JEA iFIX Graphical Standards v1.5

Revision History

Version	Date	Author(s)	Notes
1.0	2023-10-05	Alex Crocker	Initial Draft
1.1	2023-11-27	Alex Crocker	Updated faceplates and graphics, added some clarification in language
1.2	2023-12-1	Alex Crocker	Updated pump faceplates and details faceplates.
1.3	2024-02-05	Alex Crocker	Updates – some graphics, notes on placeholder with value 1
1.4	2024-02-14	Alex Crocker	Updates to analogs, added Network/PLC screen, add Appendices, Misc. edits.
1.5	2024-03-18	Alex Crocker	Updates to some screenshots, added decimal point selection for analogs with moving numerical indication and trend configuration instructions to Implementation appendix. Added material for alarm horn support.
1.6	2025-01-09	Andrei Ranga	Clerical edits.

Contents

General Principles

Introduction

The purpose of this document is to define graphical standards for JEA iFIX systems. It covers the overall layout and functionality of the application, navigation methods, and security levels, and specifies the appearance and functionality of various forms of equipment depending on which tier of graphic it is being used on.

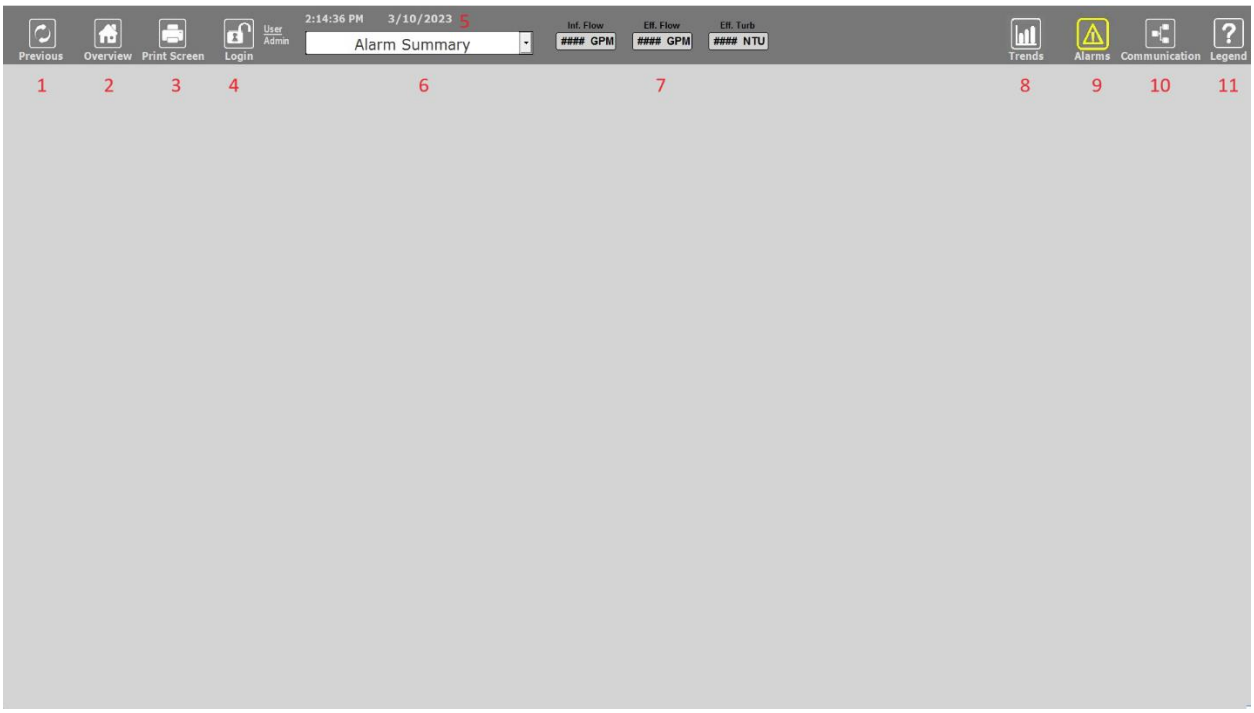
WRF Plant SCADA shall be considered the primary means of plant control, this is to be back up by field hand switches for local control. Any alarming, control, setpoint, or other operator function available from a vendor or other locally installed HMI/OIT displays shall be for fully intergraded and displayed on the Plant SCADA system, allowing for full monitoring and control.

Application Information

- The application shall be Proficy iFIX, version 6.1 or later.
- Application shall be designed to run full screen at a 1920 by 1080 resolution.
- Application shall support multiple monitor use as needed, as a 2nd monitor is used to display an alarm summary.
- iFIX graphics shall utilize the enhanced coordinate system.
- All tags shall be either AI or DI (for non-alarming tags) or AA or DA (for alarming tags). AR and DR tags are not to be used.
- Tags must be named according to JEA tag naming standard. See appendix for reference.
- Screens are categorized as one of four different Tiers. Please see the “Graphics Tiers” section for description of each of the four Tiers.

General Screen Layout

The screen is divided into two sections, the header and the main screen. The header is always showing and shall not be modified except to change KPI data displays as required by plant personnel. It occupies the top 10% of the screen across the whole width. It includes navigation features as well as user login/logout and date and time display. It also has space for some process variables, to be determined separately at each facility. The main screen occupies the rest of the monitor and contains content as controlled by user navigation. Additional data and controls popups and faceplates are accessible via clicking equipment graphics or buttons on the main screen.



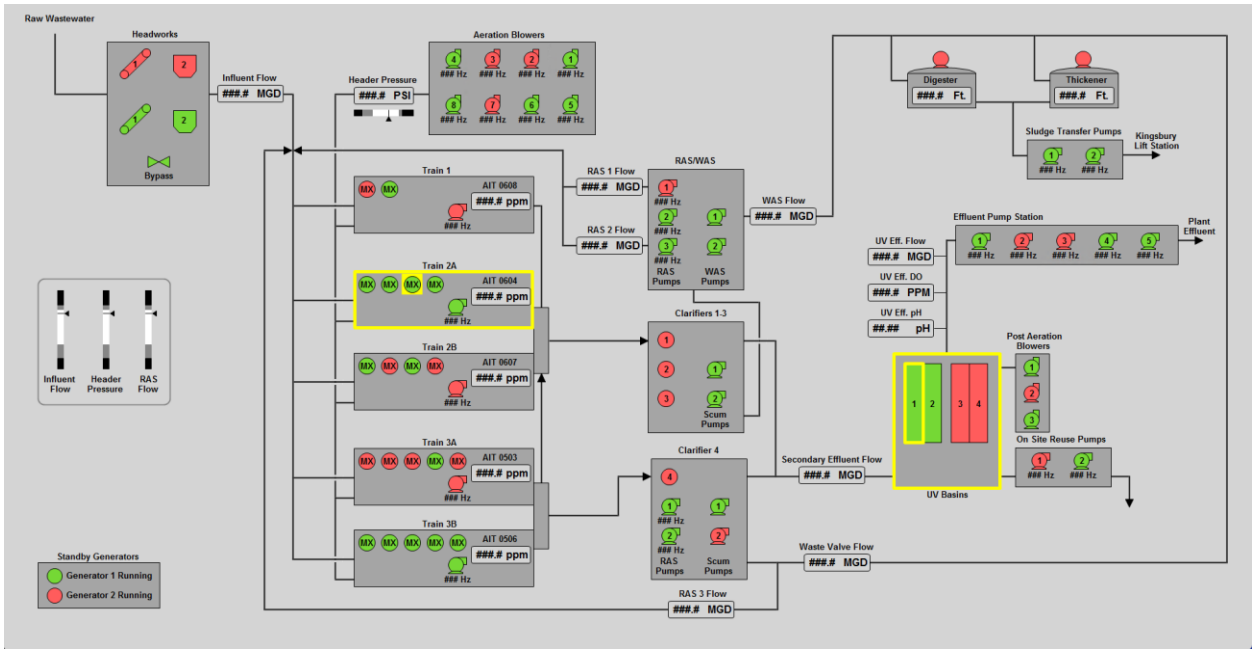
1. Previous button – navigation feature that returns to the last visited Main screen. If pressed multiple times, it will swap between the two most recent screens.
2. Overview button – This is a navigation shortcut to go directly to the main plant overview Tier 1 screen.
3. Print Screen button – This will send the currently displayed screen to a printer.
4. Login/Current User – This button brings up a prompt to login or out of iFIX and display the currently logged in user.
5. Date/Time – This displays the current system date and time.
6. Navigation Dropdown – This is the main central way of navigation through the application. Clicking it causes a dropdown to display where the operator can choose between any of the available Tier 2 screens.
7. Process Variables – This area in the header can be used to display key process variables, as determined by operations at each facility.
8. Trends Button – This navigates directly to the main trend screen, where operators can select from a number of predetermined trends or manually select tags to build custom trends.
9. Alarms button – This navigates directly to the Alarm Summary. The Shelved Alarms and Alarm History screens can be accessed from the Alarm Summary. This icon will be flashing bright yellow when unacknowledged alarms are present.
10. Communication – This navigates to the communication overview screen for the facility.
11. Legend – This navigates to a static page that contains information about the meaning of the various symbols used in the graphics.

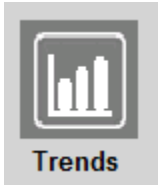
a. 

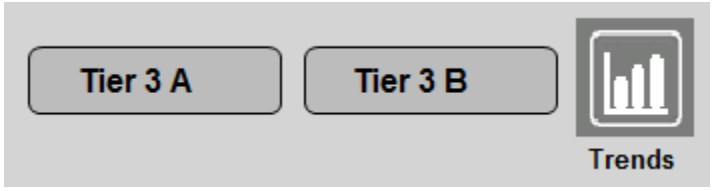
Graphics Tiers

Graphics are divided into various tiers determined by their scope and purpose within the system. They are defined as follows:

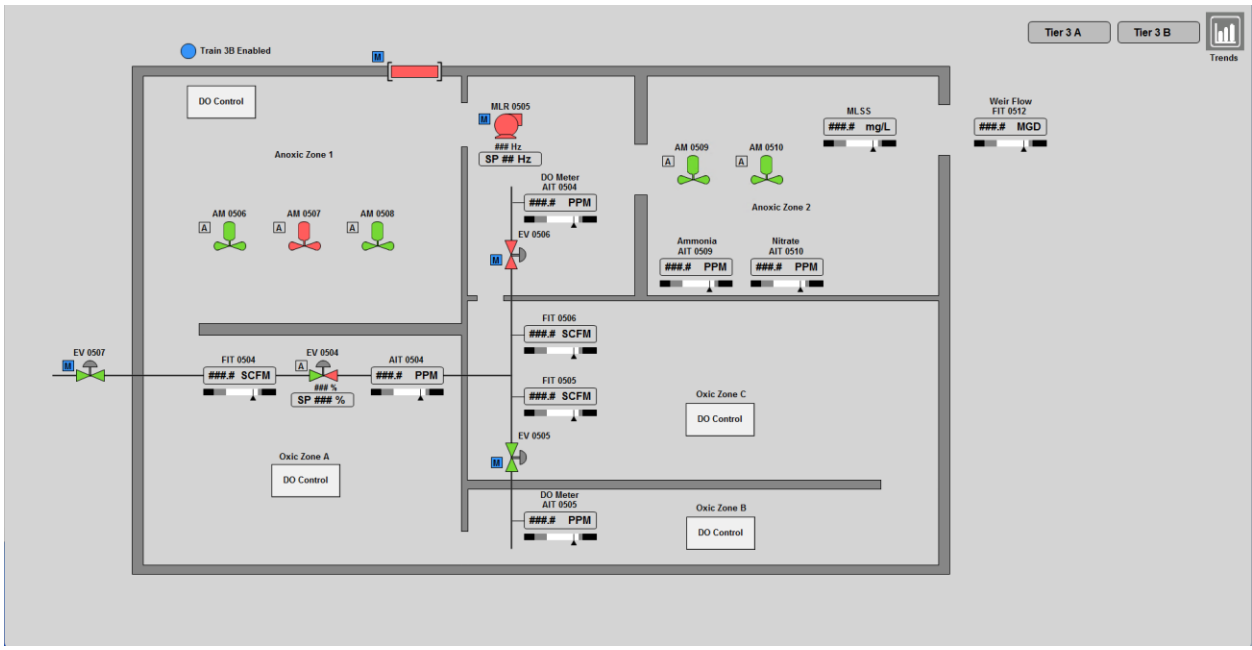
- Tier 1 – Overviews
    - Tier 1 screens are high-level overviews of entire facilities or large systems. They are designed to present the most important information in a way that is easily readable at a glance and will omit details in order to accomplish this. They use smaller, simplified representations of equipment. They are read-only and do not provide any way to make changes or control equipment but do contain navigation functionality, in that clicking on a process area will jump to that area's Tier 2 screen. If a process area has an active alarm, the area will be outlined with bright yellow. They are a birds-eye view of the layout of the facility or system.

- 

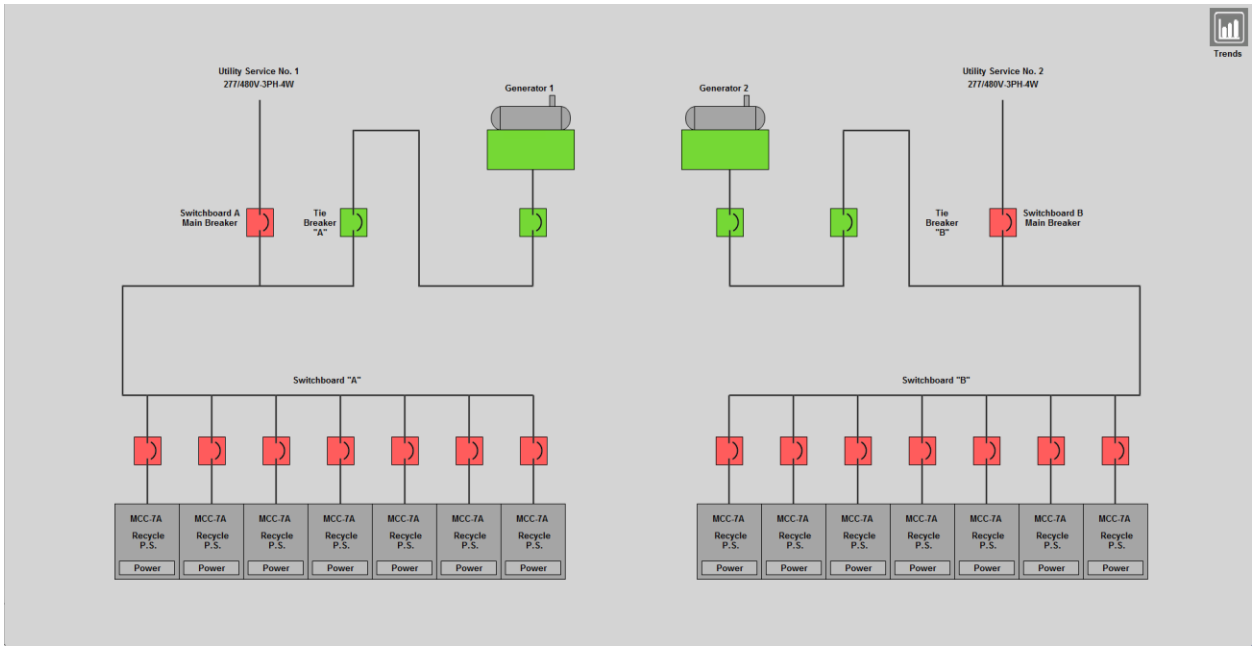
- Tier 2 – Plant Processes
  - Tier 2 screens are more detailed screens that provide the main ways of interacting with the process. Equipment graphics are more detailed than their T1 counterparts. Nothing can be changed or controlled directly from the T2 screen, but each will have buttons and objects that can be clicked to bring up equipment faceplates and controls faceplates where users can control equipment and change process setpoints. Processes will often be depicted in a profile view but may also utilize bird's eye view in some cases.
  - Tier 2 screens will each have an icon in the top right corner that will bring up a Tier 2 trend, that functions identically to the main trend screen but has predefined pen sets that correspond to just that Tier 2 area.
    - 

  - If there are Tier 3 screens associated with the area, there will be rounded rectangular navigation buttons adjacent to the "Trends" button for navigation to them.
    - 

