Situational Awareness Library - Configure and use Meters

SUMMARY

This Tech Note outlines how to configure and use Meters from the Situational Awareness Library that comes with System Platform 2014.

Application Versions

- Application Server 4.0 and later
- InTouch 11.0 and later

SITUATION

Situational Awareness Library

The Situational Awareness Library (SAL) is a set of Archestra Symbols in the Graphic Toolbox that can be embedded, in other symbols or InTouch windows, and configured to show plant data. SAL consists of symbols created with the Symbol Wizard. These symbols have various layers and include both functional properties and visual properties. SAL Symbols also have a predefined set of Choice Groups, choices and options.

Meters

The Situational Awareness Library comes with an extensive set of meters.

In this Tech Note we will configure and use SA_Meters.

This meter includes the following layers: flow meter, temperature meter, pressure meter, Target, analyzer, deviation, level and miscellaneous.

ACTION

Embedding a Meter

1. Create a new Archestra Symbol in the Graphic Toolbox. Click the "Embed Graphic" icon. From the Galaxy Browser, select "SA_Meters" from Graphic Toolbox -> Situational Awareness Library -> Meters.
2. Click **OK**. The meter is embedded in the Archestra symbol.

3. Select the embedded symbol. In the properties pane, under Wizard options, select the type of meter as **Flow**.

In this *Tech Note* we will focus on Flow meters.

*Parts of a Flow Meter*
Figure 6A below shows the appearance of a flow meter in design time. Figure B shows the appearance of the flow meter during runtime, after all the various options are configured. Various parts of the flow meter during runtime are highlighted in the figure 6B below.

1. **Tagname or short name**
   The tagname or the more common name (short name) for the meter is shown here. This can be toggled on and off using the symbol properties.

2. **Numeric PV**
   The numeric PV of the reference is shown here and can be toggled on and off using symbol properties.

3. **Engineering Units**
   The engineering units configured for the reference is shown here and can be toggled on and off using symbol properties.

4. **Graphical PV**
   The graphical representation of the PV is shown in the meter as a black dot.

5. **Controller Output**
   This bar shows the output of the associated controller.
   - When the controller output is zero, the bar fills WHITE.
   - When the output is maxed out, the bar fills BLACK.
   - When the output is in between zero and max, the bar fills GREY.

   Examples:

   - Output <= min  
     Figure 7A
   - Output > Min  
     Figure 7B
   - Output >= max  
     Figure 7C

6. **Controller Mode**
   The current mode of the controller is indicated next to the Controller output bar.
   - C = Cascade
   - A = Auto
7. Optimal Range Box

This is a target range that can be configured for the PV. It can be toggled on and off in the properties. It can be used to show the optimal or ideal range for the PV. It is independent of the alarm limits.

The optimal range box allows the user to very quickly glance at a meter and check if the value is OK.

The following examples indicate whether the PV is inside the optimal range or not:

![PV in Ideal Range](image1)
Figure 8A

![PV near the edge of Ideal Range](image2)
Figure 8B

![PV outside of Ideal Range](image3)
Figure 8C

8. Hi Hi Alarm Limit

This alarm limit is always displayed using a “flag” shape, consisting of a line with a triangle attached to it facing upwards. The flag is always at the left for vertical meters and at the top for horizontal meters.

9. Hi Alarm Limit

This alarm limit is always displayed using an “L” shape, with the tip pointing up. The high alarm is always at the left for vertical meters and at the top for horizontal meters.

10. Lo Alarm Limit

The low alarm limit looks like this. The low alarm is always at the right for vertical meters and at the bottom for horizontal meters.

11. Lo Lo Alarm Limit

This alarm limit is always displayed using a “flag” shape, consisting of a line with a triangle attached to it facing downward. The flag is always at the right for vertical meters or at the bottom for horizontal meters.

12. Tracker

The tracker is a memory aid that can be enabled and set by the operator any time the current PV needs to be marked, in order to come back later and see if it has changed.

13. Setpoint

The setpoint is a simple, black line on the meter. The setpoint is only available on controllers.

