**SCADA\_DEV\_GEN**

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

**Description**: This UDT is used for implementation of Generator monitoring.

**Naming Convention**: Tags using this UDT should be named using the first four fragments as defined in the tagging standard. Typically this will be BXX\_GEN1\_DE1 for diesel generators, where BXX will be replaced with the correct site and area code.

**UDT Members**

| **UDT Member** | **Datatype** | **Description** | **Usage** |
| --- | --- | --- | --- |
| ADDON | GEN\_v1 | Generator state evaluation AOI | Within the Device Program of the PLC |
| DA\_SS | SCADA\_SYS\_DI\_1\_2 | Generator Running Alarm | Use in DI\_EVAL routine |
| DI\_SS | SCADA\_SYS\_DI\_1\_2 | Generator Running Status | Use in DI\_EVAL routine |
| DI\_CL | SCADA\_SYS\_DI\_1\_2 | Control mode | Use in DI\_EVAL routine |
| DA\_ES | SCADA\_SYS\_DI\_1\_2 | Emergency Stop | Use in DI\_EVAL routine |
| DA\_GA | SCADA\_SYS\_DI\_1\_2 | Generator Fault | Use in DI\_EVAL routine |
| DA\_JW | SCADA\_SYS\_DI\_1\_2 | Generator Warning | Use in DI\_EVAL routine |
| PB\_SF | PB\_EN\_RA\_DLR\_1\_2 | Fail to Start Alarm Enables | Used on HMI |
| PB\_XF | PB\_EN\_RA\_DLR\_1\_2 | Fail to Stop Alarm Enables | Used on HMI |
| PB\_RM | PB\_EN\_RA\_DLR\_1\_2 | Not in Auto Alarm Enables | Used on HMI |
| PB\_AE | PB\_EN\_RA\_DLR\_1\_2 | Alarm Enables | Used on HMI |
| DI\_AD | BOOL | At least One Alarm Disabled | Used on HMI |
| DA\_SF | BOOL | Fail to Start Alarm | Used on HMI |
| DA\_XF | BOOL | Fail to Stop Alarm | Used on HMI |
| DA\_RM | BOOL | Not In Auto Alarm | Used on HMI |
| PB\_RT | BOOL | Time on Emergency Power Reset | Used on HMI |
| PB\_SM | BOOL | Alarm Simulate Enable | Used on HMI |
| AI\_RT | REAL | Generator Runtime Hours | Used on HMI |
| AI\_TD | DINT | Number of Starts Today | Optional HMI Use |
| AI\_MT | DINT | Number of Starts This Month | Optional HMI Use |
| AI\_MX | DINT | Total Starts since last Reset | Optional HMI Use |

**AOI**

The AOI will be implemented within a Generator routine within the Device Program. The default implementation assumes the presence of an ATS for detecting power feed.

