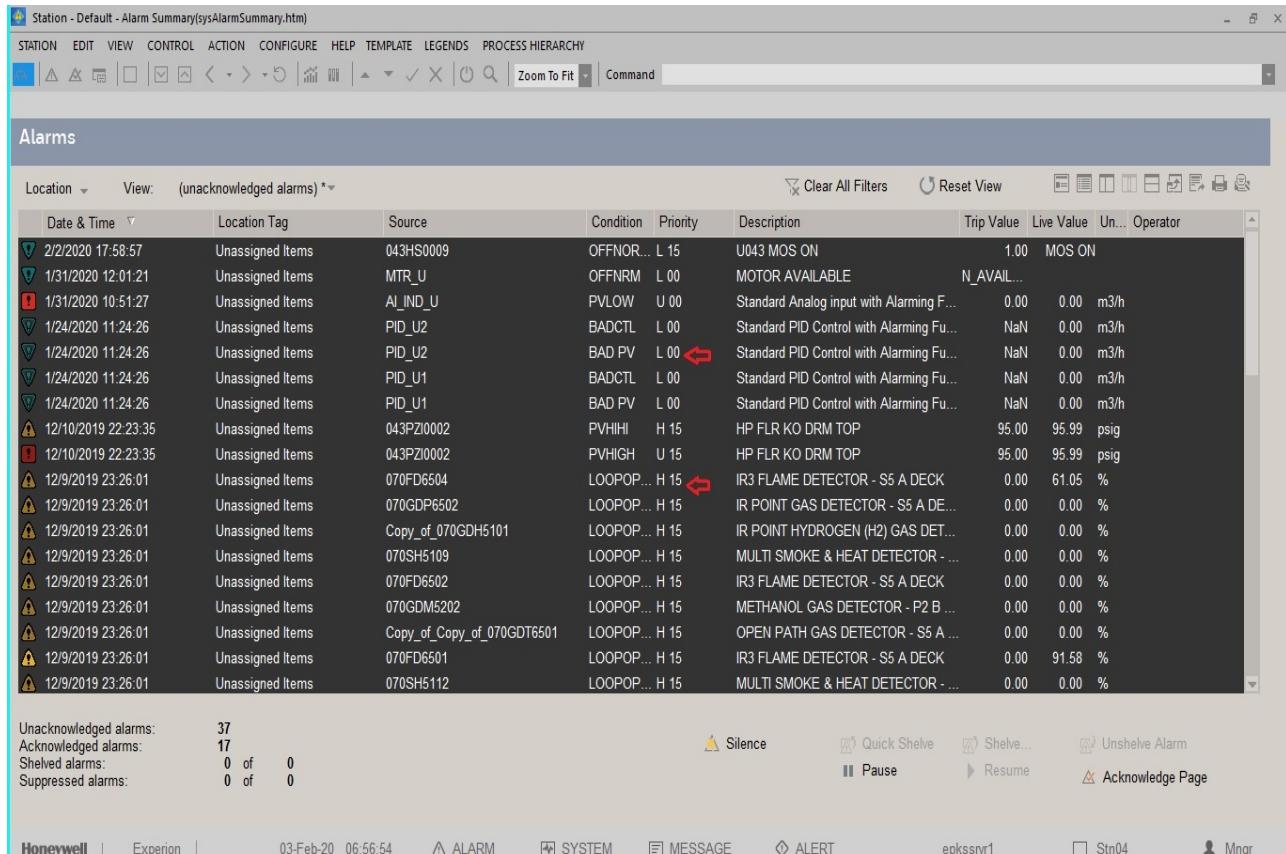


Figure 8.1. 1 Alarm Summary Showing Alarm Severity

8.2 Alarm Navigation

There are several ways that an operator can navigate or trace a graphic page containing a process alarm:

- Through the display hierarchy and the alarm indicator flashing in the appropriate priority color. Progressively selecting the alarm indicator will invoke more detailed displays and locate the display with the cause of the alarm.
- Through LED-enhanced operator keyboard buttons; pressing the button will invoke either a Level-2 or a Level-3 display.
- Through pre-configured HMI Tabs on top of displays.
- Through the Process Alarm Summary displays, then directly to the associated custom display via the context menu.

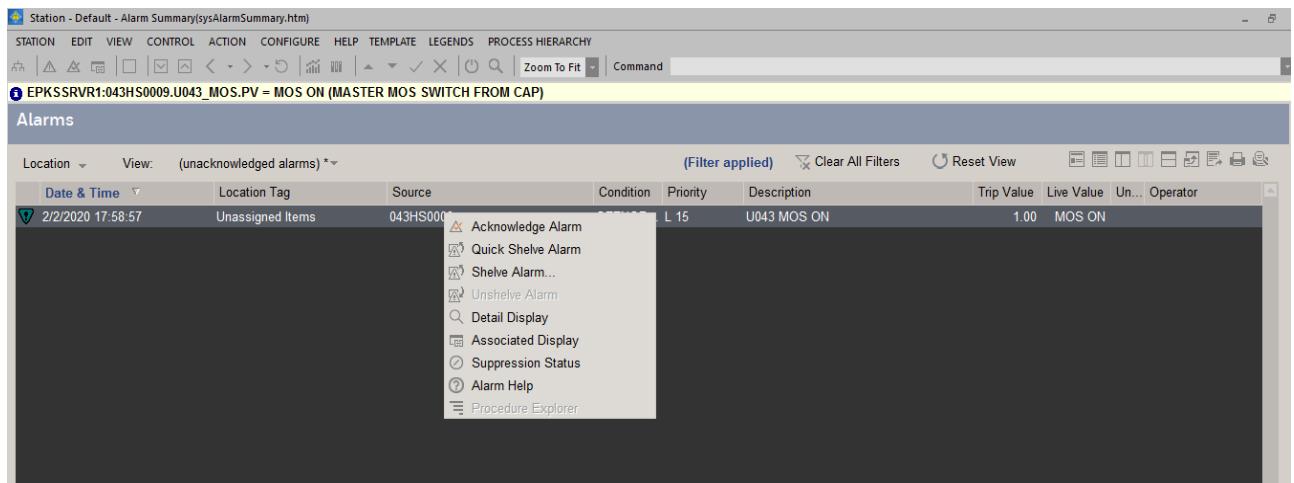


Figure 1 : Alarm Summary Page - Right Click Navigation Options.

A double click on one of the alarm lines will take the operator to the Point Detail Display. The Associated Display for BPCS, SIS / HIPPS and FGS alarms will be configured as follows:

- Process alarms configured to navigate to the process display containing the source device generating the alarm.
- SIS / HIPPS alarms configured to navigate to the associated SIS / HIPPS C&E display.
- FGS alarms configured to navigate to the associated fire zone display
- FGS alarm summary display shall be dedicated to a separate FGS console and in the Fire Station
- Alarm systems shall be capable of being segregated to different operator consoles.

9.0 INPUT DEVICE

Below user input device shall be used-

QWERTY Keyboard - available for all machine types.

Mouse – standard for all machine types.

Operator Entry Panel (OEP) – standard with console station. Includes buttons specific for operator use, e.g. Mode changing, SP/OP ramping, system display invocation.

10.0 SAMPLE FACEPLATES AND CONFIRMATION POPUP

10.1 Faceplate

A click on the final control element on the graphic such as control valve or equipment like motor would invoke a faceplate (pop-up window). Pop-up windows shall be used to allow the Operator to view or change values or parameters not shown on Process Displays. Examples of different types of faceplates are shown below.

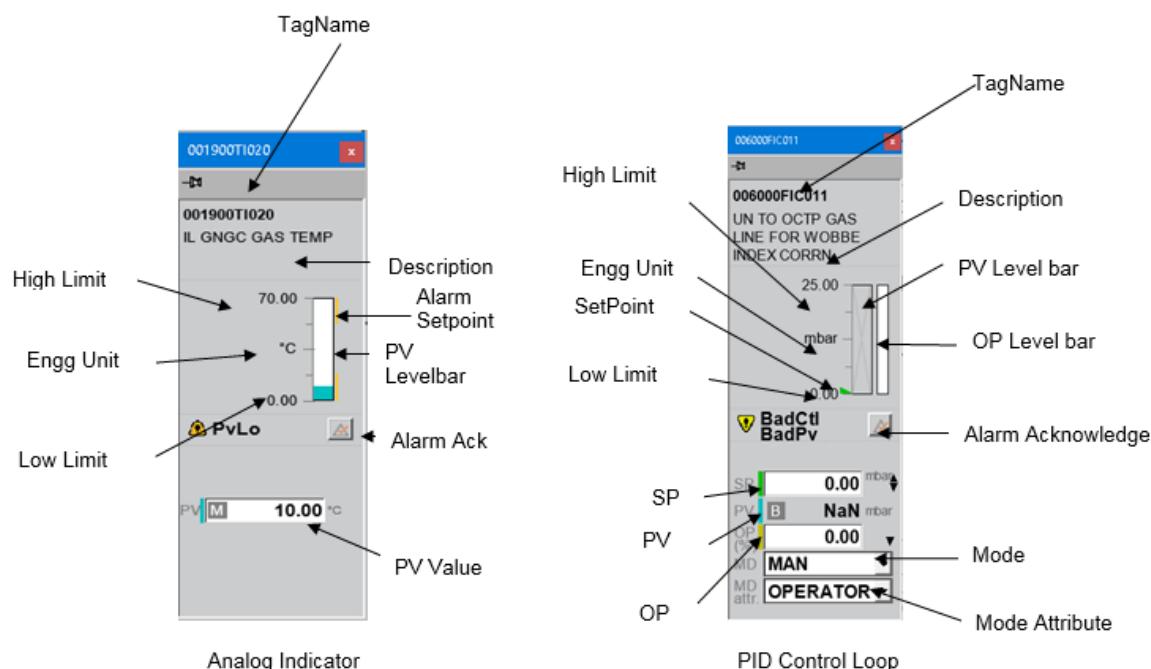


Figure 10.1.1 Faceplate Details

A maximum of four (4nos) of faceplates can be opened simultaneously in any station, opening of fifth faceplate shall lead to an automatic closure of the first faceplate in the respective station.

10.2 Confirmation Popup

Process critical task executed from faceplate as well as point detail display, for these task additional pop-up and confirmation shall be provided. For example Change of SP value in controller, and XV OPEN/CLOSE operation are identified for double confirmation as follows.

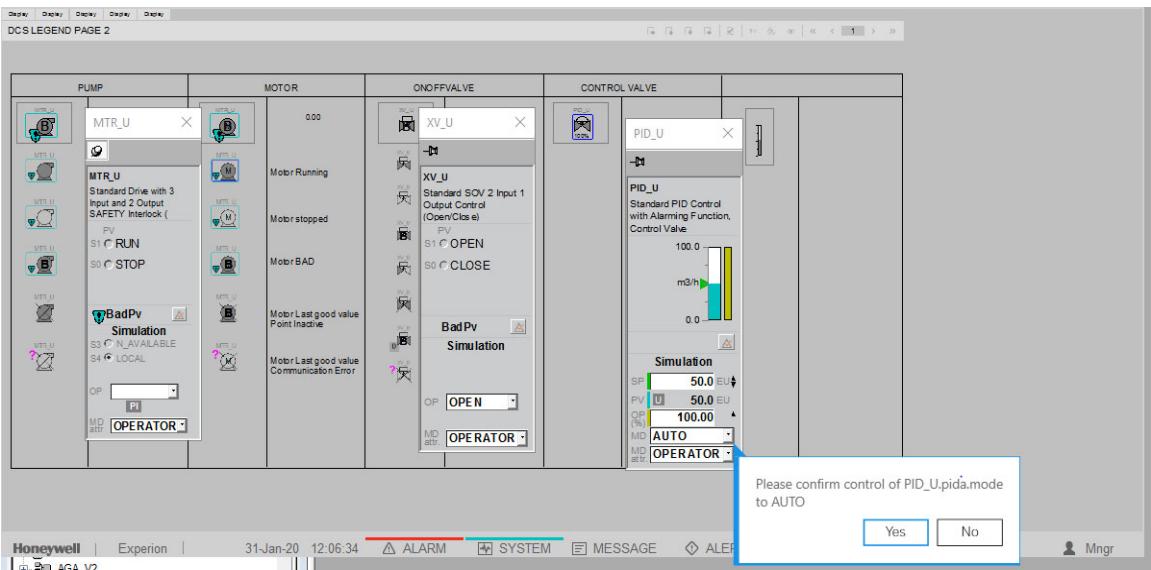


Figure 10.2 1 Faceplate details and confirmation popup

11.0 SHAPES

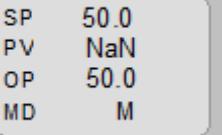
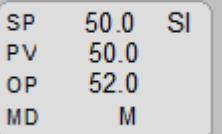
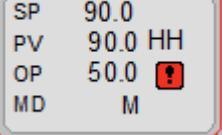
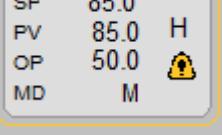
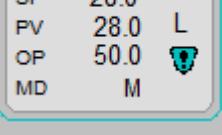
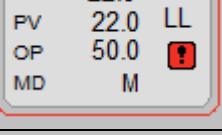
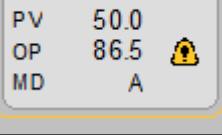
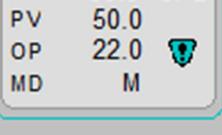
The HMIWeb Solution Pack provides shape sets for different types of controllers, such as C300, SCADA. This chapter lists all shapes used on the Standard Builds project.

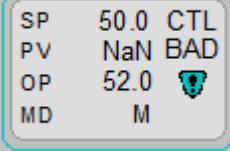
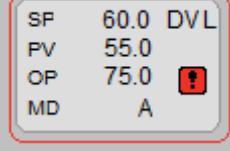
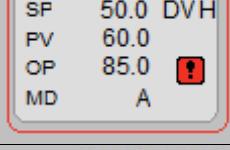
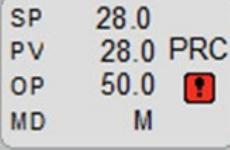
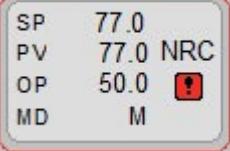
11.1 HMIWeb SP C300 / CDA / PCS Shapes

The following C300 shapes will be used for this project.

11.1.1 PCS Controller (PV-SP)

Normal Presentation	PV,SP, Tagname / Eng. Unit								
Abnormal Presentation	Error, Alarm enable state								
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unacknowledged, and Return to normal state								
CDA_RegCntl_lib_h_psomati_03_bigger.sha									
<p>S1: Tagname / S2: Engineering Unit</p> <p>D1: Selection box</p> <p>D2: Alarm Type</p> <p>D3: Alarm Rectangle</p> <p>D4: RecFrame</p> <p>D5: PV Value</p> <p>D6: Alarm Priority</p> <p>D7: Mode</p> <p>D8: SP Value</p> <p>D9: OP Value</p> <p>Note: D - Dynamic S - Static C - Invisible DB Connection</p>									
<table border="1"> <thead> <tr> <th>Shape Status Examples</th> <th></th> </tr> </thead> <tbody> <tr> <td> 065FIC0221 <div style="border: 1px solid black; padding: 5px; display: inline-block;"> SP 54.0 PV 54.0 OP 50.0 MD M </div> </td> <td> SP= 54.0 PV= 54.0 Mode=MAN Alarm Priority = Journal </td> </tr> <tr> <td> 065FIC0221 <div style="border: 1px solid black; padding: 5px; display: inline-block;"> SP 50.0 PV 60.0 OP 61.2 MD A </div> </td> <td> SP=50.0 PV=60.0 Mode=AUTO Alarm Priority = Journal </td> </tr> <tr> <td> 065FIC0221 <div style="border: 1px solid black; padding: 5px; display: inline-block;"> SP 50.0 PV 50.0 OP 50.0 MD M D </div> </td> <td> SP=50.0 PV=50.0 Mode=MAN Alarm Priority = Disabled </td> </tr> </tbody> </table>		Shape Status Examples		065FIC0221 <div style="border: 1px solid black; padding: 5px; display: inline-block;"> SP 54.0 PV 54.0 OP 50.0 MD M </div>	SP= 54.0 PV= 54.0 Mode=MAN Alarm Priority = Journal	065FIC0221 <div style="border: 1px solid black; padding: 5px; display: inline-block;"> SP 50.0 PV 60.0 OP 61.2 MD A </div>	SP=50.0 PV=60.0 Mode=AUTO Alarm Priority = Journal	065FIC0221 <div style="border: 1px solid black; padding: 5px; display: inline-block;"> SP 50.0 PV 50.0 OP 50.0 MD M D </div>	SP=50.0 PV=50.0 Mode=MAN Alarm Priority = Disabled
Shape Status Examples									
065FIC0221 <div style="border: 1px solid black; padding: 5px; display: inline-block;"> SP 54.0 PV 54.0 OP 50.0 MD M </div>	SP= 54.0 PV= 54.0 Mode=MAN Alarm Priority = Journal								
065FIC0221 <div style="border: 1px solid black; padding: 5px; display: inline-block;"> SP 50.0 PV 60.0 OP 61.2 MD A </div>	SP=50.0 PV=60.0 Mode=AUTO Alarm Priority = Journal								
065FIC0221 <div style="border: 1px solid black; padding: 5px; display: inline-block;"> SP 50.0 PV 50.0 OP 50.0 MD M D </div>	SP=50.0 PV=50.0 Mode=MAN Alarm Priority = Disabled								

	Configuration Error
	Inactive State
	Safety Interlock
	SP=90.00 PV=90.00 Mode=MAN Alarm Type = High High Alarm Alarm Priority = Urgent
	SP=85.00 PV=85.00 Mode=MAN Alarm Type = High Alarm Alarm Priority = High
	SP=28.00 PV=28.00 Mode=MAN Alarm Type = Low Alarm Alarm Priority = Low
	SP=22.00 PV=22.00 Mode=MAN Alarm Type = Low Low Alarm Alarm Priority = Urgent
	OPH = OP high SP = 45.0 PV = 50.0 Mode = Auto Alarm Priority = High
	OPL = OP low SP = 50.0 PV = 50.0 Mode = Manual Alarm Priority = Low

065FIC0221  <table border="1"> <tr><td>SP</td><td>50.0</td><td>CTL</td></tr> <tr><td>PV</td><td>NaN</td><td>BAD</td></tr> <tr><td>OP</td><td>52.0</td><td></td></tr> <tr><td>MD</td><td>M</td><td></td></tr> </table>	SP	50.0	CTL	PV	NaN	BAD	OP	52.0		MD	M		Bad PV Bad Control SP = 50.0 PV = NaN Mode = Manual Alarm Priority = Low
SP	50.0	CTL											
PV	NaN	BAD											
OP	52.0												
MD	M												
065FIC0221  <table border="1"> <tr><td>SP</td><td>60.0</td><td>DVL</td></tr> <tr><td>PV</td><td>55.0</td><td></td></tr> <tr><td>OP</td><td>75.0</td><td></td></tr> <tr><td>MD</td><td>A</td><td></td></tr> </table>	SP	60.0	DVL	PV	55.0		OP	75.0		MD	A		Deviation Low SP = 60.0 PV = 55.0 Mode = Auto Alarm Priority = Urgent
SP	60.0	DVL											
PV	55.0												
OP	75.0												
MD	A												
065FIC0221  <table border="1"> <tr><td>SP</td><td>50.0</td><td>DVH</td></tr> <tr><td>PV</td><td>60.0</td><td></td></tr> <tr><td>OP</td><td>85.0</td><td></td></tr> <tr><td>MD</td><td>A</td><td></td></tr> </table>	SP	50.0	DVH	PV	60.0		OP	85.0		MD	A		Deviation High SP = 50.0 PV = 60.0 Mode = Auto Alarm Priority = Urgent
SP	50.0	DVH											
PV	60.0												
OP	85.0												
MD	A												
065_LIC_0222  <table border="1"> <tr><td>SP</td><td>28.0</td><td></td></tr> <tr><td>PV</td><td>28.0</td><td>PRC</td></tr> <tr><td>OP</td><td>50.0</td><td></td></tr> <tr><td>MD</td><td>M</td><td></td></tr> </table>	SP	28.0		PV	28.0	PRC	OP	50.0		MD	M		Positive rate of change
SP	28.0												
PV	28.0	PRC											
OP	50.0												
MD	M												
065_LIC_0222  <table border="1"> <tr><td>SP</td><td>77.0</td><td></td></tr> <tr><td>PV</td><td>77.0</td><td>NRC</td></tr> <tr><td>OP</td><td>50.0</td><td></td></tr> <tr><td>MD</td><td>M</td><td></td></tr> </table>	SP	77.0		PV	77.0	NRC	OP	50.0		MD	M		Negative rate of change
SP	77.0												
PV	77.0	NRC											
OP	50.0												
MD	M												

Faceplate & Detail Display for PCS Controller (PV-SP):

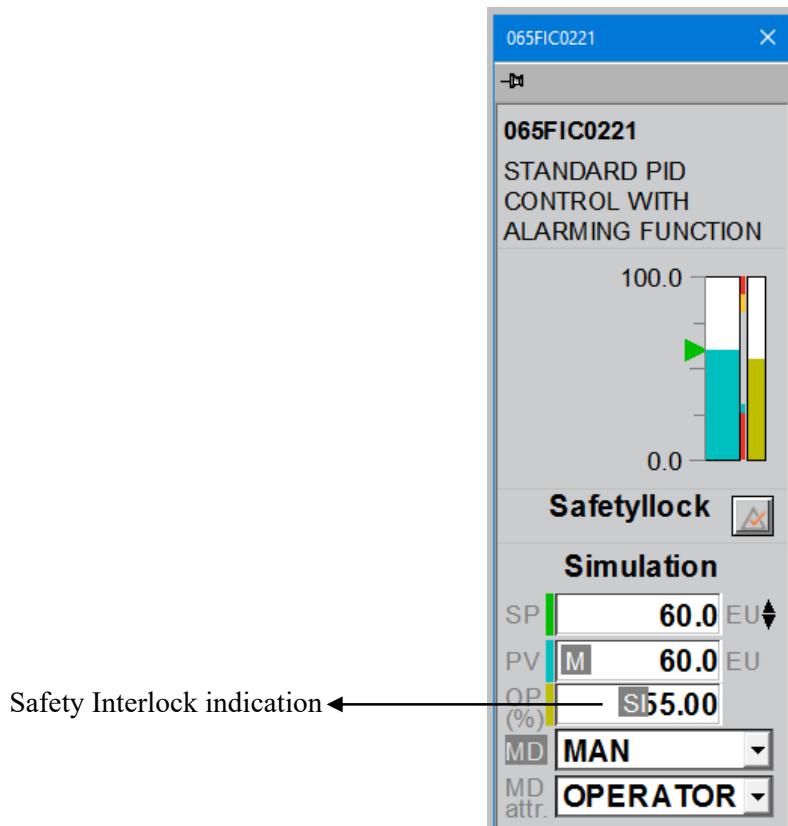


Figure 11.1.1. 1 PCS Controller Faceplate (with safety interlock indicated)

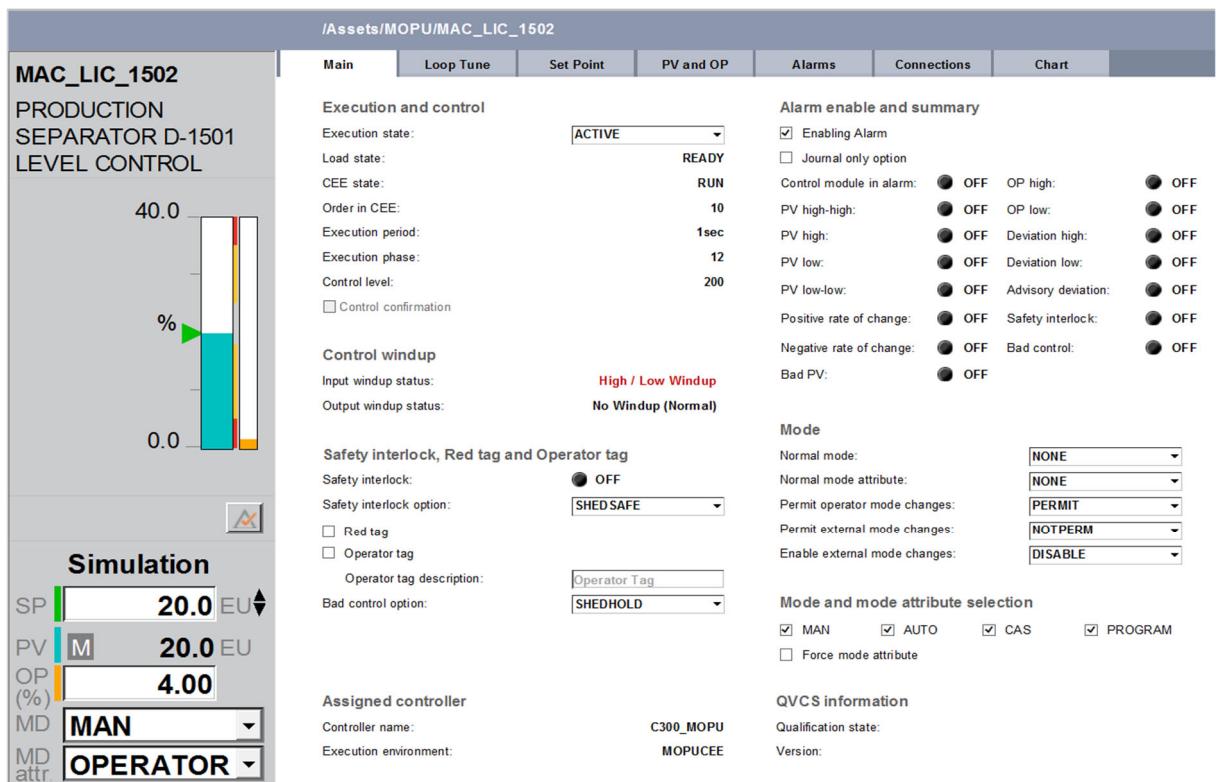


Figure 11.1.1. 2 Controller Detail Page – Main tab

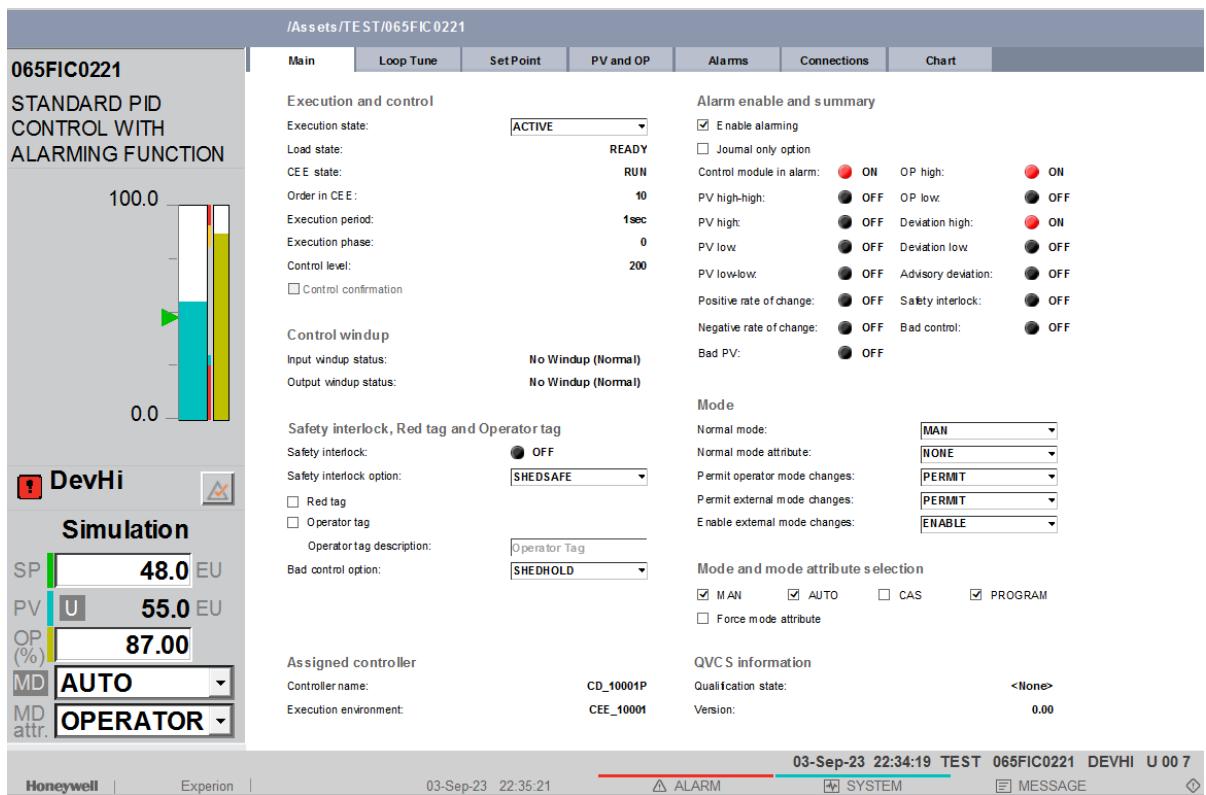


FIGURE 11.1.1. 3 Controller Detail Page – Main tab with OP High and Deviation high indication