14. Full Scale Flags

These flags indicate that the meter is displaying the full range of the instrument.

![Flag shape](image4)
Figure 9A

![Full Scale Flags](image5)
Figure 9B

15. Practical Range

The Practical Range/Operating Range is the range of values that a user normally is interested in for a given PV. If an instrument is capable of reading values from 0-1000 and the Practical Range is set from 100 to 150, the scale endpoints will correspond to these values (Figure 10A below).

If a PV drifts outside the Practical Range, the meter will automatically revert to Full Scale. (Figure 10B)
Configuring a Flow Meter

1. Orientation: This property is used to configure the meter to be displayed vertically or horizontally.

![Figure 11: Setting Orientation](image)

2. Label Type: This property is used to configure whether the label is going to be a static text, Custom Property label or the object tagname.

![Figure 12: Setting Label Type](image)

3. Symbol Mode: This property is used to configure the meter to be a basic meter or an advanced meter. Advanced meter comes with additional configurable properties and custom properties.
3.1. Basic Mode:

These are the set of properties and custom properties for a basic meter.

3.2. Advanced Mode:

These are the set of properties for an advanced meter. On selecting the additional properties of an advanced meter, additional custom properties are shown and can be configured.
The following properties and custom properties are exposed and can be configured for a meter that has been configured as an advanced mode meter.

3.2.1. Alarm Limit Indicators: If this property is set to true, additional properties and custom properties related to the alarm limit indicators are displayed and can be configured.

Alarm limit indicators’ visibility and limits for HiHi, Hi, Lo and LoLo can be individually enabled and configured.

3.2.2. Optimal Range: If the Optimal Range property is set to be true, the visibility and the min/max of the optimal range are enabled and can be configured.
3.2.3. Tracker: If this property is set to true, additional custom properties related to the tracker are displayed and can be configured.

Figure 18: Setting Tracker

3.2.4. Setpoint: If this property is set to true, the Setpoint value and its visibility can be configured.
3.2.5. Full Range Indicator: If this property is set to true, additional custom properties pertaining to the PV range like Operating Min, Operating Max, Autoscale and the Operating percent can be configured.

3.2.6. Controller: If this property is set to true, other properties and customer properties related to Controller become available and can be configured.
3.2.7. Alarm Border: If this property is set to true, customer properties related to the alarm border become available and can be configured.

**Flow Meter - Configured and working examples**

1. Download the attached **Meters.zip** file to the GR/IDE node and extract the file.
2. Open the IDE and import (Galaxy > Import > Objects(s)) the “UDO and InTouchViewApp.aaPKG” file.
3. Upon successful import of the UDO object and the InTouchViewApp.aaPKG, assign **UDObj1** to an Area and **SALTestApp_001** to a ViewEngine as shown in Figure 23 below.
4. Open **UDObj1**. Observe the configuration of the UDAs – UDA1, UDA2, UDA3 and UDSPoint and the Field Attributes – FAAnalog1, FAAnalog2 and FAAnalog3.
Figure 24: UDA List
5. Open the IDE and import (Galaxy > Import > Objects(s)) the `FlowMeters.aaPKG` file. Upon successful import of the object `FlowMeters.aaPKG` object, the following two symbols should appear in the Situational Awareness Library.

6. In the above-mentioned symbols, the custom properties have been configured and the attributes assigned to them as shown in Figure 27 (below).
7. Deploy the GR Platform and deploy the user defined object **UDObj1** and the InTouchViewApp **SALTestApp_001**.

8. Open the deployed InTouch ViewApp in Window Viewer. Open the window **FlowMeterVariations**.
9. The Advanced meter under the “Mode” section of the window has been configured to look at the field attribute “FAAnalog2”.
10. Use the Slider located next to this meter and change the value of UDA2 to around 80.
11. Observe the changes in the meter. The Graphical PV dot moves to 80. It is also apparent in the meter that the value is out of the Optimal range.
12. Open the Object Viewer and observe the properties for FAAnalog2 under UDObj1 (Figure 30 below).
13. The meters labelled as Vertical and Horizontal, in the Orientation section of the window, have been configured to look at the field attribute FAAnalog3.
14. Use the slider located next to the horizontal meter and change the value of UDA3 to 20.
15. Observe the changes in the meter. The Graphical PV dot moves to 20. It is also apparent in the meter that the value is out of the Optimal range.
16. Open the Object Viewer and observe the properties for FAAnalog3 under UDObj1.

