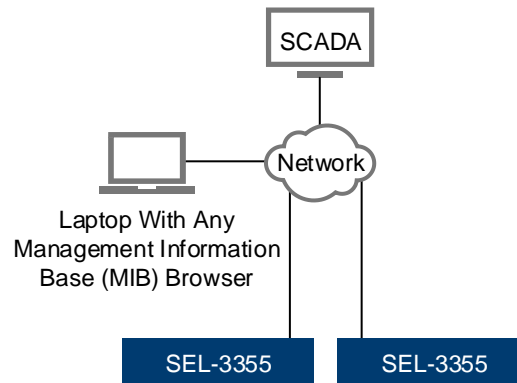


# *Monitoring the SEL-3355 Via Simple Network Management Protocol*

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## **INTRODUCTION**

A supervisory control and data acquisition (SCADA) system installed as part of a substation automation system (SAS) provides monitoring and other required functions for all SAS components, including GPS clocks, servers, gateways, Ethernet switches, firewalls, IEDs, and more. This application note provides a solution to achieve detailed monitoring of an SEL-3355 Rack-Mount Rugged Computer via Simple Network Management Protocol (SNMP) over any SCADA system (e.g., Zenon, Survalent). A typical SEL-3355 setup is shown in Figure 1.



**Figure 1 Typical Architecture for SEL-3355 in SAS**

## **PROBLEM**

SEL-3355 Computers have one hardwired alarm contact that can be wired normally open (NO) or normally closed (NC), along with one alarm LED on the front. When a set threshold for any alarm is violated, these contacts change their statuses and the alarm LED turns red. A procedure is required to not only identify the exact cause of the alarm, but also to quantify it (wherever possible) and later link this information to an SAS human-machine interface (HMI) for an operator to view and determine necessary actions.

## **SEL SOLUTION**

SEL-3355 Computers are normally loaded with Microsoft® Windows® operating systems and the SEL SysMon Service. The SysMon Service simplifies sending detailed monitoring information to the SCADA system. The SEL SysMon Service works independently of any SCADA system installed on the SEL-3355 Computer and SEL also provides a graphical user interface (GUI) to monitor statuses and real-time analog values. However, it cannot be configured for monitoring over any SCADA system until the statuses and real-time analog values are collected via a protocol.

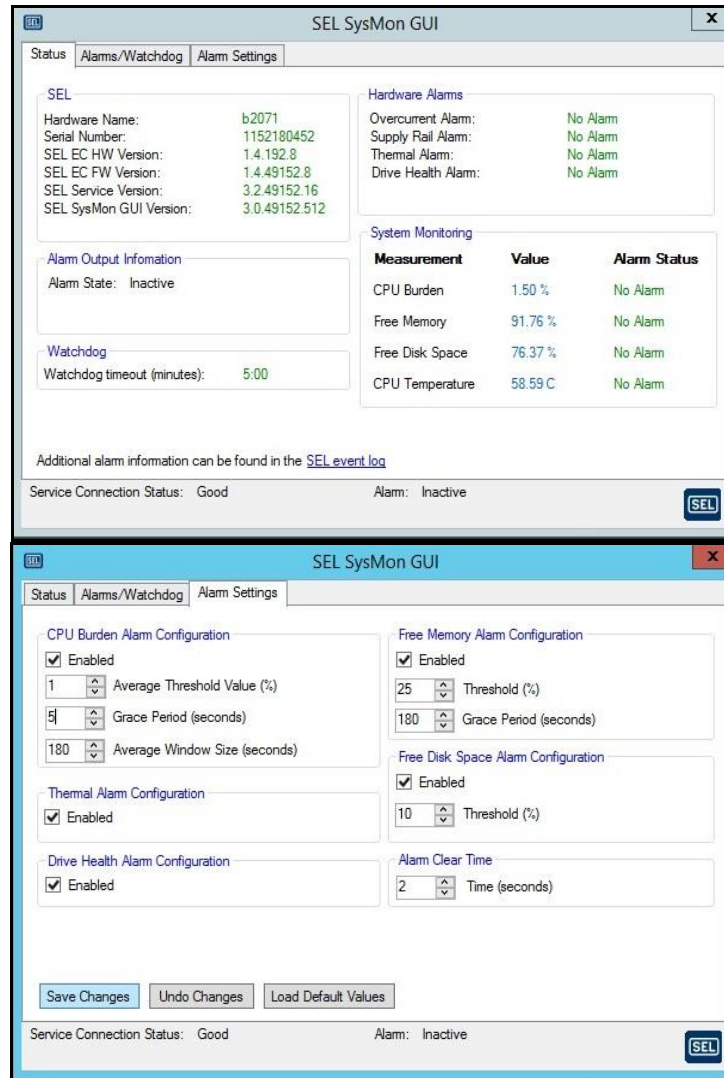


Figure 2 SEL SysMon Interface for Alarm(s) and Analog Value(s)