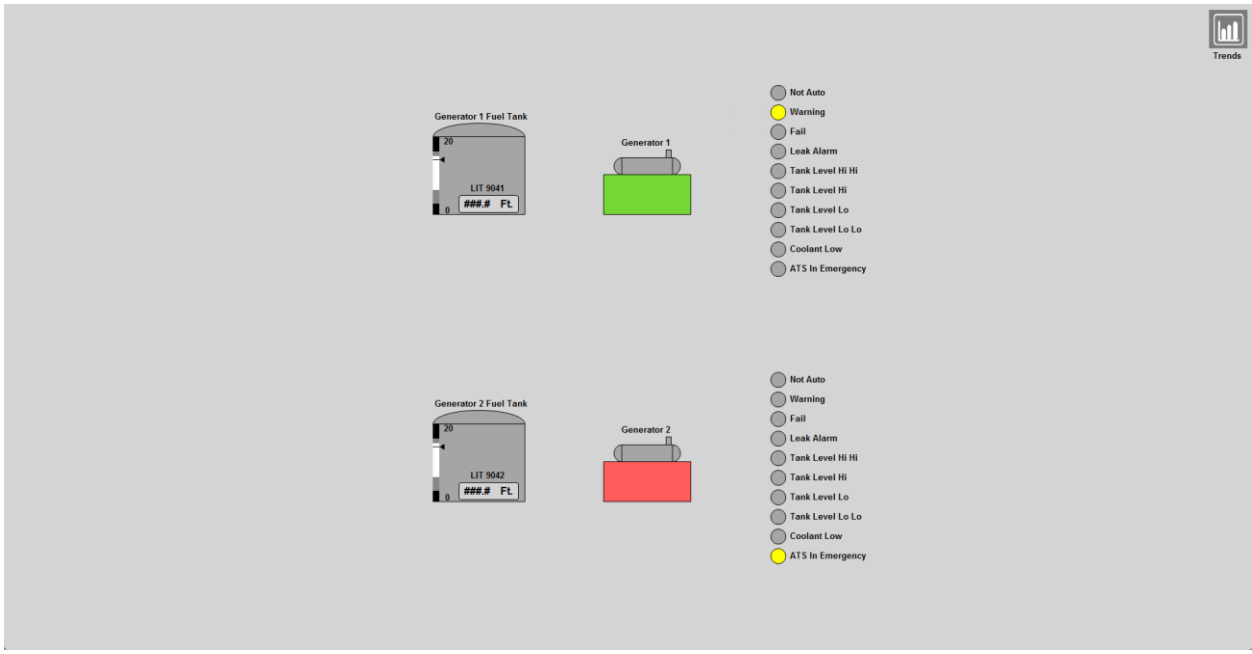
  - Example: Aeration Train

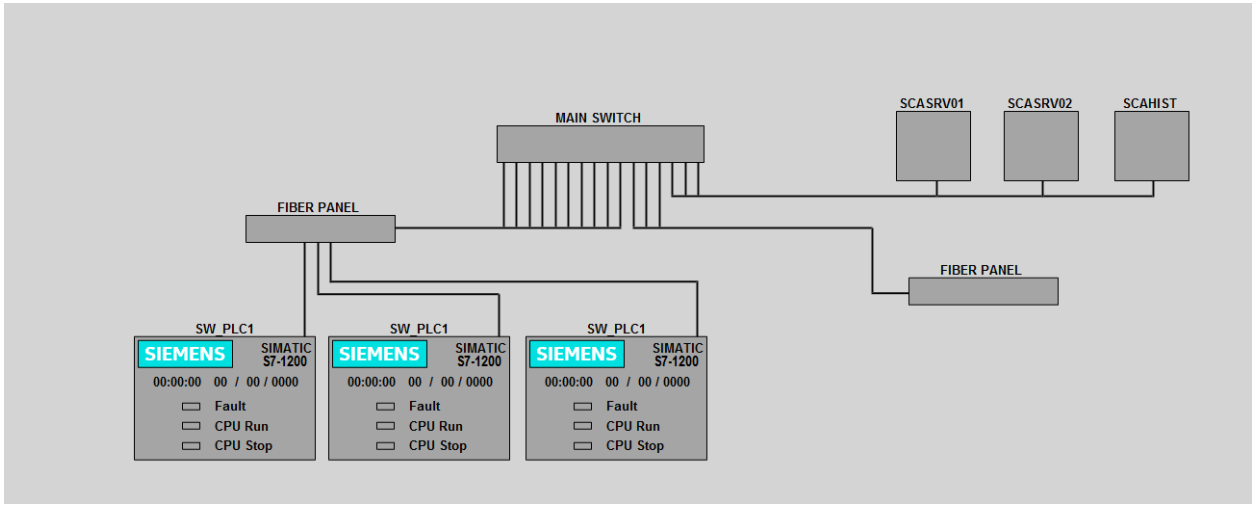


- Example: Power Distribution



- Example: Generators

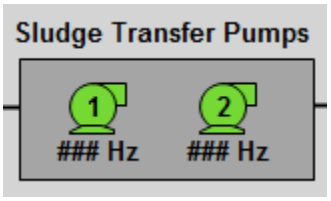
- 

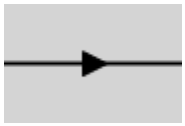
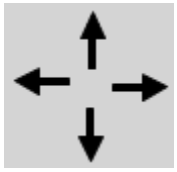
  - Example: Network Overview
- 

- Tier 3 - Systems
  - This optional tier consists of more detailed versions of T2 screens for sections of very large process areas, such as a single UV channel or SBR.
  - They will keep the same graphical standards as a Tier 2 screen but include additional detail.
  - Navigation to a Tier 3 graphic will not be from the main navigation dropdown. Tier 3 graphics are accessible from navigation buttons on Tier 2 graphics.
- Tier 4 – Trends, alarms, etc.
  - Tier 4 screens are summary or utility screens such as alarm summaries, daily flow total summaries, or equipment runtime summaries.

Graphical Standards

- Main screens will have a grey background color, specified as color 13948116 in iFIX.

- Rectangles may be used to group objects together or represent things like splitter boxes or wet wells. These should have black edges of width 1 and can have a fill color of HPGraphite (10855845) or be hollow with no fill. They may have rounded corners, in which case the roundness should be adjusted so that the corners are semicircular with a small radius, rather than gradual.
    - 

- Faceplates shall have a grey-blue background color, specified as color 13417369 in iFIX.
- Piping and process flow will be indicated by black lines of width 2.
    - Black arrows of 10h x 10w may be used to indicate flow direction.
        - 
    - Flow direction in channels/basins may be indicated with sparing use of arrows.
        - 
- Static text is 10-point arial, bold.
- Dynamic text is 12-point arial, bold.
    - Dynamic text that is operator-enterable is indicated by a white rectangle.
        - 

- Equipment that is active or in service, such as a running pump or open valve, is indicated by the color HPBlush (6053119).
- Equipment that is inactive, such as a stopped motor or closed valve, is indicated by the color HPBrightGreen (3528821).
- Alarms are indicated by the color BrightYellow (65535).
- Devices in an “Out of Comm” state will have a red X over them to indicate this.
    - 
    - The “Out of Comm” alarm shall be configured to be active when the value of the tag is 1, so for equipment that does not have an “Out of Comm” alarm it is necessary to use a placeholder tag that has a value of 1.
- Text or objects are not to be animated in such a way that they become invisible in some states. Digital statuses can be indicated by an “indicator light” with a label, as will be described in the next section.

Objects

This section details the graphical objects that are to be used for each type of equipment in each screen tier.

Integrators shall use existing JEA dynamos for all pieces of standard equipment to ensure consistent application of standards. These are located dynamo sets called JEA_PumpsMotors.fds, JEA_Valves.fds, JEA_Analogs.fds, and JEA_MiscEquip.fds. These dynamos are associated with pre-defined faceplate popups, which shall not be modified. For static graphics, integrators shall use objects from AAA_StaticGraphicPalette.grf. Process control popups will be customized for each process but shall comply with standards principles and use the same set of objects as other faceplates.

Tier 1 Objects

In general, T1 objects are smaller and less detailed than their T2 counterparts. Clicking on these has no effect, as there is no user interaction with equipment on Tier 1 screens.

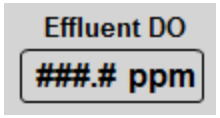
- Pumps and Motors
  - HPBlush indicates Running, HPBrightGreen indicates Stopped.
  - Variable speed motors have the speed in Hz indicated beneath the object.
  - Equipment in alarm has a bright yellow box behind it.
  - Different types of pumps/motors are indicated by different graphics, as shown here:
    - Variable Speed Pump
      - 

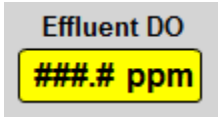
    - Fixed Speed Pump
      - 
    - Blower
      - 
    - General motor (in Alarm)
      - 
    - Mixer
      - 

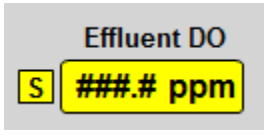
- Valves
  - HPBlush indicates Open, HPBrightGreen indicates Closed.
  - Modulating valves shall have the position (in Percent Open) indicated under the object.
  - Valves that are neither fully open nor closed are to be animated such that half is HPBrightGreen and half is HPBlush. This applies to open/close valves in transition as well as modulating valves that are not fully open or closed.
  - Valve graphic may be rotated 90 degrees when shown on a pipe that is vertical on the screen.
  - Valve in alarm has a bright yellow box behind it.

- Valve graphics shown here.
  - Modulating valve in transition
    - 

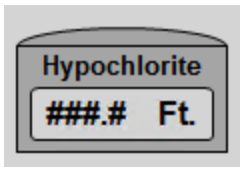
  - Fully closed valve (in Alarm)
    - 
  - Fully open valve
    - 
  - Vertical valve
    - 
- Graphics are also provided for hand-operated valves with no status indication. The just appear as static grey valve objects.
  - 

- Analog Value
  - Dynamic text in a rounded rectangle with a HPGull (13948116) fill color.
  - There will be text above the analog value containing either the instrument label or a description of the PV.
  - If the analog value is in alarm, the background of the rectangle will turn BrightYellow
  - If the analog value is in simulation mode, it will show as in alarm with a “S” indicated in a box to the left.
  - Analog value graphics shown here.
    - Analog Value
      - 

    - In alarm
      - 

    - In simulation mode
      - 

- Tank
  - A tank is indicated by an analog value within a tank graphic composed of a rectangle with a domed top.
    - Graphic shown here:



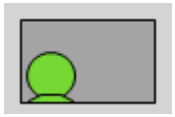
- Other equipment
    - Miscellaneous equipment can be shown with the following graphics, animated to change color based on the in-service status of the equipment.
        - Bar screen graphic

        - Grit Classifier

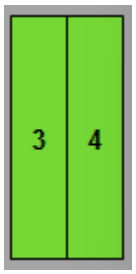
        - Clarifier

        - Centrifuge

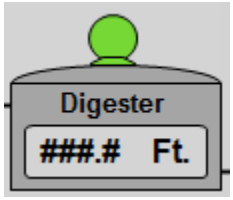
        - Compressor



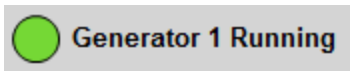
        - UV Basins



        - Digester



- Digital statuses
    - Digital statuses can be indicated with a “indicator light” circle with a text label next to it.
        - For equipment statuses such as a generator running statuses, the colors will be HPBlush/HPBrightGreen similar to motors.

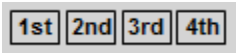


- For digital alarms, the colors will be BrightYellow for an active alarm and HPGraphite for no alarm.
  - There is also a smaller version of the alarm indication circle available for use in situations where screen space availability becomes an issue.
    - 
- For general digital statuses, the colors will be HPGraphite for "Off" and HPSkyBlue (16290614) for "On."

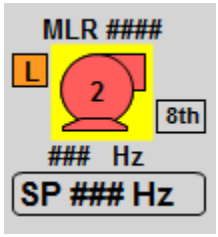
- Area Alarm Indication
  - For process areas that have a defined Alarm Area in the database configuration, they will have a yellow box appear and outline them when any alarm in that area is active.
    -

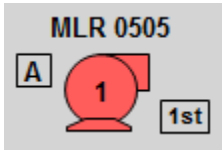
Tier 2 Objects

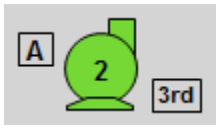
In general, Tier 2 objects are represented at a larger size than their Tier 1 counterparts. They also contain additional information regarding local, manual, or automatic status and sequence position if applicable. Clicking on a piece of equipment's Tier 2 graphic will bring up the equipment's faceplate.

- Local, Automatic, and Manual Indication
  - Wherever applicable, Tier 2 graphic objects will indicate Automatic, Manual and Local control status with a letter in a colored box to the top left of the object.
  - Only one indication at a time is shown, as Automatic and Manual control imply that the equipment is in Remote, and when it is in Local, the Automatic/Manual status is not relevant.
  - Automatic status is indicated by an "L" in a box with fill color HPGull (13948116)
    - 
  - Manual status is indicated by an "M" in a box with fill color HPSkyBlue
    - 
  - Local status is indicated by an "L" in a box with fill color HPPumpkin (2201855)
    - 
- Sequence indication
  - When equipment is part of a call sequence (such as duty-standby or lead-lag-lag2), the position in the sequence will be indicated by text in a box with fill color HPGull (13948116), to the right of the object.
    - 

- Pumps and Motors
  - HPBlush indicates Running, HPBrightGreen indicates Stopped.
  - Variable speed motors have the speed in Hz indicated beneath the object.
    - The commanded speed is indicated by larger text in a box underneath the speed feedback.
  - Equipment in alarm has a bright yellow box behind it.

- Tier 2 pump and motor objects include the Automatic/Manual/Local and sequence statuses as described above.
- Tier 2 pump and motor objects show the equipment label above the graphic.
- Clicking on the object on a Tier 2 screen brings up the equipment faceplate popup.
- Different types of pumps/motors are indicated by different graphics, as shown here:
  - Variable Speed Pump
    - 

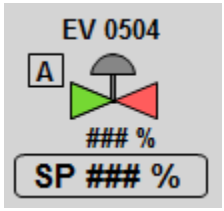
  - Fixed Speed Pump
    - 

  - Blower
    - 

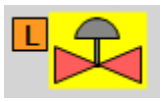
  - General motor (in Alarm)
    - 

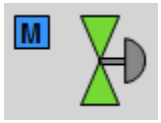
  - Mixer
    - 

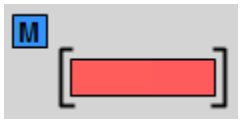
- Valves
  - HPBlush indicates Open, HPBrightGreen indicates Closed.
  - Modulating valves shall have the position (in Percent Open) indicated under the object.
    - The commanded position is indicated by larger text in a box underneath the speed feedback.
  - Valves that are neither fully open nor closed are to be animated such that half is HPBrightGreen and half is HPBlush. This applies to open/close valves in transition as well as modulating valves that are not fully open or closed.
  - Valve graphic may be rotated 90 degrees when shown on a pipe that is vertical on the screen.
  - Valve in alarm has a bright yellow box behind it.
  - Tier 2 valve objects include the Automatic/Manual/Local as described above.
  - Tier 2 valve objects show the equipment label above the graphic.
  - On Tier 2 graphics that use a birds-eye view perspective, it is permissible to use a rectangle with brackets to indicate a gate valve.

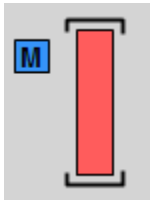
- Clicking on the object on a Tier 2 screen brings up the equipment faceplate popup.
- Valve graphics shown here.
  - Modulating valve in transition
    - 

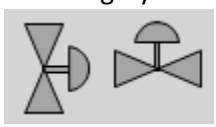
  - Fully closed valve
    - 

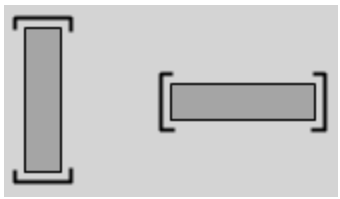
  - Fully open valve (in Alarm)
    - 

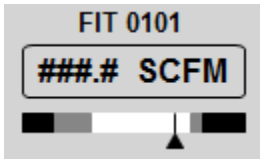
  - Vertical valve
    - 

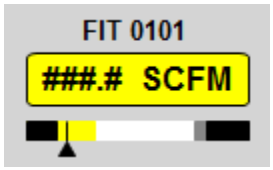
  - Gate valve
    - On Tier 2 screens that depict a channel as a pipe, generic valve graphics (shown above) will be used. If a Tier 2 screen depicts a bird's eye view of a structure like an Aeration Train and it would be un-intuitive to use a generic valve graphic, this gate valve symbol may be used.
      - 

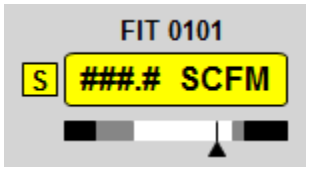
  - Vertical gate valve
    - On Tier 2 screens that depict a channel as a pipe, generic valve graphics (shown above) will be used. If a Tier 2 screen depicts a bird's eye view of a structure like an Aeration Train and it would be un-intuitive to use a generic valve graphic, this gate valve symbol may be used.
      - 

- Graphics are also provided for hand-operated valves with no status indication. The just appear as static grey valve objects.
  - 

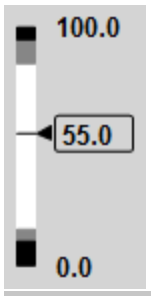
- 

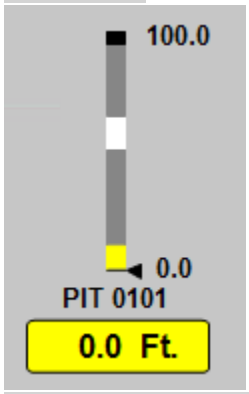
- Analog Value
  - Dynamic text in a rounded rectangle with a HPGull (13948116) fill color.
  - There will be text above the analog value containing the instrument label.
  - If the analog value is in alarm, the background of the rectangle will turn BrightYellow.
  - If the analog value is in simulation mode, it will show as in alarm with a “S” indicated in a box to the left.
  - Clicking on the object on a Tier 2 screen brings up the analog faceplate popup.
  - Optionally, the object may include horizontal bar that indicates the analog value travelling up and down its range.
    - This bar includes ranges at the high and low end to indicate alarm thresholds. The outermost range will be HPTrueBlack (0) to indicate High High and Low Low, and the inner range will be HPSmoke (8816262). If an alarm occurs, the appropriate range will be animated to change color to BrightYellow.
      - 
  - Analog value graphics shown here.
    - Analog Value with Indicator Bar
      - 

    - In alarm
      - 

    - In simulation mode
      - 

    - In addition, a standalone analog indication bar graphic is available in both vertical and horizontal varieties, as well as a vertical bar graphic with numerical indication, and one with a sparkline as well.

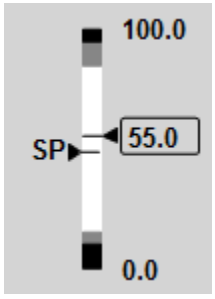
- 

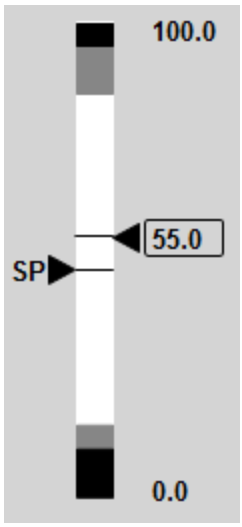
- 

- 

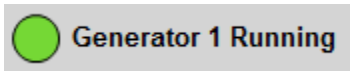
- For objects that include a moving numerical indicator along the bar graph, the number of digits after the decimal place can be specified in the "Format" property of the animation.

▪ For use on Control Setpoint Popups, there are also analog bar graphics that include an indication of the process setpoint in relation to the process variable. There is also a large version of this.