17. Under the Others section in the window, the indication for differential meter is displayed (Figure 32 below).
18. Configure the Alarm Border settings (Figure 33 below).

Figure 33: Alarm Border Settings

For more information on using border animation feature, refer Tech Note # 1033: Using the Border Animation Feature in System Platform 2014 for InTouch Alarms.

19. Critical Alarm border: Change the value of UDA1 to under 10. Observe the critical alarm border displayed for the meter labelled Alarm Border.

Figure 34: Critical Alarm Border
20. High Alarm border: Change the value of UDA1 to under 20. Observe the high alarm border displayed for the meter labelled **Alarm Border**.

![High Alarm Border](image)

21. Medium Alarm border: Change the value of UDA1 to under 76. Observe the medium alarm border displayed for the meter labelled **Alarm Border**.
22. Low Alarm border: Change the value of UDA1 to under 95. Observe the low alarm border displayed for the meter labelled Alarm Border.
Full Range Indicator: The flags are displayed on the top and the bottom of the meter to indicate that the meter is displaying the full range of the instrument.

Figure 38: Full Range Indicator

Types of Meter - Configured and working examples

1. Open the InTouch window, **TypesOfMeters**. All the various types of the meter are shown.

Figure 39: Types Of Meters

2. Use the slider located next to the meters and change the value of UDA1 to around 80. Observe the way the PV is represented in the various types of the meter.
3. **Flow Meter**

Flow meters are the simplest meter type. They are identified by a straight vertical line and a PV that is in the shape of a ball. The flow meter is meant to resemble a physical floating ball flow meter.

4. **Temperature Meter**

Temperature meters resemble a common thermometer. They are shown as a straight vertical line with a bar fill and a ball at the base of the bar.

5. **Pressure Meter**

Pressure meters are shown as an oval background shape and a square PV.

6. **Target Meter**

Target meters look like Flow meters, except that the PV is smaller and there is a second reference marker in the shape of a circle. Target meters are used to display ratios.

7. **Analyzer Meter**

Analyzers are shown as a rounded rectangle with a rectangular PV indication. Because analyzers can cover a wide range of measurements, additional features have been added to the analyzer.

A descriptive label (in this case “S”, DCS”, “O2”, “pH”) is used to help the operator identify the type of analyzer.

The clock symbol is used to show how long it has been since the last sample. The clock is scaled to the sampling interval. The more grey in the clock, the older the data. If the value is continuously measured, the clock is not shown.
8. Miscellaneous Meter

Miscellaneous meters are used to show values that don’t have their own meter types. They are often used for values such as amps, torque, etc. They are shown as a thin rectangular background while the PV is a bar-fill indication.

9. Deviation Meter

Deviation meters are intended to show a change, or deviation, from a reference point. For deviation meters, the reference point or setpoint is fixed at the middle of the meter.

The PV is represented by a filled bar that fills upwards (for vertical meters) or to the right (for horizontal meters) for a positive deviation and downward or to the left for negative deviations.

A descriptive label is used to help the operator identify the type of value.

10. Level Meter

Level meters are often shown within a tank or vessel. Level meters are displayed as a wide rectangle that is filled with a grey bar.

SUPPORTING INFORMATION

Related Tech Notes:

TechNote # 738 : Situational Awareness Library - Configure and Use Pump & Valve

FILE ATTACHMENTS

UDO and InTouchViewApp.aaPKG
2.8MB • 8 minute(s) @ 56k, < 1 minute @ broadband

FILE ATTACHMENTS

FlowMeters.aaPKG
205K • < 1 minute @ 56k, < 1 minute @ broadband