**SCADA\_PRC\_TOLERANCE**

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| **Version** | **Release Notes** |
| 1.0 | Initial Release |

**Description**: This UDT is used for monitoring analog signal rate of change and flatlines. Both alarms function in a similar manner; an analog signal is sampled on a timed interval and compared to a setpoint. A flatline alarm is generated if the sampled signal is less than the setpoint, i.e. the signal value has not changed by the expected amount over the sample time, indicating a problem with the process. A Rate of Change (ROC) alarm is generated when the sampled signal exceeds the setpoint i.e. the signal value has changed more than would be expected in the sample time.

**Naming Convention**: Tags will generally use the first three fragments of the device, followed by D1 to indicate tolerance alarms e.g. BXXRES1D1.

**UDT Members**

| **UDT Member** | **Datatype** | **Description** | **Usage** |
| --- | --- | --- | --- |
| ROC | Analog\_Tolerance\_v1 | Tolerance AOI | Used for ROC Alarms |
| FLATLINE | Analog\_Tolerance\_v1 | Tolerance AOI | Used for Flatline Alarms |
| RC\_CT | REAL | ROC Setpoint | Used on HMI |
| LW\_CT | REAL | Flatline Setpoint | Used on HMI |
| TP\_RC | REAL | ROC Sample Rate (mins) | Used on HMI |
| TP\_LW | REAL | Flatline Sample Rate (mins) | Used on HMI |
| DA\_RC | BOOL | ROC Alarm | Used on HMI |
| DA\_LW | BOOL | Flatline Alarm | Used on HMI |
| PB\_RC | PB\_EN\_RA\_DLR\_1\_2 | ROC Alarm Enables | Used on HMI |
| PB\_LW | PB\_EN\_RA\_DLR\_1\_2 | Flat Line Alarm Enables | Used on HMI |

**AOI**

| **AOI Parameter** | **Requirement** | **Default Value** | **Description** | **Implementation Guideline** |
| --- | --- | --- | --- | --- |
| Analog\_Tolerance\_V1 | Mandatory | *Tagname.*ROC or *Tagname.*Flatline | AOI | Implement as appropriate to the alarm being monitored |
| Alarm\_Config | Optional | *Tagname*.ADDON.Alarm\_Config | Configuration bit for ROC or Flatline Alarm Generation | Set to 0 for Flatline Alarms. Set to 1 for Rate of Change Alarms. |
| Scaled\_CV\_Value | Mandatory | .AI\_CV tag of instrument being monitored | Analog Value being monitored | N/A |
| Scan\_Status | Mandatory | .DI\_SC tag of instrument being monitored | Analog Instrument on Scan | N/A |
| Sample\_Delay | Mandatory | *Tagname.*TP\_RC or *Tagname.*TP\_LW | Instrument Sampling Time Delay | Select the appropriate tag for the alarm being generated |
| Difference\_Setpoint | Mandatory | *Tagname.*RC\_CT or *Tagname.*LW\_CT | Tolerance Setpoint | Select the appropriate tag for the alarm being generated |
| Alarm\_Enable | Mandatory | *Tagname.*PB\_RC or *Tagname.*PB\_LW | Alarm Enables | Select the appropriate tag for the alarm being generated |
| Alarm\_Mask | Optional | *Tagname*.ADDON.Alarm\_Mask | Alarm Mask | Program outside of AOI to mask alarm generation |
| Alarm | Mandatory | *Tagname.*DA\_RC or *Tagname.*DA\_LW | Alarm | Select the appropriate tag for the alarm being generated |
| Dialer\_Trigger | Optional | *Tagname*.ADDON.Dialer\_Trigger | Dialer Alarm Active | Use this bit in dialer routine if alarm is to callout |

**AOI Operation Description**

The AOI will condition and compute the time delay setpoint based on the entered value. If the analog device is on scan, the sample timer will run. When the timer finishes the current CV value is subtracted from the previous CV value to determine how much the value changed between samples. The current CV value then becomes the previous value for the next sample. Based on the configuration of the AOI an alarm will be generated if the signal is outside of the allowable tolerance. The alarm enables are then checked for indication to the HMI and the dialer alarm bit set, if required.

**Programming Examples**

The ROC and Flatline alarm are generally both implemented for an instrument which is why they are paired together in the UDT. The AOIs should be deployed in the device routine for the instrument they are associated with.

**HMI Integration**

There are no specific HMI integration requirements for this UDT.