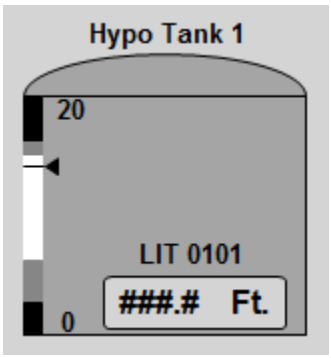
- 

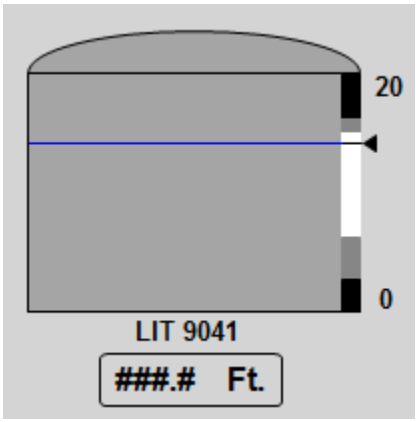


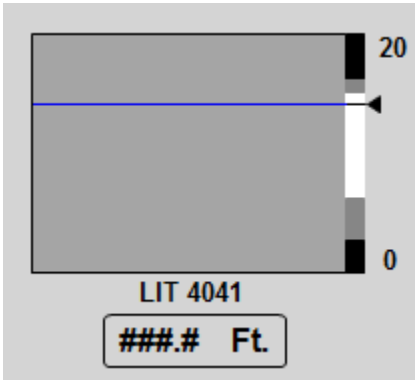
- For objects that include a moving numerical indicator along the bar graph, the number of digits after the decimal place can be specified in the “Format” property of the animation.

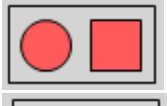
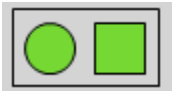
- Digital statuses
  - Digital statuses can be indicated with a “indicator light” circle with a text label next to it.
    - For equipment statuses such as a generator running statuses, the colors will be HPBlush/HPBrightGreen similar to motors.
      - 

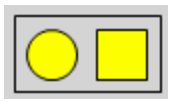
    - For digital alarms, the colors will be BrightYellow for an active alarm and HPGraphite for no alarm.
      - There is also a smaller version of the alarm indication circle available for use in situations where screen space availability becomes an issue.
        - 
      - A yellow box behind an object or piece of equipment can also be used to indicate an alarm status.
        -
    - For general digital statuses, the colors will be HPGraphite for “Off” and HPSkyBlue (16290614) for “On.”
- Tank
  - Tanks are shown as rectangles with domed tops, with an analog value inside the tank. A vertical version of the indicator bar used on the Analog Value object is placed on the left side of the tank graphic.

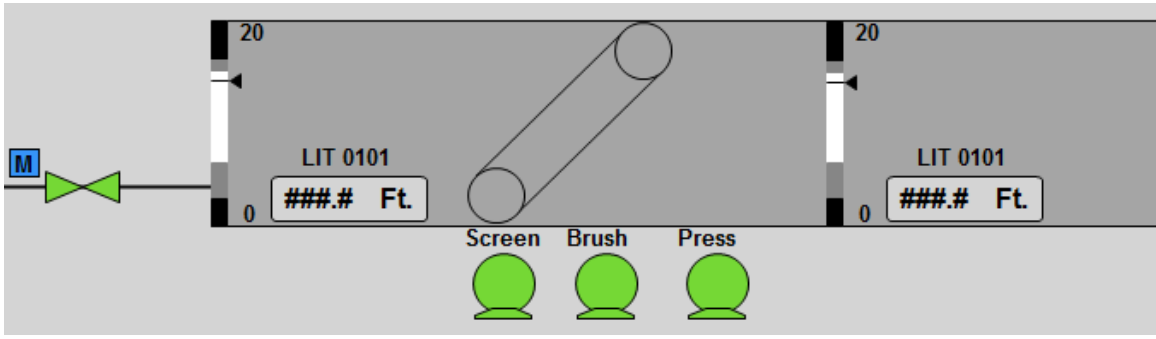
- 

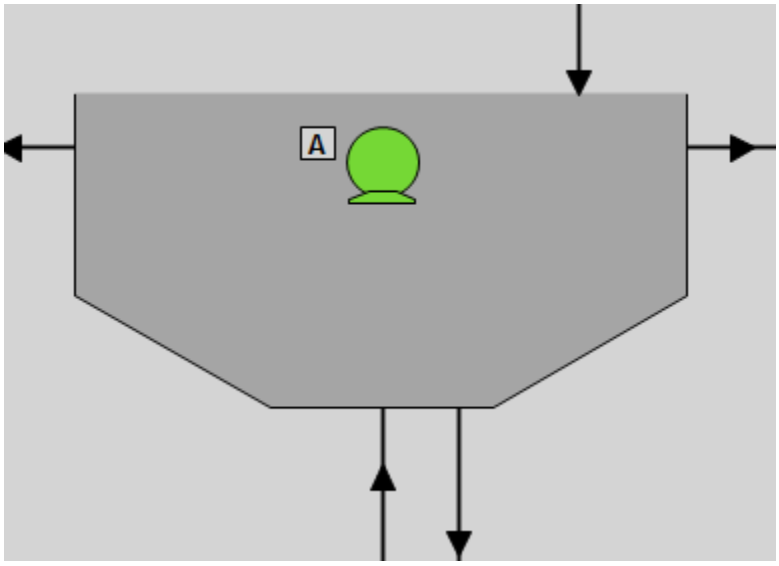
- On-screen trends
  - In some cases, it may be useful to show a simplified historical trend on the Tier 2 screen for a tank or wet well level. There is a dynamo that includes this functionality for a tank and wet well.
  - 

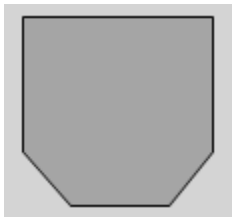
  - 

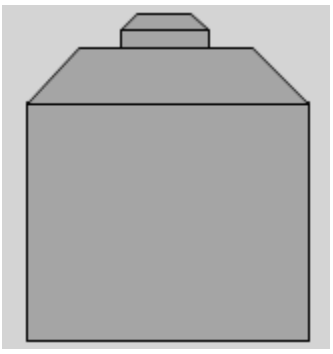
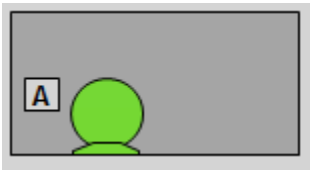
- UV System
  - UV System bulbs will be shows as circles.
  - UV System ballasts will be shown as squares.
  - Colors will match existing standards, HPBlush for on, HPBrightGreen for off and BrightYellow for alarm.
    - 
    - 

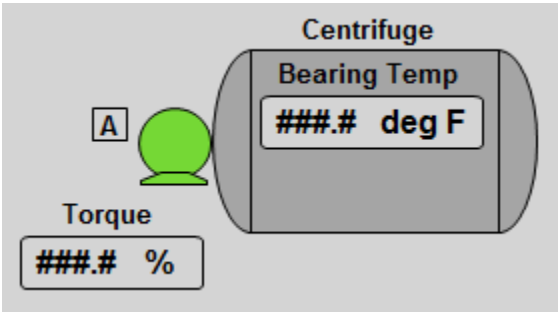
- 

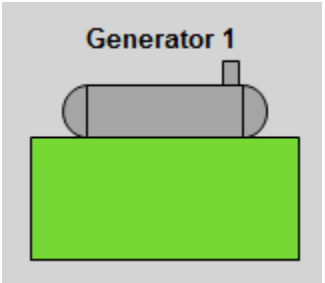
- Other Equipment
  - On Tier 2 screens, equipment is shown at a higher level of detail, so some pieces of equipment that are represented by animated symbols on Tier 1 screens are instead represented by static shapes with standard motor, valve, analog, and/or digital objects placed appropriately.
  - Bar screen channel
    - 

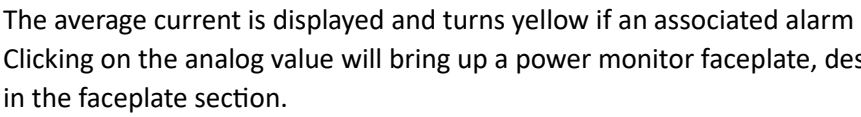
  - Clarifier
    - 

  - Grit Classifier
    - 
  - Odor Control Tower

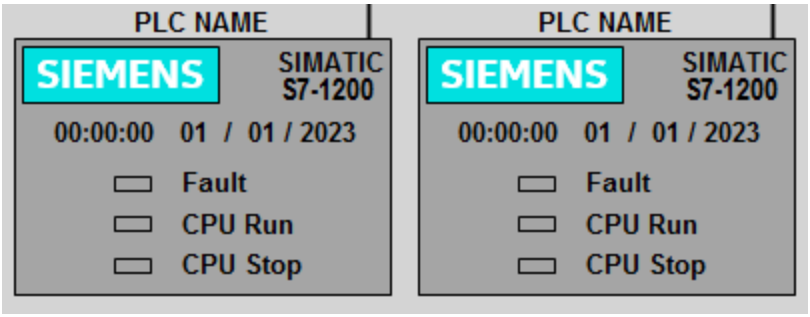
- Compressor
  - 
- Centrifuge
  - 

- Generator
  - 

- Circuit Breaker for Power Distribution Screen
  - 

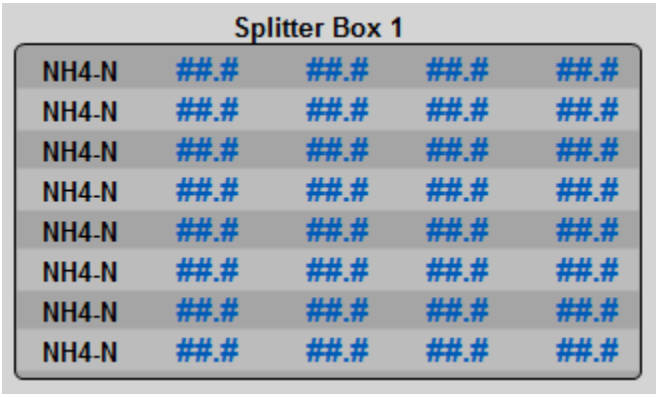
- Power Monitor
  - 
  - 

  - The average current is displayed and turns yellow if an associated alarm occurs.
  - Clicking on the analog value will bring up a power monitor faceplate, described in the faceplate section.
- PLC



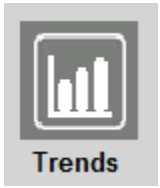
- PLC Dynamos are created for use on the Network Status screen, displaying key information from the PLC as well as indicating what type it is.
- Clicking on this object will bring up the PLC faceplate, which contains information about field devices connected to that PLC, as shown in the faceplate section.

- Data blocks
  - If a table or grid of data is needed, a data block outlined by a rounded rectangle may be used.
  - Border will be black, with width of 1. Roundness of corners will be adjusted so that they are small semi-circles instead of gradual.
  - Interior of box are alternating rows of HPGraphite (10855845) and HPAluminum (12369084), to aid readability.
  - Labels are standard static text, data in 12-point bold Arial in HPDeepBlue (12147712)



- Buttons
  - Process area controls setpoints popups are accessed by clicking on buttons on T2 screens.

- Navigation
  - Navigation arrows may be used on Tier 2 screens to jump directly to other Tier 2 screens to follow process flow.

- A "Trend" icon will be placed in the upper right corner, that navigates to the Tier 2 Trend for that area.
  - 

- Data Summary/Reporting Screens (e.g., ChemScan)
  - If there is a need for screens that display large amounts of summary data with the intent of printing them out on a regular basis for reporting needs, a black and white table of labels and values can be used.
    - These shall be created using only black text and lines on a white background to facilitate printing.
    - Shall be just a combination of static and dynamic text, along with black vertical and horizontal lines of width 1.
  - For dynamic data, columns of numerical data shall be right-aligned, with their engineering unit labels left-aligned for clarity of reading.
  -

Flow Meter	Flow Rate	Current Total	Yesterday Totals
Influent Flow	123.7 MGD	######.# MG	######.# MG
Effluent Flow	488852.4 MGD	######.# MG	######.# MG
RAS Flow	5 MGD	######.# MG	######.# MG
Influent Flow	38.25 SCFM	######.# MG	######.# MG
Influent Flow	######.# MGD	######.# MG	######.# MG
Influent Flow	######.# MGD	######.# MG	######.# MG
Influent Flow	######.# MGD	######.# MG	######.# MG
Influent Flow	######.# MGD	######.# MG	######.# MG

Faceplates

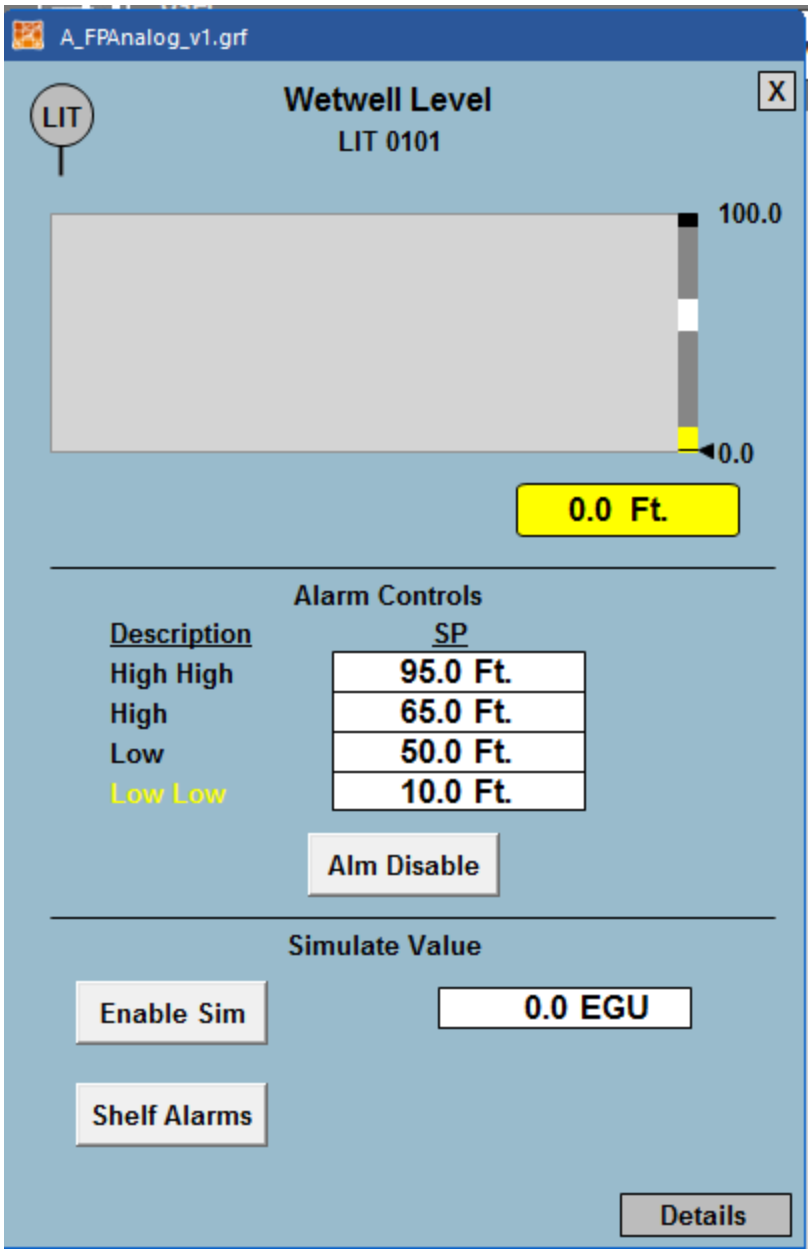
This section details faceplates that are to be used with each different type of equipment and instrument. It also provides guidelines for creating process control setpoints popups, and information on how the tag status display and quick trend is used.

General Guidelines

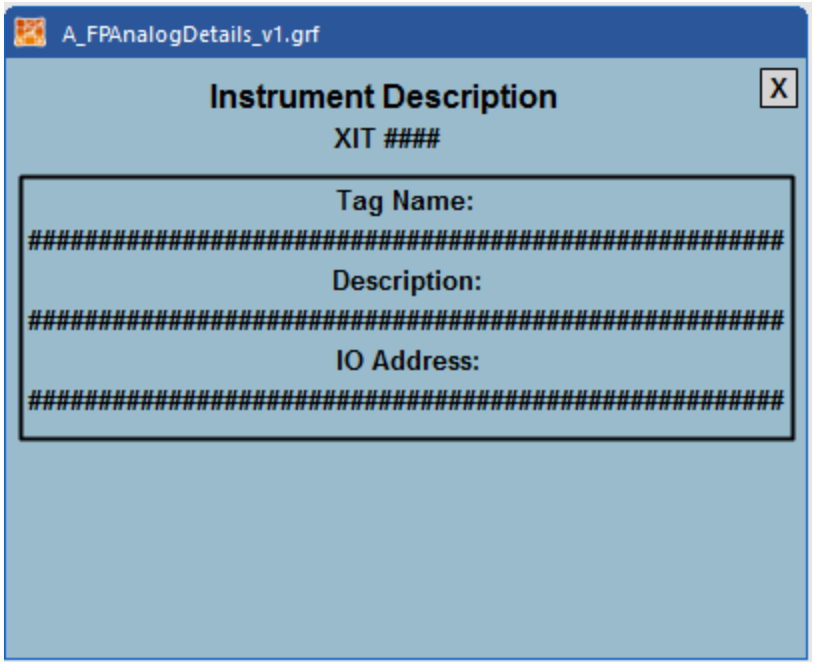
- Popup background color is a custom blue grey, specified as 13417369
- Each faceplate has a grey box in the upper right corner with an "X" in it, used to close the popup.
- For all standardized equipment and instrument faceplates, the specified .grf file is to be used with no modifications. A corresponding tag group file will be created for each piece of equipment and instrument.