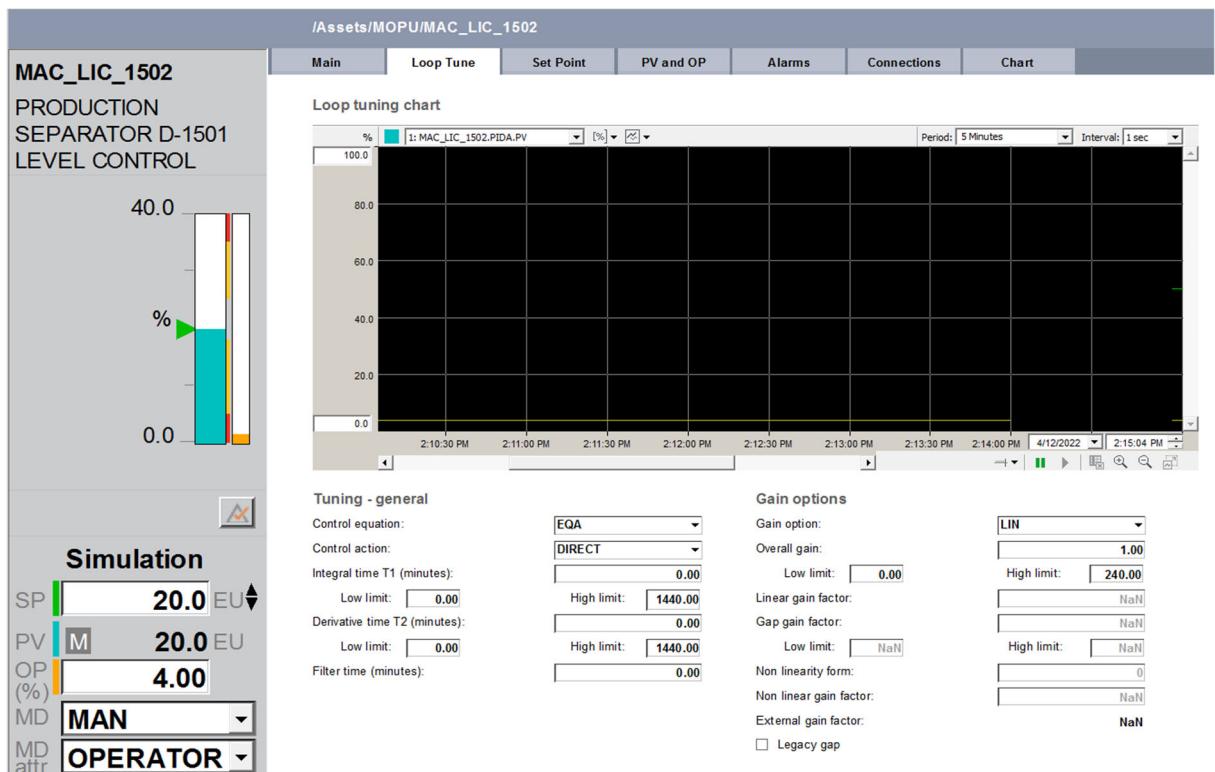


Figure 11.1.1. 4 PCS Controller detail page – loop tune tab

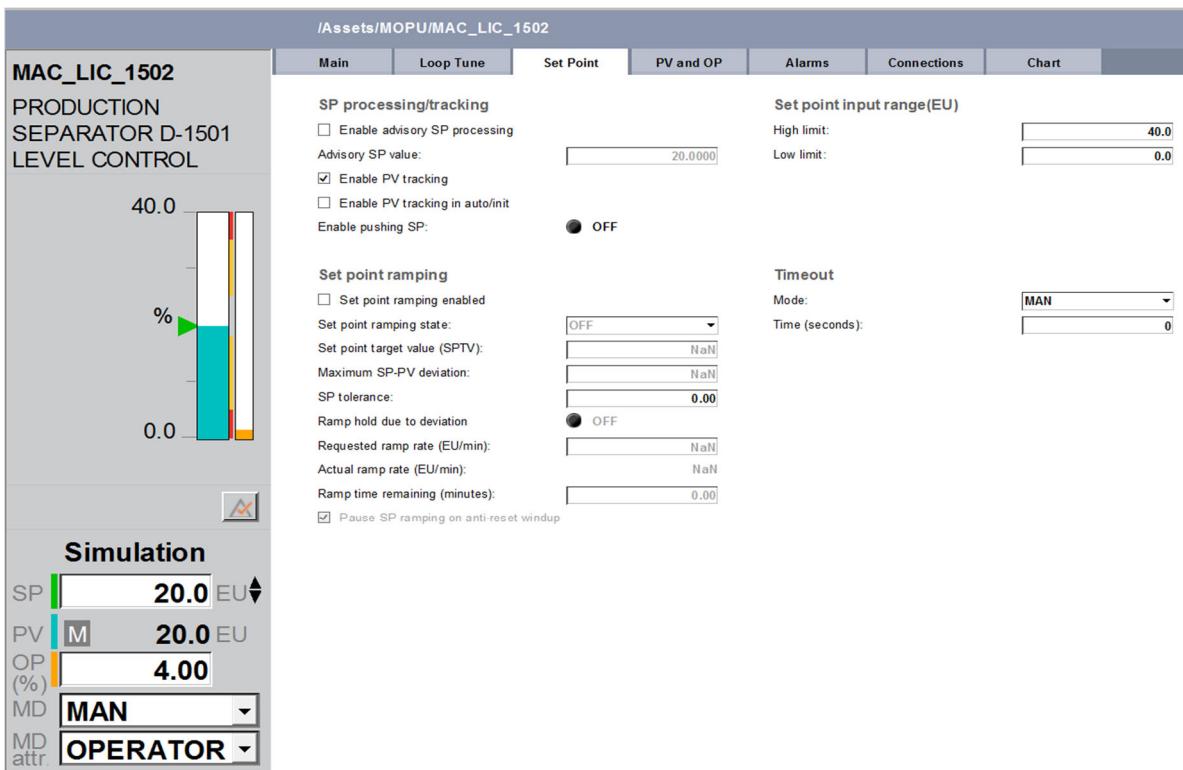


Figure 11.1.1. 5 Controller Detail Page – Set Point Tab

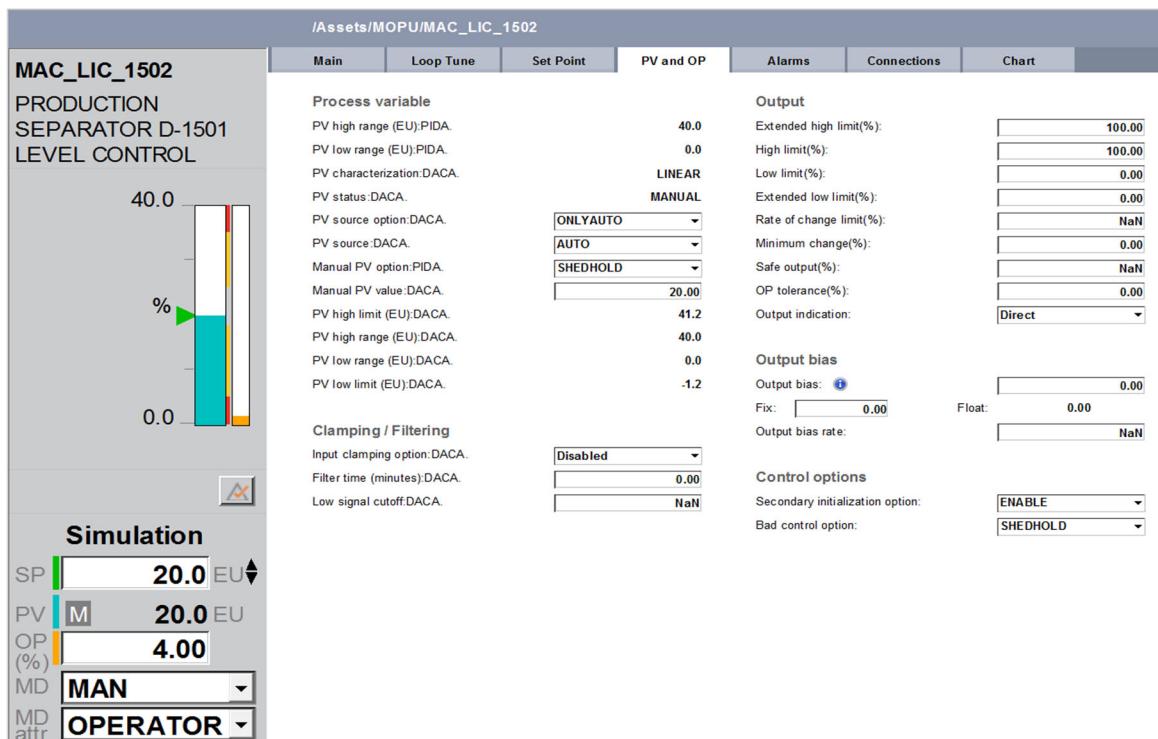


Figure 11.1.1. 6 PCS Controller Detail Page – PV and OP Tab

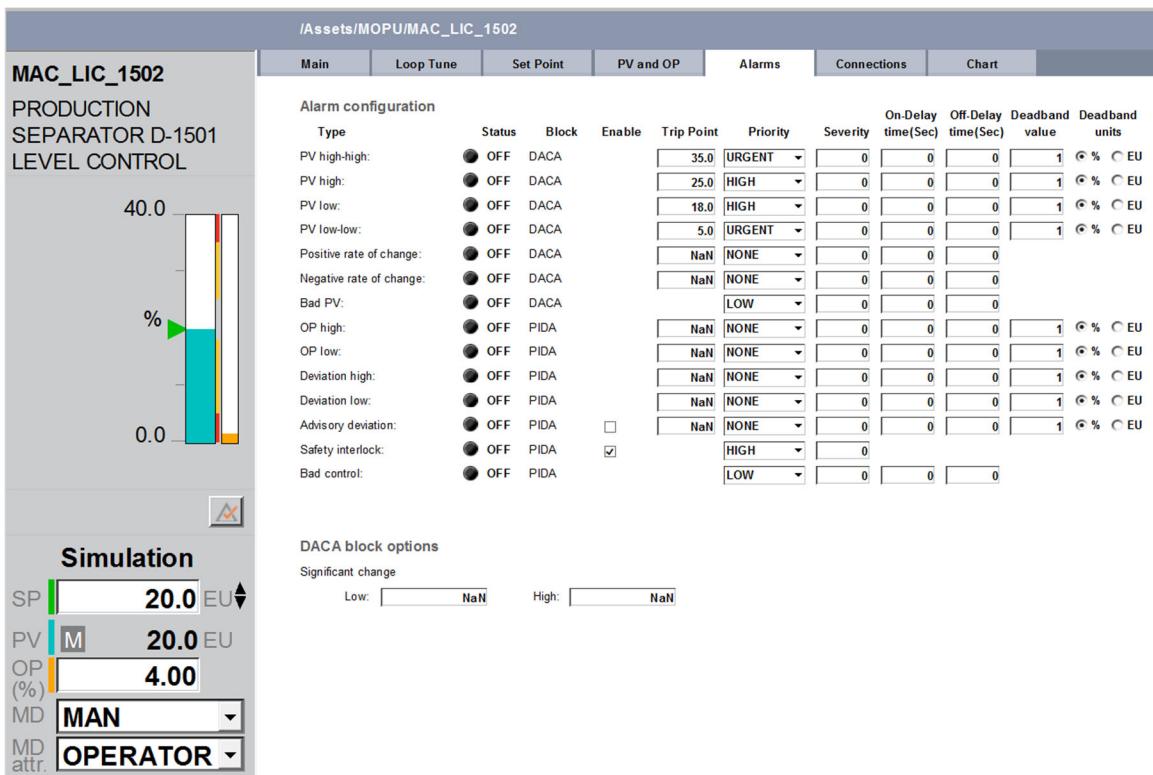


Figure 11.1.1. 7 PCS Controller Detail Page – Alarm Tab

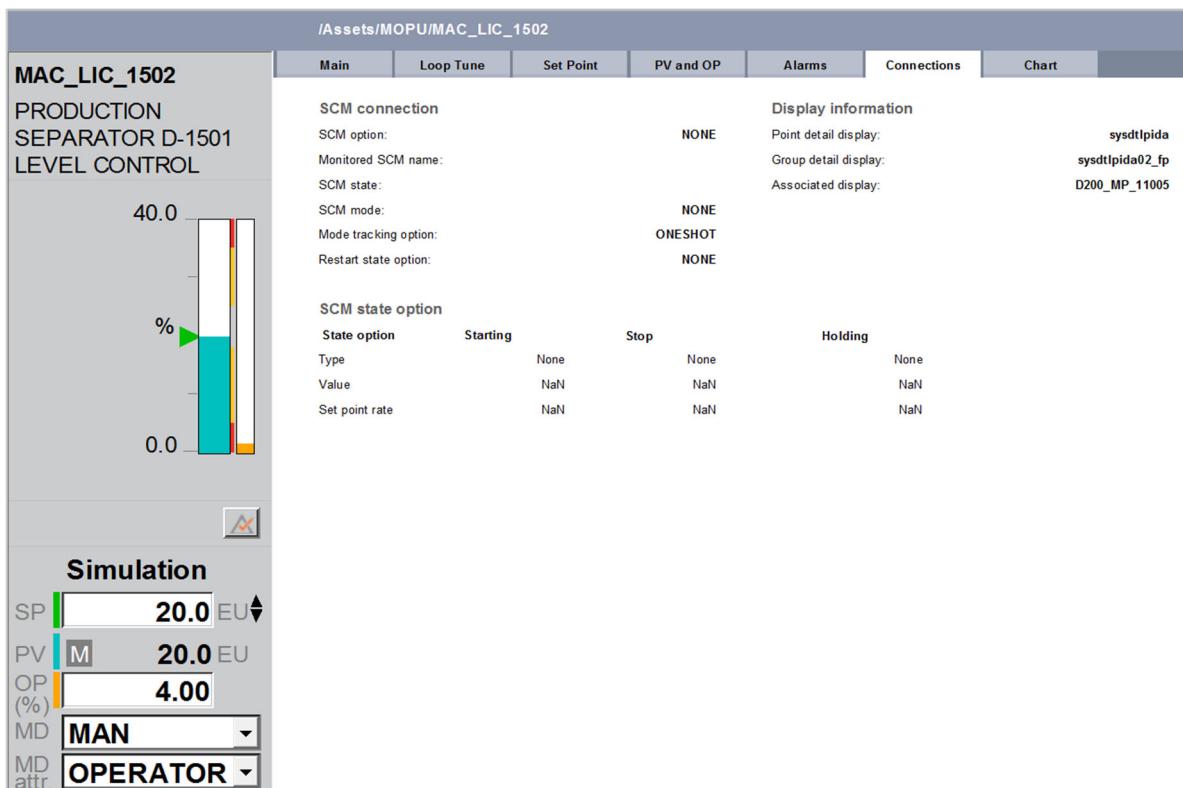


Figure 11.1.1. 8 PCS Controller Detail Page – Connection

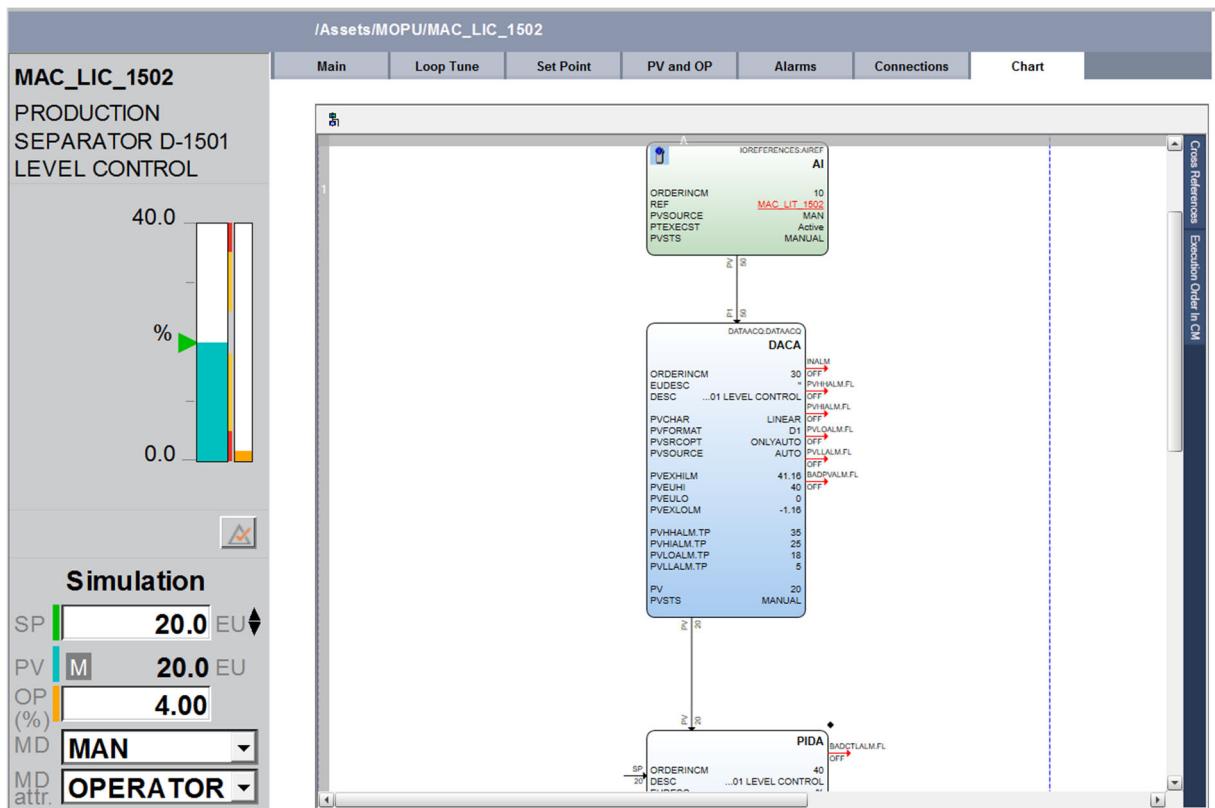
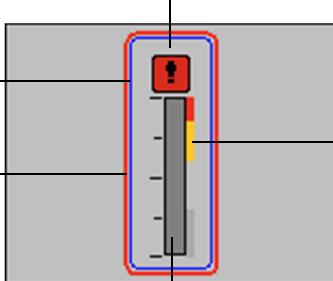
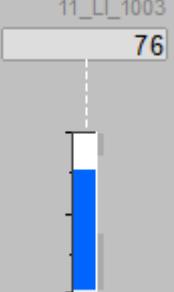
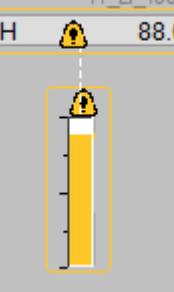
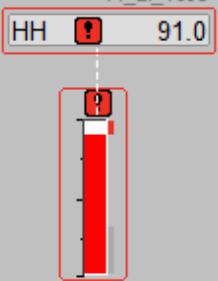
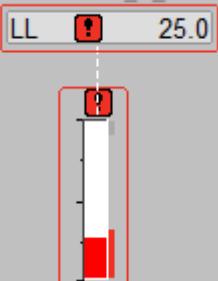
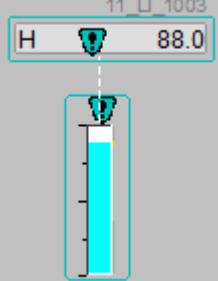
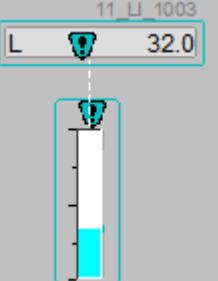
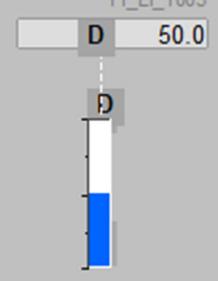
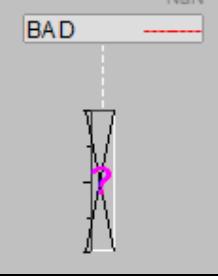


Figure 11.1.1. 9 PCS Controller Detail Page – Chart

11.1.2 PCS Level Bar

Normal Presentation	PV
Abnormal Presentation	Error, Alarm enable state
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unacknowledged, and Return to normal state
CDA_Bar.lib.v_pai_01.sha	
 D1: Alarm Priority D2: Selection box D3: Alarm Rectangle D4: PV Value D5: Alarm Limit	Note: D - Dynamic S - Static C - Invisible DB Connection
Shape Status Examples	
	PV=Normal Alarm Priority=Journal
	PV=High Alarm Alarm Priority=High
	PV=Low Alarm Alarm Priority=High

 <p>11_LI_1003 HH 91.0</p>	PV= High High Alarm Alarm priority = Urgent
 <p>11_LI_1003 LL 25.0</p>	PV= Low Low Alarm Alarm priority = Urgent
 <p>11_LI_1003 H 88.0</p>	PV = High Alarm Alarm priority = Low
 <p>11_LI_1003 L 32.0</p>	PV = Low Alarm Alarm priority = Low
 <p>11_LI_1003 D 50.0</p>	PV=Noraml Alarm Priority=Disabled
 <p>BAD NaN</p>	Configuration Error

	Inactive State
	Bad PV

Faceplate & Detail Display for above shape are as follows:

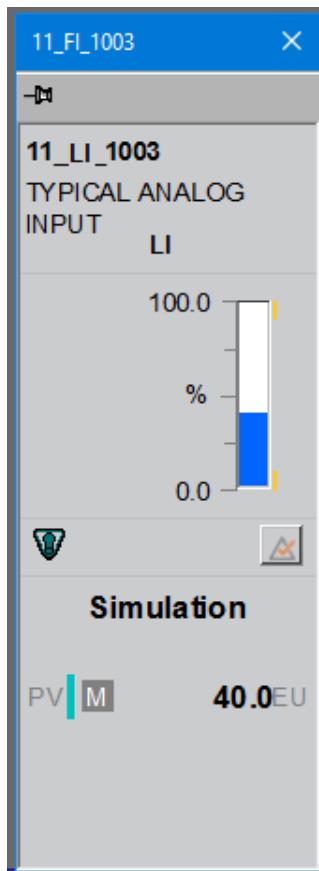


Figure 11.1.2. 1 PCS Analog Indicator Faceplate

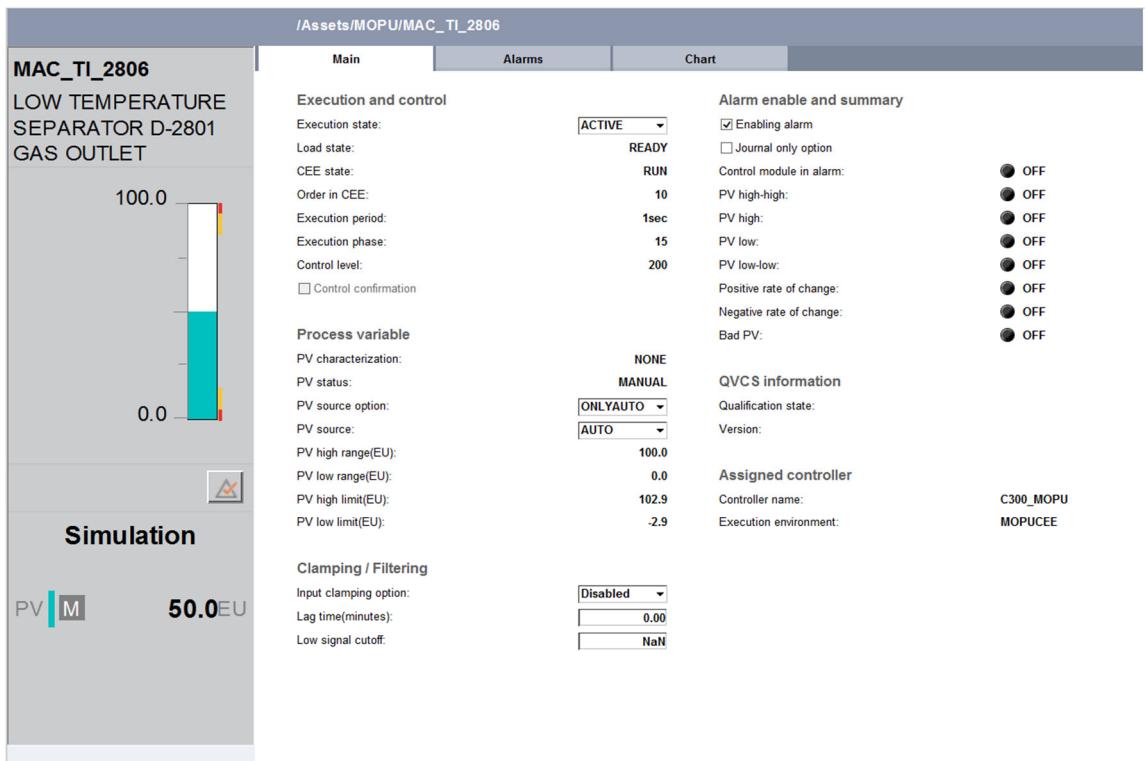


Figure 11.1.2. 2 PCS Analog Indicator Detail Page – Main Tab

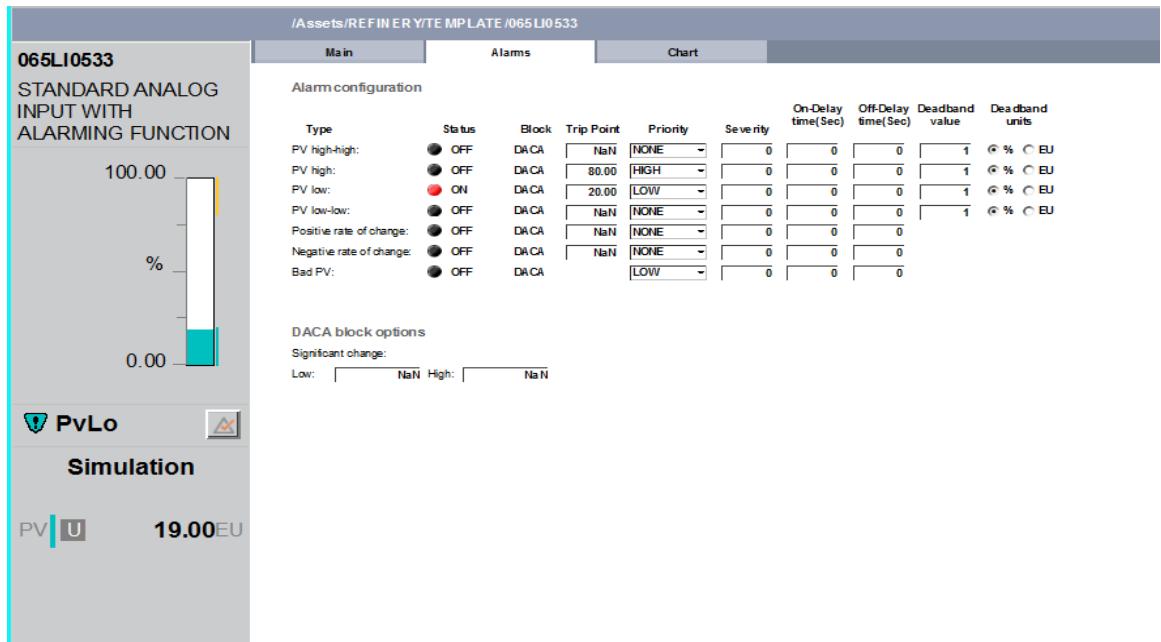


Figure 11.1.2. 3 PCS Analog Indicator Detail Page – Alarm Tab

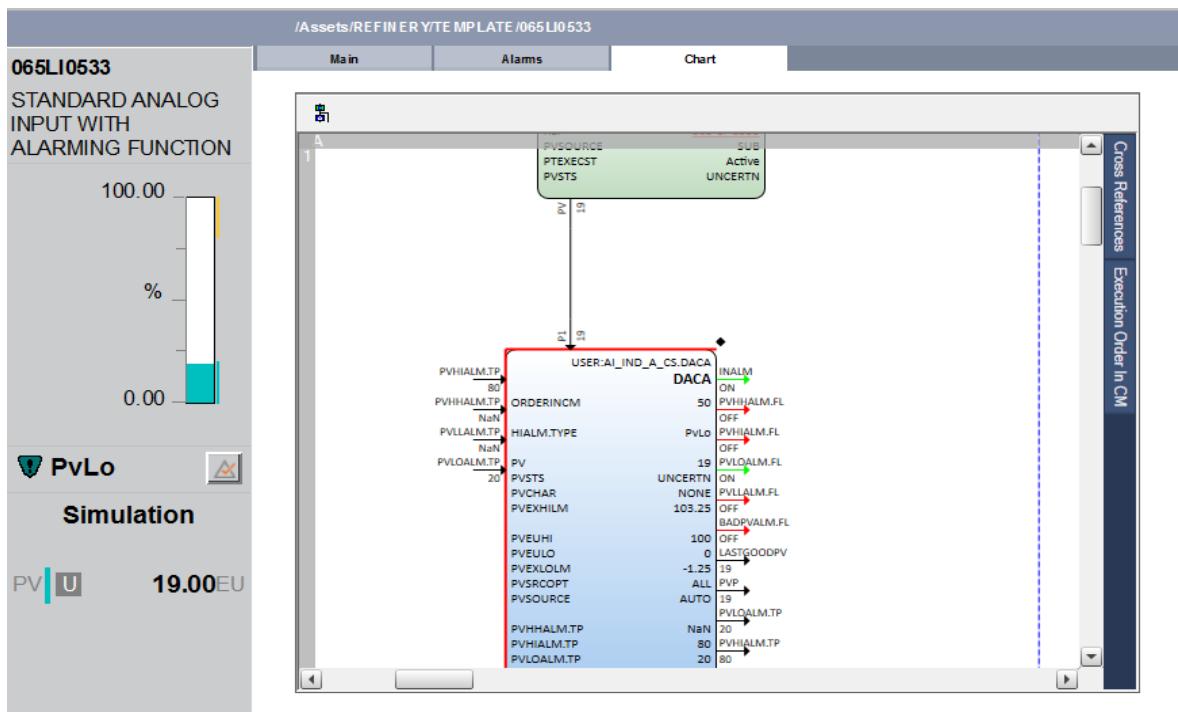
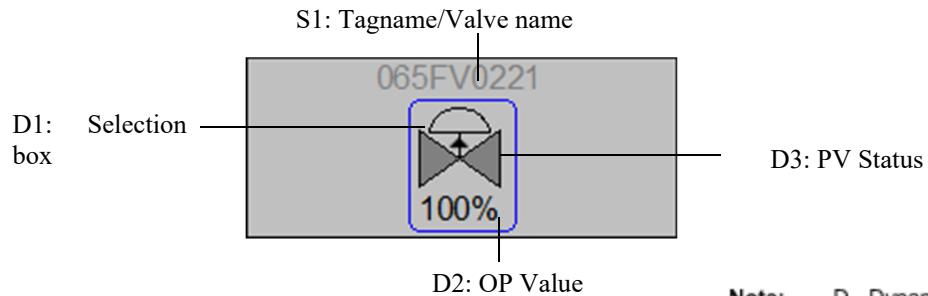


Figure 11.1.2. 4 PCS Analog Indicator Detail Page – Chart Tab

11.1.3 PCS Control Valve

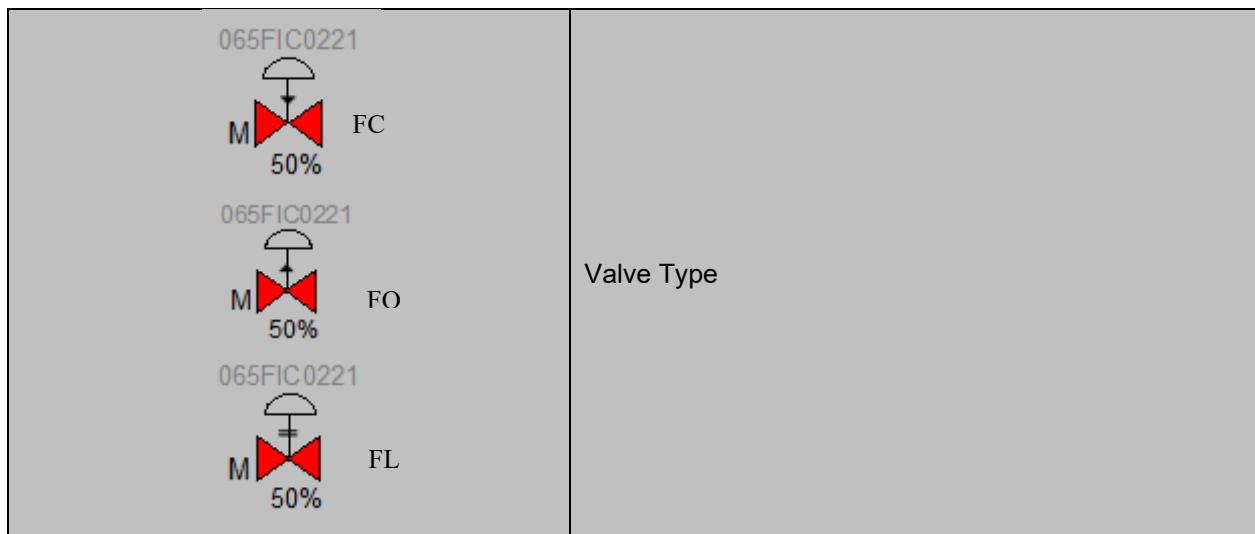
Normal Presentation	PV,SP, Tagname / Eng. Unit
Abnormal Presentation	Error, Alarm enable state
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unacknowledged, and Return to normal state

CDA_RegCntlValve_isa_h_oi_02.sha



Note:
D - Dynamic
S - Static
C - Invisible DB Connection

Shape Status Examples	
	PV=Close OP=0% Mode= Manual
	PV=Open OP=20% Mode= Auto
	BAD Control Bad PV Mode= Manual
	Configuration Error
	Inactive State Mode= Manual



Faceplate & Detail Display for above shapes are follow:

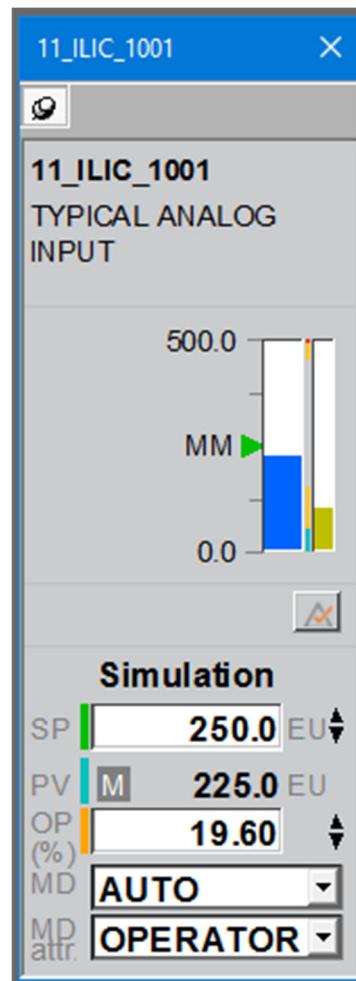


Figure 11.1.3. 1 PCS Controller faceplate

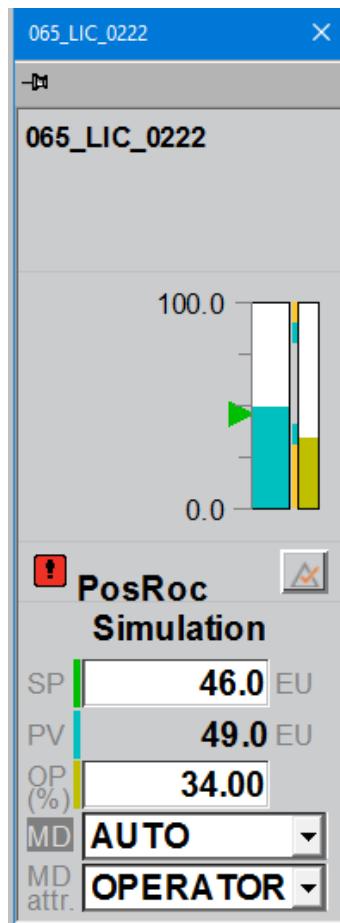


Figure 11.1.3. 2 PCS controller faceplate – positive rate of change indication

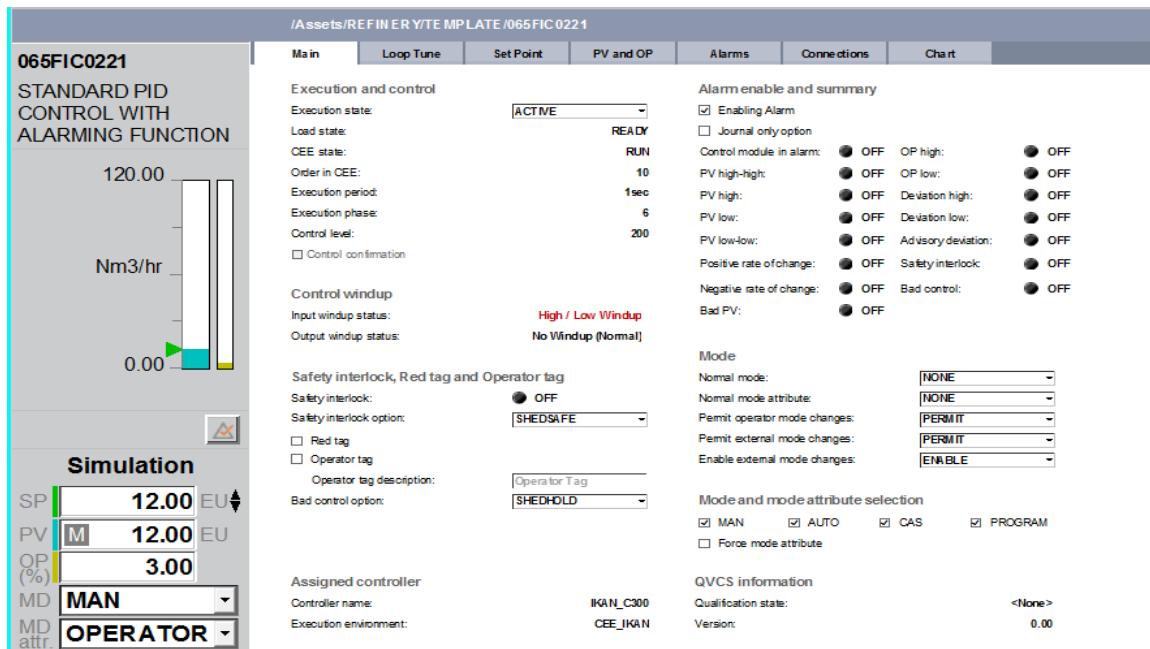


Figure 11.1.3. 3 PCS Controller Detail Page – Main Tab

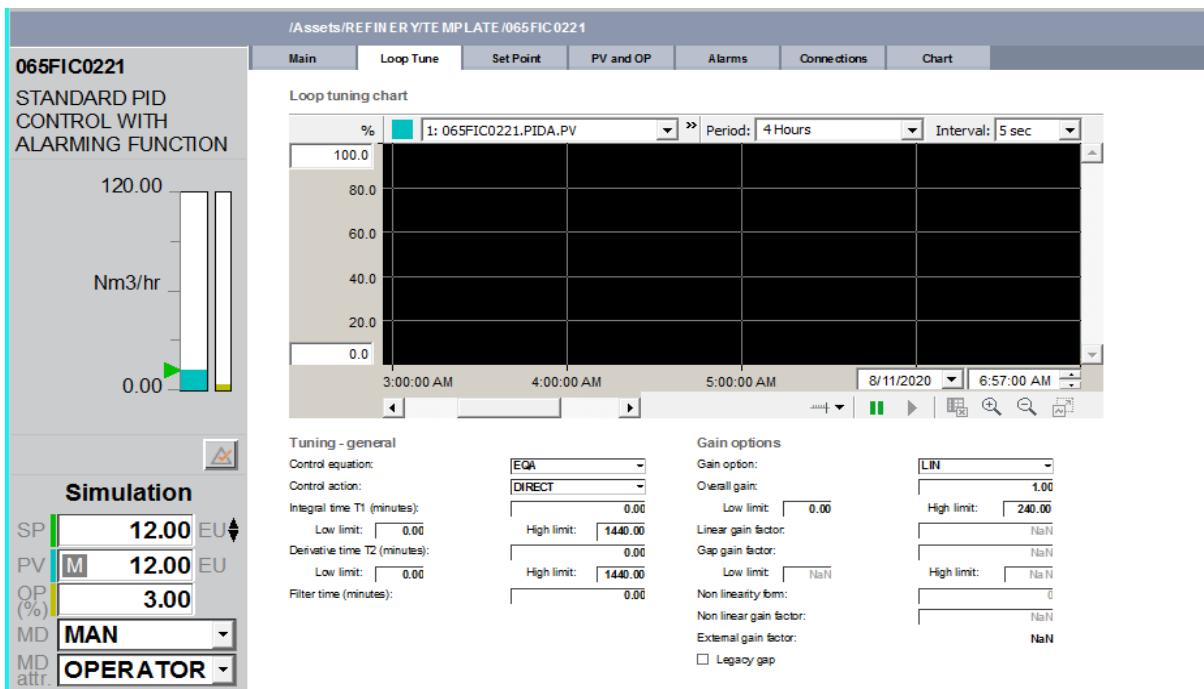


Figure 11.1.3. 4 PCS Control Detail Page – Loop Tune Tab

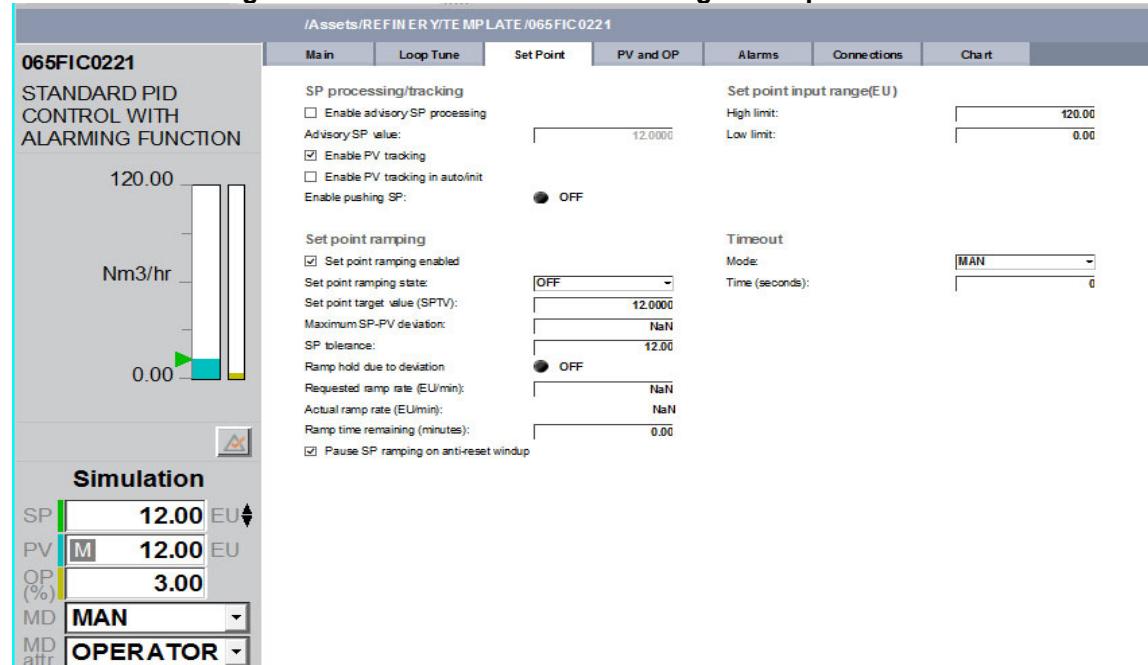


Figure 11.1.3. 5 PCS Controller Page – Setpoint Tab

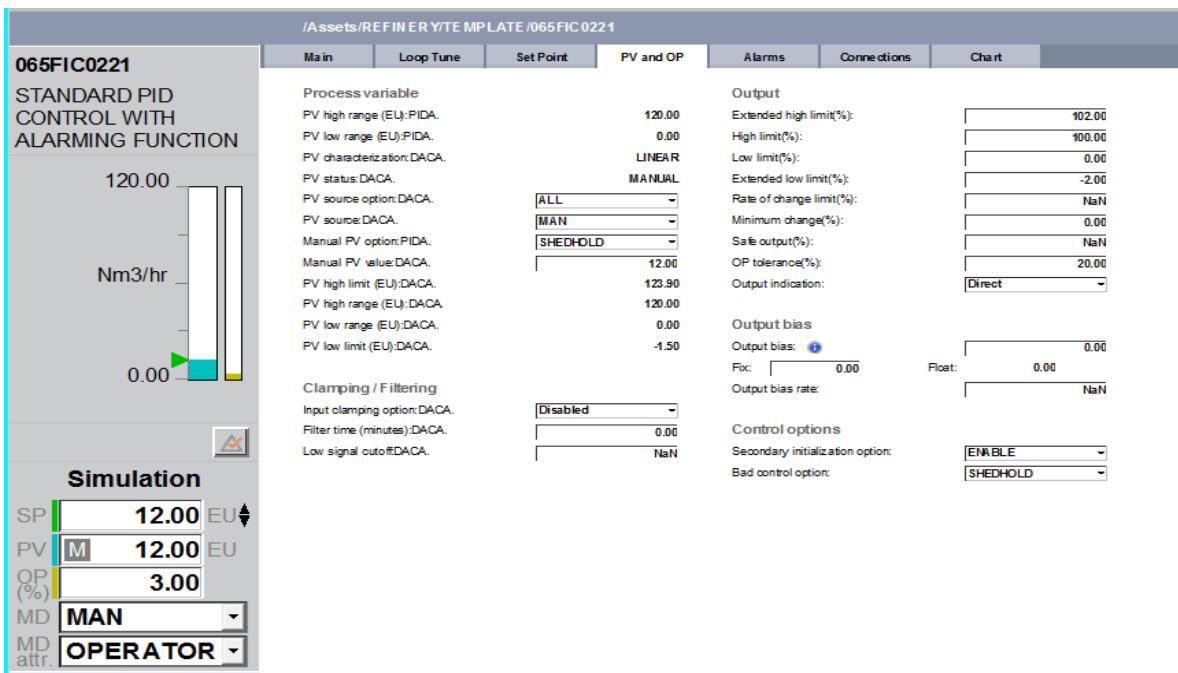


Figure 11.1.3. 6 PCS Controller Detail Page – PV and OP Tab

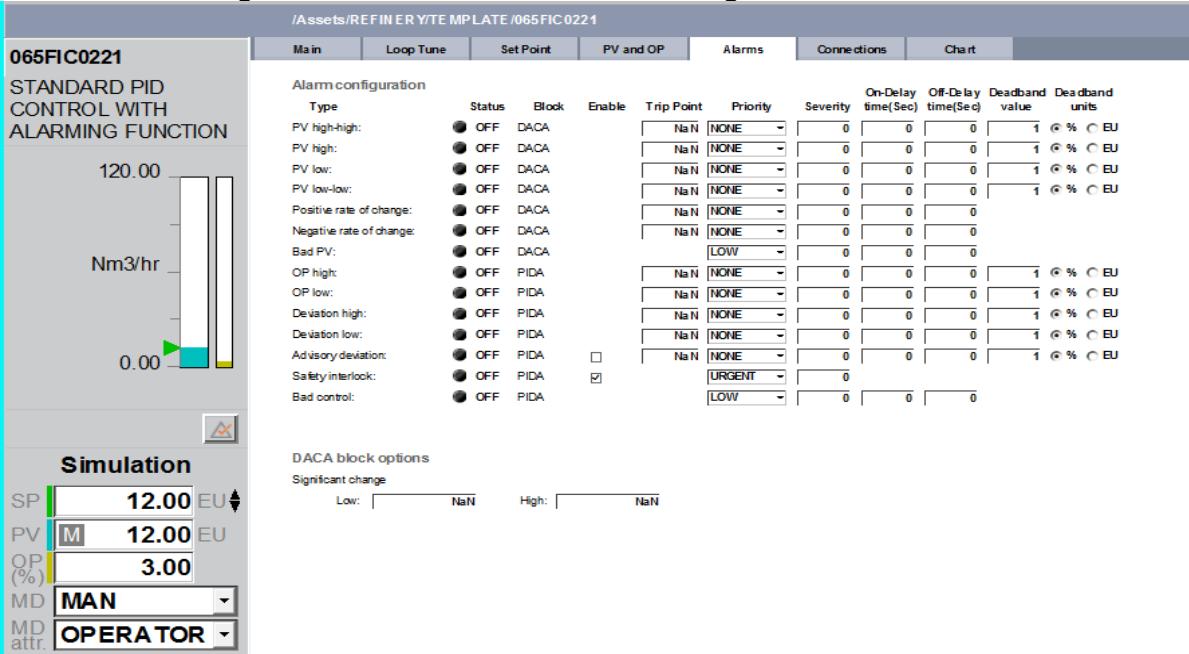


Figure 11.1.3. 7 PCS Controller Detail Page – Alarm Tab

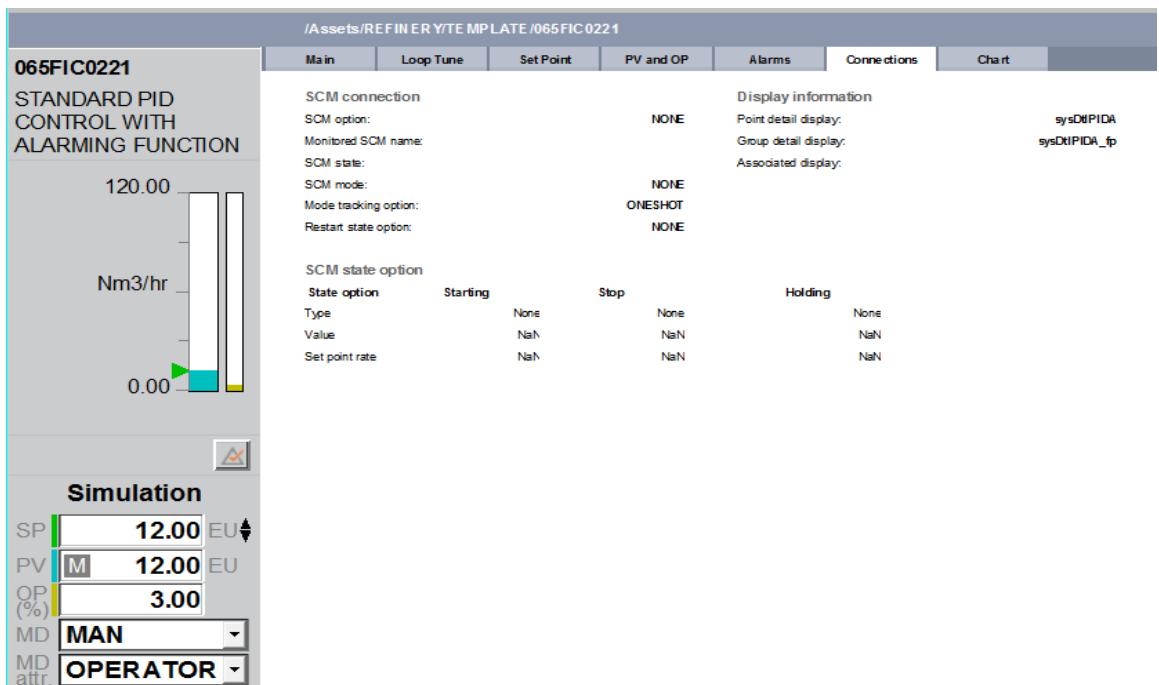


Figure 11.1.3. 8 PCS Controller Detail Page – Connection Tab

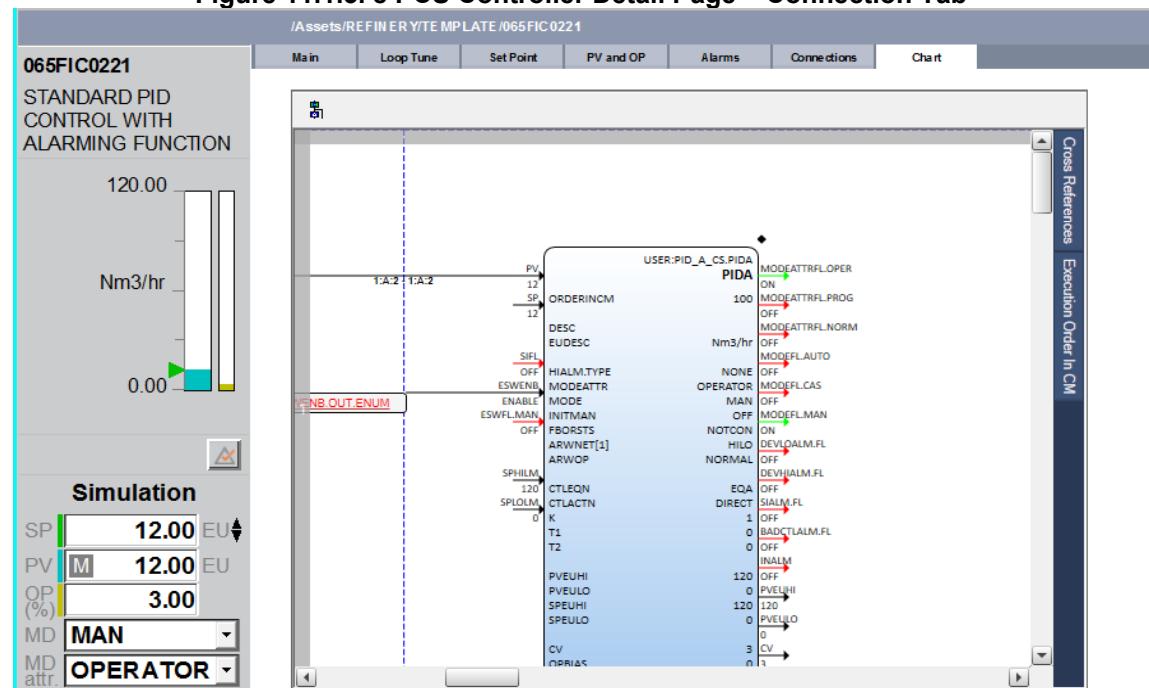
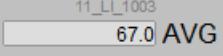
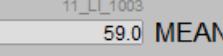
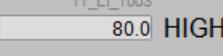
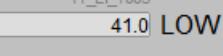


Figure 11.1.3. 9 PCS Controller Page – Chart Tab

11.1.4 PCS Analog Indicator

Normal Presentation	PV, Tagname/Eng. Unit																		
Abnormal Presentation	Error, Inactive state, Bad PV state, Alarm enable state																		
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unacknowledged, and Return to normal state																		
CDA_DataAcq_lib_h_pati_01cust																			
<p style="text-align: right;">Note: D - Dynamic S - Static C - Invisible DB Connection</p>																			
<table border="1"> <thead> <tr> <th>Shape Status Examples</th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td>PV=50.00 Alarm Priority = Journal</td> </tr> <tr> <td></td> <td>PV=92.00 Alarm Type = High High Alarm Alarm Priority = Urgent</td> </tr> <tr> <td></td> <td>PV=81.00 Alarm Type = High Alarm Alarm Priority = High</td> </tr> <tr> <td></td> <td>PV=25.00 Alarm Type = Low Alarm Alarm Priority = Low</td> </tr> <tr> <td></td> <td>PV=16.00 Alarm Type = Low Low Alarm Alarm Priority = Urgent</td> </tr> <tr> <td></td> <td>PV=31.00 Alarm Priority = Disabled</td> </tr> <tr> <td></td> <td>Configuration Error</td> </tr> <tr> <td></td> <td>Inactive State</td> </tr> </tbody> </table>		Shape Status Examples			PV=50.00 Alarm Priority = Journal		PV=92.00 Alarm Type = High High Alarm Alarm Priority = Urgent		PV=81.00 Alarm Type = High Alarm Alarm Priority = High		PV=25.00 Alarm Type = Low Alarm Alarm Priority = Low		PV=16.00 Alarm Type = Low Low Alarm Alarm Priority = Urgent		PV=31.00 Alarm Priority = Disabled		Configuration Error		Inactive State
Shape Status Examples																			
	PV=50.00 Alarm Priority = Journal																		
	PV=92.00 Alarm Type = High High Alarm Alarm Priority = Urgent																		
	PV=81.00 Alarm Type = High Alarm Alarm Priority = High																		
	PV=25.00 Alarm Type = Low Alarm Alarm Priority = Low																		
	PV=16.00 Alarm Type = Low Low Alarm Alarm Priority = Urgent																		
	PV=31.00 Alarm Priority = Disabled																		
	Configuration Error																		
	Inactive State																		

	Bad PV
	Alarm Type = Positive rate of change Alarm Priority = Urgent
	Alarm Type = Negative rate of change Alarm Priority = High
	Redundant instrument for 2oo3
	Average status
	Mean status
	High side status
	Low side status

Faceplate & Detail Display for above shape are as follows:

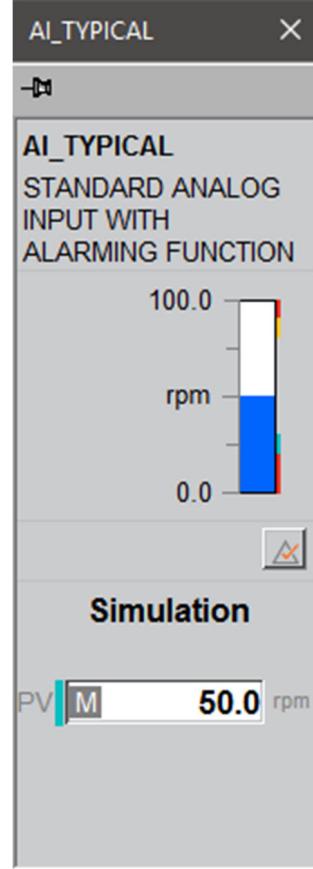


Figure 11.1.4. 1 PCS Analog Indicator Faceplate

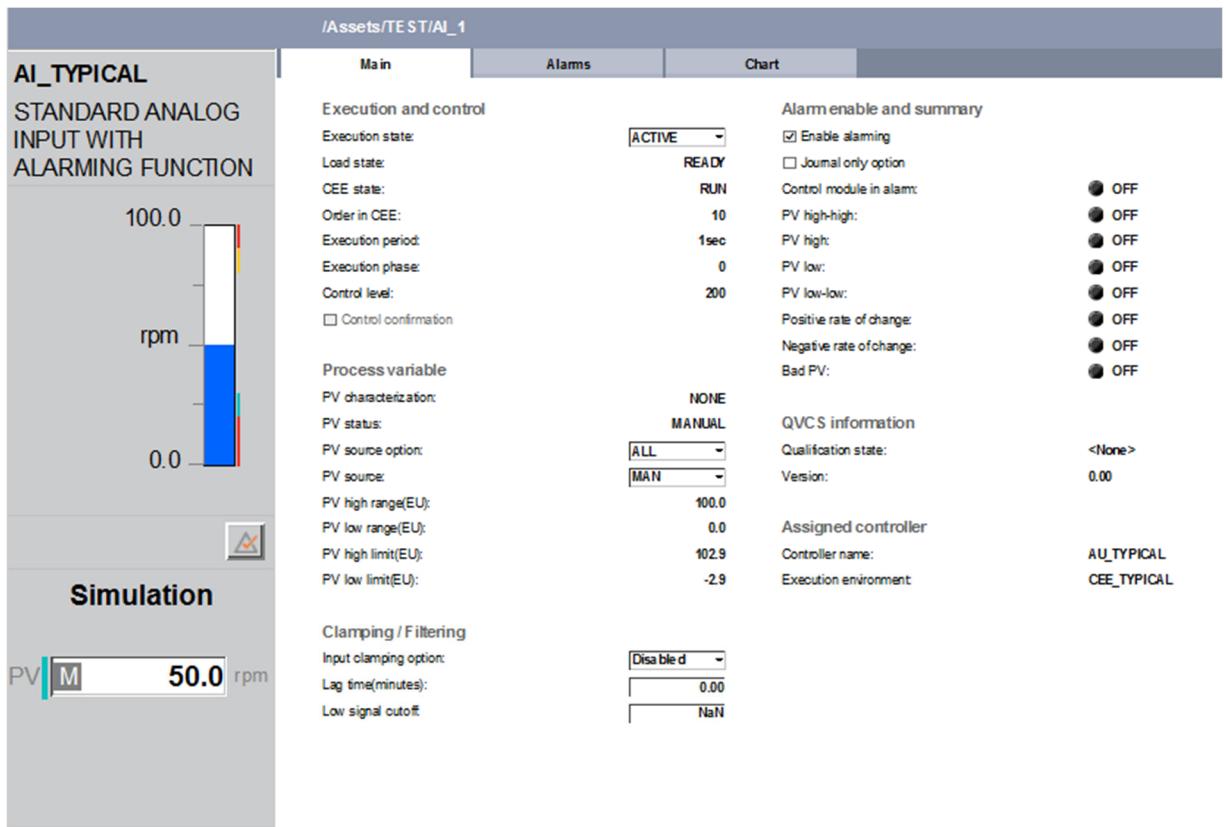


Figure 11.1.4. 2 PCS Analog Indicator Detail Page – Main Tab

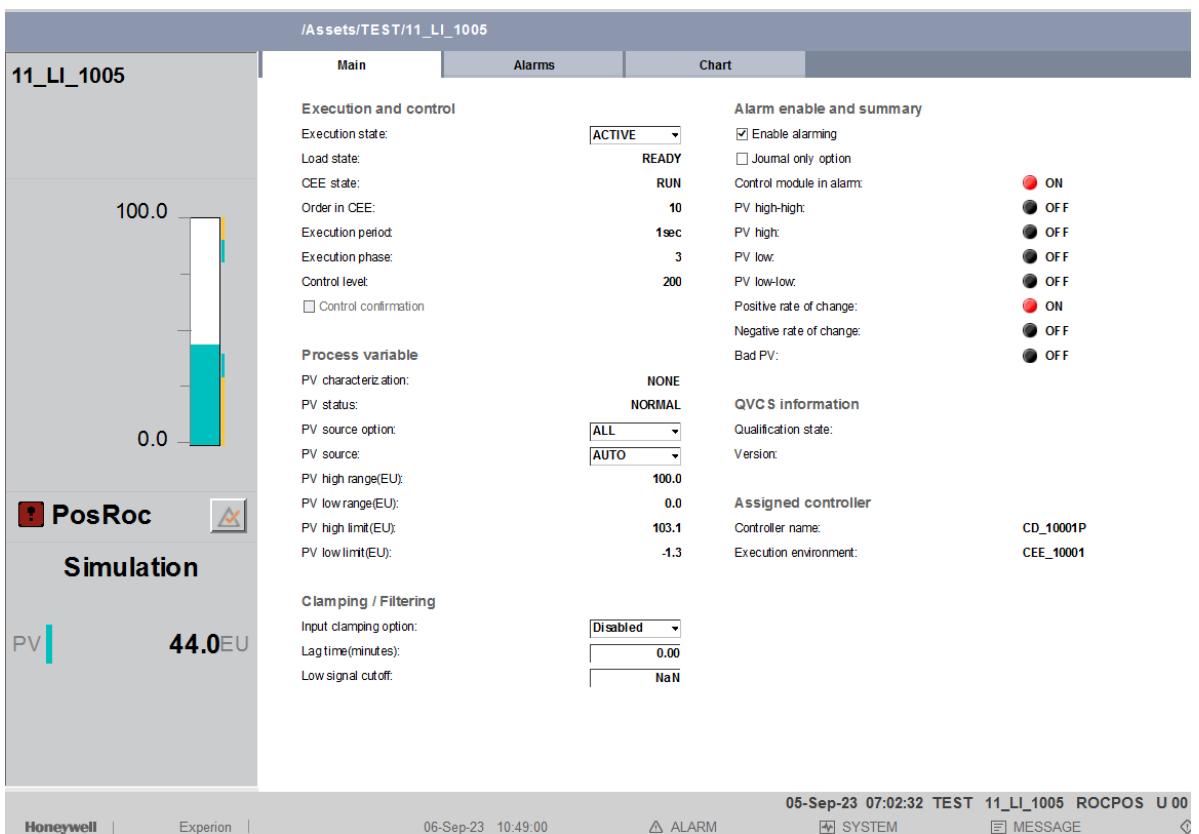


Figure 11.1.4. 3 PCS analog indicator detail page with positive rate of change indication

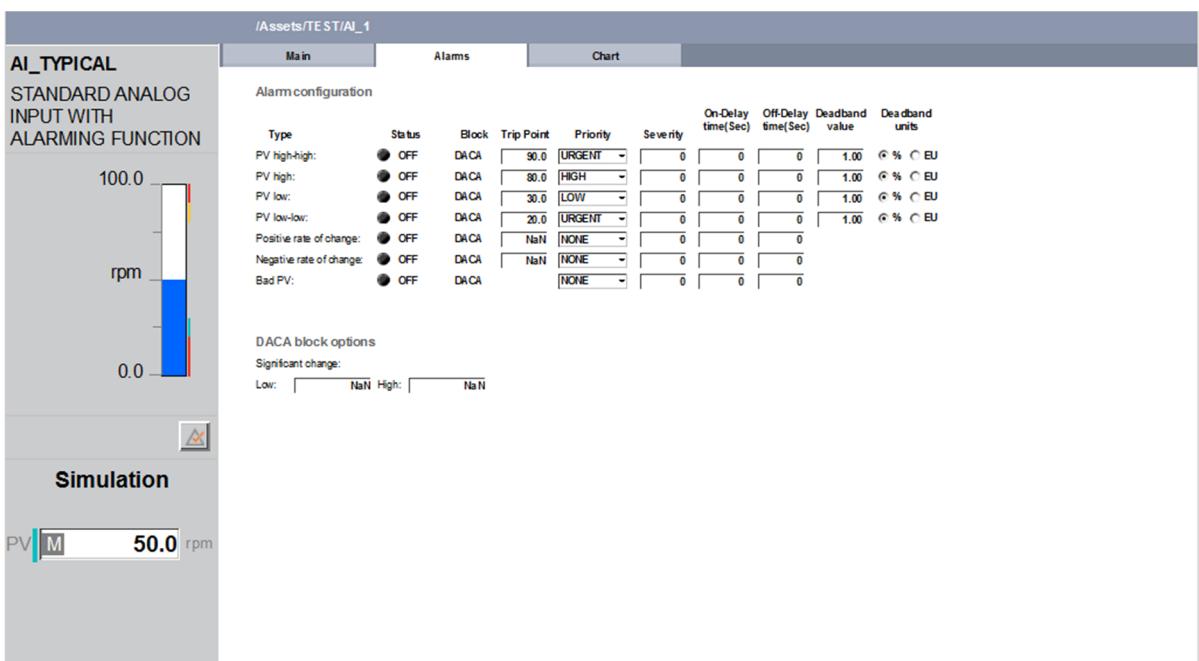


Figure 11.1.4. 4 PCS Analog Indicator Detail Page – Alarm Tab

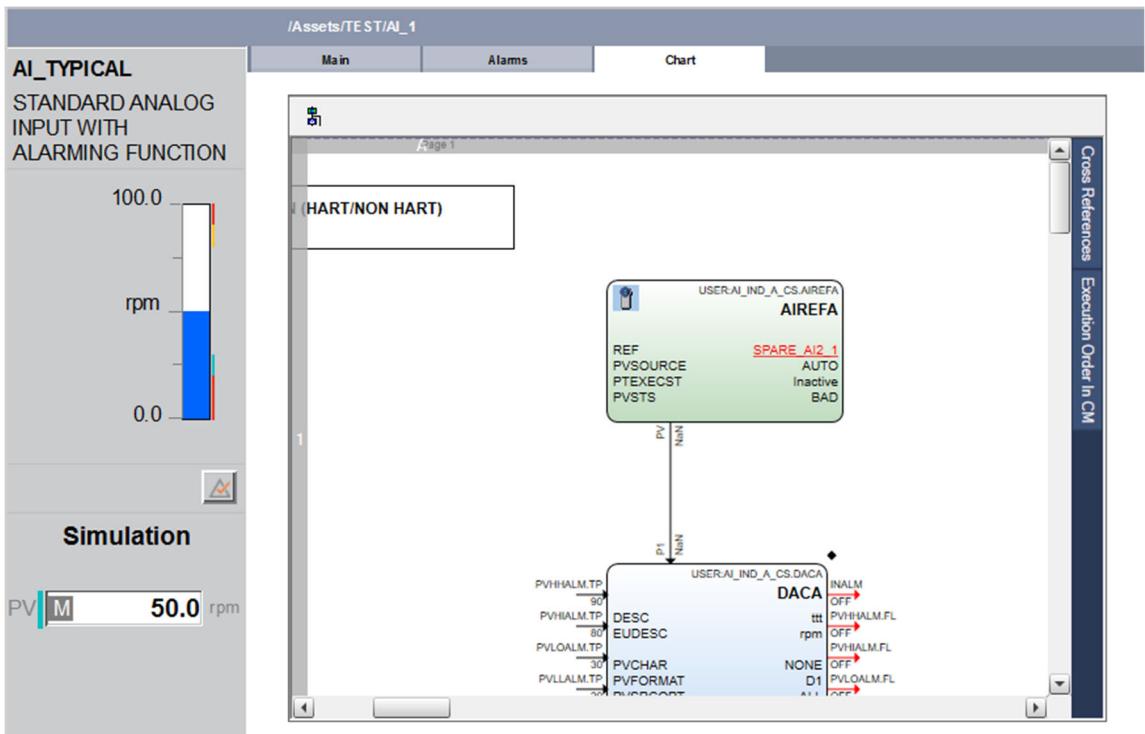


Figure 11.1.4. 5 PCS analog indicator detail page – chart tab

11.1.5 PCS Breaker

Normal Presentation	PV, Tagname/Eng. Unit
Abnormal Presentation	Error, Inactive state, Bad PV state, Alarm enable state
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unacknowledged, and Return to normal state
CDA_Switch_lib_v_pai_03_AU1.sha	
<p>S1: Tagname / S2: Engineering Unit D3: Alarm Rectangle D4: Alarm Priority</p> <p>Note: D - Dynamic S - Static C - Invisible DB Connection</p>	
Shape Status Examples	
	PV= OPEN OP = OPEN Alarm Priority = None
	PV= OPEN OP = OPEN Alarm Priority = None
	Command Disagree Alarm Priority = Low
	Bad PV Alarm Priority = Low