| **AOI Parameter** | **Requirement** | **Default Value** | **Description** | **Implementation Guideline** |
| --- | --- | --- | --- | --- |
| Gen\_v1 | Mandatory | *Tagname.*ADDON | Generator AOI | N/A |
| Alarm\_Sim\_Enable | Mandatory | *Tagname*.PB\_SM | Alarm Simulate PB | N/A |
| Control\_Mode | Mandatory | *Tagname*.DI\_CL.eng | Control Mode Input Status | N/A |
| Running \_Status | Mandatory | *Tagname*.DI\_SS.eng | Generator Running Status | N/A |
| On\_Emergency\_Power | Mandatory | *BXXATS1SG1*.DA\_JE.eng | Emergency Power Input Status | Replace with a suitable tag if no ATS installed. |
| On\_Normal\_Power | Mandatory | *BXXATS1SG1*.DI\_JN.eng | Normal Power Input Status | Replace with a suitable tag if no ATS installed. |
| Alarm\_Disabled | Mandatory | *Tagname.*DI\_AD | At least one alarm disabled | N/A |
| Alarms\_Enable | Mandatory | *Tagname.*PB\_AE | Global Alarm Enables | N/A |
| Fail\_To\_Start\_Enable | Mandatory | *Tagname.*PB\_SF | Fail to Start Enables | N/A |
| Fail\_To\_Start\_Mask | Optional | *Tagname.*ADDON.Fail\_to\_Start\_Mask | Fail to Start Alarm Mask | Program external to the AOI with conditions that should inhibit the evaluation of the fail to start alarm logic |
| Fail\_To\_Start | Mandatory | *Tagname.*DA\_SF | Fail to Start Alarm | N/A |
| Fail\_To\_Stop\_Enable | Mandatory | *Tagname.*PB\_XF | Fail to Stop Enables | N/A |
| Fail\_To\_Stop \_Mask | Optional | *Tagname.*ADDON.Fail\_to\_Stop\_Mask | Fail to Stop Alarm Mask | Program external to the AOI with conditions that should inhibit the evaluation of the fail to stop alarm logic |
| Fail\_To\_Stop | Mandatory | *Tagname.*DA\_XF | Fail to Stop Alarm | N/A |
| Not\_in\_Auto\_Enable | Mandatory | *Tagname.*PB\_RM | Not in Auto Enables | N/A |
| Not\_in\_Auto\_Mask | Optional | *Tagname.*ADDON.Not\_In\_Auto\_Mask | Not In Auto Alarm Mask | Program external to the AOI with conditions that should inhibit the evaluation of the not in auto alarm logic |
| Not\_in\_Auto | Mandatory | *Tagname.*DA\_RM | Not in Auto Alarm | N/A |
| Dialer\_Trigger | Optional | *Tagname.*ADDON.Dialer\_Trigger | Alarm Dialer Trigger | Use in a dialer routine to trigger callout of any alarms associated with the Generator |
| Interlock | Optional | *Tagname.*ADDON.Interlock | External Failure Operational Interlock | Program external to the AOI to inhibit operation based on state of hardwired alarms or other device tags |
| Failed\_Alarm\_Status | Optional | *Tagname.*ADDON.Failed\_Alarm\_Status | Indicates the presence of a virtual or hardwired device fault | Signal can be used as an interlock input to other devices or within ACP programming for failure handling |
| System\_Day\_Reset | Mandatory | SYS\_Day\_Reset | Reset tag for daily statsistics | N/A |
| System\_Monthly\_Reset | Mandatory | SYS\_Month\_Reset | Reset tag for monthly statistics | N/A |
| Runtime\_Reset | Mandatory | *Tagname.*PB\_RT | Runtime Hours and Start Counters Reset | N/A |
| Runtime\_Hours | Mandatory | *Tagname.*AI\_RT | Runtime Hours | N/A |
| Out\_TotalStarts | Optional | *Tagname.*Addon.Out\_TotalStarts | Total Generator Starts Since Last Reset | Map outside the AOI to *tagname*.AI\_MX for SCADA use, if required |
| Out\_DailyStarts | Optional | *Tagname.*Addon.Out\_DailyStarts | Total Generator Starts Today | Map outside the AOI to *tagname*.AI\_TD for SCADA use, if required |
| Out\_MonthlyStarts | Optional | *Tagname.*Addon.Out\_MonthlyStarts | Total Generator Starts This Month | Map outside the AOI to *tagname*.AI\_MT for SCADA use, if required |

**AOI Operation Description**

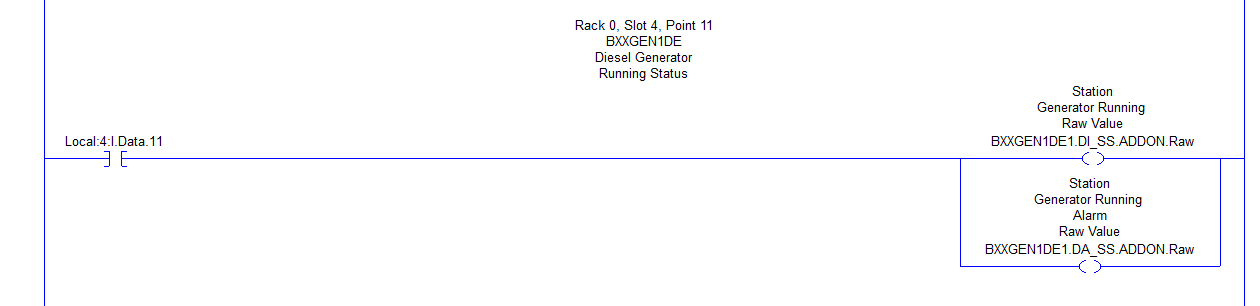
The AOI performs the following functions:

* Executes alarm simulation logic
* Checks for disabled alarms.
* Executes Alarm Logic
* Evaluates starts and runtime
* Perform check of alarm enable statues for indication of any disabled alarms
* Set the dialer bit for any configured alarms
* Setting of “last scan” values and reset of any pushbutton values