Equipment and Instrument Popups

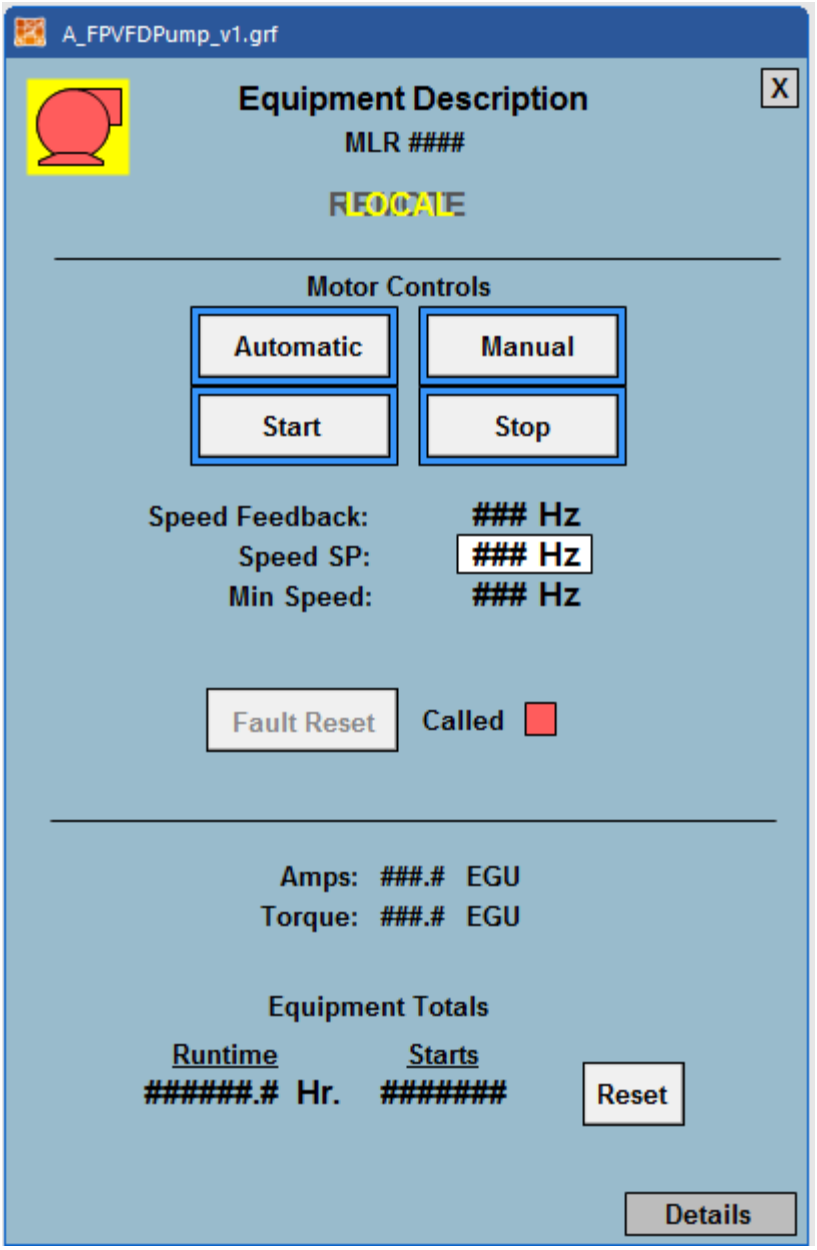
- Analog Instrument
    - Use JEA_AnalogFP_v1.grf.
    - Use associate tag group file AnalogInstrument.tgd as a template for creating the tag group file.
    - Analog instrument tags will leverage the alarming features of the AA block type in iFIX to handle alarming.
    - Alarm setpoints and disables are not editable by users in the Operator security level.
    - The PV tag must have some specific configuration in the DB for the features of the dynamo and faceplate to function.
        - On the “Advanced” tab, the Alarm Extension 1 field must be populated with the instrument label, which much exactly match the filename of the .tgd file.
        - On the “Alarm” tab, the “Enable Alarming” box must be checked, the Alarm Suspend field must be populated with the Alarm Disable SIM tag for that instrument, the “Enable Alarm Shelving” box must be checked, and some Shelve Policy must be selected.



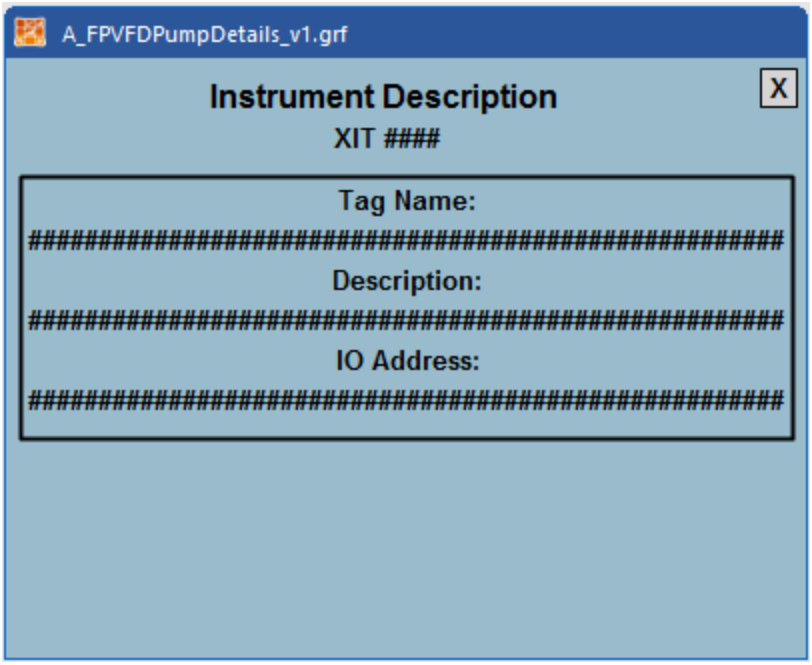
- The “details” button brings up JEA_AnalogFPDetails_v1.grf, utilizing the same tag group file.



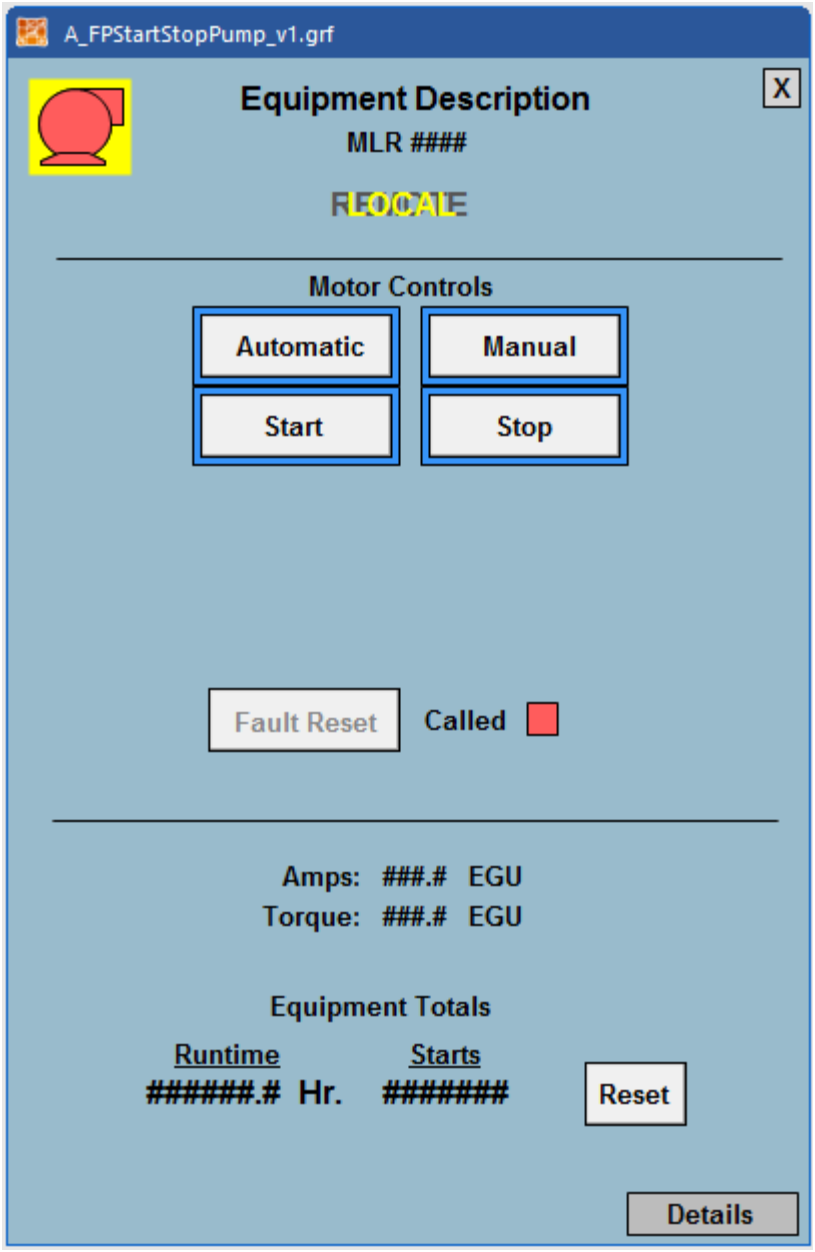
- Pumps/Motors
  - Variable Speed Motors
    - Use JEA_VFDPumpFP_v1.grf.
    - Use associate tag group file VFDPump.tgd as a template for creating the tag group file.
    - The running feedback tag must have some specific configuration in the DB for the features of the dynamo and faceplate to function.
      - On the “Advanced” tab, the Alarm Extension 1 field must be populated with the equipment label, which much exactly match the filename of the .tgd file.
      - On the “Alarm” tab, the “Enable Alarming” box must be checked, the Alarm Suspend field must be populated with the Alarm Disable SIM tag for that instrument, the “Enable Alarm Shelving” box must be checked, and some Shelve Policy must be selected.
    - There are visibility flags in the .tgd file which hide the Amps, Torque, and Runtime and Starts totals if set to 0.
      - The substitutions for these tags must still be populated, but a placeholder tag can be used.



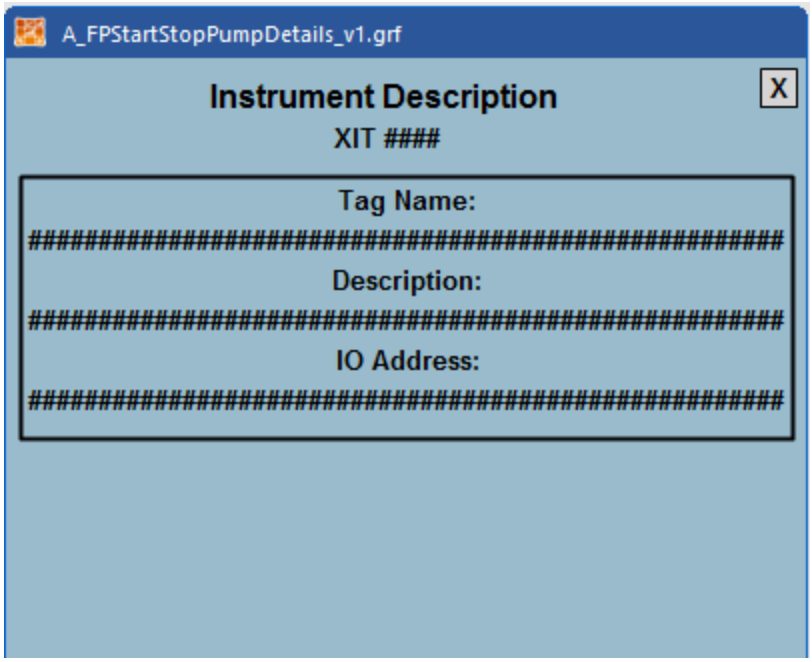
- The "details" button brings up JEA_VFDPumpFPDetails_v1.grf, utilizing the same tag group file.



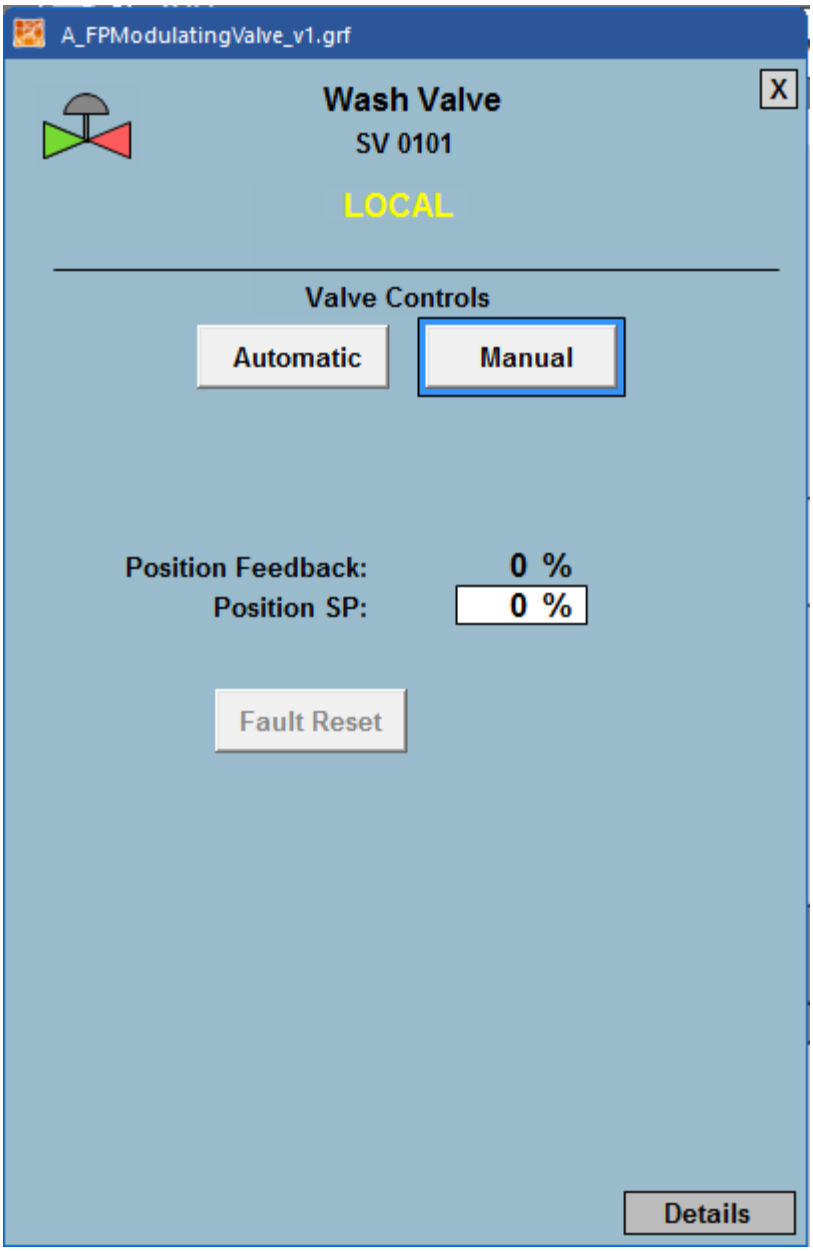
- Start/Stop Pumps and Motors
  - Use JEA_VFDPumpFP_v1.grf.
  - Use associate tag group file StartStopPump.tgd as a template for creating the tag group file.
  - The running feedback tag must have some specific configuration in the DB for the features of the dynamo and faceplate to function.
    - On the “Advanced” tab, the Alarm Extension 1 field must be populated with the equipment label, which much exactly match the filename of the .tgd file.
    - On the “Alarm” tab, the “Enable Alarming” box must be checked, the Alarm Suspend field must be populated with the Alarm Disable SIM tag for that instrument, the “Enable Alarm Shelving” box must be checked, and some Shelve Policy must be selected.
  - There are visibility flags in the .tgd file which hide the Amps, Torque, and Runtime and Starts totals if set to 0.
    - The substitutions for these tags must still be populated, but a placeholder tag can be used.



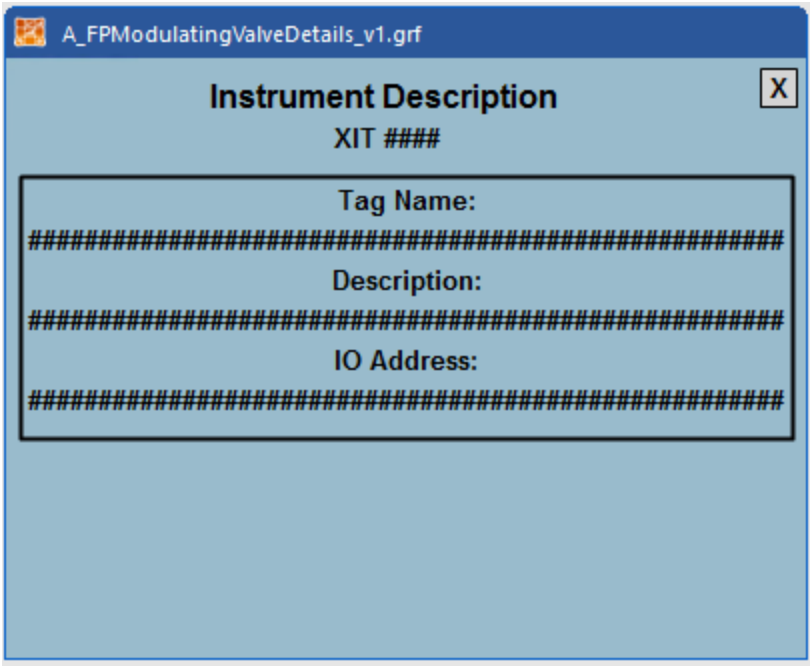
- The "details" button brings up JEA_StartStopPumpFPDetails_v1.grf, utilizing the same tag group file.