## Enabling SysMon SNMP Agent

SEL SysMon is capable of sharing the statuses and real-time analog values over SNMP (Versions 2 and 2c), but this is not a built-in feature. This feature can be enabled by installing the SEL SysMon SNMP Agent Extension available in the SEL-3355 drivers and software DVD that comes with the product or it can be downloaded from the SEL website and through the SEL Compass<sup>®</sup> application. It can also be enabled by running the SNMP-related registry files that are available at C:\Program Files\SEL\bin on the SEL-3355.

## Installing SNMP Role and/or Activating SNMP Service

Normally, SEL-3355 Computers come with a Microsoft desktop or server operating system (if they are ordered with operating systems). If a computer has a Windows server version installed, SNMP Service should be installed as a feature through the Server Manager (see Figure 3). If a computer has a desktop operating system installed, the Turn Windows Feature On or Off menu should be used to activate SNMP Service.

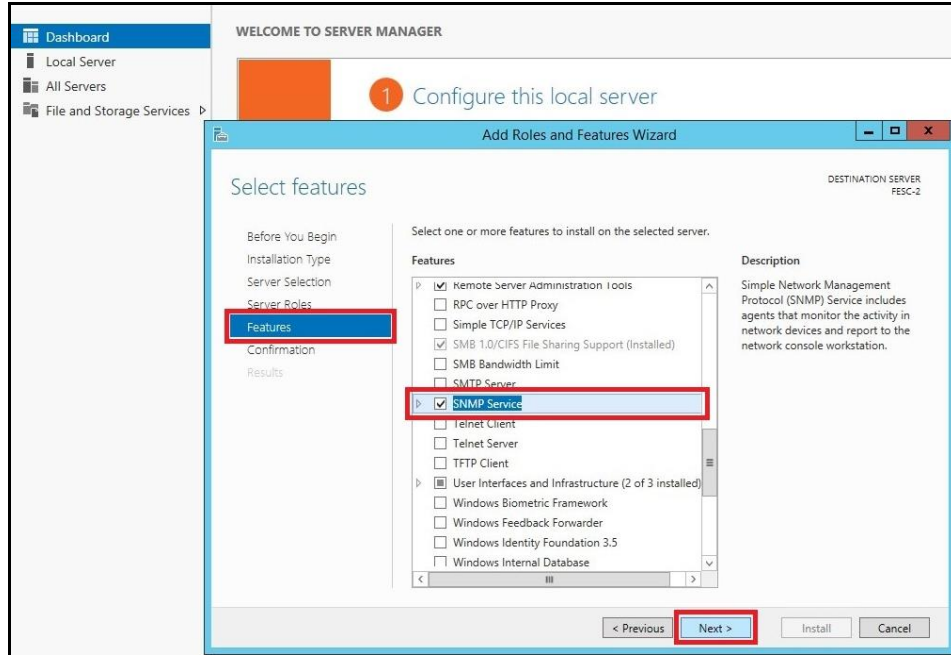


Figure 3 Roles and Features Wizard for Server 2012

### Configuring SNMP Service

Within the properties window of SNMP Service, the startup type should be set to automatic. The community should be specified with **READ ONLY** rights, and hosts from which SNMP packets can be accepted should be specified. An example of the proper configuration for SNMP Service is shown in Figure 4.