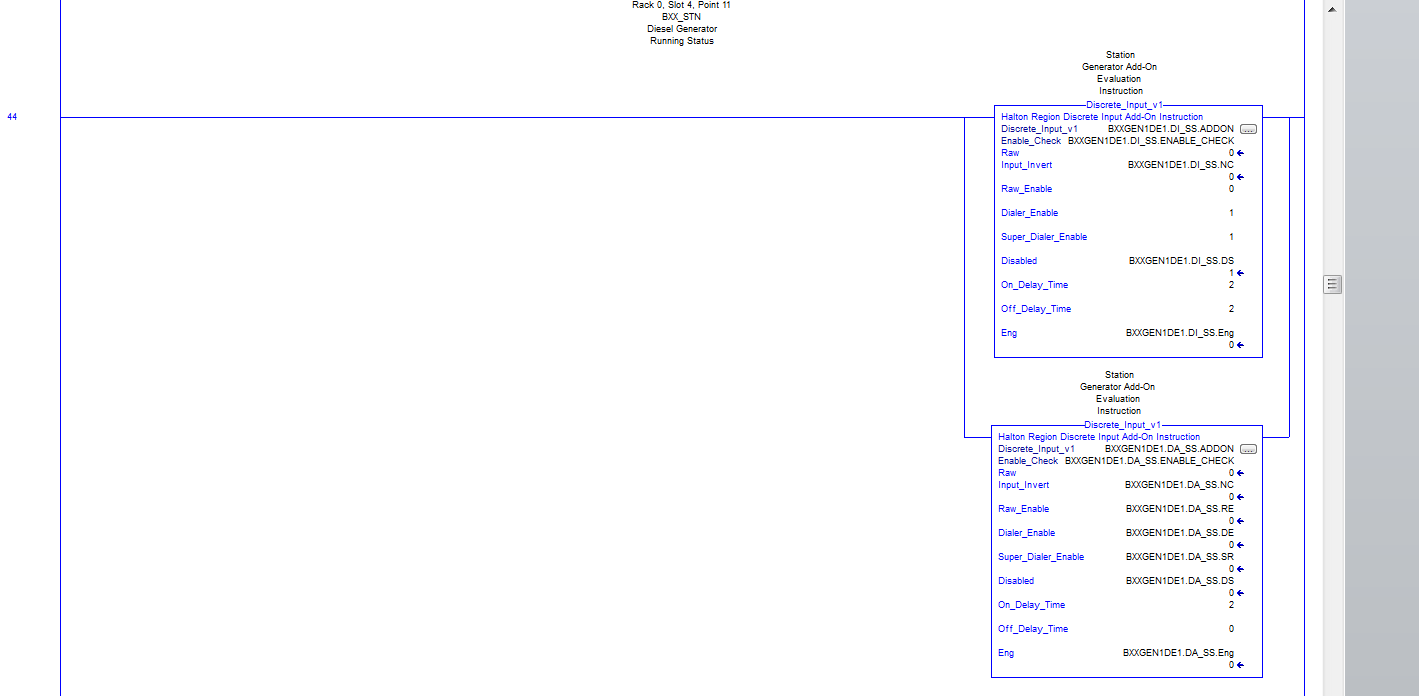
**Programming Examples**

There are two generator running tags – running status (DI\_SS) and running Alarm (DA\_SS). Running status is meant to be used in the same manner as any motor running status, it is always enabled so it can be used in the test of fail to stop and fail to start alarms and should be used to animate the generator on SCADA. The running alarm should be configured as any other hardwired alarm, and will have full control of alarm enables on the dialer page. Thus it is possible to disable the running alarm if it is a nuisance without losing information about the running status of the Generator.

In the DI\_MAP routine, the input signal from the generator should map to both the status tag and the alarm tag:



In the DI\_EVAL routine, both signals should be evaluated on the same rung. Not that all enables for the running status are hard-coded as they are not intended to be modifiable. As with other running status signals the on and off delay are configured, but only the on delay time needs to be configured for the alarm.



In the absence of an ATS, consideration must be given to either using substitute signals for the detection of emergency and normal power, or appropriate disabling of alarms must be programmed in the PLC to prevent any nuisance alarms from triggering.

**HMI Integration**

This AOI is primarily intended for use with the following pop-ups:

* Generator v1\_0

The ATS alarm group should be a child group of the generator alarm group so that alarms for both devices will display on the pop-up.

A standard HMI graphic object exists for the Generator on the “Symbols Library – Power I” In the InTouch Baseload. Reference tags can be updated by selecting the object and performing a Substitute Tag Operation. Note that if the backup power system only consists of a generator the pop-up script must be manually edited to map a null string (“”) to all ATS Indirect tags.

The following settings must be configured manually in the pop-up action script, if required:

ATS\_VIS1 – Set to 0 if the Backup Power System only consists of a Generator.

ATS\_VIS1 – Set to 0 to hide the Remote Test pushbuttons if remote testing of the ATS is not installed or is not to be made accessible.

GEN\_SRV – If the device is located on a remote InTouch Server, then this indirect tag must be changed to point at that server. By default, it looks at the Hot Backup Pair Configuration for the local system.