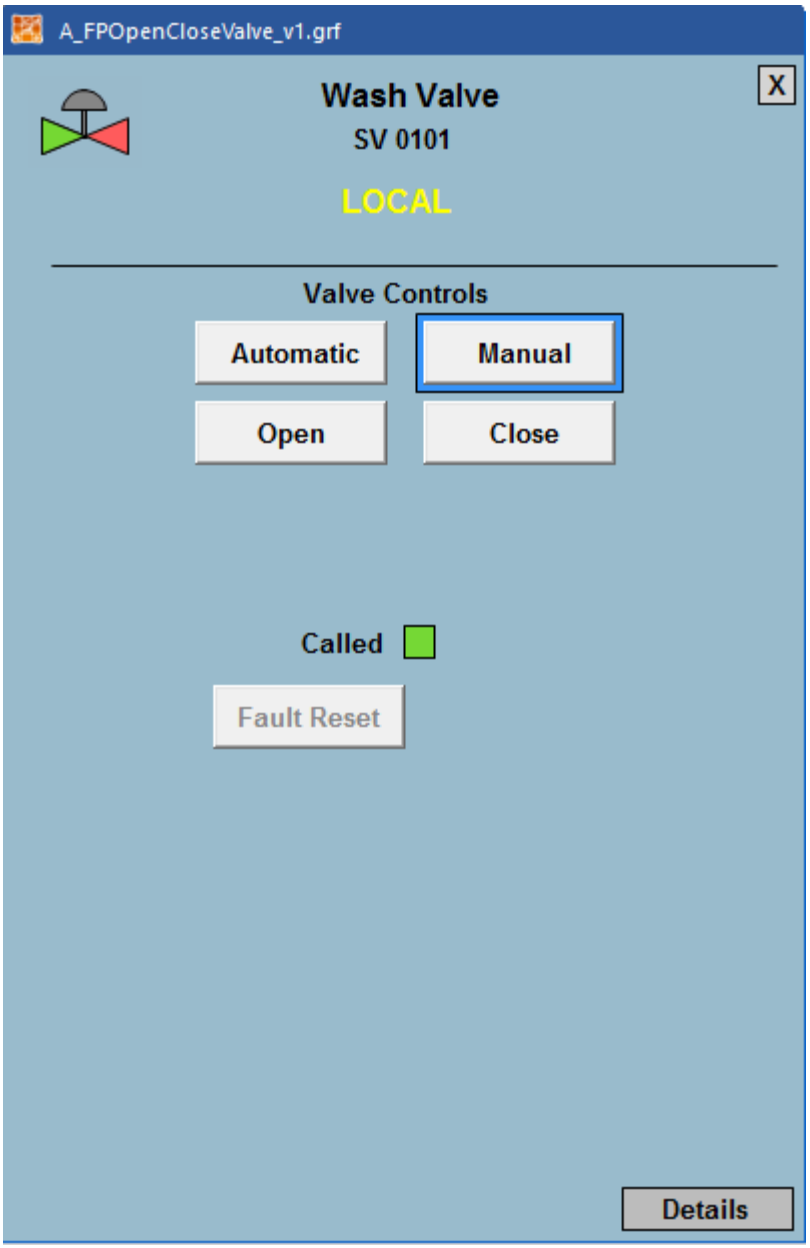
- Valves
  - Modulating Valve
    - Use JEA_ModulatingValveFP_v1.grf
    - Use associate tag group file ModulatingValve.tgd as a template for creating the tag group file.
    - The opened feedback tag must have some specific configuration in the DB for the features of the dynamo and faceplate to function.
      - On the “Advanced” tab, the Alarm Extension 1 field must be populated with the equipment label, which much exactly match the filename of the .tgd file.
      - On the “Alarm” tab, the “Enable Alarming” box must be checked, the Alarm Suspend field must be populated with the Alarm Disable SIM tag for that instrument, the “Enable Alarm Shelving” box must be checked, and some Shelve Policy must be selected.



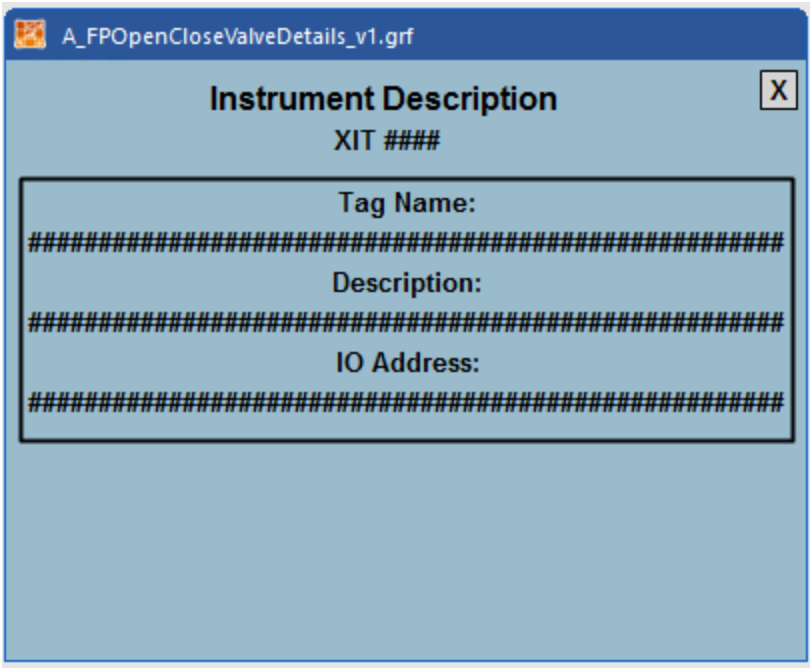
- The "details" button brings up JEA_ModulatingValveFPDetails_v1.grf, utilizing the same tag group file.



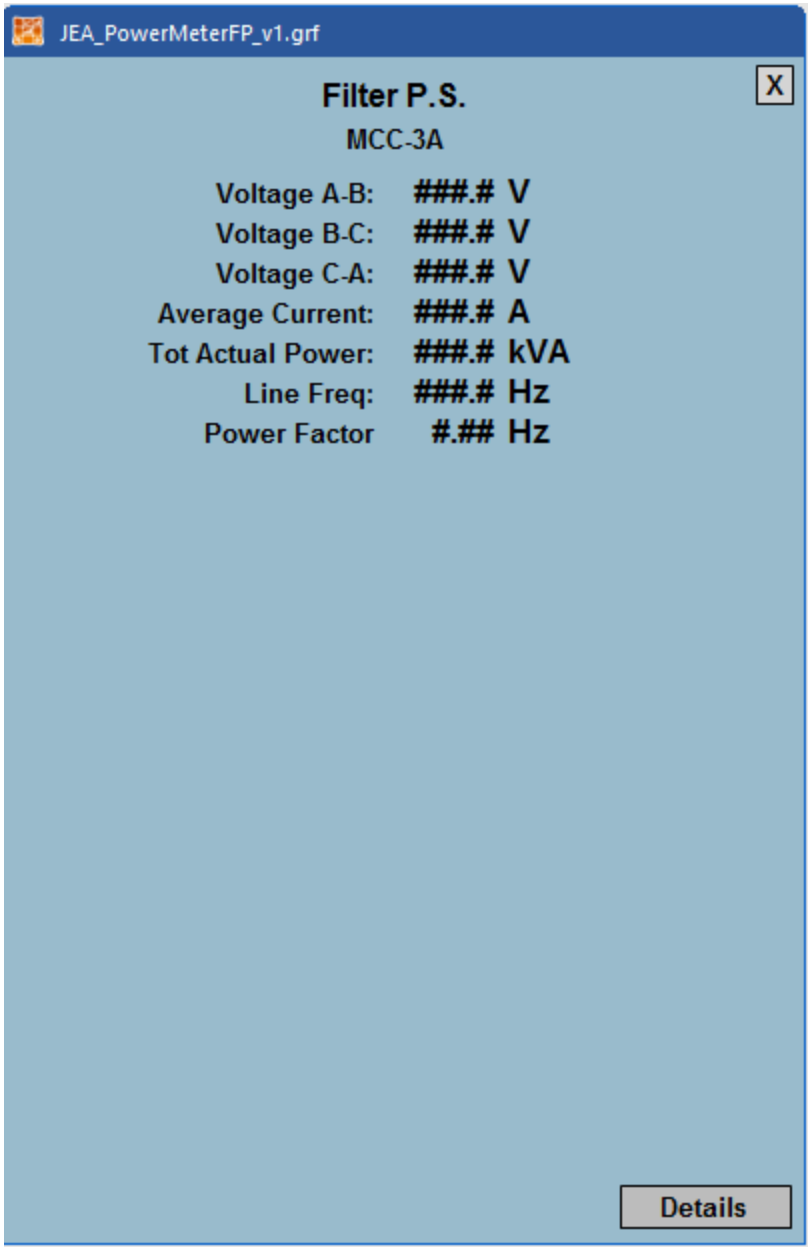
- Open/Close Valves
  - Use JEA_OpenCloseValveFP_v1.grf.
  - Use associate tag group file OpenCloseValve.tgd as a template for creating the tag group file.
  - The opened feedback tag must have some specific configuration in the DB for the features of the dynamo and faceplate to function.
    - On the “Advanced” tab, the Alarm Extension 1 field must be populated with the equipment label, which much exactly match the filename of the .tgd file.
    - On the “Alarm” tab, the “Enable Alarming” box must be checked, the Alarm Suspend field must be populated with the Alarm Disable SIM tag for that instrument, the “Enable Alarm Shelving” box must be checked, and some Shelve Policy must be selected.



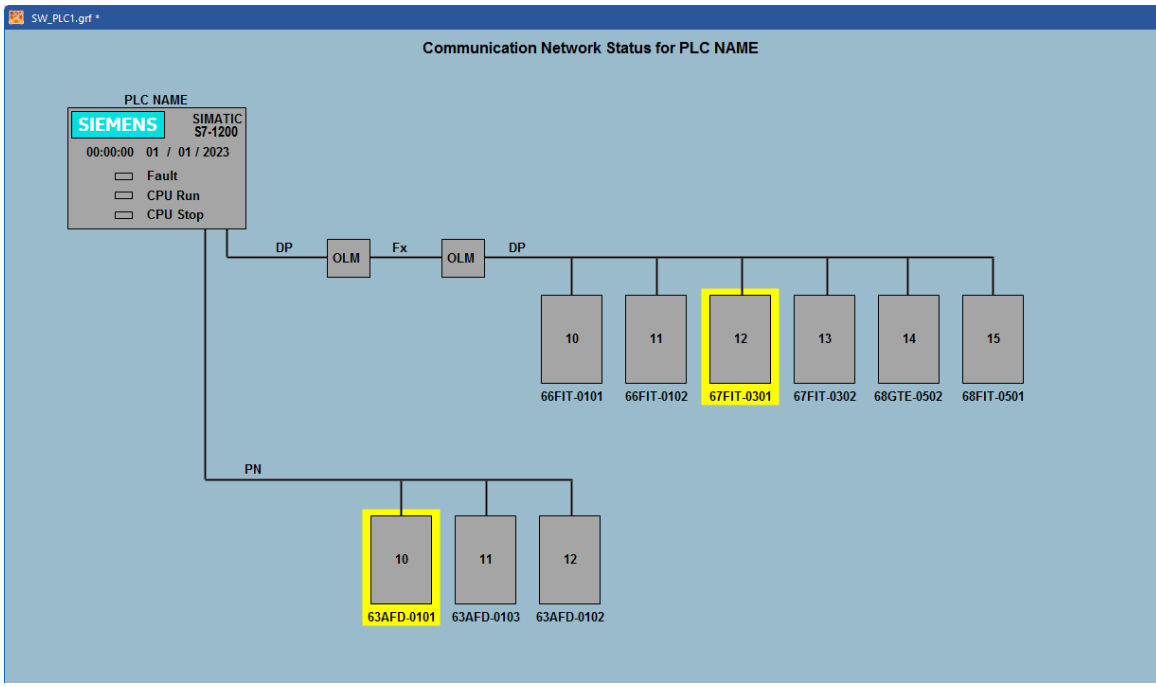
- The “details” button brings up JEA_OpenCloseValveFPDetails_v1.grf, utilizing the same tag group file.



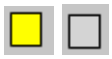
- MCC Power Monitor
  - The MCC Power Monitor faceplate displays power monitoring data.
  - Use JEA_PowerMonitorFP_v1.grf

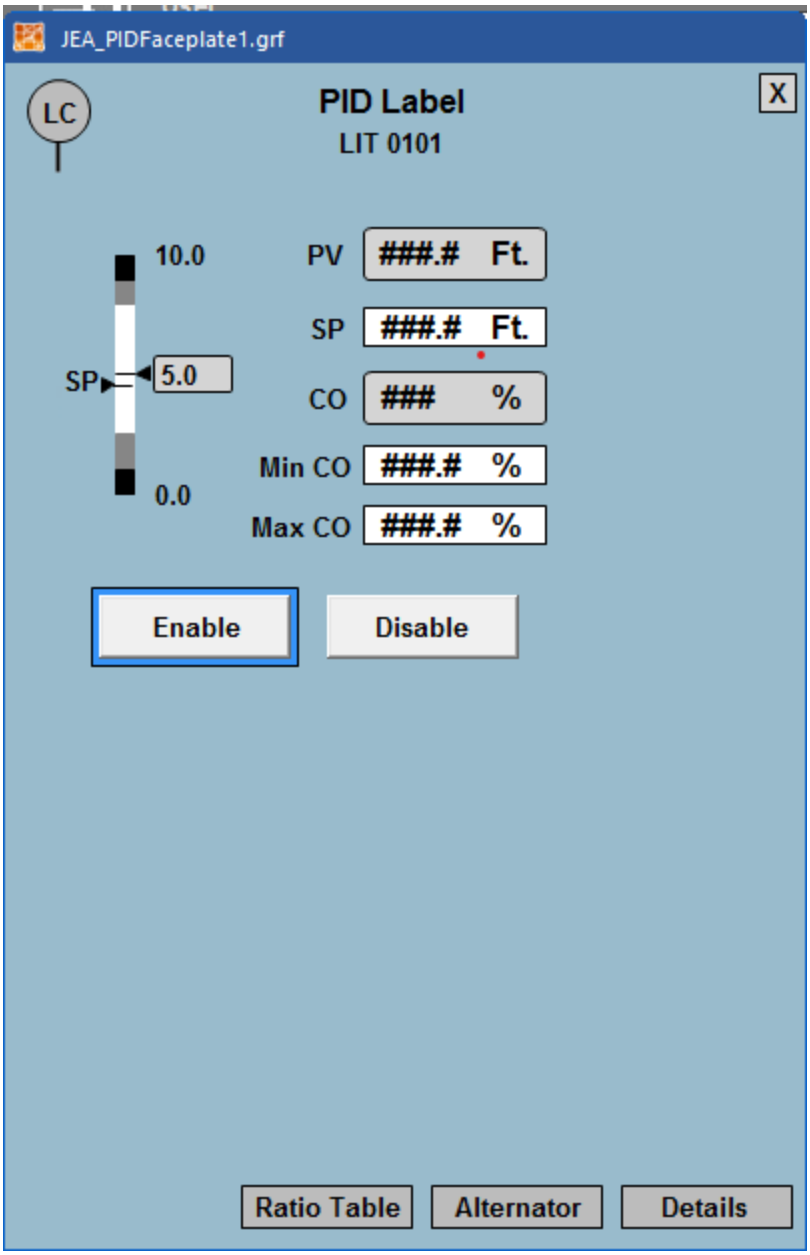


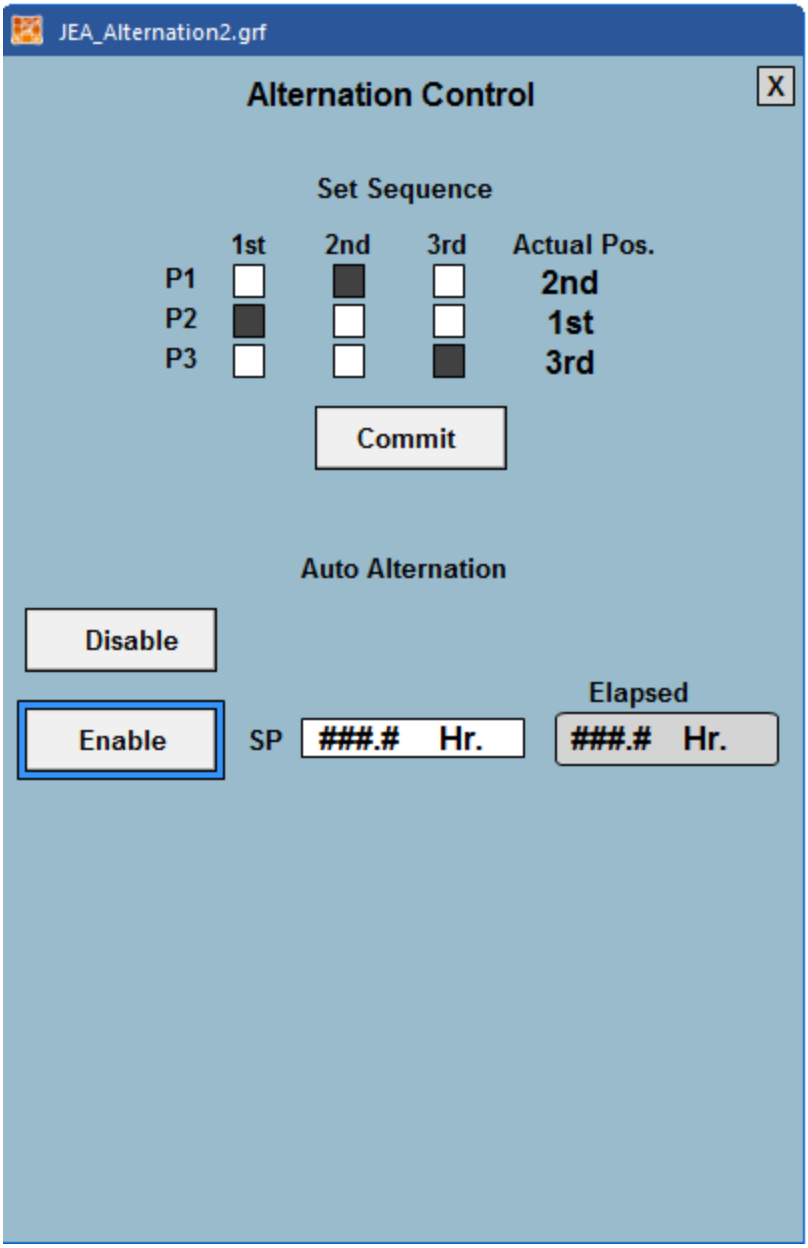
- PLC
  - This is a large popup which will display the statuses of all field devices connected to the PLC, as well as the PLC itself.
  - Since these will be unique for each PLC, each will need its own .grf file and they will not utilize tag group files.