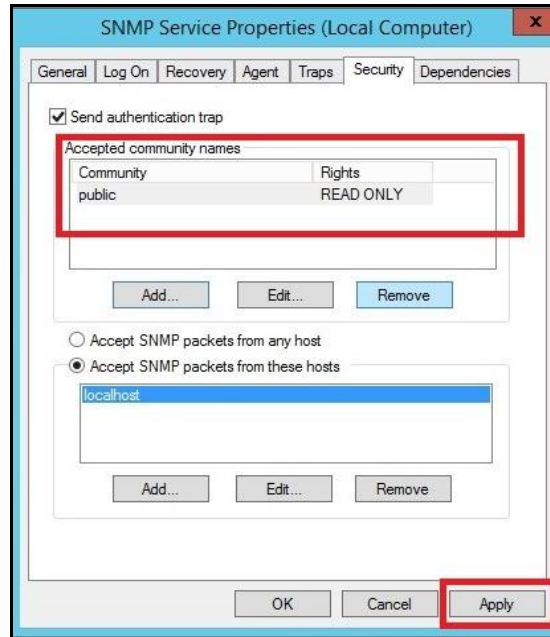


Figure 4 SNMP Service Properties

## Validation

The method described in this application note can be validated by using any SNMP MIB browser. If all the settings have been configured appropriately, then the SNMP MIB browser can read all the statuses and real-time analog values monitored by the SEL SysMon Service with specific object identifiers (OIDs) for each signal (see Table 1).

**Table 1 MIB Addresses for SEL SysMon Signals**

| S.No. | SIGNAL NAME                      | TYPE   | OBJECT ID                            |
|-------|----------------------------------|--------|--------------------------------------|
| 1     | CPU BURDEN                       | Status | .1.3.6.1.4.1.31823.1.3300.1.2.2.1.0  |
| 2     | DRIVE HEALTH                     | Status | .1.3.6.1.4.1.31823.1.3300.1.2.2.2.0  |
| 3     | FILE SYSTEM USAGE                | Status | .1.3.6.1.4.1.31823.1.3300.1.2.2.3.0  |
| 4     | GLOBAL ALARM                     | Status | .1.3.6.1.4.1.31823.1.3300.1.2.2.4.0  |
| 5     | JUMPER ALARM                     | Status | .1.3.6.1.4.1.31823.1.3300.1.2.2.5.0  |
| 6     | MEMORY USAGE                     | Status | .1.3.6.1.4.1.31823.1.3300.1.2.2.6.0  |
| 7     | OVERCURRENT ALARM                | Status | .1.3.6.1.4.1.31823.1.3300.1.2.2.7.0  |
| 8     | POWER SUPPLY HEALTH              | Status | .1.3.6.1.4.1.31823.1.3300.1.2.2.8.0  |
| 9     | SUPPLY RAIL ALARM                | Status | .1.3.6.1.4.1.31823.1.3300.1.2.2.9.0  |
| 10    | THERMAL ALARM                    | Status | .1.3.6.1.4.1.31823.1.3300.1.2.2.10.0 |
| 11    | CPU BURDEN                       | Analog | .1.3.6.1.4.1.31823.1.3300.1.2.3.1.0  |
| 12    | FILE SYSTEM USAGE                | Analog | .1.3.6.1.4.1.31823.1.3300.1.2.3.2.0  |
| 13    | MEMORY USAGE                     | Analog | .1.3.6.1.4.1.31823.1.3300.1.2.3.3.0  |
| 14    | CPU CORE TEMPERATURE             | Analog | .1.3.6.1.4.1.31823.1.3300.1.2.5.1.0  |
| 15    | POWER SUPPLY TEMPERATURE         | Analog | .1.3.6.1.4.1.31823.1.3300.1.2.5.2.0  |
| 16    | DEVICE AMBIENT TEMPERATURE       | Analog | .1.3.6.1.4.1.31823.1.3300.1.2.5.3.0  |
| 17    | FIRST MEMORY MODULE TEMPERATURE  | Analog | .1.3.6.1.4.1.31823.1.3300.1.2.5.4.0  |
| 18    | SECOND MEMORY MODULE TEMPERATURE | Analog | .1.3.6.1.4.1.31823.1.3300.1.2.5.5.0  |

## CONCLUSION

The OIDs gathered by the validation process using an MIB browser can be configured in a SCADA database and can subsequently be used over an HMI to achieve SEL-3355 real-time monitoring. The ability of SEL SysMon to share statuses and real-time analog values over SNMP allows real-time monitoring of SEL-3355 over any SCADA application that supports SNMP Version 2/2c. This provides flexibility when configuring SCADA databases with required statuses and real-time analog information. It also allows the user to integrate the configured database over an HMI based on customer-specific standards, eliminating the need for separate monitoring of an SEL-3355 via the SEL SysMon GUI.