Faceplate & Detail Display for above shape are as follows:



Figure 11.1.5. 1 PCS Breaker – Faceplate

/Assets/TEST/BRK_TYPICAL_2		Main	Input States	Output States	Alarms	Maintenance	Connections	Chart
BRK_TYPICAL_2 PV S1 CLOSE S0 OPEN	Execution and control		Alarm enable and summary					
	Execution state:	ACTIVE	<input checked="" type="checkbox"/> Enable alarming					
	Load state:	READY	<input type="checkbox"/> Journal only option					
	CEE state:	RUN	<input checked="" type="checkbox"/> Control module in alarm: ON					
	Order in CEE:	10	<input checked="" type="checkbox"/> Function block in alarm: ON					
	Execution period:	1sec	<input type="checkbox"/> Command disagree: OFF					
	Execution phase:	7	<input type="checkbox"/> Command fail: OFF					
	Control level:	200	<input type="checkbox"/> Uncommanded change: OFF					
	<input checked="" type="checkbox"/> Control confirmation		<input type="checkbox"/> Bad PV: ON					
	<input checked="" type="checkbox"/> Enable PV source selection:	AUTO	<input type="checkbox"/> Safety override: OFF					
PV Normal state selection:	Bad	<input type="checkbox"/> State 0 override interlock: OFF						
Permissive and override (P&O) interlocks								
Enable P&O interlock bypassing:	Disabled	<input type="checkbox"/> State 1 override interlock: OFF						
Bypass P&O interlocks:	Off	<input type="checkbox"/> State 2 override interlock: OFF						
State	Permit	Off normal condition: OFF						
S1: CLOSE	Permit	<input type="checkbox"/> PV Off normal condition: OFF						
S0: OPEN	Permit	<input type="checkbox"/> Mode attribute:						
Nominal mode attribute:								
BadPv Simulation LOCALMAN PV Bad OP OPEN								
Safety interlock, Red tag and Operator tag <input checked="" type="radio"/> Safety interlock <input type="radio"/> Safe Red tag <input type="checkbox"/> Red tag <input type="checkbox"/> Operator tag Operator tag description: <input type="text" value="Operator Tag"/>				Mode attribute selection <input checked="" type="checkbox"/> PROGRAM				
				QVCS information Qualification state: <None> Version: 0.00				
Assigned controller Controller name: AU_TYPICAL Execution environment: CEE_TYPICAL								

Figure 11.1.5. 2 PCS Breaker – Point Display Main Tab

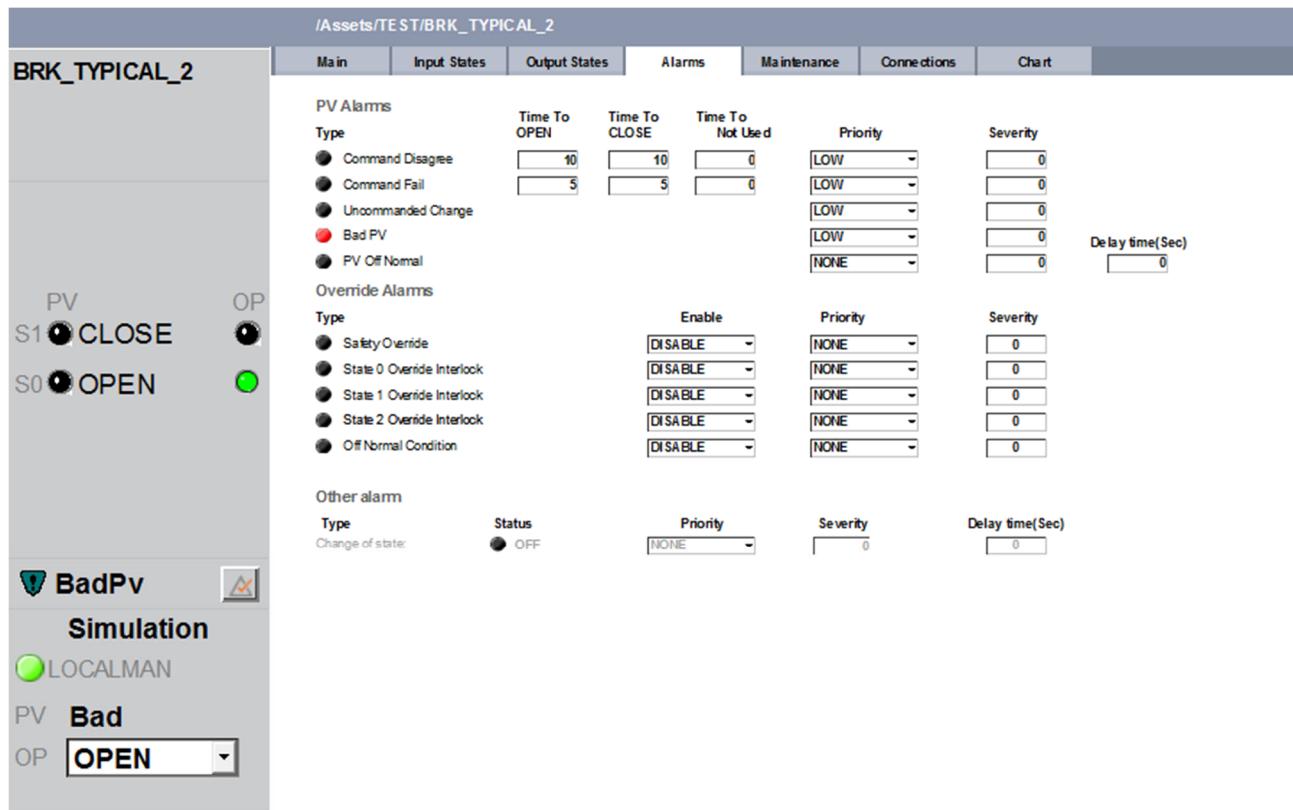


Figure 11.1.5. 2 PCS Breaker – Point Display Alarm Tab

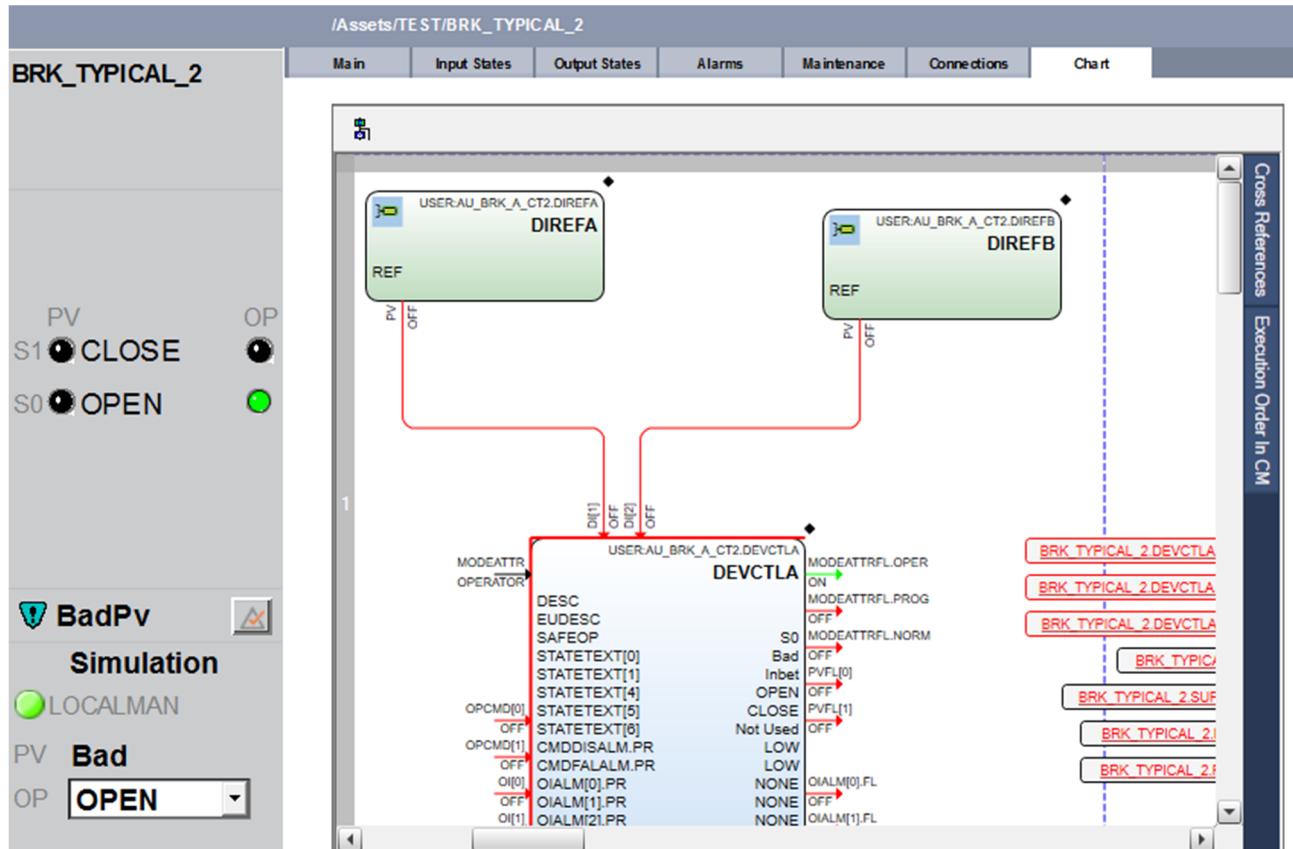


Figure 11.1.5. 2 PCS Breaker – Point Display Chart Tab

11.1.6 PCS Digital

Normal Presentation	PV, Tagname														
Abnormal Presentation	Error, Alarm enable state														
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unacknowledged, and Return to normal state														
CDA_DigState_lib_h_pai_02.sha															
<p style="text-align: center;">S1: Tagname</p> <p style="text-align: center;">065ZIC0108</p> <p>D1: Selection box D2: Alarm Rectangle D3: Alarm Priority D4: State</p> <p>Note: D - Dynamic S - Static C - Invisible DB Connection</p>															
<table border="1"> <thead> <tr> <th colspan="2">Shape Status Examples</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"> MAC_ZIO_0551A </td><td>PV=NORMAL Alarm Priority = Journal</td></tr> <tr> <td style="text-align: center;"> MAC_ZIO_0551A </td><td>PV=ALARM Alarm Priority = Low</td></tr> <tr> <td style="text-align: center;"> MAC_ZIO_0551A </td><td>PV=NORMAL Alarm Priority = Disabled</td></tr> <tr> <td style="text-align: center;"> MAC_ZIO_0551 </td><td>Configuration Error</td></tr> <tr> <td style="text-align: center;"> MAC_ZIO_0551A </td><td>Inactive State</td></tr> <tr> <td style="text-align: center;"> </td><td>Redundant instrument for 2oo3</td></tr> </tbody> </table>		Shape Status Examples		MAC_ZIO_0551A 	PV=NORMAL Alarm Priority = Journal	MAC_ZIO_0551A 	PV=ALARM Alarm Priority = Low	MAC_ZIO_0551A 	PV=NORMAL Alarm Priority = Disabled	MAC_ZIO_0551 	Configuration Error	MAC_ZIO_0551A 	Inactive State		Redundant instrument for 2oo3
Shape Status Examples															
MAC_ZIO_0551A 	PV=NORMAL Alarm Priority = Journal														
MAC_ZIO_0551A 	PV=ALARM Alarm Priority = Low														
MAC_ZIO_0551A 	PV=NORMAL Alarm Priority = Disabled														
MAC_ZIO_0551 	Configuration Error														
MAC_ZIO_0551A 	Inactive State														
	Redundant instrument for 2oo3														

Faceplate & Detail Display for above shape are as follows:

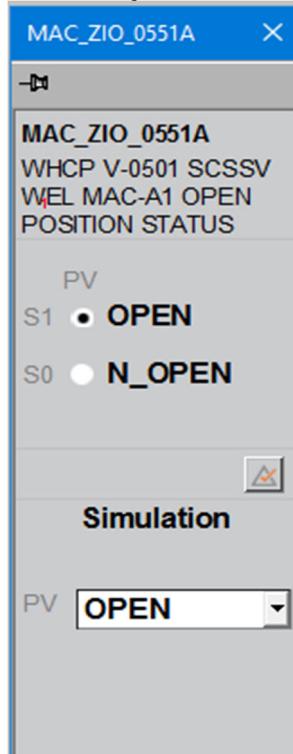


Figure 11.1.6. 2 PCS Digital Indicator Detail Page – Main Tab

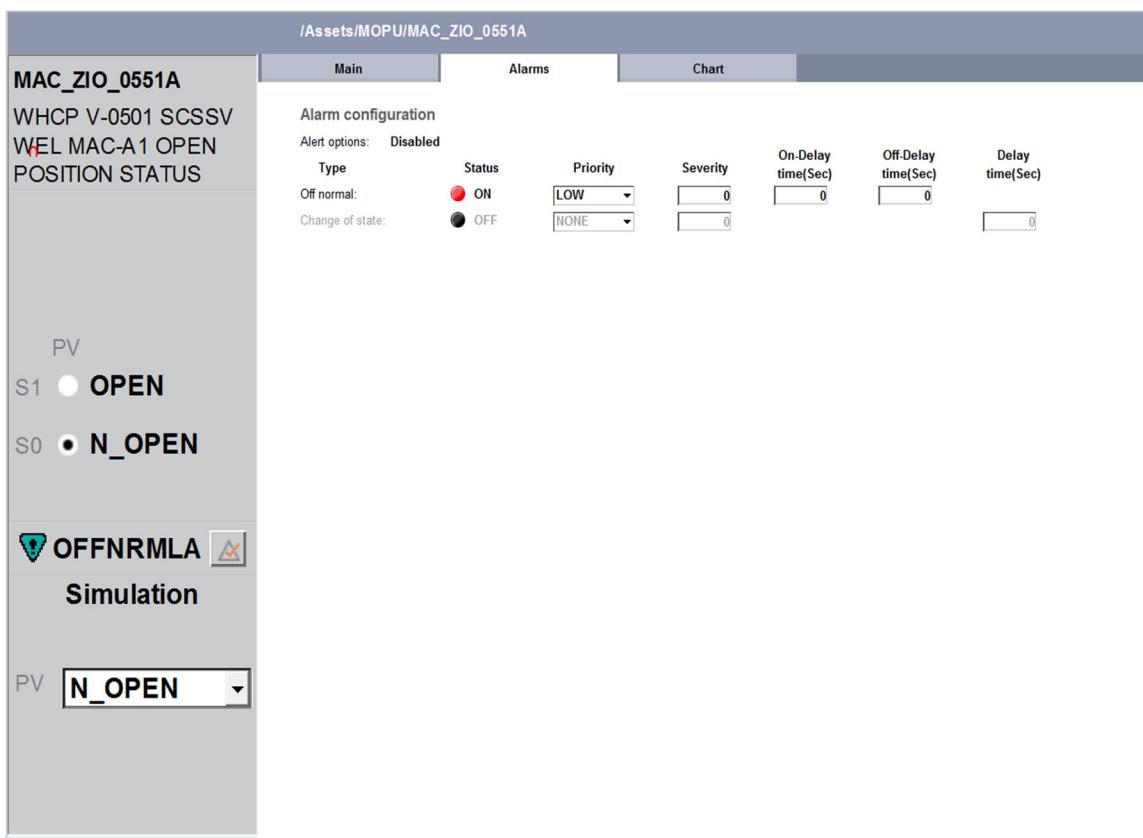


Figure 11.1.5. 3 PCS Digital Indicator Page – Alarm Tab

11.1.7 PCS Totalizer

Normal Presentation	PV, Tagname											
Abnormal Presentation	Error, Alarm enable state											
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unacknowledged, and Return to normal state											
CDA_Totalizer_lib_h_pi_02.shd												
<p>S1: Tagname</p> <p>D1: Selection box</p> <p>065FQI0533</p> <p>0</p> <p>D2: PV/Value</p> <p>Note: D - Dynamic S - Static C - Invisible DB Connection</p>												
<table border="1"> <thead> <tr> <th>Shape Status Examples</th> </tr> </thead> <tbody> <tr> <td></td> <td>PV=30.0%</td> </tr> <tr> <td></td> <td>Configuration Error</td> </tr> <tr> <td></td> <td>InActive State</td> </tr> <tr> <td></td> <td>Alarm Disable</td> </tr> <tr> <td></td> <td>BAD</td> </tr> </tbody> </table>		Shape Status Examples		PV=30.0%		Configuration Error		InActive State		Alarm Disable		BAD
Shape Status Examples												
	PV=30.0%											
	Configuration Error											
	InActive State											
	Alarm Disable											
	BAD											

Faceplate & Detail Display for Above shape are as follows:

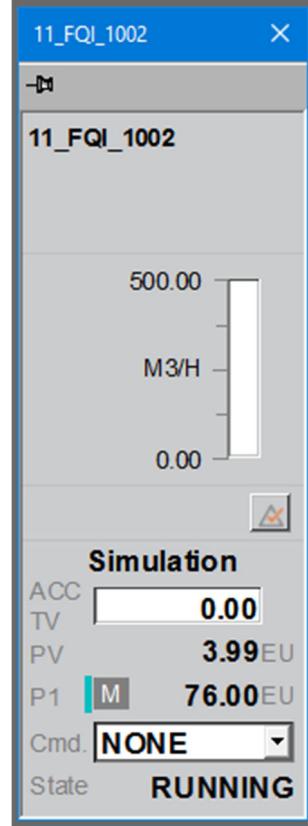


Figure 11.1.7. 1 PCS totalizer detail page – operator tab

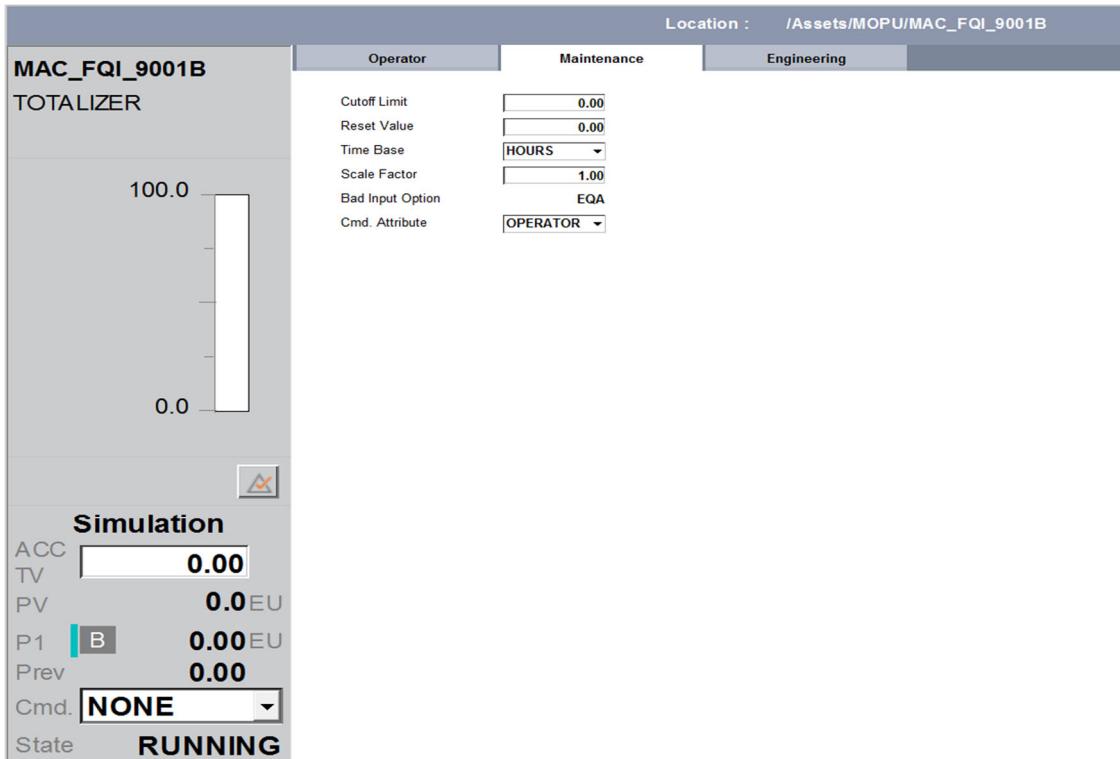


Figure 11.1.7. 2 PCS Totalizer Detail Page – Maintenance Tab

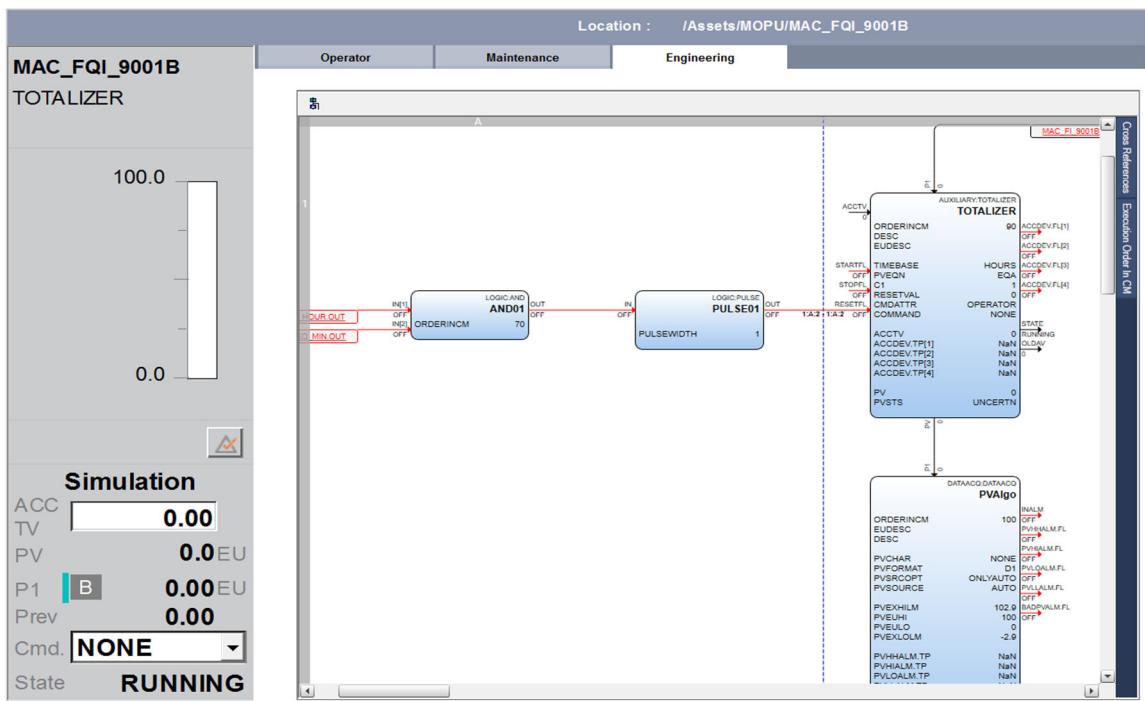
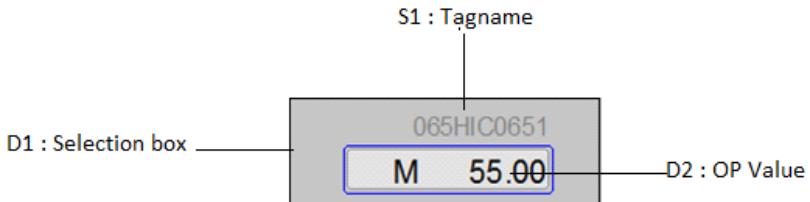
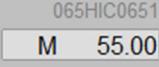
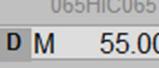
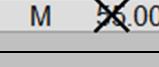
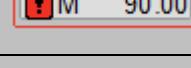
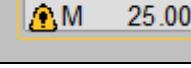


Figure 11.1.7. 3 PCS Totalizer Detail Page – Engineering Tab

11.1.8 PCS Automan – Standard Automatic Controller (Operator Control)

Normal Presentation	PV, Tagname
Abnormal Presentation	Error, Alarm enable state
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unacknowledged, and Return to normal state
CDA_AnOutput.lib.h_omai_01.sha	
 <p>Note: D - Dynamic S - Static C - Invisible DB Connection</p>	
Shape Status Examples	
	OP = 55% Mode = MAN
	OP= 55 % Mode = MAN Alarm Priority =Disabled
	Configuration Error
	InActive State
	OP = 90% Mode = MAN Alarm priority = Urgent
	OP = 25% Mode = MAN Alarm priority = High

Faceplate & Detail Display for above shape are as follows:

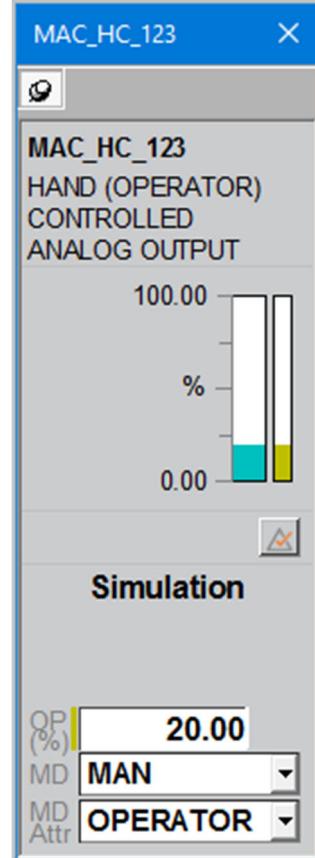


Figure 11.1.8. 1 PCS Automana Faceplate

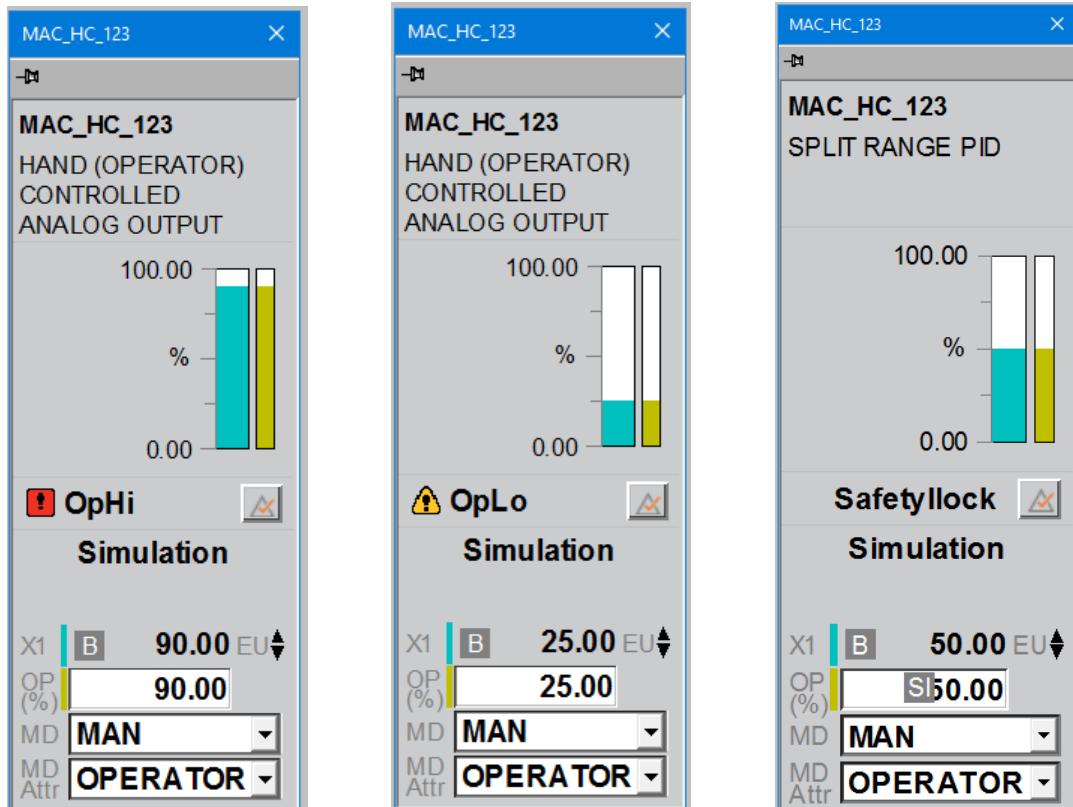


FIGURE 11.1.8. 2 CS Automana Faceplate – OP High, OP Low and Safety Interlock

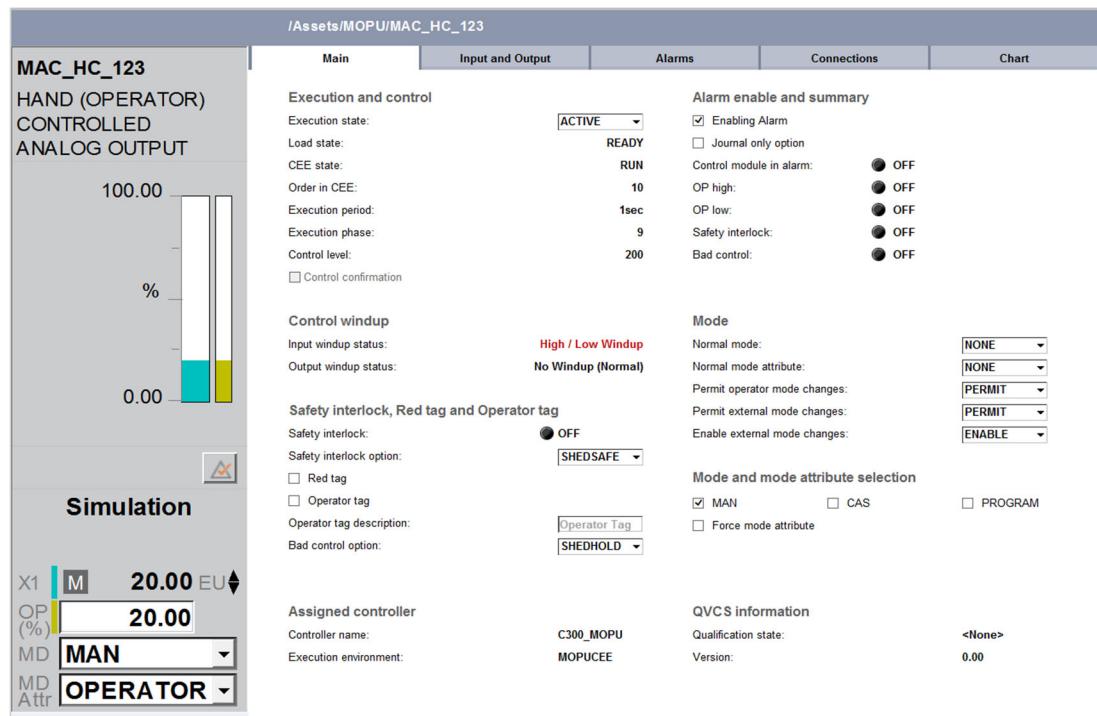


Figure 11.1.8. 3 PCS Automana Detail Page – Main Tab

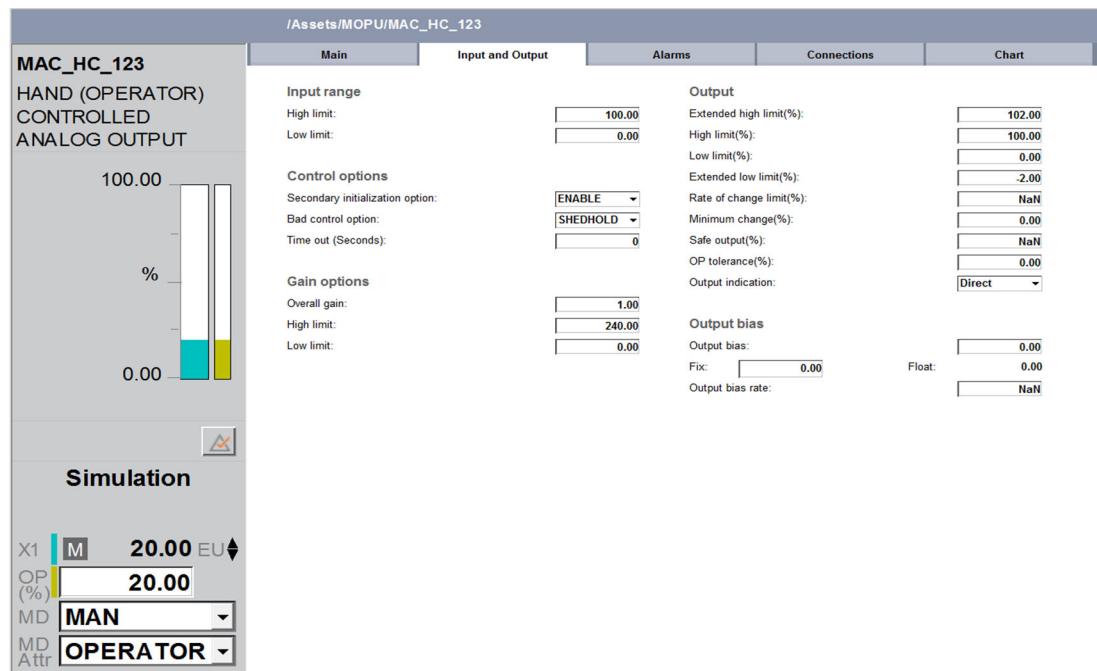


Figure 11.1.8. 4 PCS Automana – Input and Output Tab

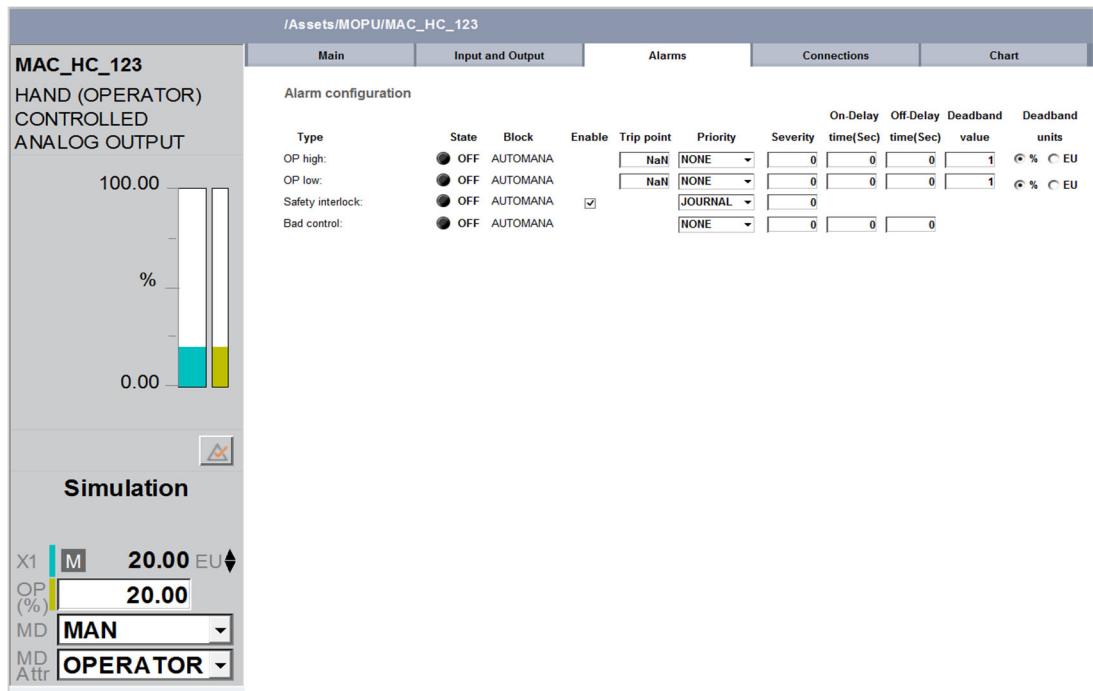


Figure 11.1.8. 5 PCS Automana Detail Page – Alarms Tab

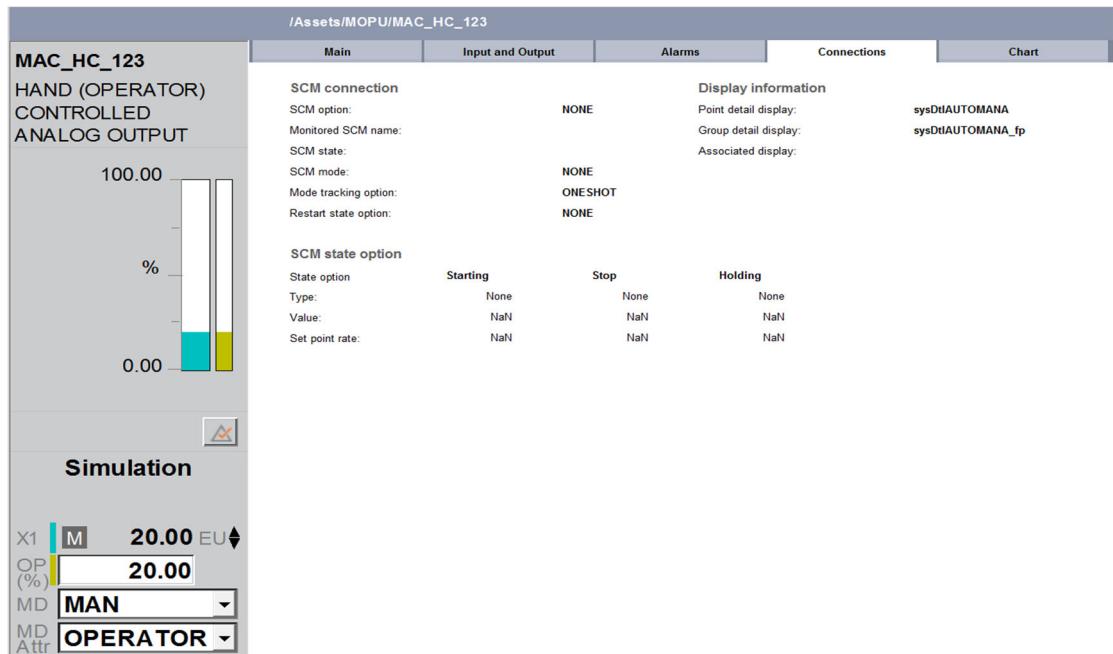


Figure 11.1.8. 6 PCS Automana Detail Page – Connection Tab

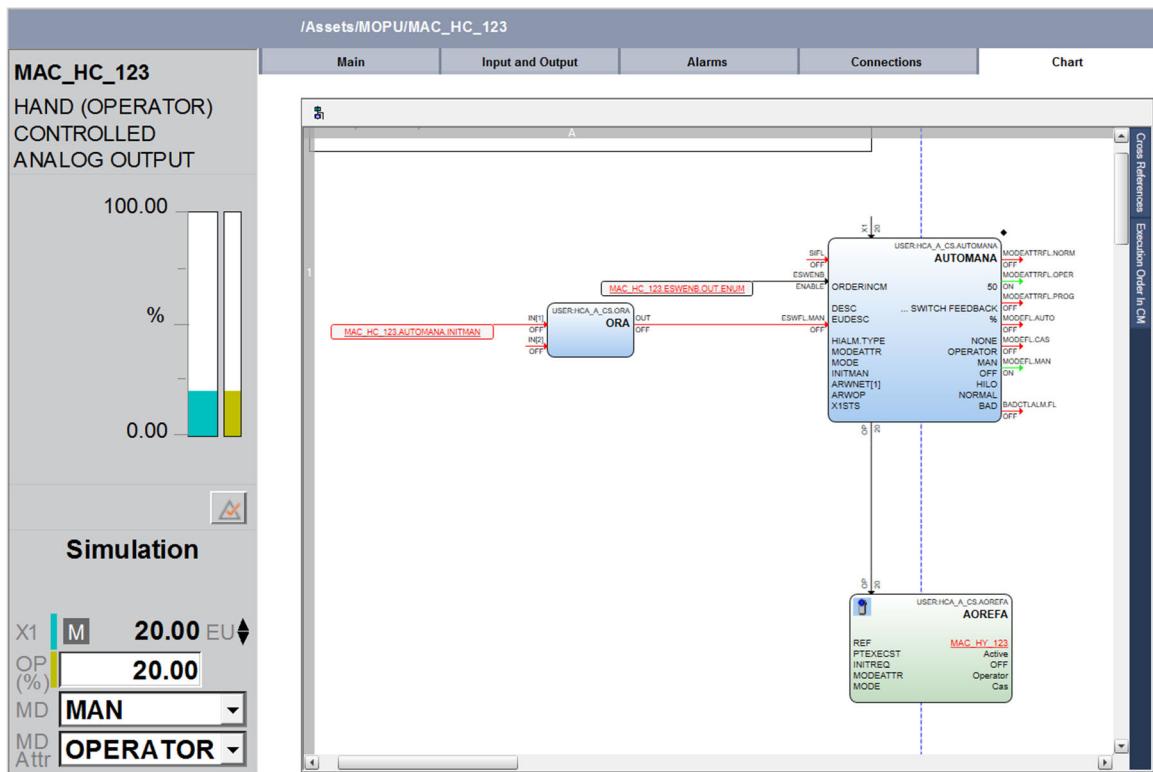


Figure 11.1.8. 7 PCS Automan Detail Page – Chart Tab

11.1.9 PCS ON OFF Valve

Normal Presentation	PV, Tagname												
Abnormal Presentation	Error, Inactive state, Bad PV state, Alarm enable state												
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unacknowledged, and Return to normal state												
CDA_OnOffValve_isa_h_poatri_01_cust													
<p>Note: D - Dynamic S - Static C - Invisible DB Connection</p>													
Shape Status Examples <table border="1"> <tr> <td></td> <td>PV=Open OP=Open Alarm Priority = Journal</td> </tr> <tr> <td></td> <td>PV=Close OP=Close Alarm Priority = Journal</td> </tr> <tr> <td></td> <td>PV=Inbitween OP=Close Open Command Disagree/Command Fail Alarm Alarm Priority = Low</td> </tr> <tr> <td></td> <td>PV=Inbitween OP=Open Close Command Disagree/Command Fail Alarm Alarm Priority = Low</td> </tr> <tr> <td></td> <td>Valve Type</td> </tr> <tr> <td></td> <td>Bad PV</td> </tr> </table>			PV=Open OP=Open Alarm Priority = Journal		PV=Close OP=Close Alarm Priority = Journal		PV=Inbitween OP=Close Open Command Disagree/Command Fail Alarm Alarm Priority = Low		PV=Inbitween OP=Open Close Command Disagree/Command Fail Alarm Alarm Priority = Low		Valve Type		Bad PV
	PV=Open OP=Open Alarm Priority = Journal												
	PV=Close OP=Close Alarm Priority = Journal												
	PV=Inbitween OP=Close Open Command Disagree/Command Fail Alarm Alarm Priority = Low												
	PV=Inbitween OP=Open Close Command Disagree/Command Fail Alarm Alarm Priority = Low												
	Valve Type												
	Bad PV												

Faceplate & Detail Display for above shape are as follows:

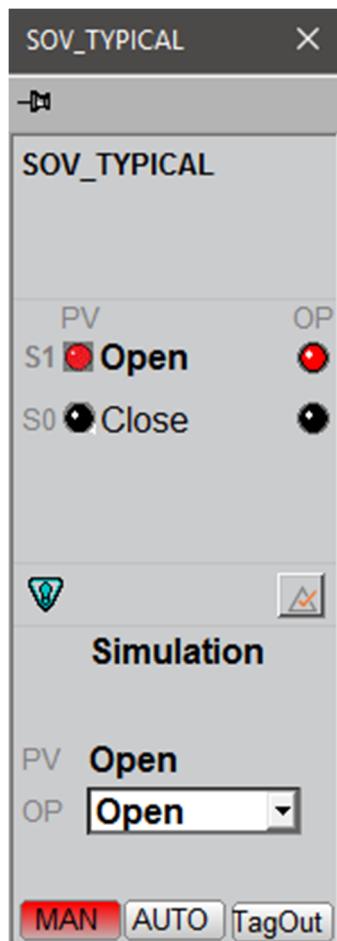


Figure 11.1.9. 1 PCS ON OFF Valve Faceplate

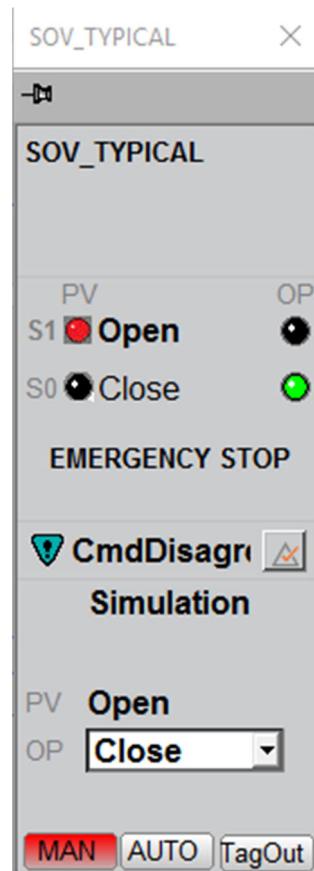


Figure 11.1.9. 2 PCS on off valve faceplate – Emergency Stop and Command Disagree

/Assets/TEST/SOV_TYPICAL		Main	Input States	Output States	Alarms	Maintenance	Connections	Chart											
SOV_TYPICAL																			
PV S1 <input checked="" type="radio"/> Open OP S0 <input checked="" type="radio"/> Close <input checked="" type="radio"/>		Execution and control Execution state: ACTIVE Load state: READY CEE state: RUN Order in CEE: 10 Execution period: 1sec Execution phase: 3 Control level: 200 <input type="checkbox"/> Control confirmation <input checked="" type="checkbox"/> Enable PV source selection: AUTO PV Normal state selector: Bad Permissive and override (P&O) interlocks Enable P&O interlock bypassing: Disabled Bypass P&O interlocks: Off <table border="1"> <tr> <th>State</th> <th>Permit</th> <th>Override</th> </tr> <tr> <td>S1: Open</td> <td>Permit</td> <td>Off</td> </tr> <tr> <td>S0: Close</td> <td>Permit</td> <td>Off</td> </tr> </table> Safety interlock, Red tag and Operator tag <input checked="" type="radio"/> Safety interlock <input type="checkbox"/> Red tag <input type="checkbox"/> Operator tag Operator tag description: Operator Tag Assigned controller Controller name: AU_TYPICAL Execution environment: CEE_TYPICAL							State	Permit	Override	S1: Open	Permit	Off	S0: Close	Permit	Off	Alarm enable and summary <input checked="" type="checkbox"/> Enable alarming <input type="checkbox"/> Journal only option Control module in alarm: ON Function block in alarm: ON Command disagree: OFF Command fail: OFF Uncommanded change: OFF Bad PV: ON Safety override: OFF State 0 override interlock: OFF State 1 override interlock: OFF State 2 override interlock: OFF Offnormal condition: OFF PV Offnormal condition: OFF Mode attribute Normal mode attribute: NONE	
State	Permit	Override																	
S1: Open	Permit	Off																	
S0: Close	Permit	Off																	
BadPv Simulation PV Bad OP Close		Mode attribute selection <input checked="" type="checkbox"/> PROGRAM QVCS information Qualification state: <None> Version: 0.00																	
MAN AUTO TagOut																			

Figure 11.1.9. 3 PCS ON OFF Valve Detail Page – Main Tab

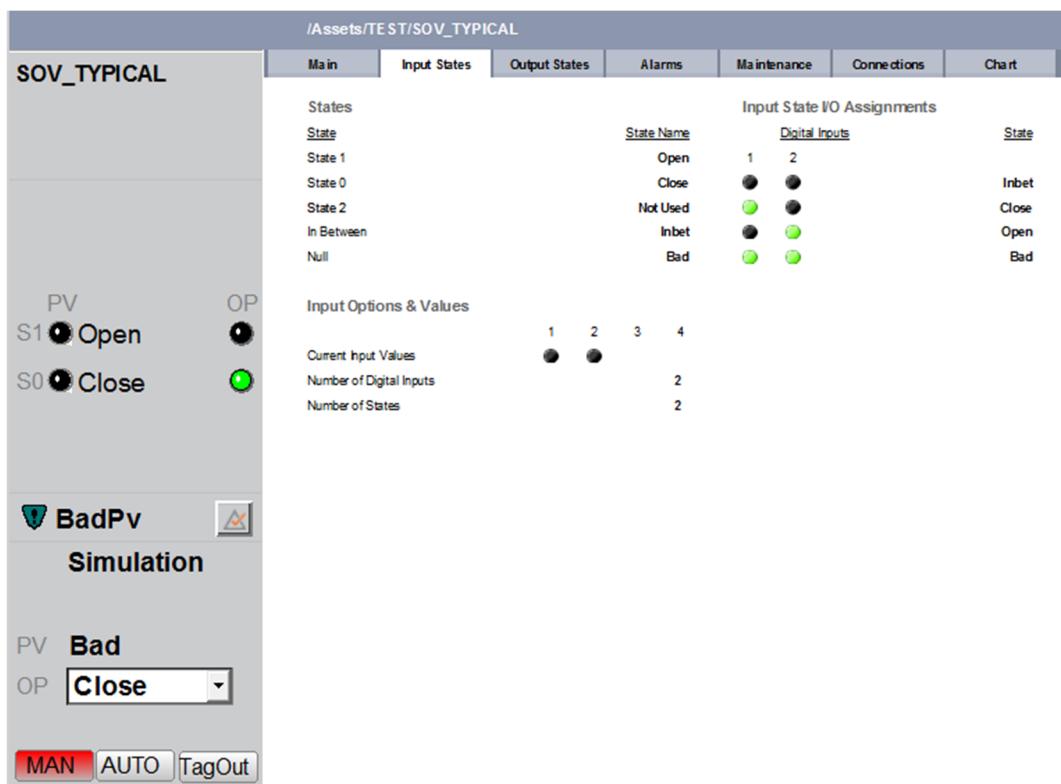


Figure 11.1.9. 4 PCS ON OFF Valve Detail Page – Input State Tab

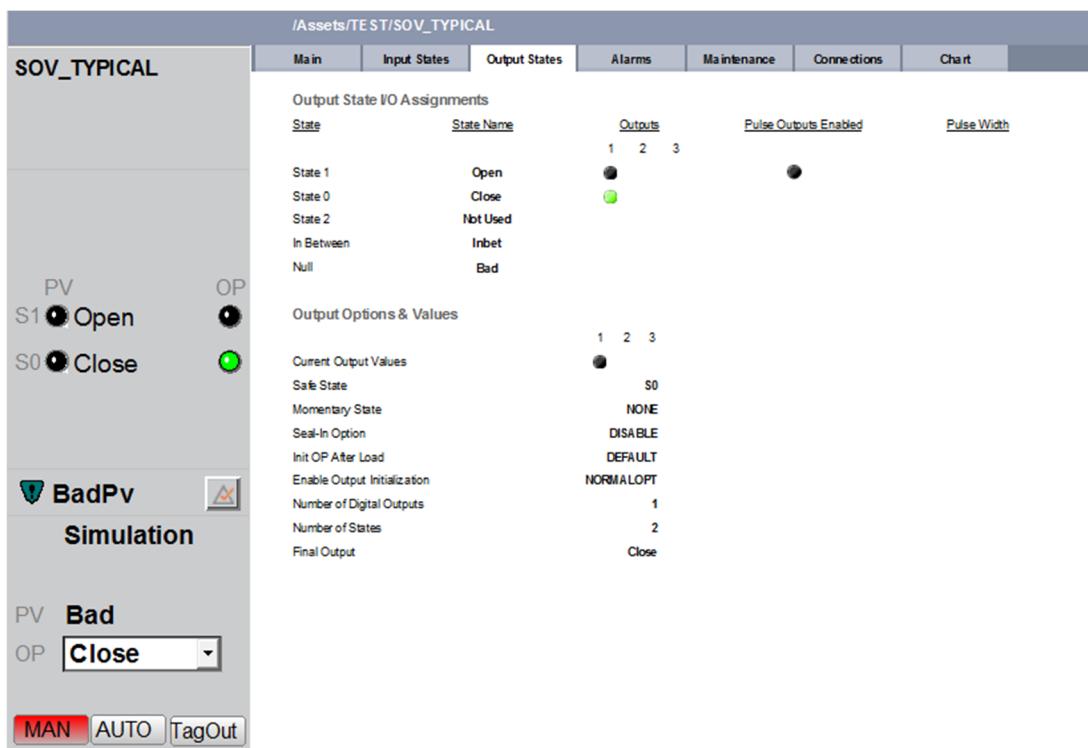


Figure 11.1.9. 5 PCS ON OFF Valve Detail Page – Output State Tab

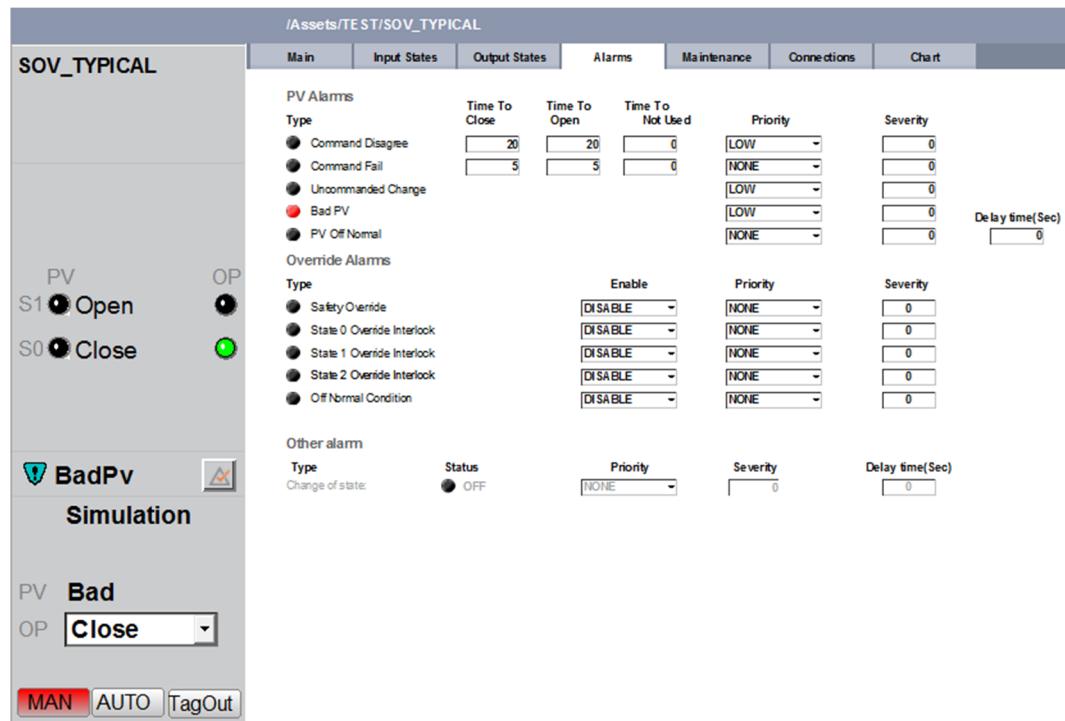


Figure 11.1.9. 6 PCS ON OFF Valve Detail Page – Alarm Tab

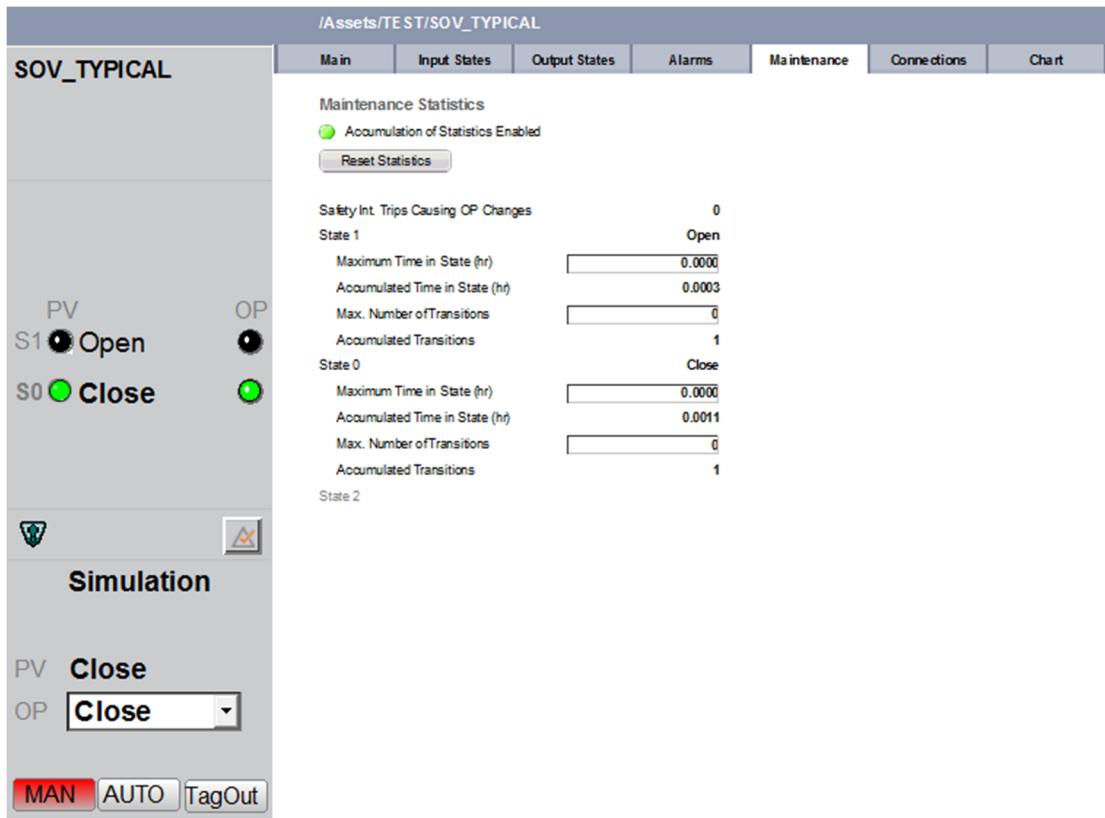


Figure 11.1.9. 7 PCS ON OFF Valve Detail Page – Maintenance Tab

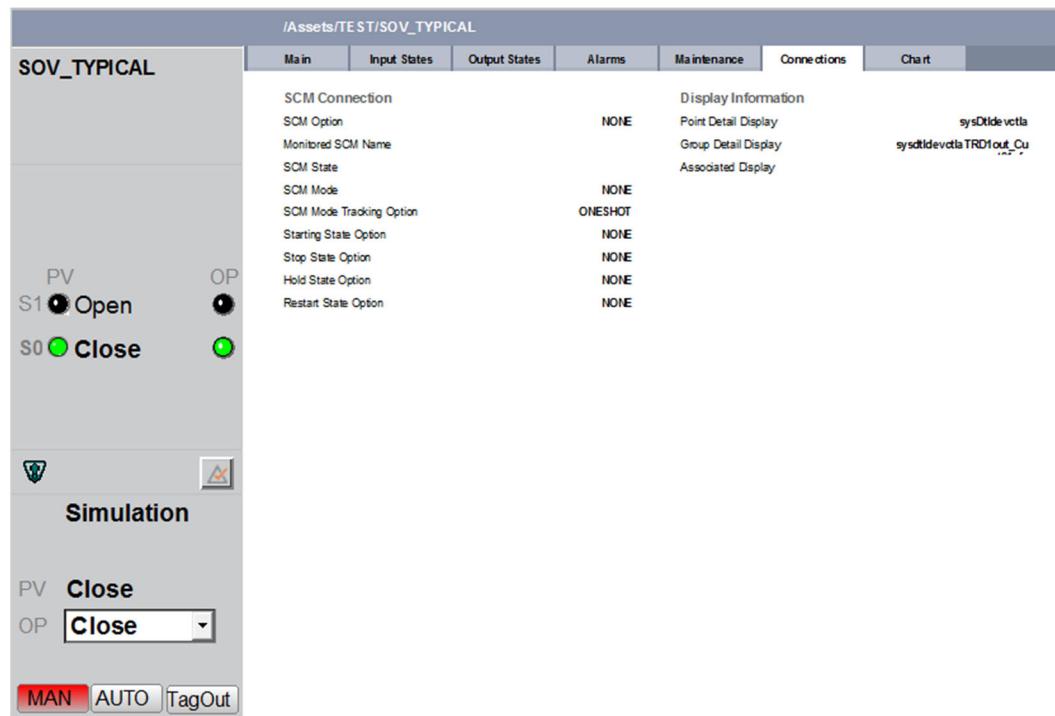


Figure 11.1.9.8 PCS ON OFF Valve Detail Page – Connection Tab

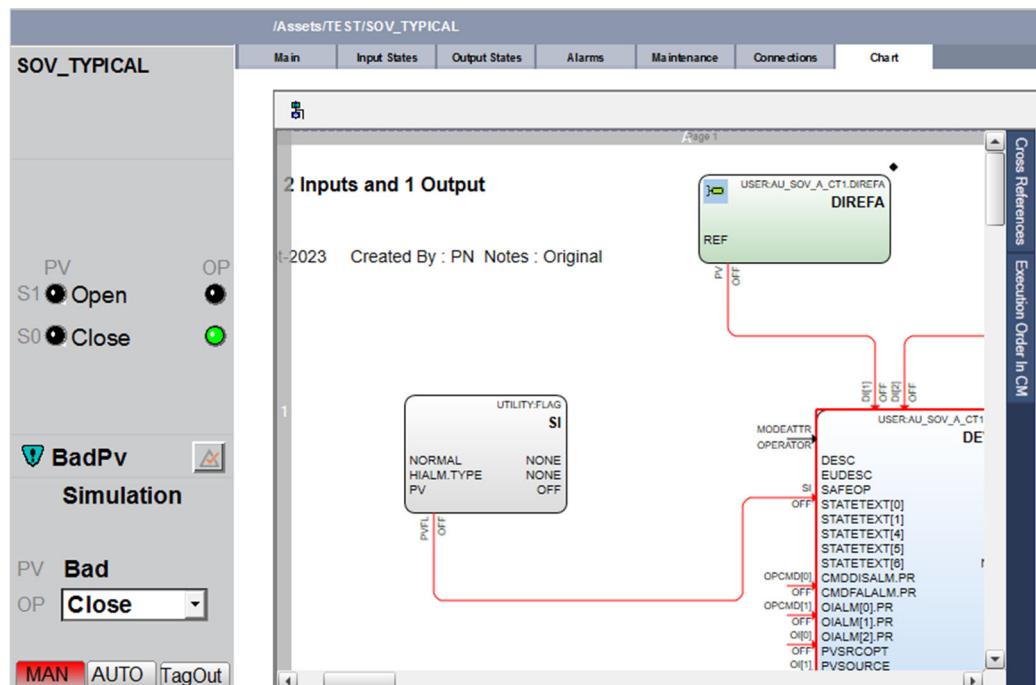
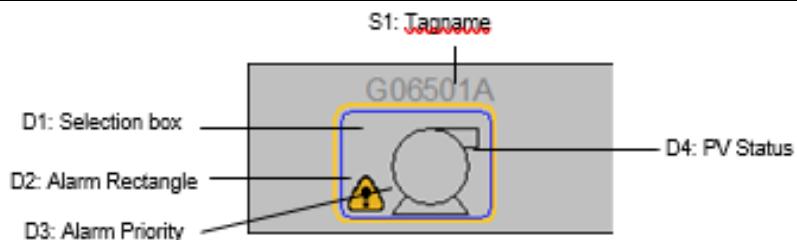


Figure 11.1.9.9 PCS ON OFF Valve Detail Page – Chart Tab

11.1.10 PCS Pump / Drive

Normal Presentation	PV, Tagname
Abnormal Presentation	Error, Inactive state, Bad PV state, Alarm enable state
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unacknowledged, and Return to normal state

CDA_Pump_isa_I_pati_01.sha



Note: D - Dynamic
 S - Static
 C - Invisible DB Connection

Shape Status Examples	
	PV=Stop Alarm Priority = Journal
	PV=Run Alarm Priority = Journal
	Inactive state
	Bad PV Alarm priority = Low
	Uncommanded change Alarm Priority = Low

Faceplate & Detail Display for above shape are as follows:

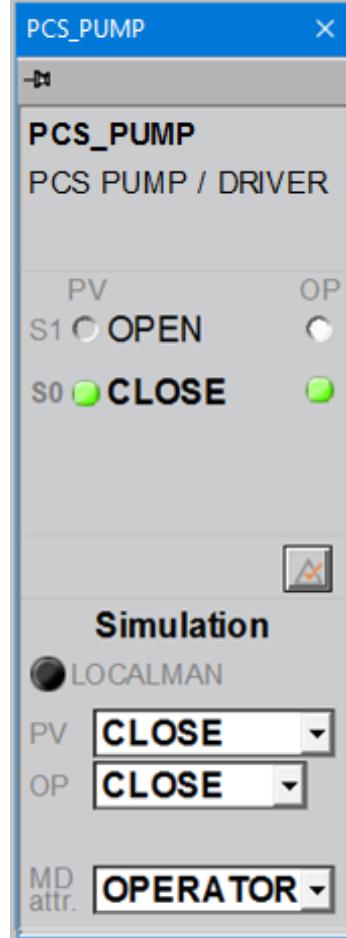


Figure 11.1.10. 1 PCS Pump Faceplate

MAC_E_1801B		Main	Input States	Output States	Alarms	Maintenance	Connections	Chart																																																																						
		<p>Execution and control</p> <table> <tr> <td>Execution state:</td> <td>ACTIVE</td> </tr> <tr> <td>Load state:</td> <td>READY</td> </tr> <tr> <td>CEE state:</td> <td>RUN</td> </tr> <tr> <td>Order in CEE:</td> <td>10</td> </tr> <tr> <td>Execution period:</td> <td>1sec</td> </tr> <tr> <td>Execution phase:</td> <td>3</td> </tr> <tr> <td>Control level:</td> <td>200</td> </tr> <tr> <td colspan="2"> <input type="checkbox"/> Control confirmation <input checked="" type="checkbox"/> Enable PV source selection: AUTO PV Normal state selection: BAD </td> </tr> </table> <p>Permissive and override (P&O) interlocks</p> <table> <tr> <td>Enable P&O interlock bypassing:</td> <td>Disabled</td> </tr> <tr> <td>Bypass P&O interlocks:</td> <td>Off</td> </tr> <tr> <td>S1: START</td> <td>Permit</td> <td>Override</td> </tr> <tr> <td>S0: STOP</td> <td>Permit</td> <td>Off</td> </tr> </table> <p>Safety interlock, Red tag and Operator tag</p> <table> <tr> <td><input checked="" type="radio"/> Safety interlock</td> <td><input type="radio"/> Safe Red tag</td> </tr> <tr> <td><input type="checkbox"/> Red tag</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Operator tag</td> <td></td> </tr> <tr> <td>Operator tag description:</td> <td>Operator Tag</td> </tr> </table> <p>Assigned controller</p> <table> <tr> <td>Controller name:</td> <td>C300_MOPU</td> </tr> <tr> <td>Execution environment:</td> <td>MOPUCEE</td> </tr> </table> <p>Alarm enable and summary</p> <table> <tr> <td><input checked="" type="checkbox"/> Enabling Alarm</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Journal only option</td> <td></td> </tr> <tr> <td>Control module in alarm:</td> <td>OFF</td> </tr> <tr> <td>Function block in alarm:</td> <td>OFF</td> </tr> <tr> <td>Command disagree:</td> <td>OFF</td> </tr> <tr> <td>Command fail:</td> <td>OFF</td> </tr> <tr> <td>Uncommanded change:</td> <td>OFF</td> </tr> <tr> <td>Bad PV:</td> <td>OFF</td> </tr> <tr> <td>Safety override:</td> <td>OFF</td> </tr> <tr> <td>State 0 override interlock:</td> <td>OFF</td> </tr> <tr> <td>State 1 override interlock:</td> <td>OFF</td> </tr> <tr> <td>State 2 override interlock:</td> <td>OFF</td> </tr> <tr> <td>Off normal condition:</td> <td>OFF</td> </tr> <tr> <td>PV Off normal condition:</td> <td>OFF</td> </tr> <tr> <td>Mode attribute</td> <td></td> </tr> <tr> <td>Normal mode attribute:</td> <td>NONE</td> </tr> </table>							Execution state:	ACTIVE	Load state:	READY	CEE state:	RUN	Order in CEE:	10	Execution period:	1sec	Execution phase:	3	Control level:	200	<input type="checkbox"/> Control confirmation <input checked="" type="checkbox"/> Enable PV source selection: AUTO PV Normal state selection: BAD		Enable P&O interlock bypassing:	Disabled	Bypass P&O interlocks:	Off	S1: START	Permit	Override	S0: STOP	Permit	Off	<input checked="" type="radio"/> Safety interlock	<input type="radio"/> Safe Red tag	<input type="checkbox"/> Red tag		<input type="checkbox"/> Operator tag		Operator tag description:	Operator Tag	Controller name:	C300_MOPU	Execution environment:	MOPUCEE	<input checked="" type="checkbox"/> Enabling Alarm		<input type="checkbox"/> Journal only option		Control module in alarm:	OFF	Function block in alarm:	OFF	Command disagree:	OFF	Command fail:	OFF	Uncommanded change:	OFF	Bad PV:	OFF	Safety override:	OFF	State 0 override interlock:	OFF	State 1 override interlock:	OFF	State 2 override interlock:	OFF	Off normal condition:	OFF	PV Off normal condition:	OFF	Mode attribute		Normal mode attribute:	NONE
Execution state:	ACTIVE																																																																													
Load state:	READY																																																																													
CEE state:	RUN																																																																													
Order in CEE:	10																																																																													
Execution period:	1sec																																																																													
Execution phase:	3																																																																													
Control level:	200																																																																													
<input type="checkbox"/> Control confirmation <input checked="" type="checkbox"/> Enable PV source selection: AUTO PV Normal state selection: BAD																																																																														
Enable P&O interlock bypassing:	Disabled																																																																													
Bypass P&O interlocks:	Off																																																																													
S1: START	Permit	Override																																																																												
S0: STOP	Permit	Off																																																																												
<input checked="" type="radio"/> Safety interlock	<input type="radio"/> Safe Red tag																																																																													
<input type="checkbox"/> Red tag																																																																														
<input type="checkbox"/> Operator tag																																																																														
Operator tag description:	Operator Tag																																																																													
Controller name:	C300_MOPU																																																																													
Execution environment:	MOPUCEE																																																																													
<input checked="" type="checkbox"/> Enabling Alarm																																																																														
<input type="checkbox"/> Journal only option																																																																														
Control module in alarm:	OFF																																																																													
Function block in alarm:	OFF																																																																													
Command disagree:	OFF																																																																													
Command fail:	OFF																																																																													
Uncommanded change:	OFF																																																																													
Bad PV:	OFF																																																																													
Safety override:	OFF																																																																													
State 0 override interlock:	OFF																																																																													
State 1 override interlock:	OFF																																																																													
State 2 override interlock:	OFF																																																																													
Off normal condition:	OFF																																																																													
PV Off normal condition:	OFF																																																																													
Mode attribute																																																																														
Normal mode attribute:	NONE																																																																													

Figure 11.1.10. 2 PCS Pump Detail Page – Main Tab

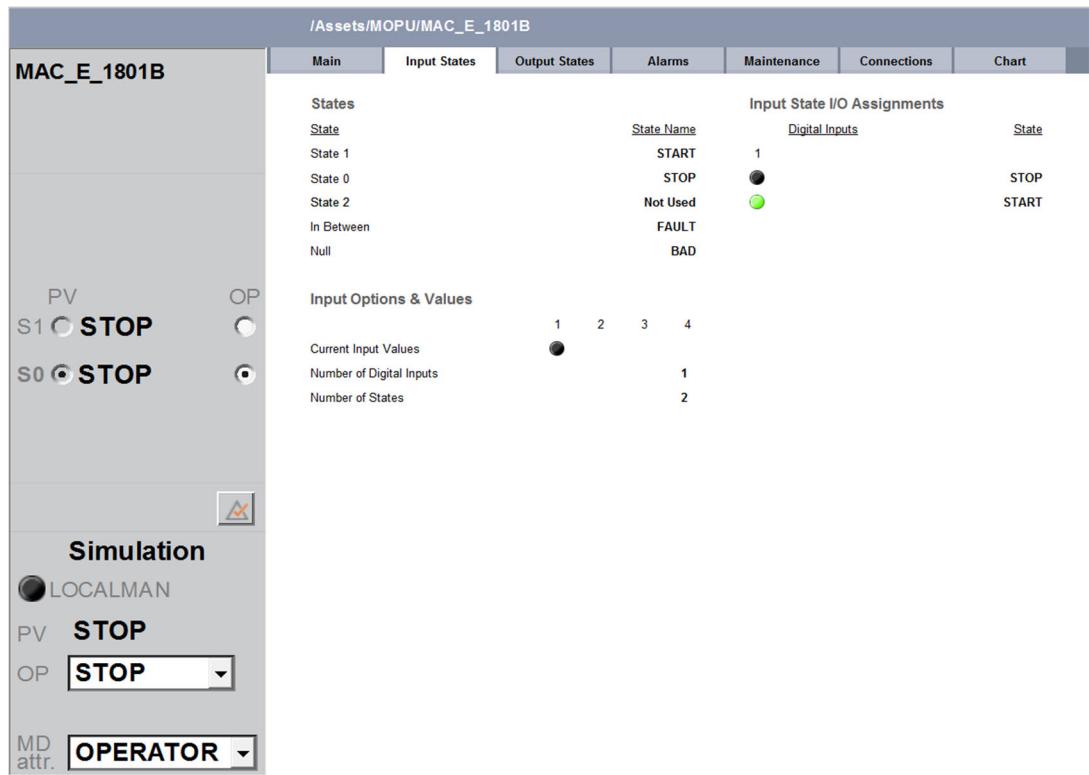


Figure 11.1.10. 3 PCS Pump Detail Page – Input States Tab

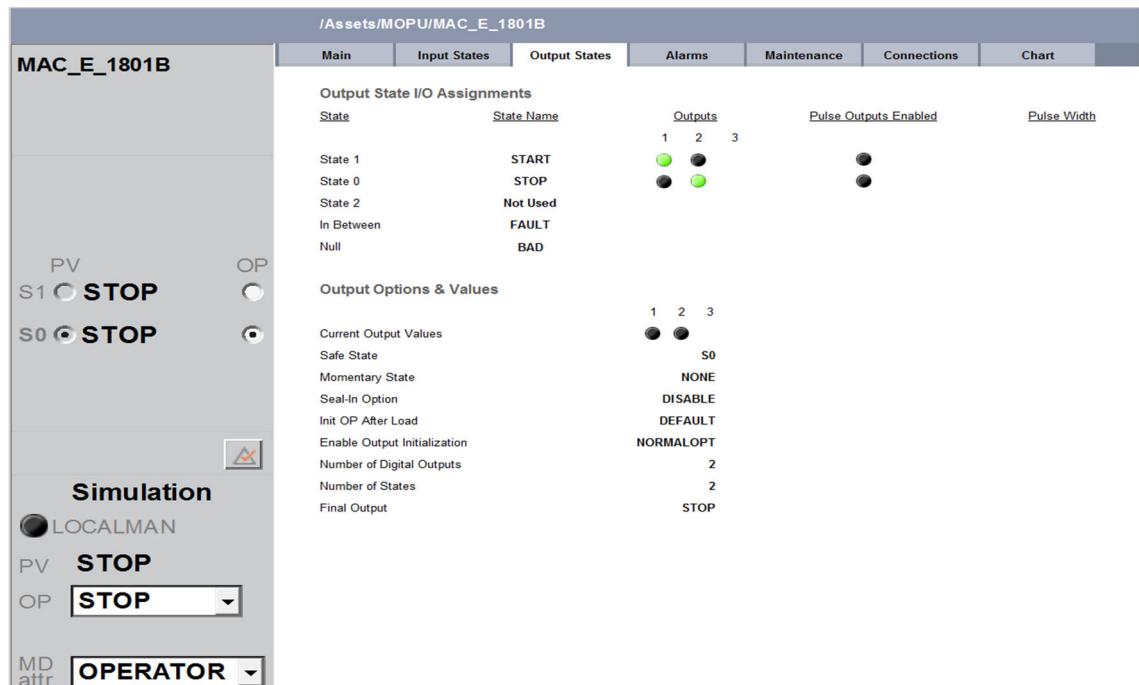


Figure 11.1.10. 4 PCS Pump Detail Page – Output States Tab

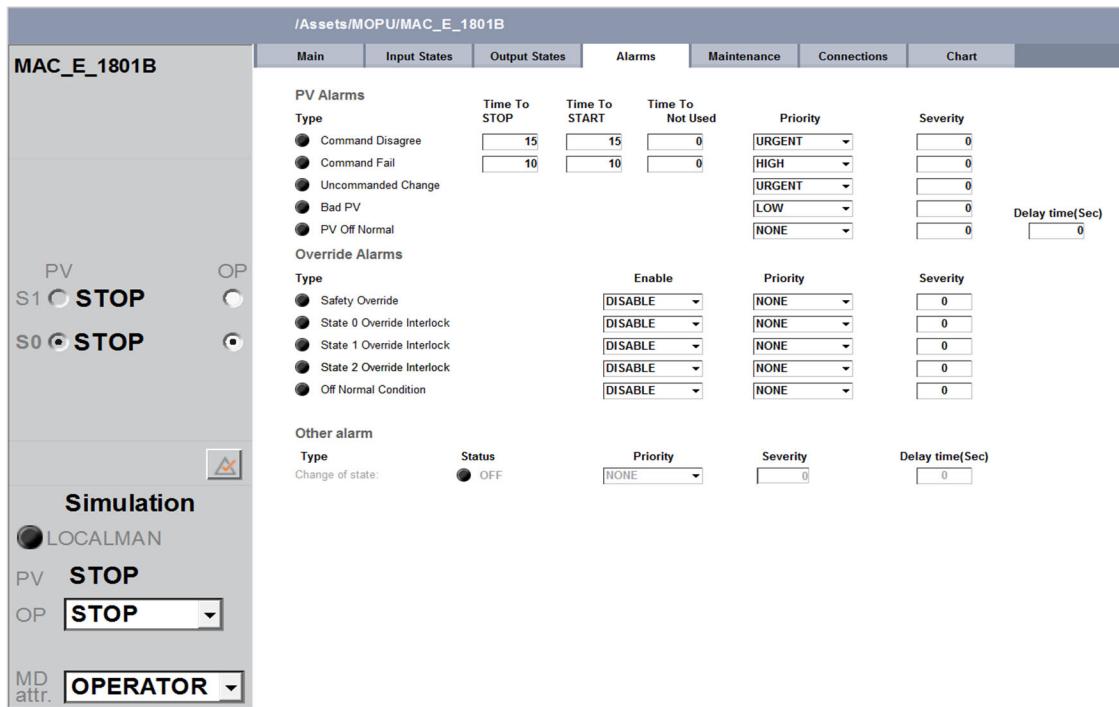


Figure 11.1.10. 5 PCS Pump Detail Page – Alarm Tab

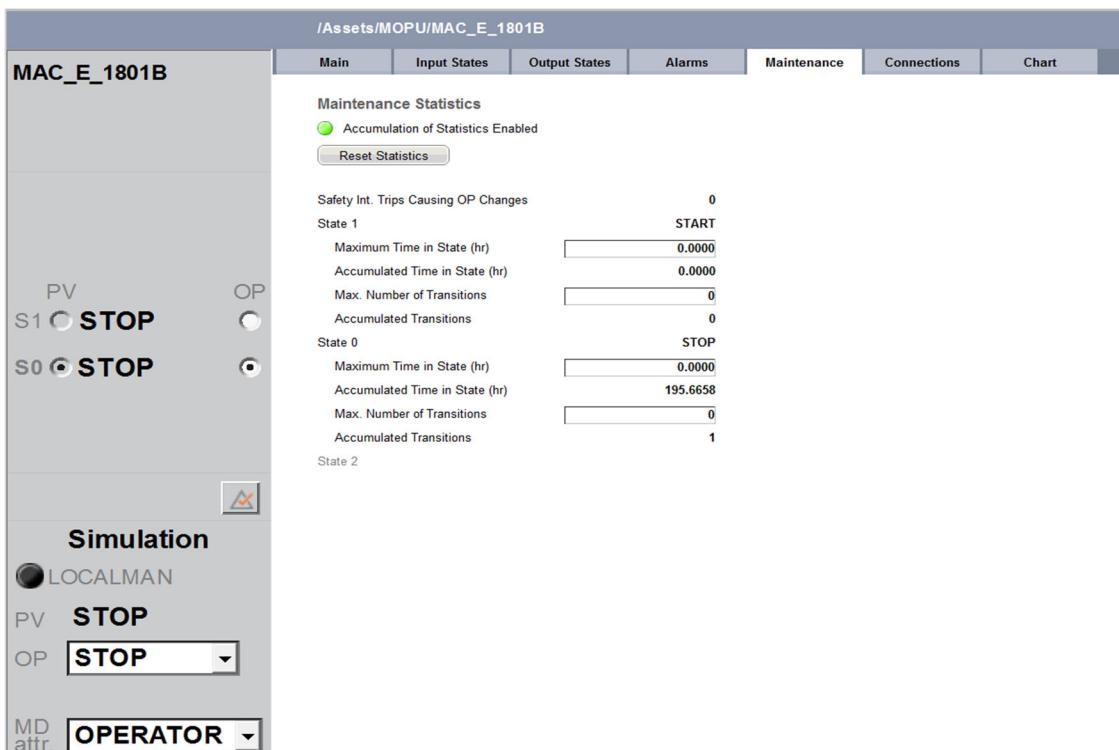


Figure 11.1.10. 6 PCS Pump Detail Page – Maintenance Tab

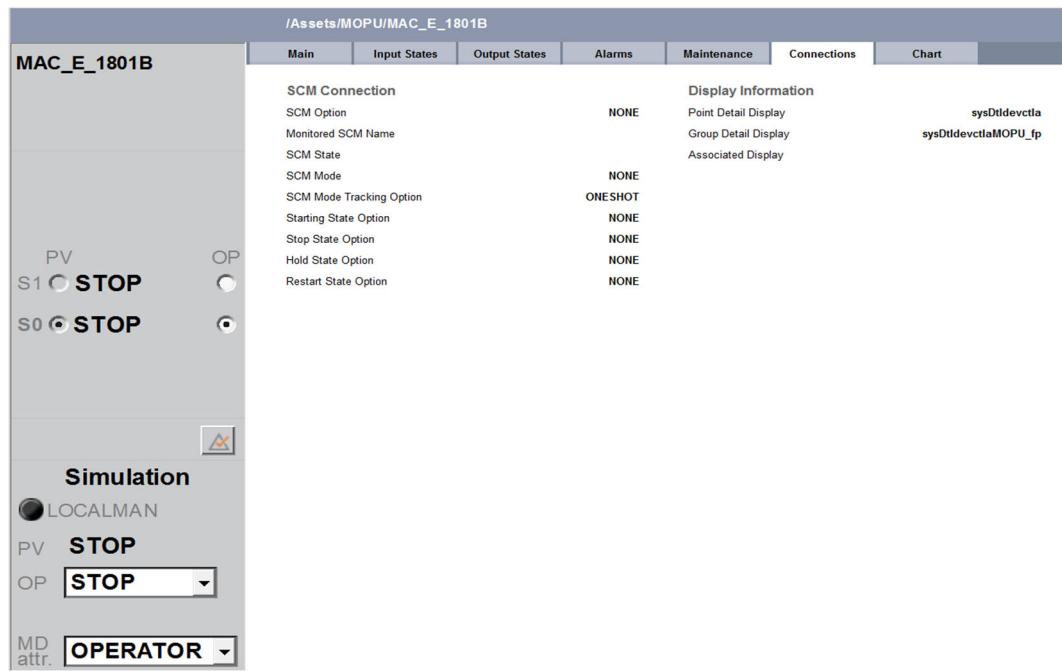


Figure 11.1.10. 7 PCS Pump Detail Page – Connection Tab

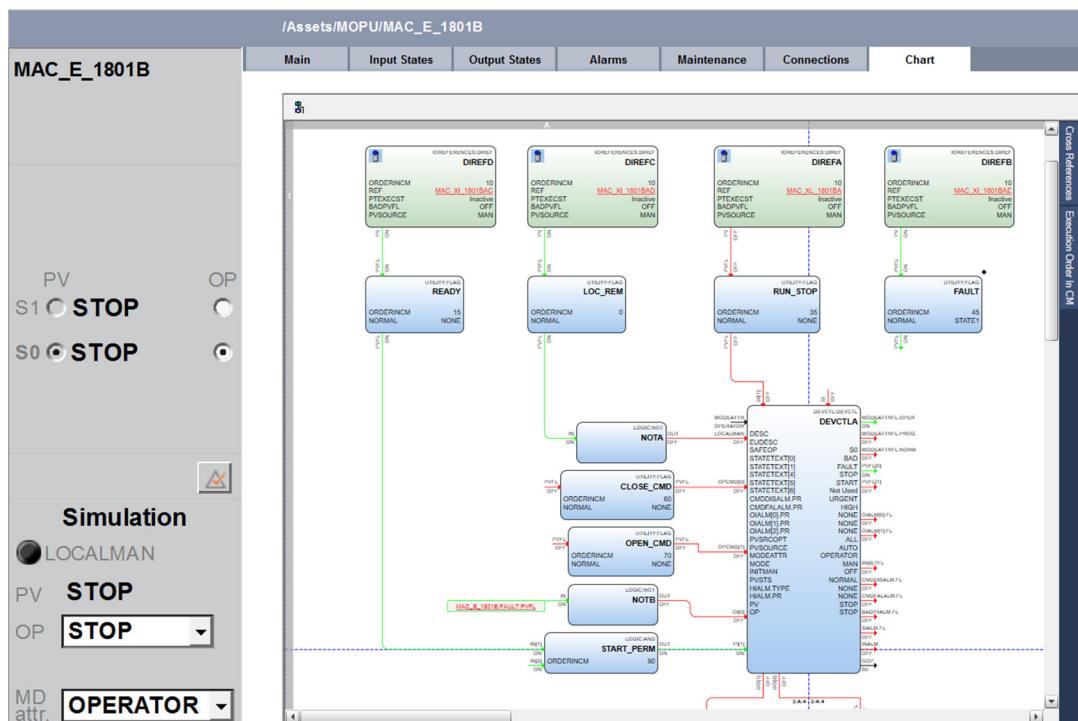
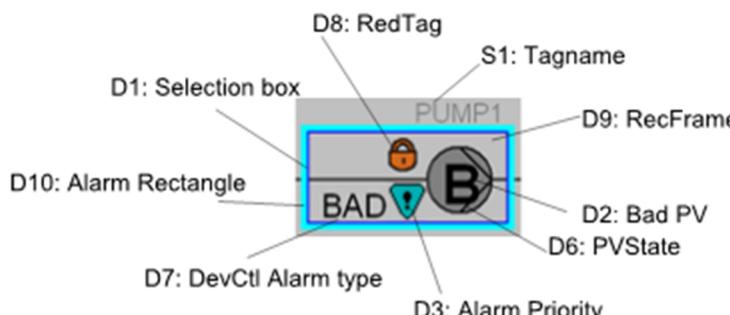
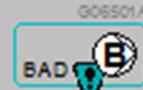
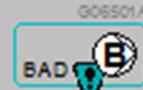
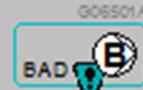


Figure 11.1.10. 8 PCS Pump Detail Page – Chart Tab

11.1.11 PCS Motor

Normal Presentation	PV, Tagname												
Abnormal Presentation	Error, Inactive state, Bad PV state, Alarm enable state												
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unacknowledged, and Return to normal state												
CDA_Pump_din_r_patri_cust_02.sha													
 <p>Note: D - Dynamic S - Static C - Invisible DB Connection</p>													
<table border="1"> <thead> <tr> <th>Shape Status Examples</th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td>PV=Stop Alarm Priority = Journal</td> </tr> <tr> <td></td> <td>PV=Run Alarm Priority = Journal</td> </tr> <tr> <td></td> <td>Uncommand disagree Alarm priority = Low</td> </tr> <tr> <td></td> <td>Override interlock</td> </tr> <tr> <td></td> <td>Bad PV Alarm priority = Low</td> </tr> </tbody> </table>		Shape Status Examples			PV=Stop Alarm Priority = Journal		PV=Run Alarm Priority = Journal		Uncommand disagree Alarm priority = Low		Override interlock		Bad PV Alarm priority = Low
Shape Status Examples													
	PV=Stop Alarm Priority = Journal												
	PV=Run Alarm Priority = Journal												
	Uncommand disagree Alarm priority = Low												
	Override interlock												
	Bad PV Alarm priority = Low												

Faceplate & Display for above shape are as follows:



Figure 11.1.11. 1 PCS Motor Faceplate

The screenshot shows the PCS Motor Detail Page - Main Tab for PUMP_TYPICAL_3. The tabs include Main, Input States, Output States, Alarms, Maintenance, Connections, and Chart. The Main tab is active and displays the following details:

- Execution and control:**
 - Execution state: ACTIVE
 - Load state: READY
 - CEE state: RUN
 - Order in CEE: 10
 - Execution period: 1sec
 - Execution phase: 2
 - Control level: 200
 - Control confirmation:
 - Enable PV source selection: AUTO
 - PV Normal state selection: Bad
- Permissive and override (P&O) interlocks:**
 - Enable P&O interlock bypassing: Disabled
 - Bypass P&O interlocks: Off
 - State: Permit Override
 - S1: Run (Permit, Off)
 - S0: Stop (Permit, Off)
- Safety interlock, Red tag and Operator tag:**
 - Safety interlock:
 - Safe Red tag:
 - Red tag:
 - Operator tag:
 - Operator tag description: Operator Tag
- Mode attribute:**
 - Normal mode attribute: NONE
- Mode attribute selection:**
 - PROGRAM:
- QVCS information:**
 - Qualification state: <None>
 - Version: 0.00