- 

Process Control Setpoints Faceplates

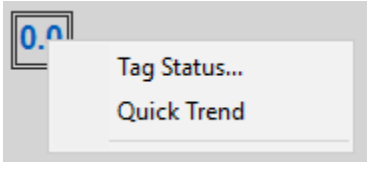
- Processes are controlled via Control Setpoints Faceplates that are accessible by clicking buttons on the Tier 2 screens.
- These faceplates are not standardized, they must be customized as appropriate for each processes control strategy. However, general standards as far as structure and content will be followed.
    - In cases where there will be multiple process control setpoints that are specific to one process area and are not part of this standard, but will occur in multiple places (e.g., if there were 4 clarifiers, each with identical controls), a single popup shall be used which leverages tag group functionality, for ease of maintenance.
    - It is not acceptable to use tag group substitutions embedded within other tag group substitutions, i.e., there shall not be tag groups within tag groups.
- Upon clicking the T2 process controls setpoints button, a popup of the same size and general appearance as the standard instrument and equipment popups will appear. This will contain the main controls for the process area such as PID setpoint or start/stop setpoints.
    - Optional buttons at the bottom popup will bring up additional controls such as pump sequence control, ratio table, or feed forward control.
- An ISA symbol indicating the type of control appears in the top left of the popup.
- A grey box that turns yellow when permissives are not met may be used to indicate the permissive status of the system.
    - 

- 
JEA_PIDFaceplate1.grf
LC
PID Label
LIT 0101
X
10.0
SP
5.0
0.0
PV
###.# Ft.
SP
###.# Ft.
CO
%
Min CO
###.# %
Max CO
###.# %
Enable
Disable
Ratio Table
Alternator
Details

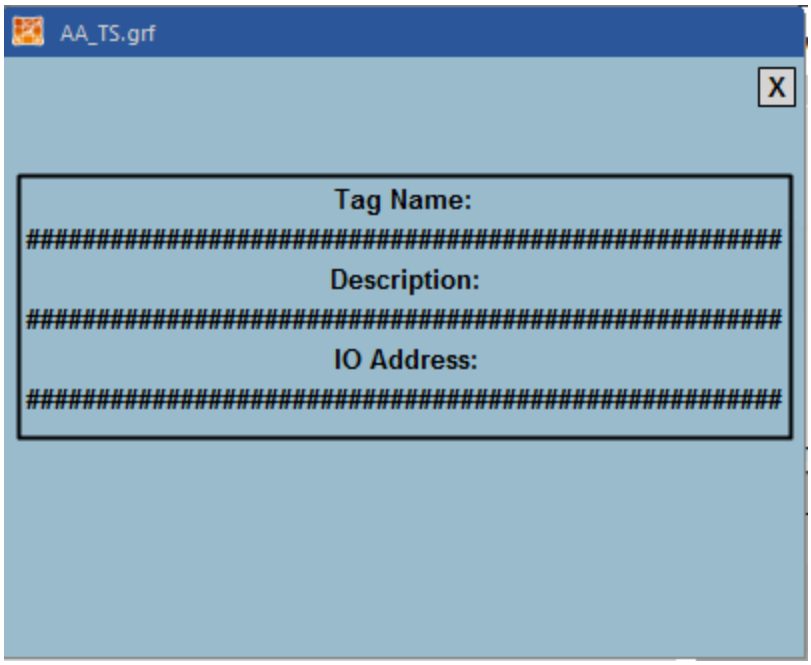


-
- Details popup here will be similar to other equipment popups.

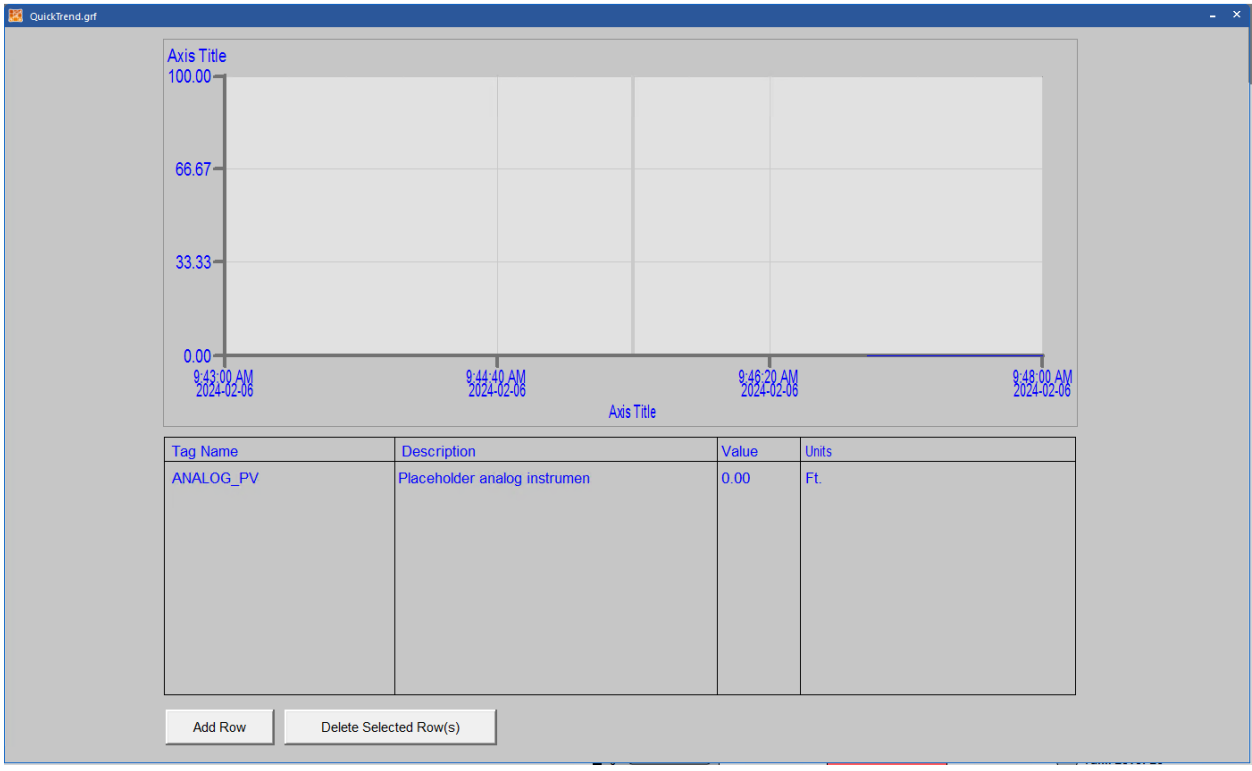
Tag Status and Quick Trend

- For analogs and digitals that don't have an associated popup, they shall have the properties "HighlightEnabled" and "IsSelectable" set to "True". This allows users to select and then right-click the object to bring up a menu to select the Tag Status or Quick Trend screen.
  - 

- A custom tag status display has been developed that mimics the layout of the "Details" faceplates that are accessible from other popups.



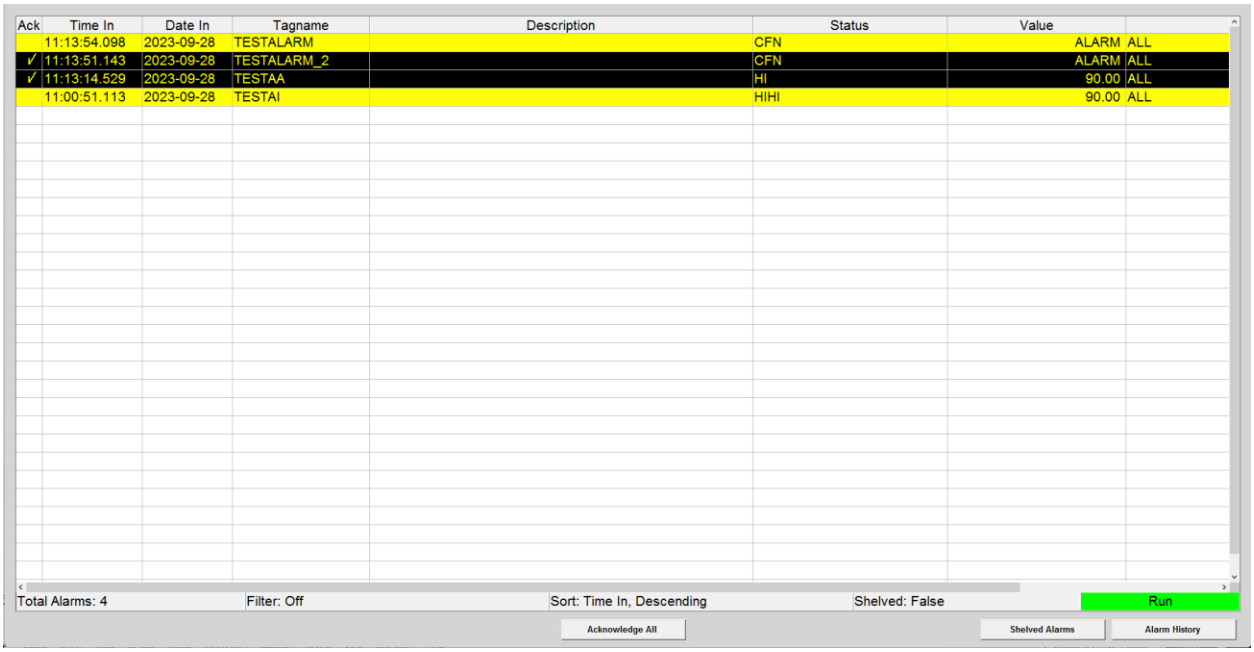
- A customized real-time trend with a 5-minute timespan is accessible by selecting “Quick Trend”. For a more fully featured trend, it is recommended to use the other trend screens that exist in the system.



Alarms

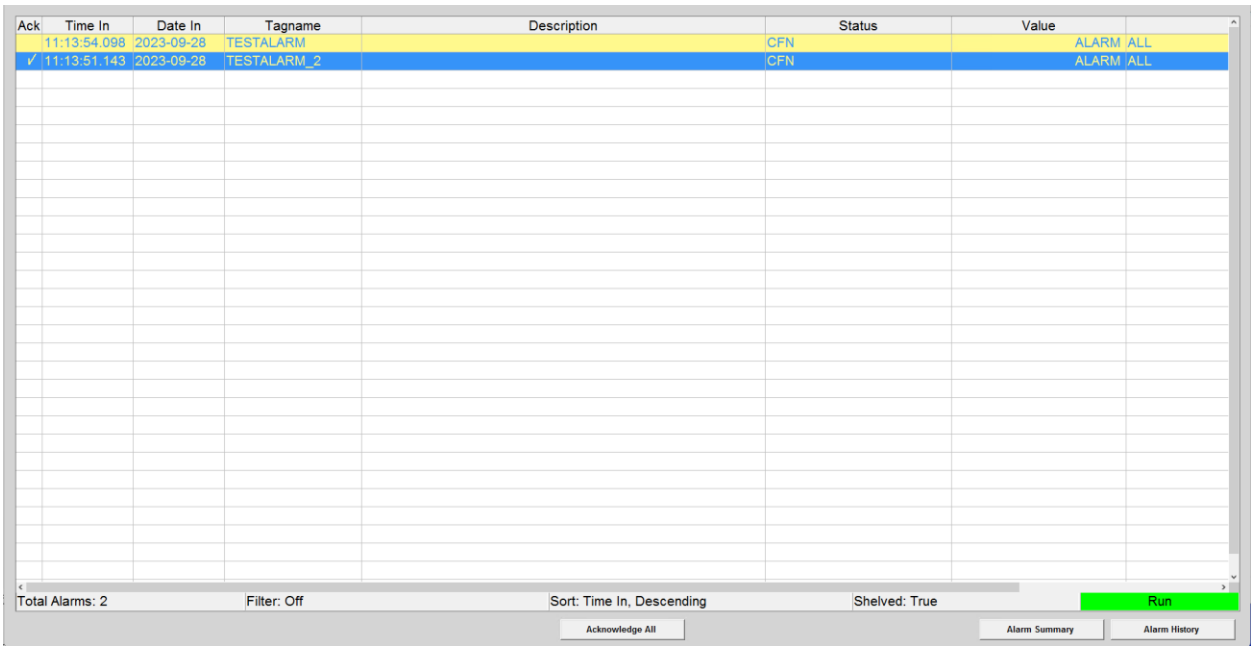
Alarm Summary

- The main alarm summary is accessible from the alarm button on the header.

- Alarms areas must be defined in the tag database. Alarm areas will correspond to the ‘Process’ field of the tag name, based on the defined tag naming standard.
- Alarm summary font will be sized at 16 point.
    - Unacknowledged alarms will have a yellow background with black text.
    - Acknowledged alarms will have a black background with yellow text.
- The alarm summary object will display columns for Time In, Date In, Tagname, Description, Status, Value, and Area
- A button at the bottom of the screen allows the operator to acknowledge all alarms at once.
- Additional buttons provide navigation to the shelved alarms screen and the alarm history screen.
- If the facility has a “Global Alarm Reset”, which sends an alarm reset command to each PLC in the facility, the button to perform this reset will be located on this screen.
- 

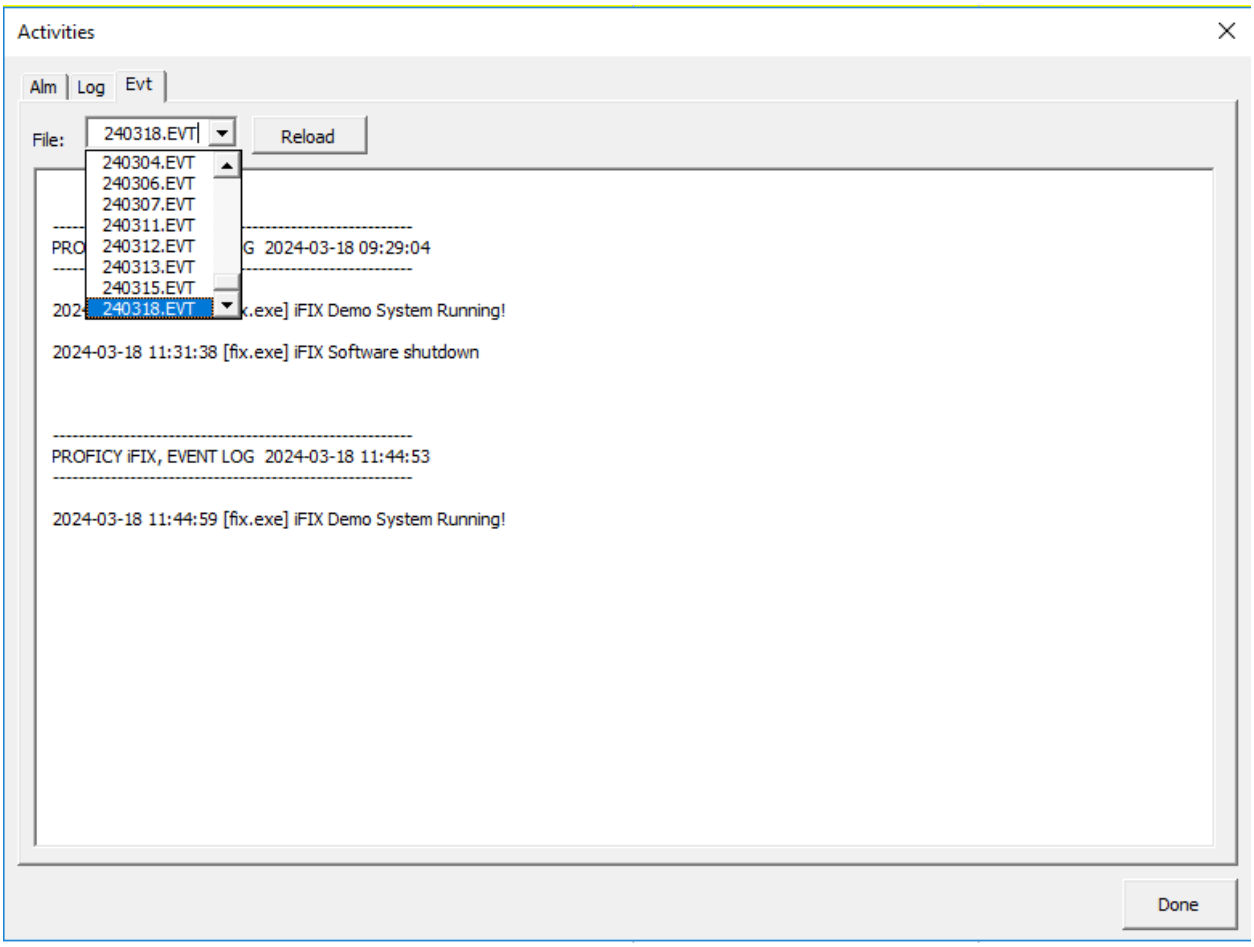
Shelved Alarms

- Shelved Alarms screen is accessible from a button on the main Alarm Summary screen.
- It is similar to the Alarm Summary except it is filtered to show only shelved alarms, and the color scheme is different.
    - Unacknowledged alarms have HPDaisy background and HPSkyBlue text.
    - Acknowledged alarms have HPSkyBlue background and HPDaisy text.

- 

Alarm History

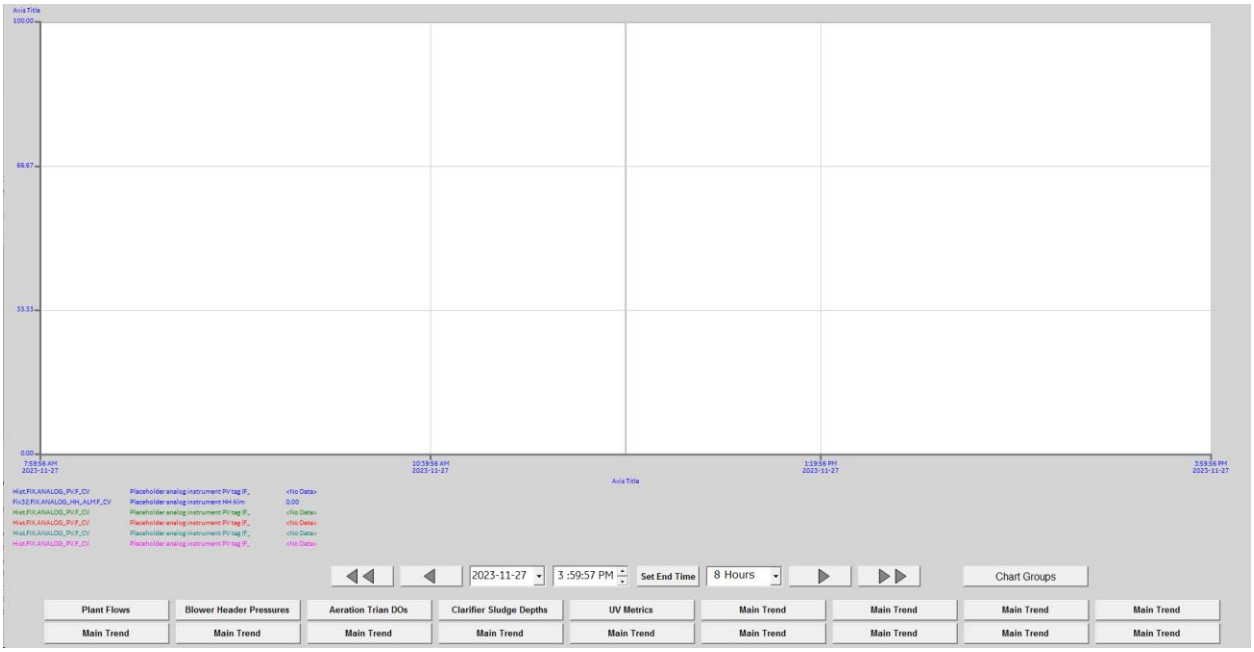
- The Alarm History popup is accessible from the Alarm Summary and the Shelved Alarms screen.
- This functions by performing reading the .ALM, .LOG, and .EVT files in the /ALM directory withing the iFIX application directory.
- When the popup first appears, it will show the contents of the most recent file of the selected tab.
- Files from earlier dates can be selected using the dropdown menu.

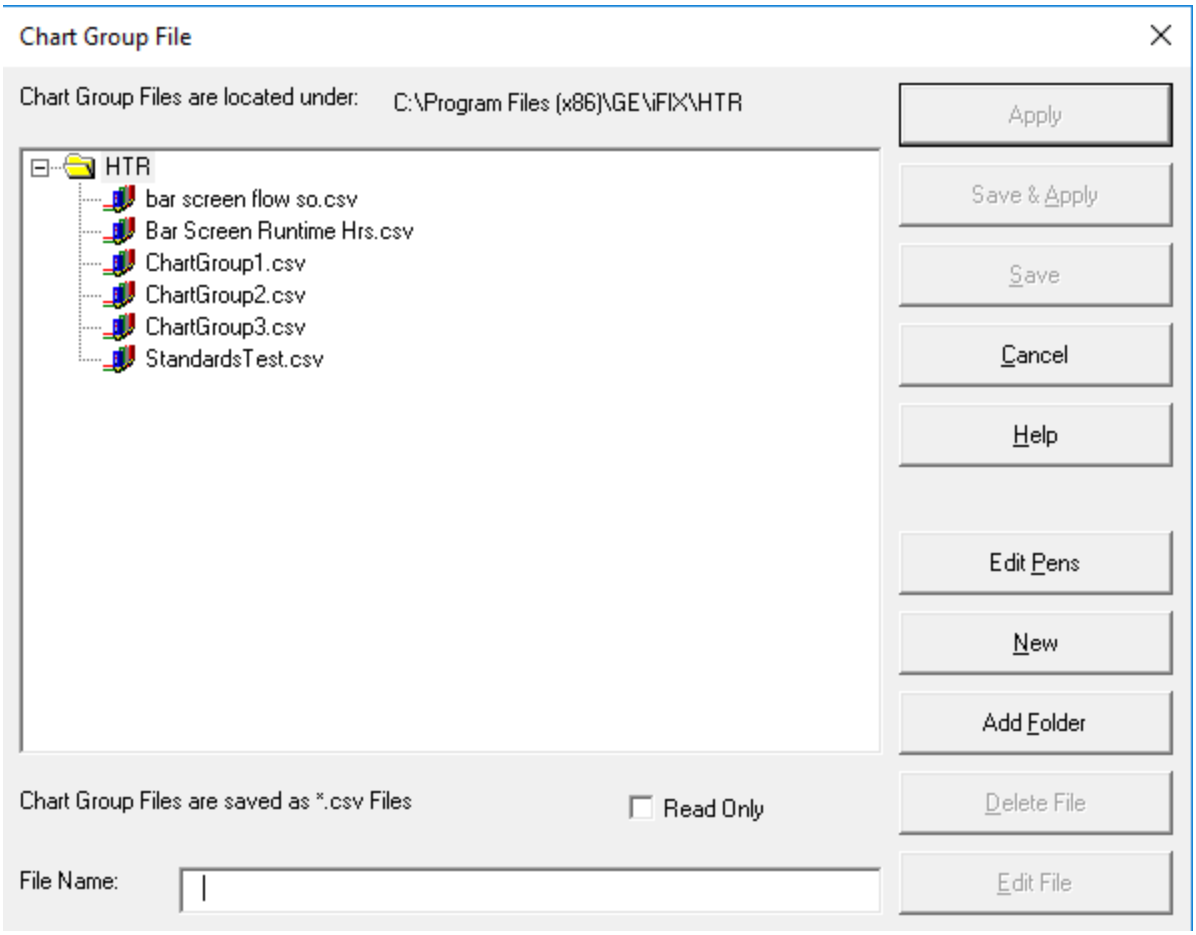
- 

Trending

- Generally speaking, all instrument process variables, motor run statuses, speed feedback, motor amps, valve positions, and totalizer values shall be historized, excluding UV bulb statuses, which shall be sent to PI instead. Additional data such as process setpoints may be historized, depending on operator preferences.
- The historian configuration of each tag must be populated in the iFIX database with the correct description, matching the description in the iFIX tag database.
- The area for displaying trend data is white. The surrounding area will match the background color of the screen and have no borders.
- The trend area is sized in such a way that there is room for 10 pens to be selected without the legend overlapping any of the other screen features.
- Trend pens will be a solid line of a width of either 1 or 2, determined based on readability depending on how busy the trend is. The pens will be in high-contrast colors.
- There are control buttons and drop-downs below the trend object to scroll forward and backward in time, as well as select and end time and duration.
- At the bottom of the screen, there are buttons to allow the operator to select between up to 18 pre-defined sets of pens.

- These buttons run a script to populate the trend object from trend configuration .csv files, located in the HTR directory. As new sites and areas are added, new .csv files will need to be created.
- The “Chart Groups” button opens an interface that can be used to load any trend configuration file in the HTR directory, as well as modify, save, and create new ones.





Security

- Once Job is awarded Refer to SCADA System Admin group for Security Settings.

Appendix 1 – Tag Naming Standards

SYSTEM_ PI only		PROCESS_ or SUB PROCESS FOR BIGGER ONES		DETAIL_ _ VALVES TO BE ADDED TO DETAIL		EQUIPTMENT TYPE_		ID_ From P&IDs or Equipment #
AE – Arlington East	AB (1,2,3…)	*Aeration Bays*	ARM	*Rake Arms*	AIT	*Analyzer*	1
BF – Blacksford	CCC	*Chlorine Contact Chamber*	BALST	*Ballast*	AOV	*Air operated VLV*	22
BS – Buckman Biosolids	CENT	*Centrifuge*	BISF	*Sodium Bisulfite*	CMP	*Compressor*	333
BW – Buckman (wet)	EFF	*Effluent*	BULB	*Bulb*	FCV	*Flow Control Valve*	4444
CB – Cedar Bay	EQTNK	*EQ tanks*	BLWR	*Blowers*	FT or FIT	*Flow transmitters*	1&2
GL – Greenland	FILT	*Filters*	BRSH	*Brush*	GAT	*Gates*	
JP – JCP	GEN	*Generator*	BWL	*Bowl*	HOA	*HOA Switch*	
MN – Mandarin	HLUV	*High Level UV disinfection*	CHMSN	*Chemical Scan*	LIMSW	*Limit Switch*	
MR – Monterey	INF	*Influent*	CH	*Channel*	LSH(H) or LSL(L)	*Level Switch (Float)*	
NS – Nassau	LIGHT	*Plant Lighting*	CL2	*Sodium Hypo CL*	LT or LIT	*Level transmitters*	
PL – PdL	LLUV	*Low Level UV disinfection*	CMA	*Channel Mixing Air*	MCC	*Motor control Center*	
PV – Ponte Vedra	ODR	*Odor control*	COMP	*Compactors*	MOV	*Motor operated valve*	
SW – Southwest	OSLS(1,2,3..)	*Onsite Liftstation*	CSCRN	*Coarse screens*	MTR	*Motor*	
	OSRU	*Onsite Reuse*	DISCG	*Discharge*	NETSW	*Network switch*	
	PCLR(1,2,3,..)	*Primary Clarifiers*	DO	*Dissolved oxygen*	PCV	*Pressure control valve*	
	PLNT	*Plant*	DURM	*Drum*	PMP	*Metering pumps*	
	PRI	*Primary*	DRAIN	*Drain valves*	PMP	*Pump*	
	RCL	*recycle*	EXFAN	*Exhaust Fan*	PSH(H) or PSL(L)	*Pressure Switch*	
	RU	*Reuse*	FEED	*Feed pumps*	PT or PIT	*Pressure transmitters*	
	SBR	*SBR*	FILL	*Fill*	PWRMTR	*Power meters*	
	SBX(1,2,3..)	*Splitter Box*	FSCRN	*Fine screens*	PWRSUP	*Power supply*	
	SCLR(1,2,3..)	*Secondary Clarifiers*	GRNDR	*Grinder*	SPDSW	*Speed Switch*	
	SEC	*Secondary*	HWTR	*Hot Water*	TCV	*Temperature control vlv*	
	SHLD	*Sludge Holding*	INLT	*Inlet*	TSH(H) or TSL(L)	*Temperature switch*	
	THKNR	*Thickener*	INT	*Intensity*	TT or TIT	*Temperature transmitter*	
			LUOIL	*Lube oil*	UPS	*UPS*	
			MSRTR	*Macerator*	VFD	*Variable freq Drive*	
			MTV	*Motive pumps*	VLV	*Valve*	
			MIXER	*Mixers*			
			NH4	*NH4-N ait*			
			NOX	*NOX ait*			
			NRCY	*NRCY*			
			ORP	*ORP*			
			PH	*Ph Analyzers*			
			PLC	*PLC*			
			POLY	*Polymer*			
			PWR	*Power*			
			RAS	*RAS*			
			REJECT	*Reject*			
			SCUM	*Scum*			
			SLDG	*Sludge*			
			SUC	*Suction*			
			SWTR	*Seal water*			
			TANK	*Tank*			
			TRAIN	*Train*			
			TURB	*Turbidity*			
			UVT	*UVT*			
			VFD	*VFD*			
			WAS	*Waste*			
			WASH	*Wash or Wash down*			
			WELL	*Wet well*			
			BRNING	*BEARING*			
			BYP	*BYPASS*			
			CAB	*CABINET*			
			DRV	*DRIVE*			
			GEAR	*GEAR*			
			HYDR	*HYDROLIC*			
			PNL	*PANEL*			
			RCIRC	*RECIRC*			

Examples
INF_INLT_VLV_001_FLT
PCLR_SLDG_PMP_001_RST_CMD
AB1_MIXER_MTR_5_RUN
PCLR_WAS_PMP_1&2_BTCH_FLOW_SP
SBX2_FILL_MOV_305_FTO_ALM_RST_CMD
INF_BLWR_PLC_101_MIDNIGHT_RESET_PULSE
PLNT_PLC_100_OOC_ALRM

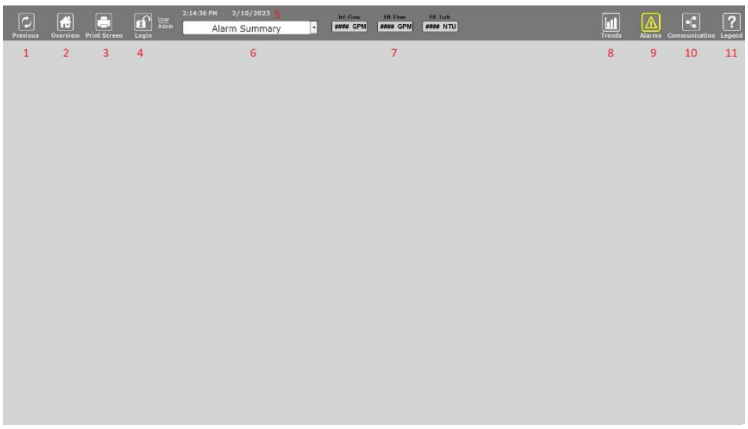
STATUS_ AS NEEDED		ACTION_ for commands as needed AS NEEDED		CONTROLING COMPONENTS_ AS NEEDED	
INTERCHANGEABLE TO MAKE THE MOST SENSE STATUS, ACTIONS, OR CONTROLS					
ACC	*Accumulation*	CLSD_CMD	*Close command*	ACT_ROWS_ON	*ACTUAL ROWS ON*
ALRM	*Alarm*	DELAY_CMD	*Delay*	ALT	*Alternators*
AMPS	*Current*	DISABLE_CMD	*Disabled\Offline*	BTCH	*Batching*
AUTO	*Auto*	ENABLE_CMD	*Enable\Offline*	DEV	*Deviation*
AVG	*Average*	FLT_RST_CMD	*Fault reset*	DOSE_SP	*Dose target*
BATT	*Battery*	JOG_CMD	*Jog*	ELAP_TM	*Elapse time*
BUS	*Bus*	OPN_CMD	*Open Command*	FF	*Feed forward*
BYP	*Bypass*	OVERRIDE_CMD	*Override*	FLOW	*FLOW*
CALL	*Called to run*	RESET_CMD	*Reset*	FLOW_FACTOR	*Flow Factor*
CLSD	*Close*	SPD_CMD	*Speed Command*	FLOW_PACE	*Flow pacing*
CURRDD	*Current day*	STBY_CMD	*Standby*	LMPS_OUT	*Lamps out*
DAILY	*Daily*	STOP_CMD	*Stop CMD or Call*	LVL	*LEVEL*
DD	*Day*	STRT_CMD	*Start CMD or Call*	MANSP	*Manual Setpoint*
DMD	*Demand*			MAXOUT	*Max output*
DOSE	*Dosing*			MINOUT	*Min Output*
DSTRTS	*Daily Starts*			OFFSET	*Offset*
ESTP	*E-stop*			PERC	*PERCENTAGE*
FBK	*Feedback*			PID	*PID controller*
FLT	*Failed \fault*			PID OUT	*PID Output*
FTC	*Failed to close*			PID_DERIV	*PID Derivative*
FTO	*Failed to open*			PID_GAIN	*PID Gain*
FTR	*Fail to run*			PID_RESET	*PID Reset*
GAL(s)	*Gallons*			PRESS	*PRESSURE*
hh	*Hours*			PROP_FACTOR	*Proportional Factor*
HZ	*Frequency*			PULSE	*Pulse*
KVA	*KVA*			PV	*Process Variable*
LAG	*Lag*			RATIO	*Ratio*
LEAD	*Lead\Duty*			RMN_TM	*Time remaining*
LOCAL	*Local*			ROWS_REQ	*Rows required*
LOCK	*Lockout*			RT	*Runtime*
MANUAL	*Manual/hand*			SIM	*Simulate*
MAX	*Max*			SLP_CTRL	*Slope control*
MAX_LIM	*Max limit*			SP	*Setpoint*
MGD	*Million gals per day*			SPD	*SPEED*
MIDNIGHT	*Midnight*			T_DELAY	*Time delay*
MIN	*Minimum*			TEMP	*TEMPARATURE*
MINLIM	*Minimum Limit*			TMR	*Timers*
mm	*Minutes*			TOT	*TOTAL*
MON(S)	*Month*				
OFF	*Off*				
ON	*On*				
OOC	*Out of comm*				
OPN	*Open*				
PERVmm	*Previous Minutes*				
PF	*Power factor*				
PWR	*Power*				
RANGEHI or LO	*Scale, range, EU*				
REMOTE	*Remote*				
RLY	*Relay*				
RPM	*RPM*				
RT	*Runtime*				
RUNNING	*Running*				
SPD	*Speed*				
ss	*Seconds*				
STAT	*Status*				
TIME	*Time*				
TOD	*Time of day*				
TOT	*Total*				
TQFLT	*Torque fault*				
TSTRTS	*Total starts*				
VOLT	*Voltage*				
WDOG	*Watch dog*				
YY	*Year*				

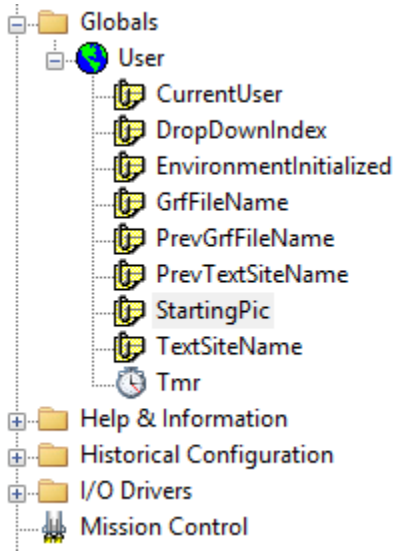
Appendix 2 – Implementation

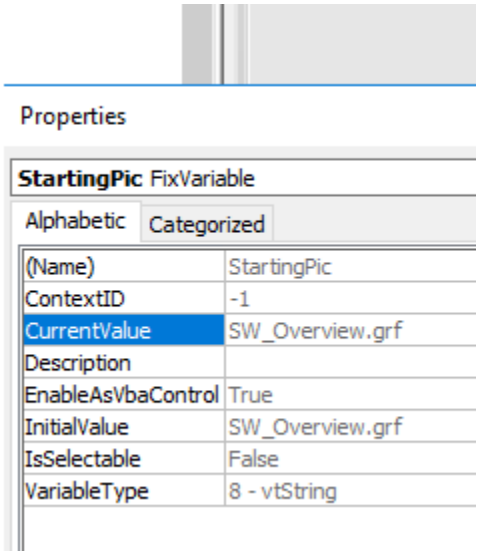
IFIX GRAPHICS IMPLEMENTATION

After loading IFix delete all the standard Dynamo sets. Go to _____folder and copy all files into your DYNAMICS PIC folder this should give you all your Global, Graphic, TGD's, Dynamos, Tag Groups, Nav, and Trend files. Trend CSV need to go into the HTR folder. A placeholder SIM tag with a value of 0 will be needed in cases where there is no actual tag to populate a field, so create a single SIM tag in the DB for this purpose. A placeholder SIM tag with a value of 1 will be needed in place of the Out of Comm tag when the device does not have an Out of Comm status, so create a single SIM for this as well. Please note that the value will revert to the lowest value in the engineering unit range when the DB is restarted, so use an AI SIM tag with the Engineering Units Low Limit set to 1.