Figure 11.1.11. 2 PCS Motor Detail Page – Main Tab

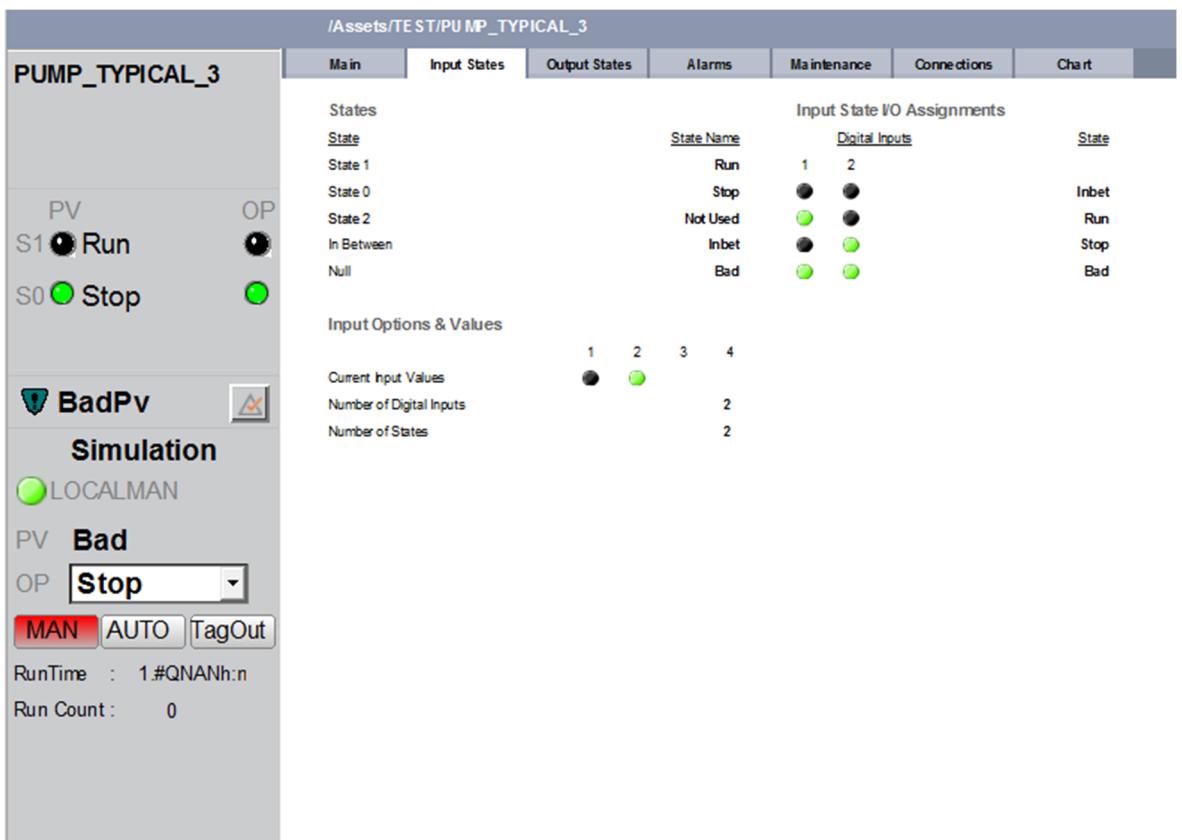


Figure 11.1.11. 3 PCS Motor Detail Page – Input States Tab

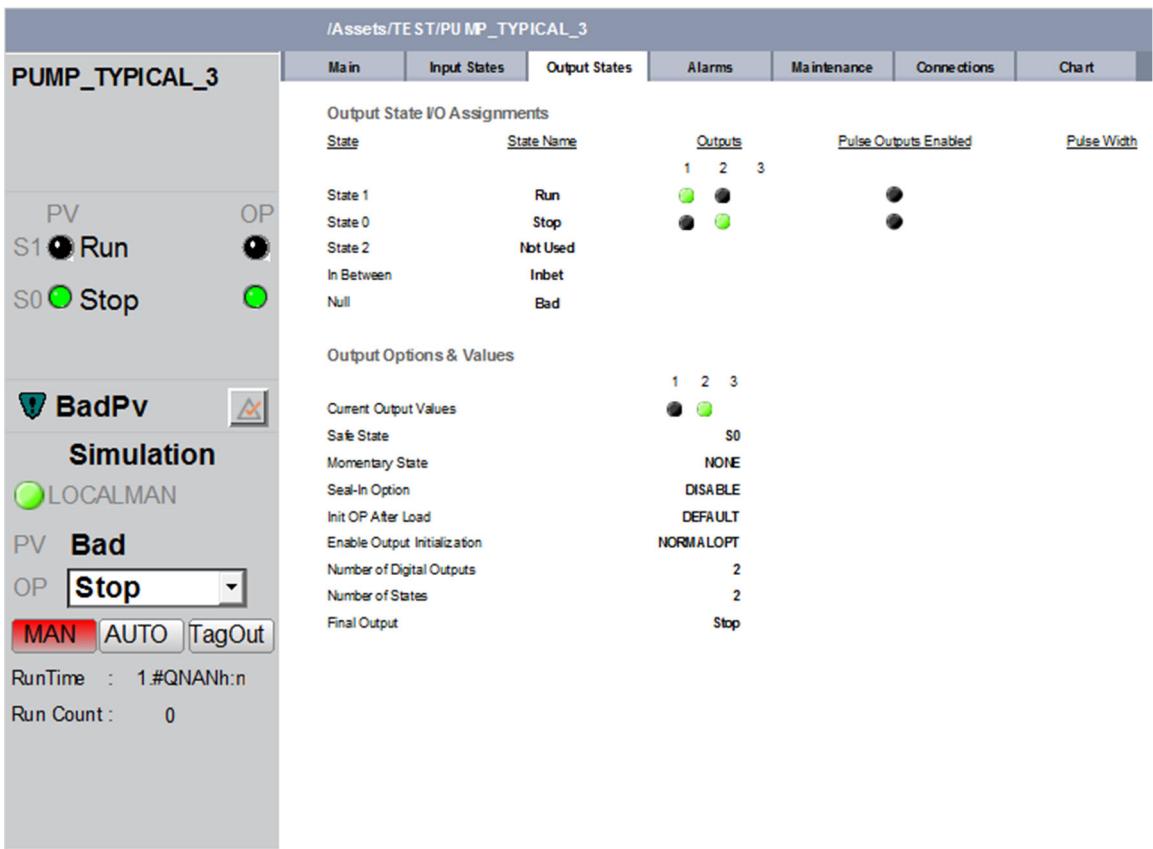


Figure 11.1.11.4 PCS Motor Detail Page – Output States Tab

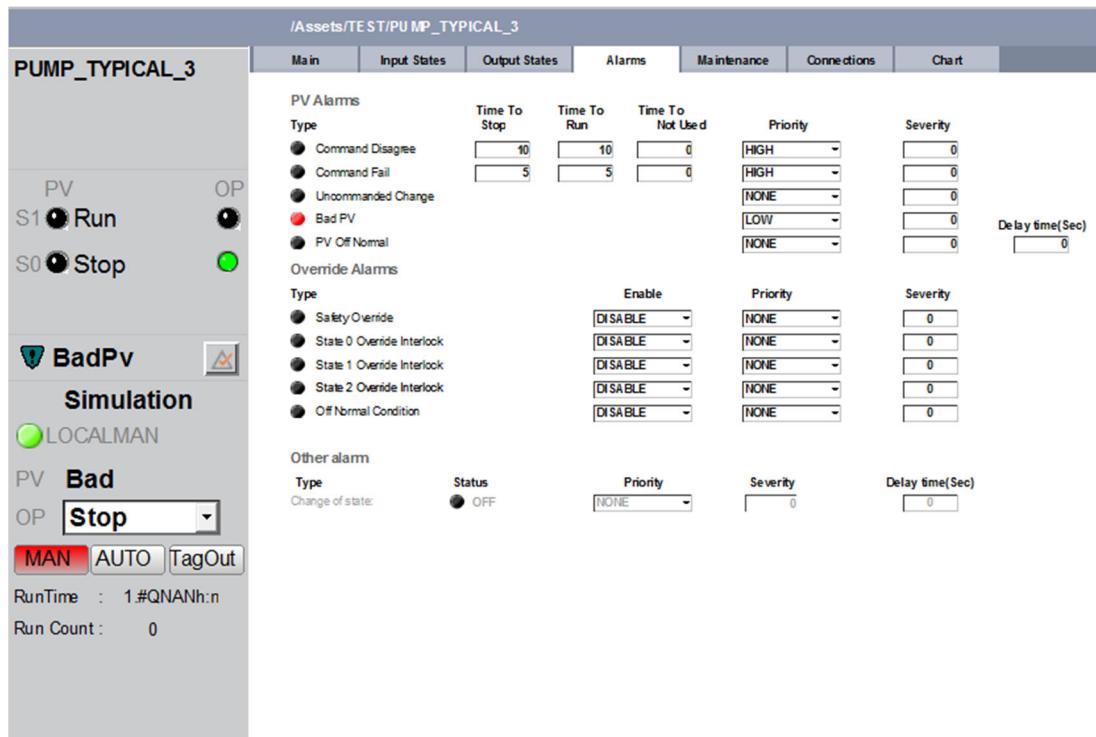


Figure 11.1.11.5 PCS Motor Detail Page – Alarm Tab

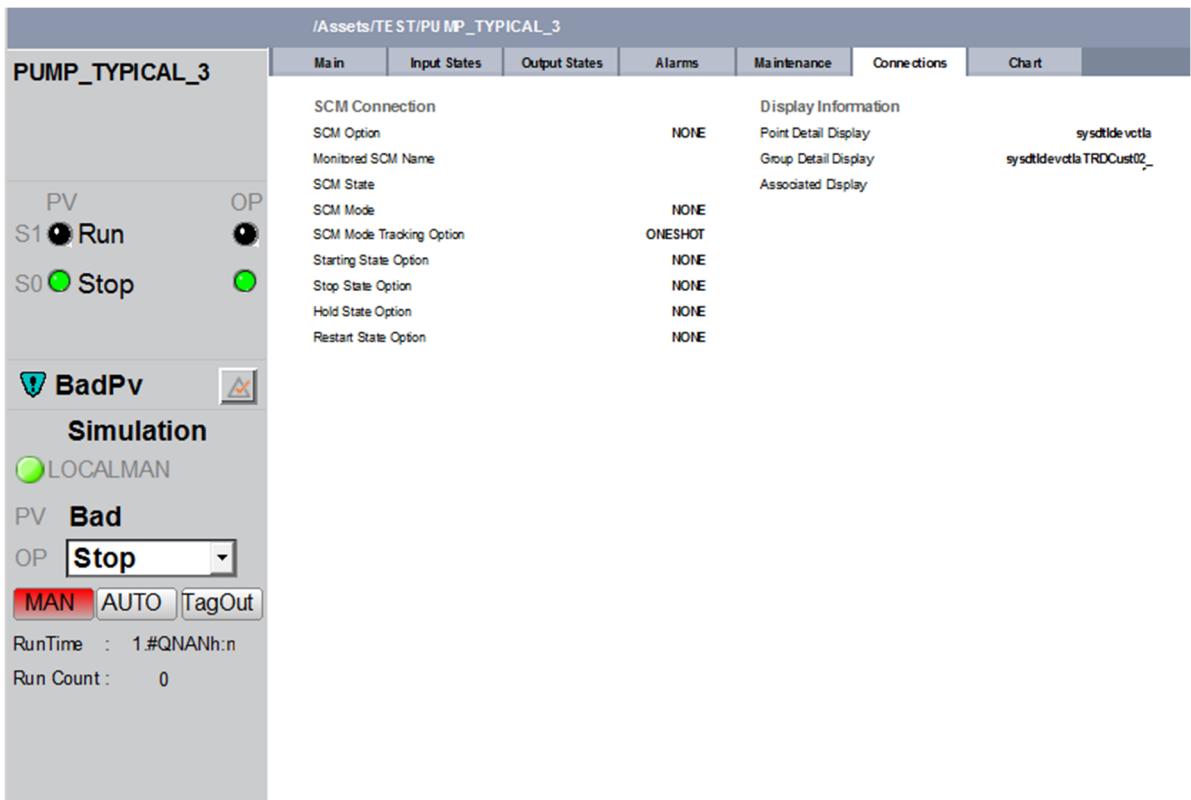


Figure 11.1.11.6 PCS Motor Detail Page – Connection Tab

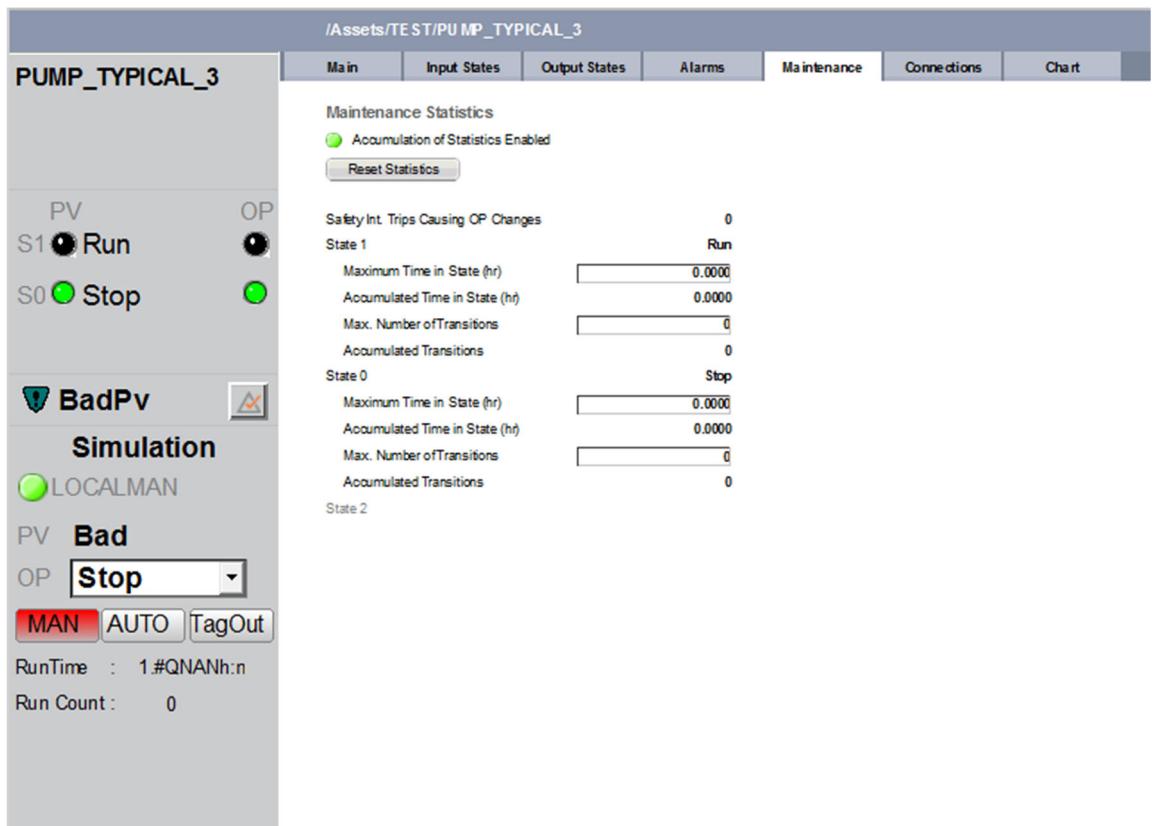


Figure 11.1.11.7 PCS Motor Detail Page – Maintenance Tab

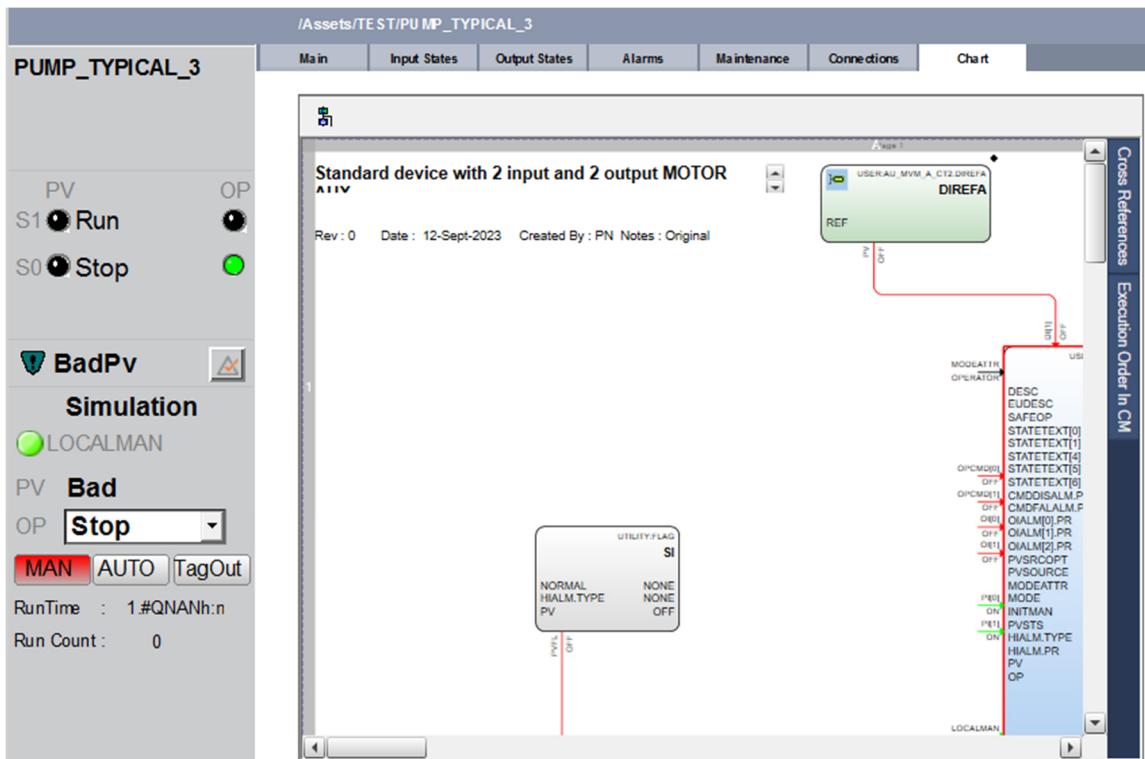
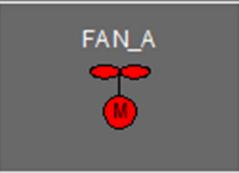
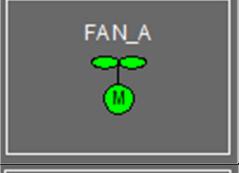
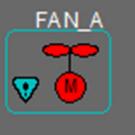
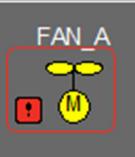


Figure 11.1.11. 8 PCS Motor Detail Page – Chart Tab

11.1.12 PCS FAN

Normal Presentation	PV, Tagname
Abnormal Presentation	Error, Inactive state, Bad PV state, Alarm enable state
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unacknowledged, and Return to normal state
CDA_Fan_isa_d_pai_01.sha	
S1: Tagname / S2: Engineering Unit	
D1: Selection box	
D2: Alarm Rectangle	
D3: Alarm Priority	
D4: Fan Status	
Note: D - Dynamic S - Static C - Invisible DB Connection	
Shape Status Examples	

			PV=Stop Alarm Priority = Journal
			PV=Run Alarm Priority = Journal
			PV=Stop Uncommand Alarm Alarm Priority = Low
			Fault/Trip Alarm Priority = Urgent
			PV=Stop Alarm Priority = Disabled
			Configuration Error
			Inactive State
			Bad PV

Faceplate & Display for above shape are as follows:

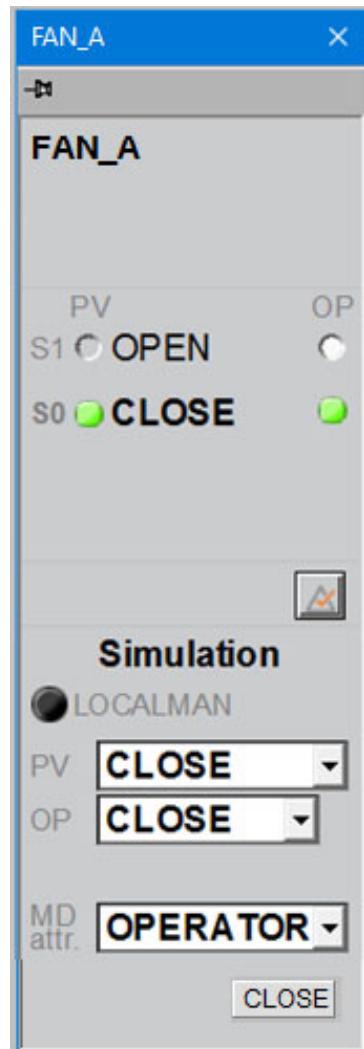


Figure 11.1.12. 1 PCS Fan Faceplate

/Assets/MOPU/MAC_EM_1501_01

Main	Input States	Output States	Alarms	Maintenance	Connections	Chart											
Execution and control Execution state: ACTIVE Load state: READY CEE state: RUN Order in CEE: 10 Execution period: 1sec Execution phase: 2 Control level: 200 <input type="checkbox"/> Control confirmation <input checked="" type="checkbox"/> Enable PV source selection: AUTO PV Normal state selection: BAD Permissive and override (P&O) interlocks Enable P&O interlock bypassing: Disabled Bypass P&O interlocks: Off <table border="1"> <thead> <tr> <th>State</th> <th>Permit</th> <th>Override</th> </tr> </thead> <tbody> <tr> <td>S1: START</td> <td>Permit</td> <td>Off</td> </tr> <tr> <td>S0: STOP</td> <td>Permit</td> <td>Off</td> </tr> </tbody> </table> Safety interlock, Red tag and Operator tag <input checked="" type="radio"/> Safety interlock <input checked="" type="radio"/> Safe Red tag <input type="checkbox"/> Red tag <input type="checkbox"/> Operator tag Operator tag description: Operator Tag Assigned controller Controller name: C300_MOPU Execution environment: MOPUCEE							State	Permit	Override	S1: START	Permit	Off	S0: STOP	Permit	Off	Alarm enable and summary <input checked="" type="checkbox"/> Enabling Alarm <input type="checkbox"/> Journal only option Control module in alarm: OFF Function block in alarm: OFF Command disagree: OFF Command fail: OFF Uncommanded change: OFF Bad PV: OFF Safety override: OFF State 0 override interlock: OFF State 1 override interlock: OFF State 2 override interlock: OFF Off normal condition: OFF PV Off normal condition: OFF Mode attribute Normal mode attribute: NONE	
State	Permit	Override															
S1: START	Permit	Off															
S0: STOP	Permit	Off															

Simulation
 LOCALMAN
 PV **STOP**
 OP **STOP**
 MD attr. **OPERATOR**

CmdDisagre

Figure 11.1.12. 2 PCS Fan Detail Page – Main Tab

/Assets/TEST/FAN_A

Main	Input States	Output States	Alarms	Maintenance	Connections	Chart											
FAN_A Execution and control Execution state: ACTIVE Load state: READY CEE state: RUN Order in CEE: 10 Execution period: 1sec Execution phase: 0 Control level: 200 <input type="checkbox"/> Control confirmation <input checked="" type="checkbox"/> Enable PV source selection: AUTO PV Normal state selection: Bad Permissive and override (P&O) interlocks Enable P&O interlock bypassing: Disabled Bypass P&O interlocks: Off <table border="1"> <thead> <tr> <th>State</th> <th>Permit</th> <th>Override</th> </tr> </thead> <tbody> <tr> <td>S1: OPEN</td> <td>Permit</td> <td>Off</td> </tr> <tr> <td>S0: CLOSE</td> <td>Permit</td> <td>Off</td> </tr> </tbody> </table> Safety interlock, Red tag and Operator tag <input checked="" type="radio"/> Safety interlock <input checked="" type="radio"/> Safe Red tag <input type="checkbox"/> Red tag <input type="checkbox"/> Operator tag Operator tag description: Operator Tag Assigned controller Controller name: CD_10001P Execution environment: CEE_10001							State	Permit	Override	S1: OPEN	Permit	Off	S0: CLOSE	Permit	Off	Alarm enable and summary <input checked="" type="checkbox"/> Enable alarming <input type="checkbox"/> Journal only option Control module in alarm: ON Function block in alarm: ON Command disagree: ON Command fail: ON Uncommanded change: OFF Bad PV: OFF Safety override: OFF State 0 override interlock: OFF State 1 override interlock: OFF State 2 override interlock: OFF Off normal condition: OFF PV Off normal condition: OFF Mode attribute Normal mode attribute: NONE	
State	Permit	Override															
S1: OPEN	Permit	Off															
S0: CLOSE	Permit	Off															

Simulation
 LOCALMAN
 PV **CLOSE**
 OP **OPEN**
 MD attr. **OPERATOR**

Figure 11.1.12. 3 PCS Fan Detail Page – Command disagree condition

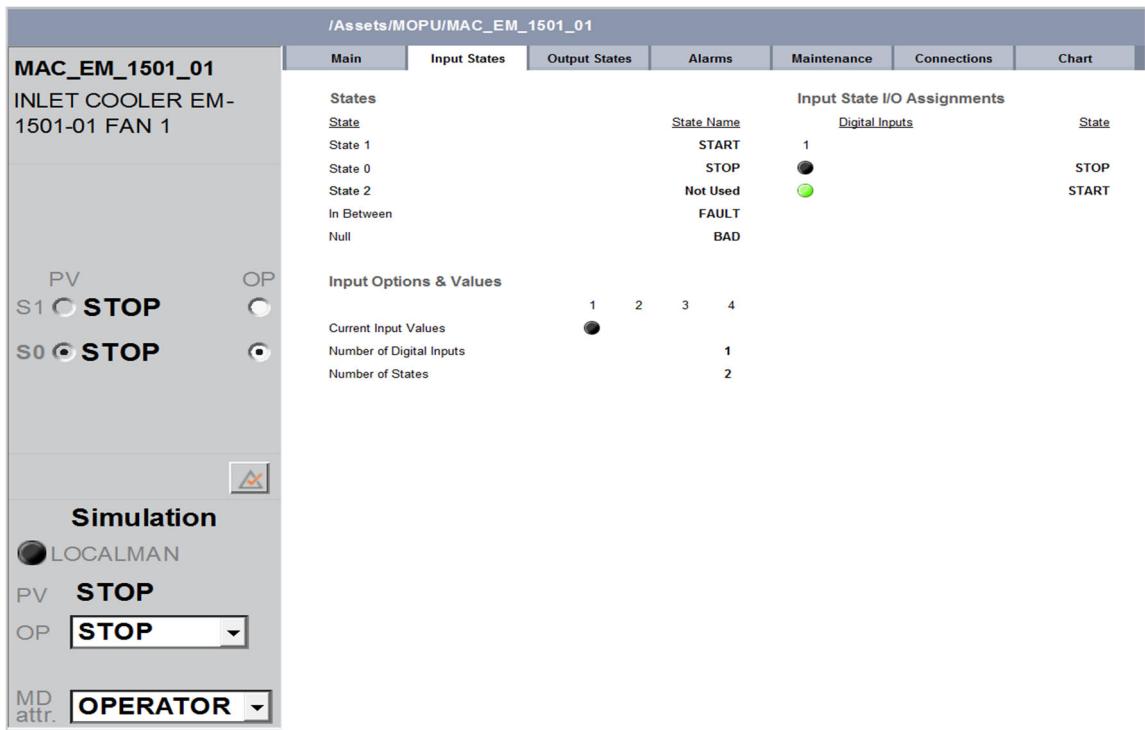


Figure 11.1.12. 4 PCS Fan Detail Page – Input States Tab

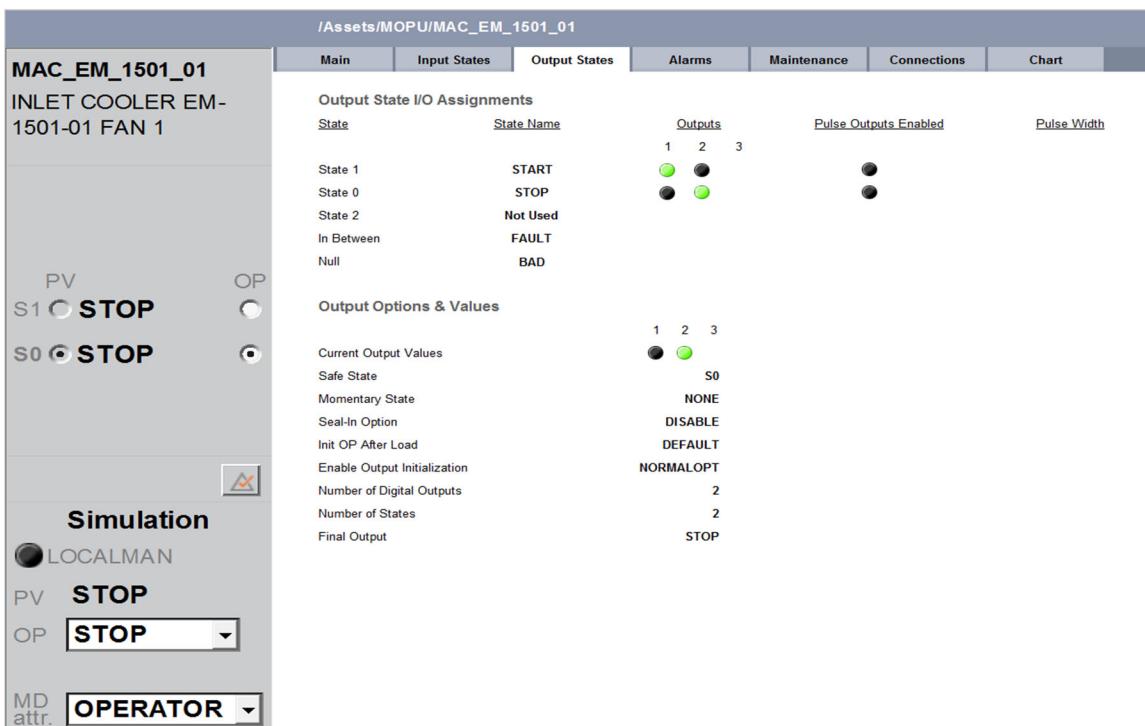


Figure 11.1.12. 5 PCS Fan Detail Page – Output States Tab

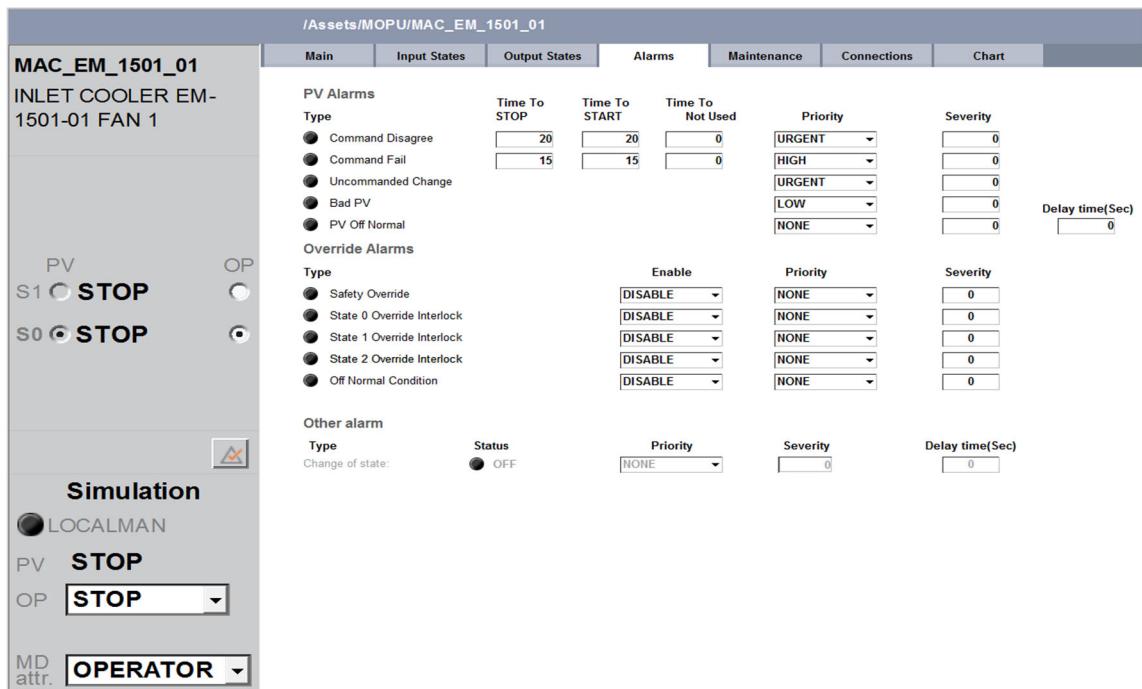


Figure 11.1.12. 6 PCS Fan Detail Page – Alarms Tab

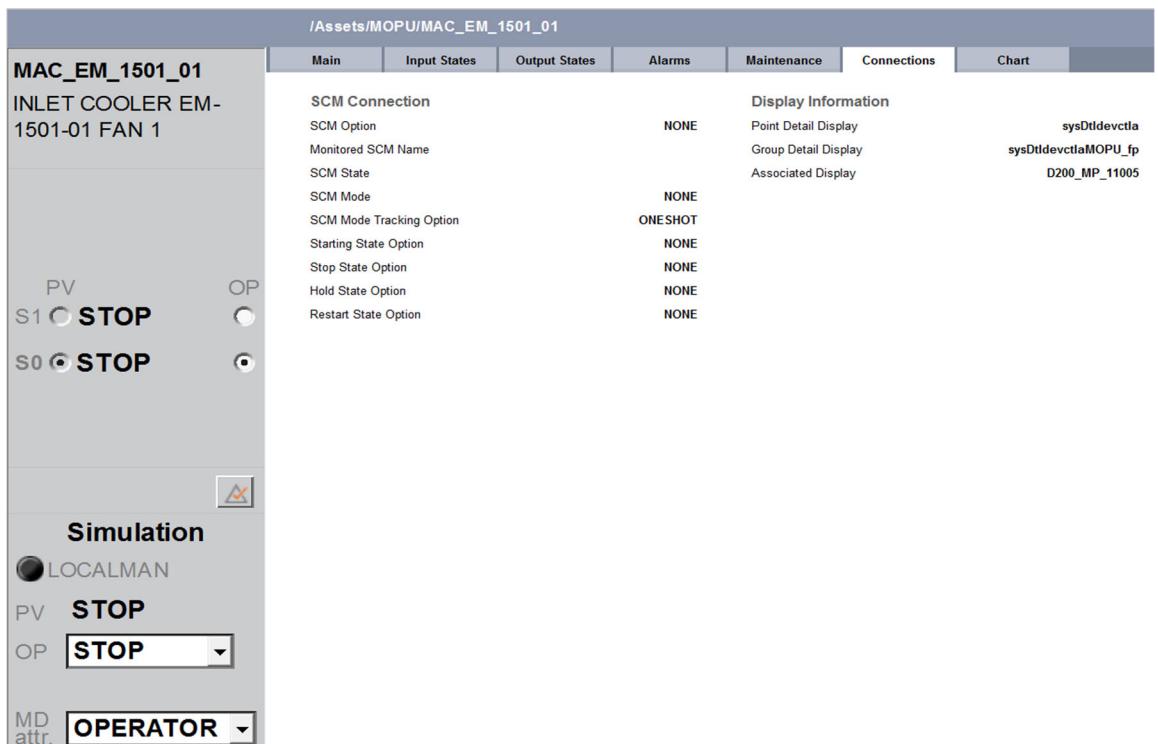


Figure 11.1.12. 7 PCS Fan Detail Page – Maintenance Tab

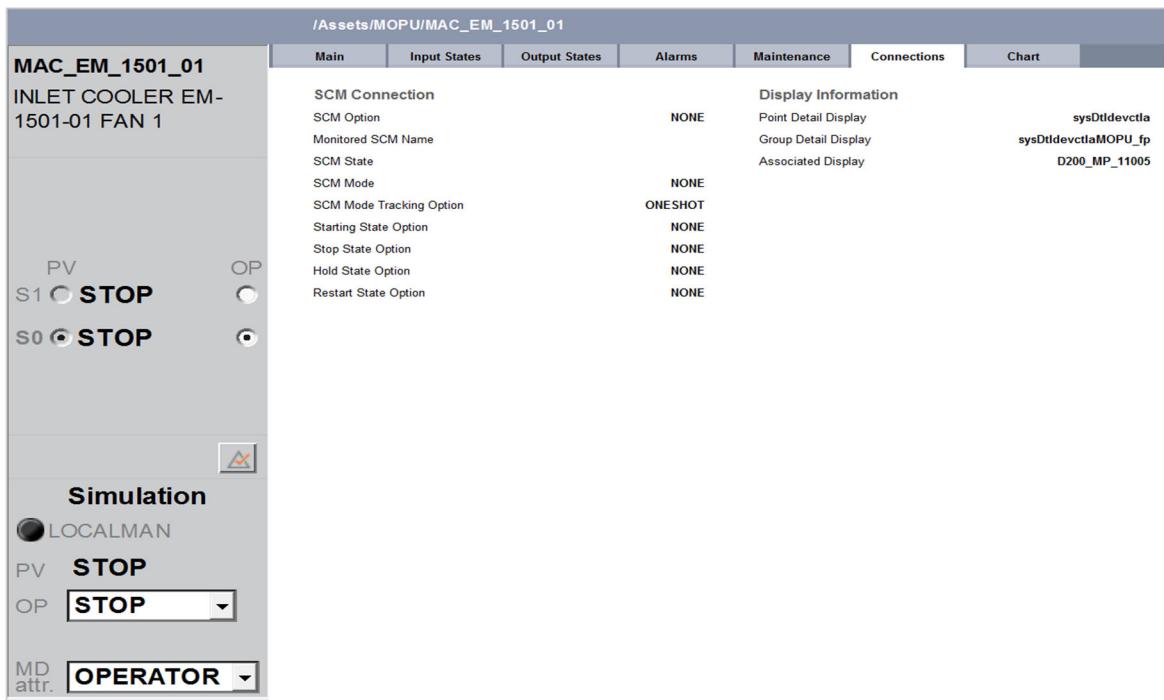


Figure 11.1.12. 8 PCS Fan Detail Page – Connection Tab

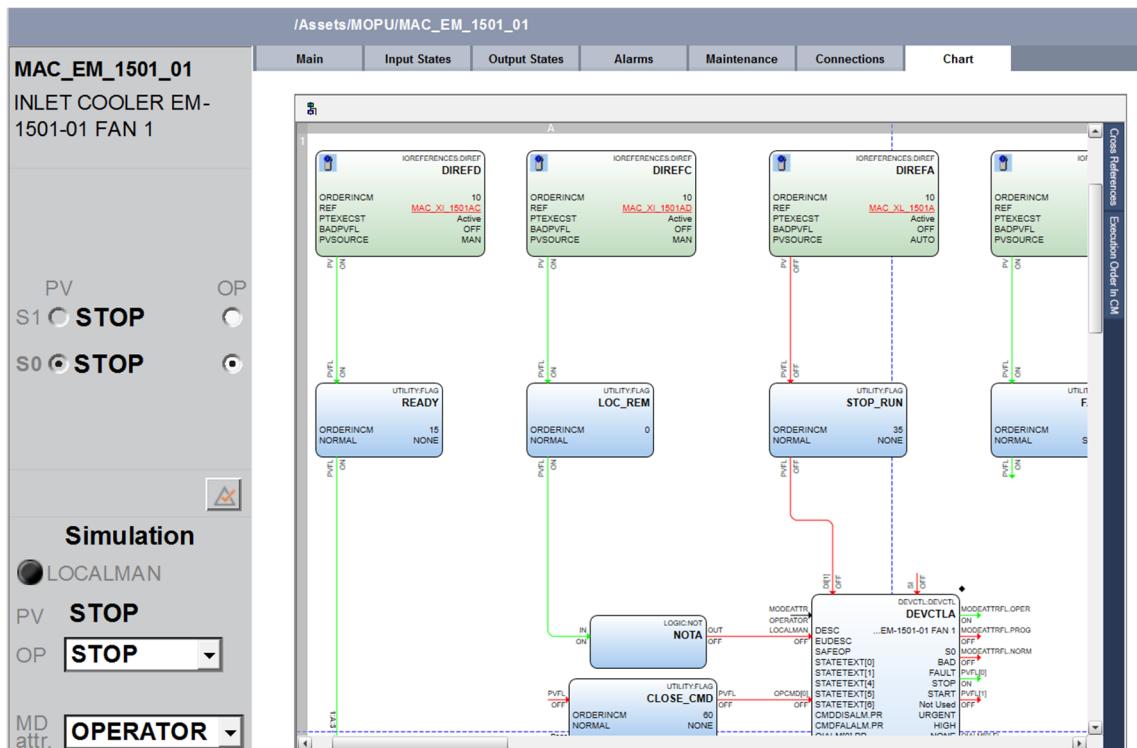
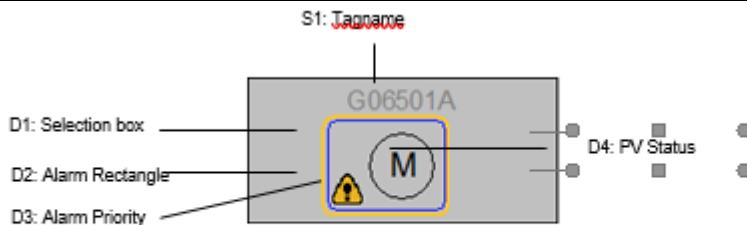
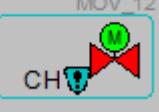
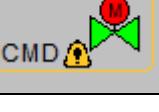
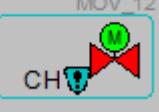
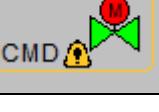
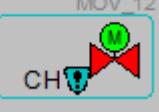
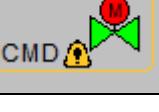