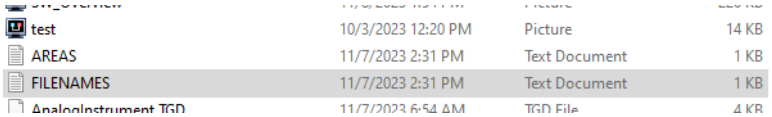
Header, Start Screen, Navigation



1. Populate the CurrentValue and InitialValue fields of the variable StartingPic in Globals-User with the filename of the overview screen.
   a.




2. The navigation Drop down is set up using two TEXT files in the pic folder.



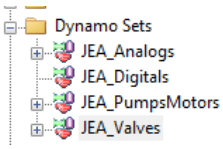
3. In the AREAs file put the name you would like to see in the drop down.
4. In the FILENAMES put the actual graphic name. NOTE: they need to line up line by line.

Main screen navigation is set up to navigate to tier 2 graphics when system is clicked this is done in script.

```
Private Sub Rect194_Click()
Call ChangeScreen("SW_AerTrain3B.grf", "Aeration Train 3B")

End Sub
```

Dynamos & Faceplates



Note: All Dynamos will Follow the same procedure, and all include faceplates except digitals. The differences mainly include Tags required. Analog Dynamos takes you thru the full procedure all other I will show only the particular differences for each type of Dynamo.

Analog Dynamos

Required tags in data base.

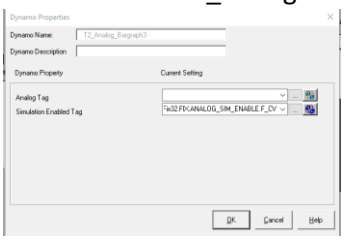
TAG TYPE	TAG NAME	TGD SYMBOL	NOTE
AA	AIT123	ANALOG_PV	Alarming and Alarm Shelving must be enabled in block configuration. An alarm shelving policy must be selected. The "Alarm Suspend" field must be populated with the name of the Alarm Disable tag. Alarm Extension Field 1 must be populated with an instrument label that matches the filename of the .TGD file. Set TAG for Historical Collect
DA	AIT123_CMD_SIM	ANALOG_SIM_ENABLE	1=Simulation enabled, ALSO SET TO ALARM
AA or AI	AIT123_SIM_VALUE	ANALOG_SIM_VALUE	
DA or DI	AIT123_ALM_DISABLE	ANALOG_ALARM_SUSPEND	Must create a sim tag with unique address for each instrument.
AA or AI	AIT123_OOC	OUT_OF_COMM	If there is no Out of Comm tag for this instrument, use a placeholder tag with value 1.

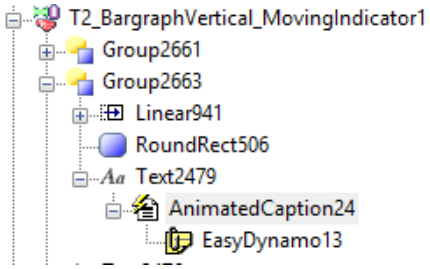
(note ANALOG_ALARM_SUSPEND is not a PLC tag this is a SIM tag you must create)

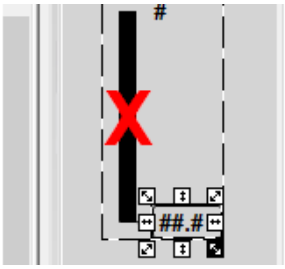
1. Drag Dynamo onto graphic (say no to creating tags)

This is the same for all analog dynamos.

2. Add the ANALOG_PV tag below and an ANALOG_SIM_ENABLE

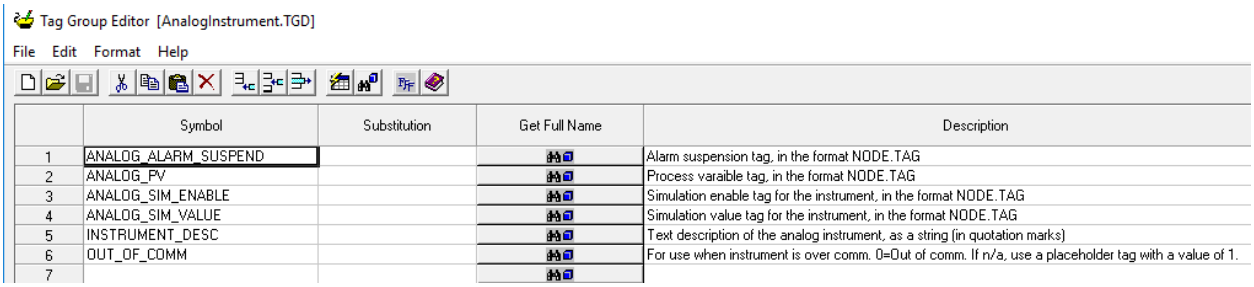


3. For analog dynamos that have a moving numerical indicator along the bar graph, the number of digits to display after the decimal point.
   a. 

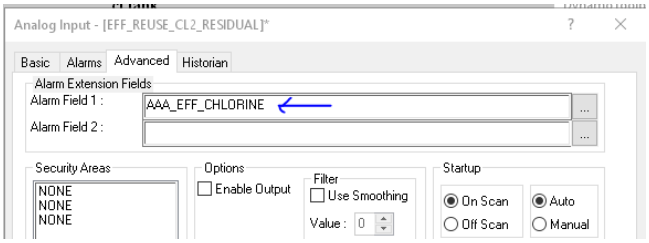


ErrorMode	1
FixedDate	12:00:00 AM
FixedTime	12:00:00 AM
Format	%3.1f
HistMode	13 - HDS_CurrentValue
HistUpdateRate	0
IsSelectable	False
Justification	0 - LeftJustify
LockStartTime	False

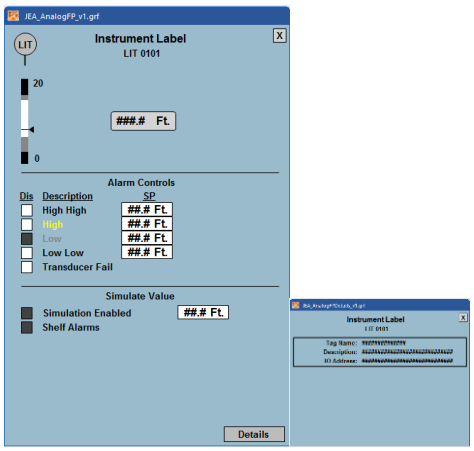
   b. Select the dynamo, and then expand it in the navigation tree on the left until you find the correct “Text” object, then right-click and select “Properties” on the “AnimatedCaption” object that is a child of the “Text” object.
   c. In the “Format” property field, change the number just to the right of the decimal point to the desired number of digits.
4. Open the AnalogInstrument.TGD file



	Symbol	Substitution	Get Full Name	Description
1	ANALOG_ALARM_SUSPEND			Alarm suspension tag, in the format NODE.TAG
2	ANALOG_PV			Process varaible tag, in the format NODE.TAG
3	ANALOG_SIM_ENABLE			Simulation enable tag for the instrument, in the format NODE.TAG
4	ANALOG_SIM_VALUE			Simulation value tag for the instrument, in the format NODE.TAG
5	INSTRUMENT_DESC			Text description of the analog instrument, as a string (in quotation marks)
6	OUT_OF_COMM			For use when instrument is over comm. 0=Out of comm. If n/a, use a placeholder tag with a value of 1.
7				

5. Add your tags.
6. Go file Save as. Save the TGD file as the name you want to appear above the instrument as the instrument label.
   Also, you need to put this file name in the Main tag Alarm Field 1.
7. 

8. Test your graphic.



Pumps and Motors Dynamos

On\off motor

Required tags in database.

TAG TYPE	TAG NAME	TGD SYMBOL	NOTE
DI	**MOT123_RUNNING**	**RUN_FB**	Alarm Extension Field 1 must be populated with an equipment label that matches the filename of the .TGD file.
DI	**MOT123_AUTO**	**AUTO**	
DI	**MOT123_RUN_CMD**	**MANUAL_START**	
DA	**MOT123_FAULT**	**FAULT**	
DI	**MOT123_FAULT_RESET**	**FAULT_RESET**	
DI	**MOT123_CALLED**	**CALL**	
AI	**MOT123_TORQUE**	**TORQUE**	**If this does not exist, use a placeholder and set the visibility flag in the .tgd to 0**
AI	**MOT123_AMPS**	**AMPS**	**If this does not exist, use a placeholder and set the visibility flag in the .tgd to 0**
AI	**MOT123_RUNTIME**	**RUNTIME**	**If this does not exist, use a placeholder and set the visibility flag in the .tgd to 0**
DI	**MOT123_TOTALS_RESET**	**TOTALS_RESET**	**If this does not exist, use a placeholder and set the visibility flag in the .tgd to 0**
AI	**MOT123_STARTS**	**STARTS**	**If this does not exist, use a placeholder and set the visibility flag in the .tgd to 0**
AI	**MOT123_OOC**	**OUT_OF_COMM**	**If there is no Out of Comm tag for this instrument, use a placeholder tag with value 1.**

Analog motor

Required tags in database.

TAG TYPE	TAG NAME	TGD SYMBOL	NOTE
DI	**MOT123_RUNNING**	**RUN_FB**	Alarm Extension Field 1 must be populated with an equipment label that matches the filename of the .TGD file.
DI	**MOT123_AUTO**	**AUTO**	
DI	**MOT123_RUN_CMD**	**MANUAL_START**	
DA	**MOT123_FAULT**	**FAULT**	
DI	**MOT123_FAULT_RESET**	**FAULT_RESET**	
DI	**MOT123_CALLED**	**CALL**	
AI	**MOT123_TORQUE**	**TORQUE**	**If this does not exist, use a placeholder and set the visibility flag in the .tgd to 0**
AI	**MOT123_AMPS**	**AMPS**	**If this does not exist, use a placeholder and set the visibility flag in the .tgd to 0**
AI	**MOT123_RUNTIME**	**RUNTIME**	**If this does not exist, use a placeholder and set the visibility flag in the .tgd to 0**
DI	**MOT123_TOTALS_RESET**	**TOTALS_RESET**	**If this does not exist, use a placeholder and set the visibility flag in the .tgd to 0**
AI	**MOT123_STARTS**	**STARTS**	**If this does not exist, use a placeholder and set the visibility flag in the .tgd to 0**
AI	**MOT123_SPEED_FEEDBACK**	**SPEED_FB**	
AI	**MOT123_SPEED_SETPOINT**	**SPEED_SP**	**When in Manual mode, this functions as the manual speed SP.**
AI	**MOT123_OOC**	**OUT_OF_COMM**	**If there is no Out of Comm tag for this instrument, use a placeholder tag with value 1.**

Open Close Valve

Required tags in database.

TAG TYPE	TAG NAME	TGD SYMBOL	NOTE
DI	**VLV123_OPENED**	**FULLOPEN_FB**	Alarm Extension Field 1 must be populated with an equipment label that matches the filename of the .TGD file.
DI	**VLV123_CLOSED**	**FULLCLOSED_FB**	
DI	**VLV123_REMOTE**	**VAVLE_IN_REMOTE**	
DA	**VLV123_FAULT**	**VAVLE_FAULT**	
DI	**VLV123_FAULT_RESET**	**FAULT_RESET**	
DI	**VLV123_CALLED_OPEN**	**MANUAL OPEN**	
DI	**VLV123_CALLED CLOSE**	**MANUAL_CLOSE**	
DI	**VLV123_AUTO**	**AUTO**	
DI	**VLV123_OPENCALL**	**OPEN_CALL**	
AI	**VLV123_OOC**	**OUT_OF_COMM**	**If there is no Out of Comm tag for this instrument, use a placeholder tag with value 1.**

Analog Valve

Required tags in database.

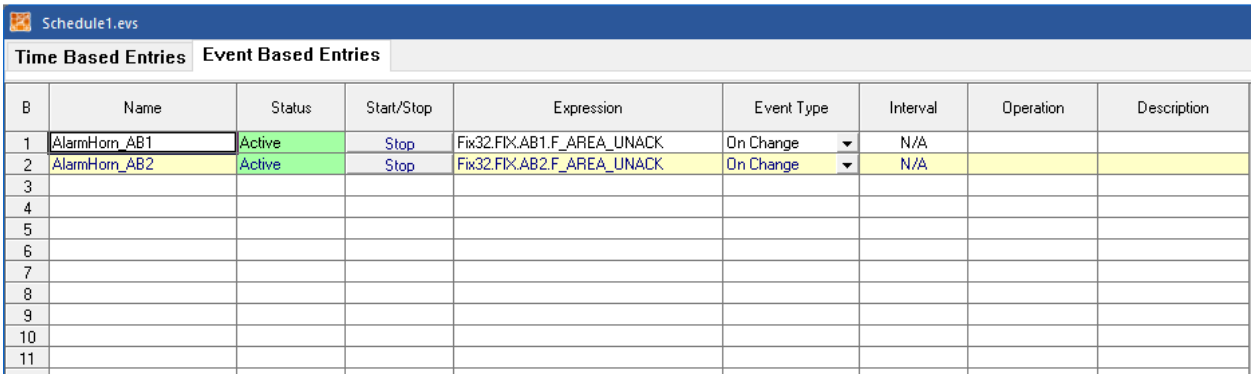
TAG TYPE	TAG NAME	TGD SYMBOL	NOTE
DI	VLV123_OPENED	FULLOPEN_FB	Alarm Extension Field 1 must be populated with an equipment label that matches the filename of the .TGD file.
DI	MOT123_CLOSED	FULLCLOSED_FB	
DI	VLV123_REMOTE	VALVE_IN_REMOTE	
DA	VLV123_FAULT	VAVLE_FAULT	
DI	VLV123_FAULT_RESET	FAULT_RESET	

Trends

If it's desired to have a trend screen have pens populated onto it when it's initially pulled up, these must be manually configured in the trend object in development mode. Otherwise, the trend object will only have placeholder pens populated when the screen is initially displayed, and a user will need to select one of the pen set selection buttons to populate relevant pens onto the chart.

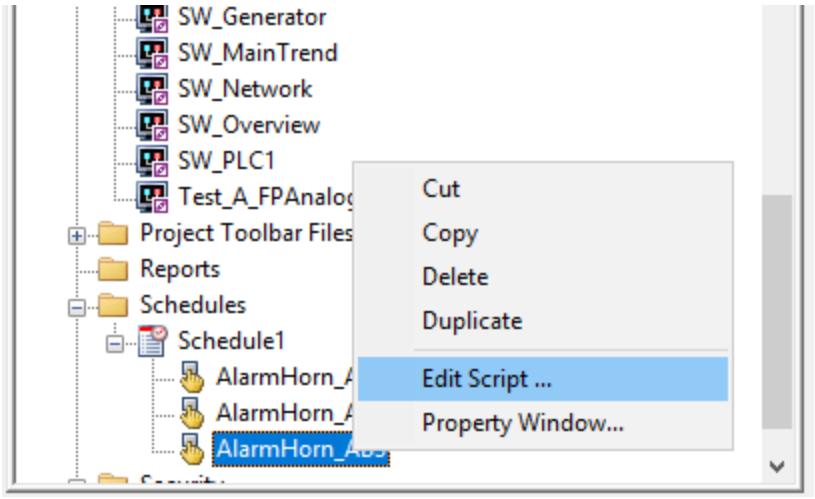
Alarm Beacon Script

There is a schedule in place that runs a script to write a value out to a specified PLC tag when there is an unacknowledged alarm in a given alarm area. This is to be used to trigger a physical beacon or horn in the relevant area. These are created as "Event Based Entries" on Schedule1.evs.



B	Name	Status	Start/Stop	Expression	Event Type	Interval	Operation	Description
1	AlarmHorn_AB1	Active	Stop	Fix32.FIX.AB1.F_AREA_UNACK	On Change	N/A		
2	AlarmHorn_AB2	Active	Stop	Fix32.FIX.AB2.F_AREA_UNACK	On Change	N/A		
3								
4								
5								
6								
7								
8								
9								
10								
11								

In order to implement new ones, right click on one of the entries and select "Duplicate". Update the name to be "AlarmHorn_{Alarm Area}". Double click on the "Expression" field of the new entry and update the alarm area string to the name of the new alarm area. Right click on the new entry in the navigation tree under the schedule and select "Edit Script".



In the script, substitute the appropriate tag name into the AlarmHornTag assignment expression, and update the name of the alarm area in the alarm counter conditional expression.

```
Private Sub AlarmHorn_AB3_DataChange(ByVal DataValue As Variant, ByVal TimeStamp As Date, ByVal Transition As Long, ByVal Reserved As Variant)

Dim AlarmHornTag As String

AlarmHornTag = "Fix32.FIX.ALARM_HORN_AB2.F_CV"

    If Fix32.Fix.AB2.A_AREA_UNACK > 0 Then
        If ReadValue(AlarmHornTag) = "0" Then
            CloseDigitalPoint AlarmHornTag
        End If
    Else
        If ReadValue(AlarmHornTag) = "1" Then
            OpenDigitalPoint AlarmHornTag
        End If
    End If

End Sub
```