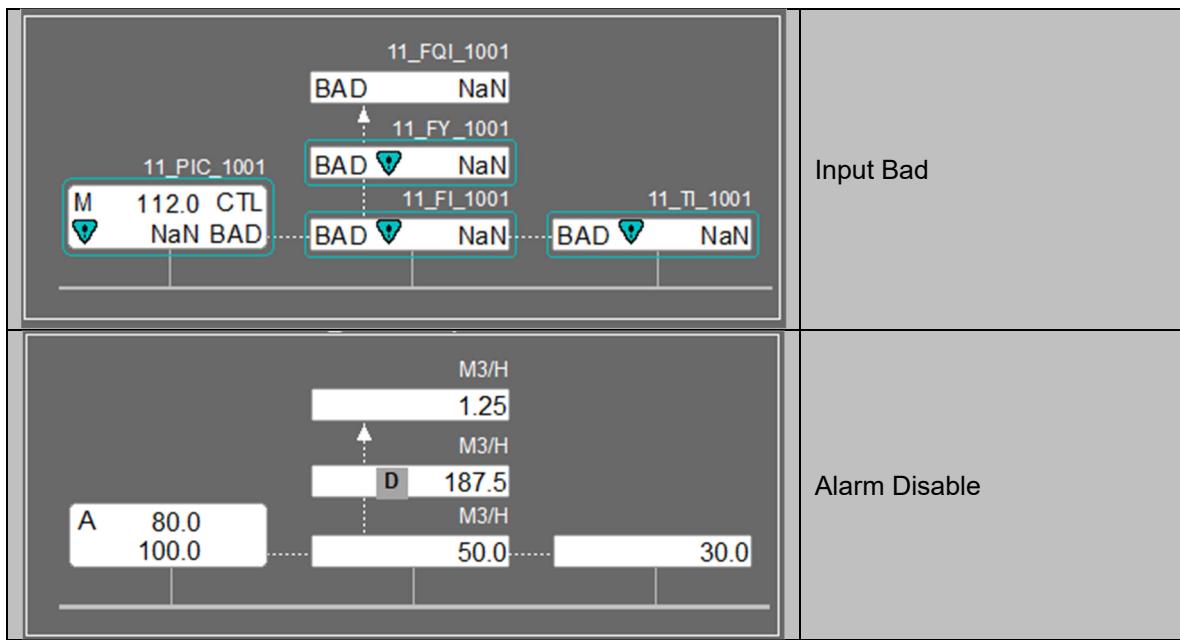
Figure 11.1.12. 9 PCS Fan Detail Page – Chart Tab

11.1.13 MOV

Normal Presentation	PV, Tagname										
Abnormal Presentation	Error, Inactive state, Bad PV state, Alarm enable state										
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unacknowledged, and Return to normal state										
CDA_MOV_isa_h_pooti_01.sha											
 <p style="text-align: right;">Note: D - Dynamic S - Static C - Invisible DB Connection</p>											
Shape Status Examples <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; padding: 5px;">  </td> <td style="padding: 5px;"> PV=Stop Alarm Priority = Journal </td> </tr> <tr> <td style="text-align: center; padding: 5px;">  </td> <td style="padding: 5px;"> PV=Run Alarm Priority = Journal </td> </tr> <tr> <td style="text-align: center; padding: 5px;">  </td> <td style="padding: 5px;"> Uncommand disagree Alarm priority = Low </td> </tr> <tr> <td style="text-align: center; padding: 5px;">  </td> <td style="padding: 5px;"> Bad PV Alarm priority = Low </td> </tr> <tr> <td style="text-align: center; padding: 5px;">  </td> <td style="padding: 5px;"> Command disagree Alarm priority = High </td> </tr> </table>			PV=Stop Alarm Priority = Journal		PV=Run Alarm Priority = Journal		Uncommand disagree Alarm priority = Low		Bad PV Alarm priority = Low		Command disagree Alarm priority = High
	PV=Stop Alarm Priority = Journal										
	PV=Run Alarm Priority = Journal										
	Uncommand disagree Alarm priority = Low										
	Bad PV Alarm priority = Low										
	Command disagree Alarm priority = High										

11.1.14 FlowComp

Normal Presentation	PV, Tagname
Abnormal Presentation	Error, Inactive state, Bad PV state
Alarm Presentation	-
CDA_dataacq_lib_h_pati_01.sha	
<p>Note: D - Dynamic S - Static C - Invisible DB Connection</p>	
Shape Status Examples	
	PV=Normal
	PV=High High Alarm Alarm Priority=Urgent FlowComp = Bad
	PV=High Alarm Alarm Priority= High
	Communication Error



Faceplate & Display for above shape are as follows:

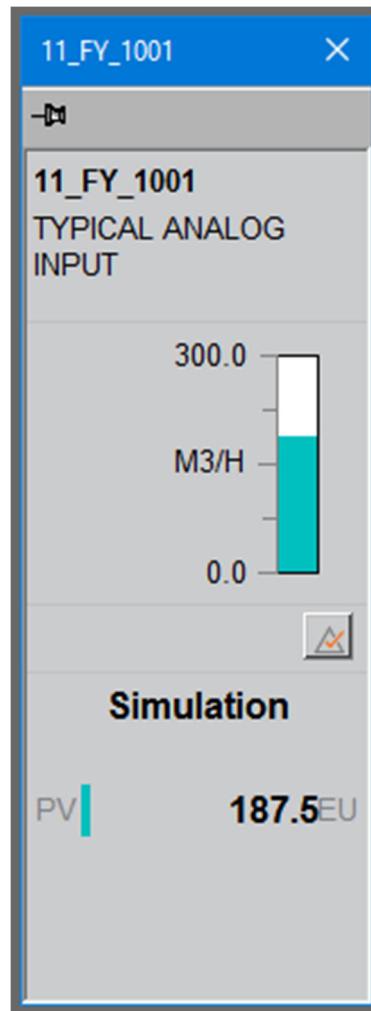


Figure 11.1.14 1 PCS Flowcomp Faceplate

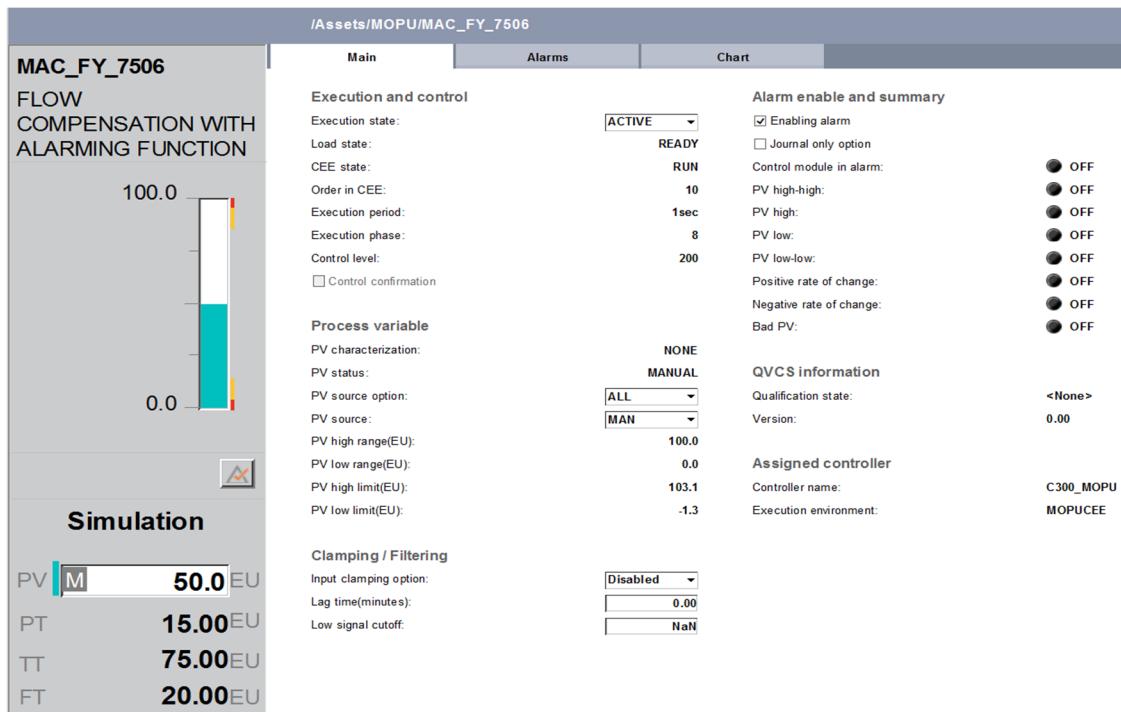


Figure 11.1.14 2 PCS FlowComp Detail Page – Main Tab

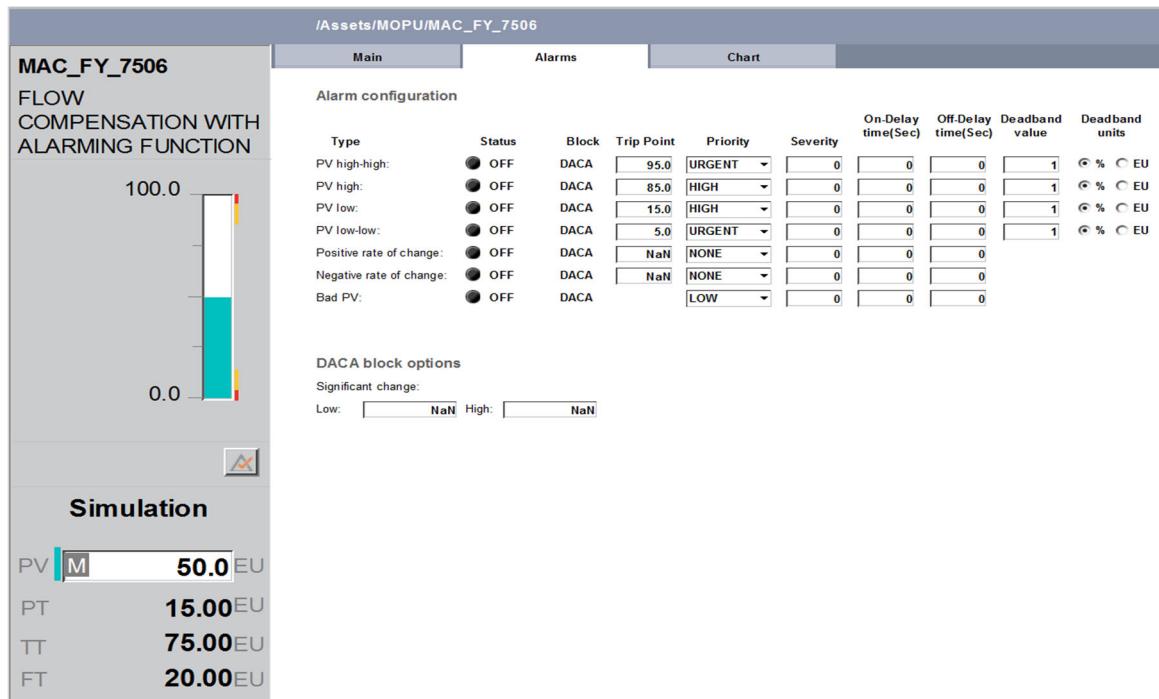


Figure 11.1.14 3 PCS FlowComp Detail Page – Alarm Tab

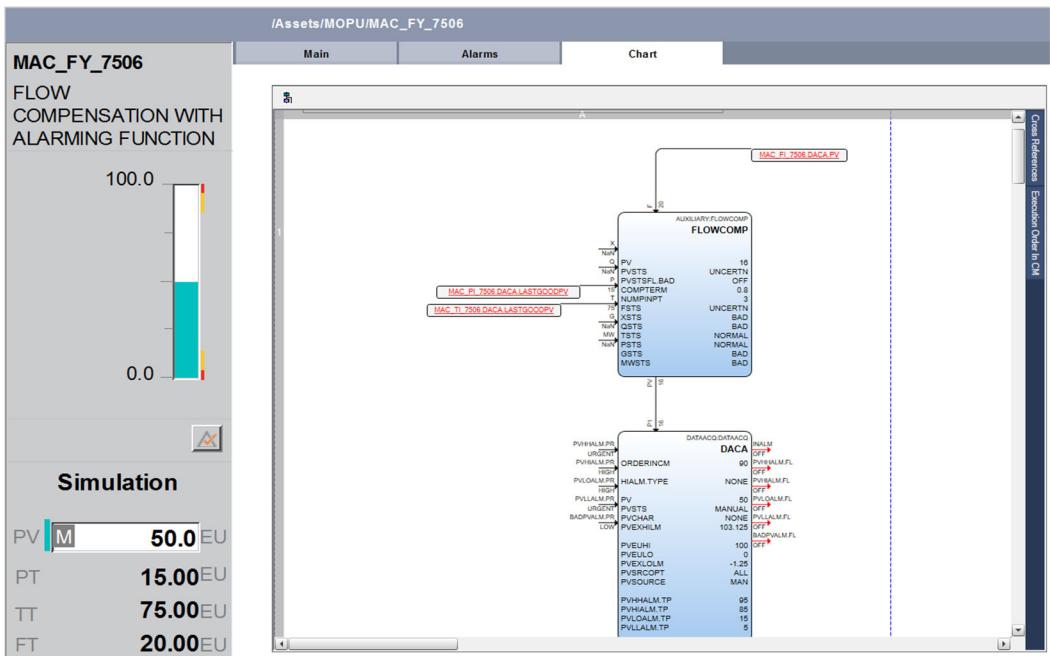
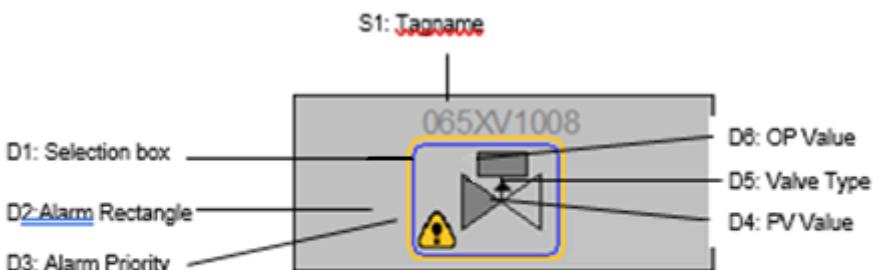


Figure 11.1.14 4 PCS FlowComp Detail Page – Chart Tab

11.2 HMIWeb ESD Shapes

The following C300 shapes will be used for this project

11.2.1 ESD ON OFF Valve (SDV)

Normal Presentation	PV, Tagname
Abnormal Presentation	Error, Inactive state, Bad PV state, Alarm enable state
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unacknowledged, and Return to normal state
ESD_OnOffValve_isa_h_pai_01.sha	
 <p>S1: Tagname D1: Selection box D2: Alarm Rectangle D3: Alarm Priority D4: PV Value D5: Valve Type D6: OP Value</p> <p>Note: D - Dynamic S - Static C - Invisible DB Connection</p>	
Shape Status Examples	
	PV= Open OP= Open Alarm Priority = Journal
	PV= Close OP= Close Alarm Priority = Journal

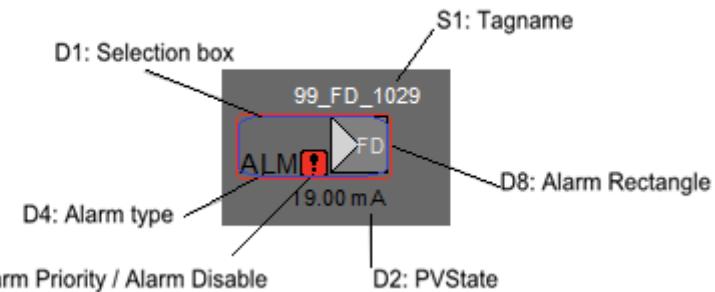
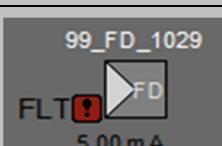
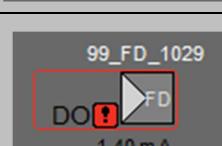
11.2.2 ESD Analog Indicator

Normal Presentation	PV, Tagname
Abnormal Presentation	Error, Inactive state, Bad PV state, Alarm enable state
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unacknowledged, and Return to normal state
CDA_SgsDataAcq_lib_h_pai_01.sha	
<p>S1: Tagname / S2: Engineering Unit</p> <p>D1: Selection box</p> <p>D2: Alarm Type</p> <p>D3: Alarm Rectangle</p> <p>D4: Alarm Priority</p> <p>D5: PV Value</p> <p>Note: D - Dynamic S - Static C - Invisible DB Connection</p>	
Shape Status Examples	
	PV=55.02 Alarm Priority = Journal
	PV=91.00 Alarm Type = High High Alarm Alarm Priority = Urgent
	PV=9.00 Alarm Type = Low Low Alarm Alarm Priority = Urgent
	PV=91.00 MOS active
	PV=48.00 Fault Condition

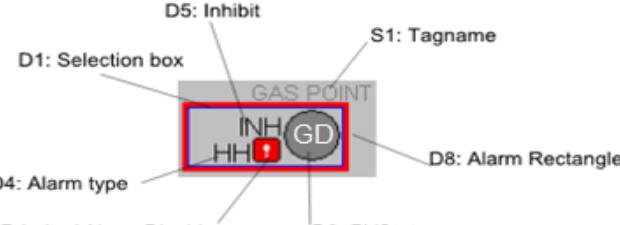
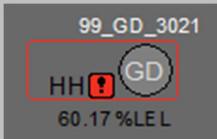
11.2.3 ESD ON OFF Valve (BDV)

Normal Presentation	PV, Tagname
Abnormal Presentation	Error, Inactive state, Bad PV state, Alarm enable state
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unacknowledged, and Return to normal state
ESD_OnOffValve_isa_h_pai_01.sha	
<p>S1: Tagname</p> <p>D1: Selection box</p> <p>D2: Alarm Rectangle</p> <p>D3: Alarm Priority</p> <p>D4: PV Value</p> <p>D5: Valve Type</p> <p>D6: OP Value</p> <p>Note: D - Dynamic S - Static C - Invisible DB Connection</p>	
Shape Status Examples	
 12_BDV_1006	PV= Open OP= Open Alarm Priority = Journal
 12_BDV_1006	PV= Close OP= Close Alarm Priority = Journal

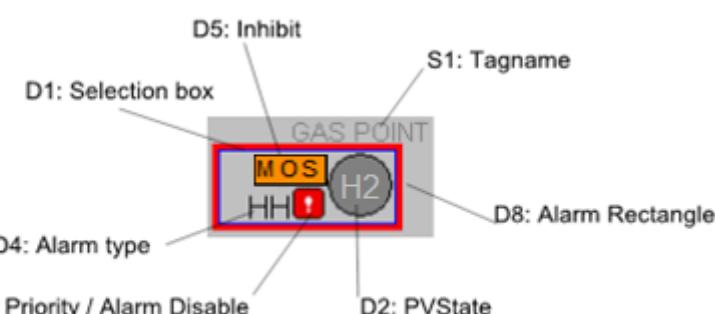
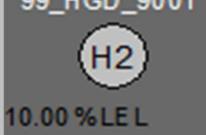
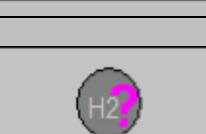
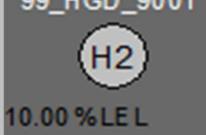
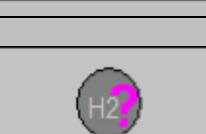
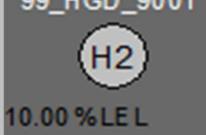
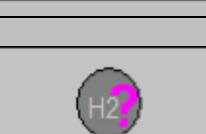
11.2.4 Flame Detector

Normal Presentation	PV, Description
Abnormal Presentation	Error, Alarm enable state
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unack and RTN STate and Alarm Type Context menu
Cda_Flame_sms_h_pati_01.sha	
<p>Note :</p>  <p>The diagram shows a Flame Detector icon with the following components and labels:</p> <ul style="list-style-type: none"> D1: Selection box S1: Tagname: 99_FD_1029 D2: PVState D3: Alarm Priority / Alarm Disable D4: Alarm type D8: Alarm Rectangle 	
<p>D - Dynamic S - Static C - Invisible DB Connection</p>	
Shape Status Examples	
 <p>State = Normal</p>	
 <p>State = Alarm</p>	
 <p>State = No Alarm MOS Active</p>	
 <p>State = Fault Condition</p>	
 <p>Dirty Optics</p>	

11.2.5 Gas Detector

Normal Presentation	PV, Description
Abnormal Presentation	Error, Alarm enable state
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unack and RTN STate and Alarm Type Context menu
Cda_GasPoint_sms_h_pati_01.sha	
 <p>The diagram shows a central rectangular box labeled "GAS POINT". Inside this box, the letters "GD" are displayed. A red rectangle surrounds the "GD" text, which is labeled "D8: Alarm Rectangle". Above the "GD" text, there is a small circle containing a red exclamation mark, labeled "D5: Inhibit". To the left of the "GD" text, the letters "INH" are visible, labeled "D4: Alarm type". Below the "GD" text, the letters "HH" are visible, labeled "D3: Alarm Priority / Alarm Disable". At the top of the central box, the text "S1: Tagname" is labeled next to "GAS POINT". On the right side of the central box, the text "D2: PVState" is labeled.</p>	
Shape Status Examples	
 <p>99_GD_3021 GD 14.99 %LEL</p>	State = Normal
 <p>99_GD_3021 HH 60.17 %LEL</p>	State = Alarm Alarm Type = HH
 <p>99_GD_3021 MOS GD 10.99 %LEL</p>	State = No Alarm MOS Active
 <p>99_GD_3021 H GD 20.11 %LEL</p>	State = Alarm Alarm Type = H
 <p>99_GD_3021 FLT GD 14.99 %LEL</p>	State = Fault Condition

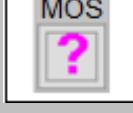
11.2.6 Hydrogen Detector

Normal Presentation	PV, Description												
Abnormal Presentation	Error, Alarm enable state												
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unack and RTN STate and Alarm Type Context menu												
Cda_Hydrogen_sms_h_pati_01.sha													
 <p>D5: Inhibit S1: Tagname D1: Selection box D2: PVState D3: Alarm Priority / Alarm Disable D4: Alarm type D8: Alarm Rectangle</p>													
<table border="1"> <thead> <tr> <th>Shape Status Examples</th> <th></th> </tr> </thead> <tbody> <tr> <td>  99_HGD_9001 H2 10.00 %LEL </td> <td>State = Normal Condition</td> </tr> <tr> <td>  99_HGD_9001 HH ! H2 29.99 %LEL </td> <td>State = Alarm Alarm Type = HH</td> </tr> <tr> <td>  99_HGD_9001 MOS ! H2 8.01 %LEL </td> <td>State = No Alarm MOS Requested</td> </tr> <tr> <td>  99_HGD_9001 FLT ! H2 0.00 %LEL </td> <td>State = Alarm Fault Condition</td> </tr> <tr> <td>  H2? </td> <td>PV = Last good Value Communication Error</td> </tr> </tbody> </table>		Shape Status Examples		 99_HGD_9001 H2 10.00 %LEL	State = Normal Condition	 99_HGD_9001 HH ! H2 29.99 %LEL	State = Alarm Alarm Type = HH	 99_HGD_9001 MOS ! H2 8.01 %LEL	State = No Alarm MOS Requested	 99_HGD_9001 FLT ! H2 0.00 %LEL	State = Alarm Fault Condition	 H2?	PV = Last good Value Communication Error
Shape Status Examples													
 99_HGD_9001 H2 10.00 %LEL	State = Normal Condition												
 99_HGD_9001 HH ! H2 29.99 %LEL	State = Alarm Alarm Type = HH												
 99_HGD_9001 MOS ! H2 8.01 %LEL	State = No Alarm MOS Requested												
 99_HGD_9001 FLT ! H2 0.00 %LEL	State = Alarm Fault Condition												
 H2?	PV = Last good Value Communication Error												

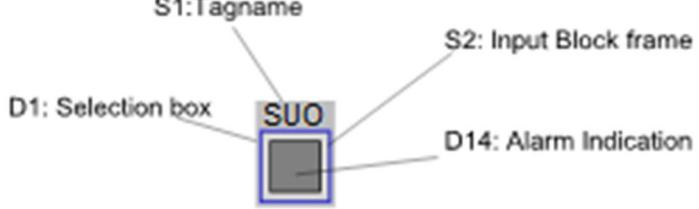
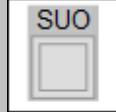
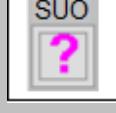
11.2.7 Manual Alarm Call Point

Normal Presentation	PV, Description										
Abnormal Presentation	Error, Alarm enable state										
Alarm Presentation	Alarm Priority, Alarm Acknowledged, Unack and RTN STate and Alarm Type Context menu										
Cda_ManualAlmCall_sms_h_pati_01.sha											
<table border="1"> <thead> <tr> <th>Shape Status Examples</th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td>State = Normal</td> </tr> <tr> <td></td> <td>State = Alarm</td> </tr> <tr> <td></td> <td>State = No Alarm MOS Active</td> </tr> <tr> <td></td> <td>State = Fault Condition</td> </tr> </tbody> </table>		Shape Status Examples			State = Normal		State = Alarm		State = No Alarm MOS Active		State = Fault Condition
Shape Status Examples											
	State = Normal										
	State = Alarm										
	State = No Alarm MOS Active										
	State = Fault Condition										

11.2.8 MOS

Normal Presentation	PV, Tagname
Abnormal Presentation	Error, Alarm Indication
Alarm Presentation	Dinamic Fill Color When In Alarm Context Menu
Cda_SgsMOS_lib_h_pi_01.sha	
<p>S1: Tagname D1: Selection box S2: Input Block frame D14: Alarm Indication</p>	
Shape Status Examples	
	Alarm Indication = Off
	Alarm Indication = On
	Communication/Configuration Error

11.2.9 SUO

Normal Presentation	PV, Tagname
Abnormal Presentation	Error, Alarm Indication
Alarm Presentation	Dinamic Fill Color When In Alarm Context Menu
Cda_SgsSUO_lib_h_pi_01.sha	
 <p>The diagram illustrates the internal structure of the SUO shape. It consists of three nested rectangles. The outermost rectangle is light blue and contains the text "SUO". Inside it is a dark grey square, which is further enclosed by a thin blue border. Four lines point to different parts of this structure with labels: "S1: Tagname" points to the "SUO" text; "D1: Selection box" points to the blue border; "S2: Input Block frame" points to the dark grey square; and "D14: Alarm Indication" points to the blue border of the inner square.</p>	
Shape Status Examples	
	Alarm Indication = Off
	Alarm Indication = On
	Communication/Configuration Error

11.3 HMIWeb Static Shapes

11.3.1 Switch

Normal Presentation	-
Abnormal Presentation	-
Function	Circuit breaker, Disconnector switch, Contactor, Fuse
	

11.3.2 Earthing Switch

Normal Presentation	-
Abnormal Presentation	-
Alarm Presentation	-
	

11.3.3 Transformer

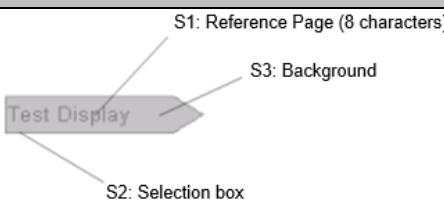
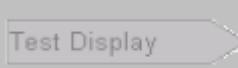
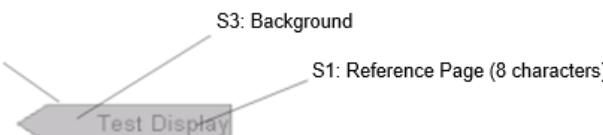
Normal Presentation	-
Abnormal Presentation	-
Alarm Presentation	-
	

11.3.4 Generator

Normal Presentation	-
Abnormal Presentation	-
Alarm Presentation	-
	

11.4 HMIWeb SP Navigation Shapes

11.4.1 Navigation Arrow

Normal Presentation	Display Description (Display description 8 Characters)
Abnormal Presentation	-
Alarm Presentation	Alarm Priority and Alarm Acknowledged on Alarm Group or Asset
All_Navigation_lib_r_i_04	
 <p>S1: Reference Page (8 characters) S3: Background S2: Selection box</p> <p>Note: D - Dynamic S - Static C - Invisible DB Connection</p>	
	Normal View
All_Navigation_lib_l_i_04	
 <p>S2: Selection box S3: Background S1: Reference Page (8 characters)</p> <p>Note: D - Dynamic S - Static C - Invisible DB Connection</p>	
	Normal View

Note: In navigation label, vessel / equipment name will appear and in tooltip the detail will be given. Tooltip shall be seen on station when operator takes mouse cursor on that particular navigation.

12.0 Folder Locations and Distributions:

Below folder paths shall be used for this project.

Path for Complete Project

C:\ProgramData\Honeywell\Experion PKS\Client\Abstract

Path for Shape:

C:\ProgramData\Honeywell\ExperionPKS\Client\Abstract\Shapes

Path for Display

C:\ProgramData\Honeywell\ExperionPKS\Client\Abstract\Displays

Path for Faceplate & Popup

C:\ProgramData\Honeywell\ExperionPKS\Client\Abstract\Popup.

Path for Context Menu

C:\ Program Files (x86) \Honeywell\Experion\Client\system\R5XX

1. Path For Modified Faceplate

C:\ProgramData\Honeywell\ExperionPKS\zent\Abstract\Custom Faceplates

2. Path For CSS File

C:\ProgramData\Honeywell\Experion PKS\Client\Abstract\CSS

3. Path For Script Folder

C:\ProgramData\Honeywell\Experion PKS\Client\Abstract\Script

C:\ProgramData\Honeywell\Experion PKS\Client\Abstract\Custom Script

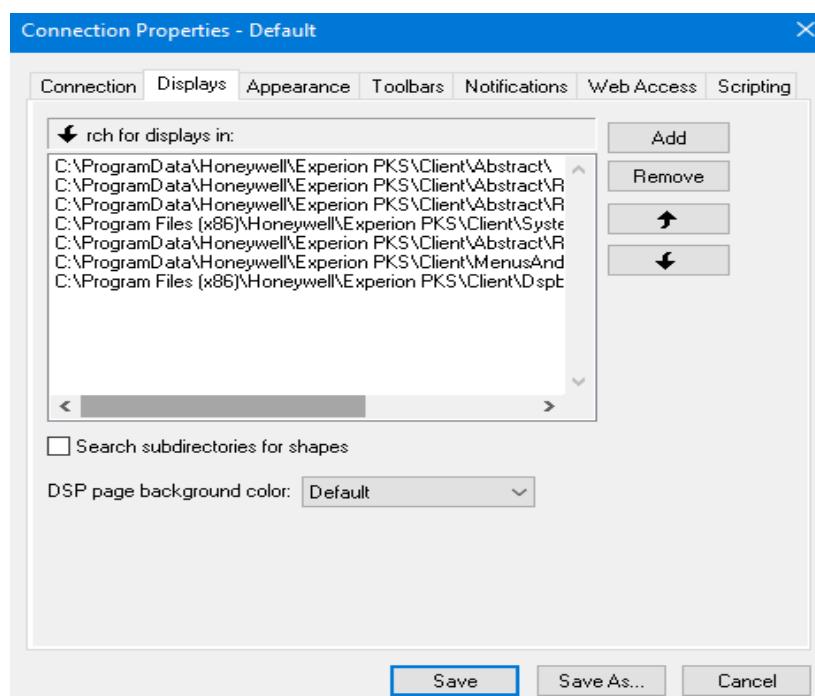


Figure 12. 1 Display Connection Properties in Station