



RTAC R149 Technical Note

With the addition of firmware version R149-V0 to the RTAC product line, the following are some notes and additional comments about new additions or changes in the firmware. These items are compiled from the release notes found in *Appendix A: Firmware and Manual Versions* of the ACSELERATOR RTAC[®] SEL-5033 Software Instruction Manual. Please note that this document does not discuss each release note, but rather just those with additional context or conversation points.

Some new features or enhancements to existing features in R149-V0 include the following:

- ▶ Support for IPv6 when using the RTAC web interface, APIs, and DNP, Modbus, SEL, and SFTP protocols.
- ▶ Enhanced User API to include support for adding, deleting, and modifying user accounts.
- ▶ Encrypted port 1217 communications between ACSELERATOR RTAC software and RTAC firmware.
- ▶ Added support for Axion Recording Group channel calculations.
- ▶ Added support for Axion Bay Controller and SEL-2242 touchscreen display.
- ▶ Added support to SEL Client devices to collect events from SEL relays connected as children through a tiered 2020/203x connection.
- ▶ Enhanced Project API to include information about project connections.
- ▶ Added support for SEL-3390T PCI Time card.
- ▶ Added support to Modbus Client to support COMTRADE and SOE collection when communicating with IEDs using GE UR firmware versions 8.0 and later.
- ▶ Enhanced SEL Client to support the SEL-851.
- ▶ Updated BIOS for SEL-3350 to 1.1.49152.36.
- ▶ Updated BIOS for SEL-3355-2 to 2.4.49152.159.
- ▶ Added a setting to Global network settings which enables automatic redirect from http port 80 to https port 443 for web server connections. Setting defaults to false.
- ▶ Added support for user-defined primary and backup DNS servers.

The following are additional comments on new features and changes in the RTAC product line.

Updated BIOS for SEL-3350 to 1.1.49152.36.

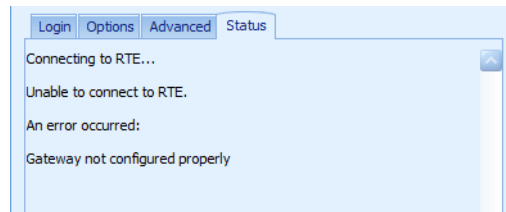
Updated BIOS for SEL-3355-2 to 2.4.49152.159.

Firmware versions R149-V0, R148-V4, R147-V3, R146-V4, and R145-V4 all offer updated BIOS versions for RTAC hardware variants that have a user-accessible BIOS. This corresponds with Service Bulletins 2021.18 and 2021.19. As a reminder, when firmware is loaded onto an automation hardware platform, the hardware will check the BIOS version upon startup. If the BIOS on the hardware is the same as or newer than the version listed for the firmware revision, the BIOS

will not be touched. If the BIOS is older than what the firmware supports, the BIOS will automatically be updated to the version number listed with the associated firmware.

Encrypted port 1217 communications between acSELeRator RTAC software and RTAC firmware.

In firmware versions R149-V0, R148-V4, R147-V3, R146-V4, and R145-V4, communications on Port 1217 between the RTAC and ACSELERATOR RTAC software are now encrypted. It is important to note that all communications that exchange user credentials, project configuration, and downloads or uploads have always been encrypted, as has all web interface communication. These communications occur on different ports. Port 1217, which was not previously encrypted, provides real-time diagnostic information about the logic engine to ACSELERATOR RTAC while online with the automation controller. It is important to note that R149-V0 (and the associated point releases) will not allow ACSELERATOR RTAC versions earlier than 1.33.149.12000 to go online because those earlier versions do not support the encrypted traffic. If an attempt is made to download or go online with a project with software prior to 1.33.149.12000 with R148-V4, R147-V3, R146-V4, or R145-V4, then a message stating cannot “Unable to connect to RTE” will be shown to the user.



Added support for Axion Bay Controller and SEL-2242 touchscreen display.

The SEL Axion[®] Bay Controller is SEL’s new flagship bay control solution. This release includes support for the new SEL-2242 Backplane touchscreen display with 6 programmable pushbuttons, 19 programmable LEDs, and a front-panel Ethernet port (Port F). It provides local control and monitoring of switchyard equipment, including circuit breakers, disconnect switches, instrument transformers, and more. The touchscreen is only compatible with the SEL-2241 RTAC. However, you can still expand the Axion bay controller with other standard SEL-2242 backplane nodes.

To support communication between the SEL-2241 RTAC and touchscreen, R149-V0 also includes an enhancement for the RTAC’s hardware. Consequently, only new SEL-2241 RTACs that ship with R149-V0 support this new touchscreen. You can determine if an SEL-2241 RTAC is compatible with the touchscreen by the existence of **Port F** on the RTAC’s web interface. If Port F does not exist for configuration, the RTAC will not support the touchscreen display.

For device configuration, ACSELERATOR RTAC now includes a Bay Screen Builder for designing as many as 25 custom bay screens. You can launch this application directly from ACSELERATOR RTAC after adding an “SEL-Touchscreen” to your project.

Added support for Axion Recording Group channel calculations.

This enhancement includes a new Calculations tab in the Axion Recording group that allows you to create virtual channels using SEL-2245-42 analog inputs or Custom Analogs. This feature provides a simple method for capturing oscillography recordings from a transmission line by summing line currents from other

connected lines, rather than measuring current directly. You can use basic math operations (add, subtract, multiply, or divide) on any channels in the Recording Group.

Added support for SEL-3390T PCI Time card on the SEL-3555.

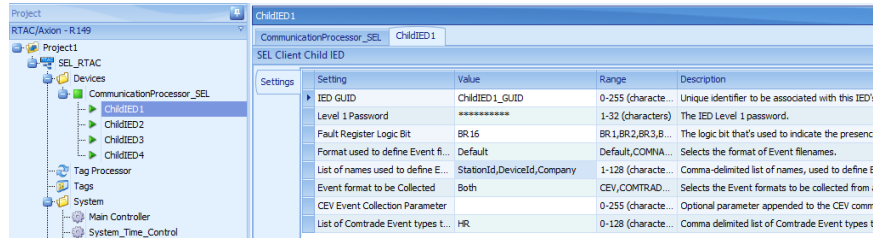
With R149-V0, the SEL-3555 and SEL-3560 RTAC support the SEL-3390T Universal Time Card. This card provides IRIG (via BNC connector) and PTP timing to the RTAC operation system. The accuracy of IRIG timing is the same as any other RTAC hardware (better than 1 μ s). The PTP interface is only accurate to 500 μ s, although future enhancements may increase the accuracy of PTP to a finer resolution of 1 μ s to support synchrophasors and other applications that require high-accuracy time stamps.

Currently, the SEL-3390T is not orderable as an accessory with an SEL-3555 or SEL-3560. This option will be added to the orderable configurations for these products in 2022. Currently, customers can purchase the SEL-3390T and install the time card into a PCI card slot in the field and, when using firmware R149-V0 or later, use the IRIG and PTP functionality. Please note that the SEL-2242 Backplane only supports one SEL-3390T card at a time.



Added support to SEL Client devices to collect events from SEL relays connected as children through a tiered 2020/203x connection.

The SEL-2020, SEL-2030, and SEL-2032 Communications Processors have been used for several decades as data concentrators and protocol converters to allow SCADA systems to monitor SEL IEDs. There are several thousands of these communications processors still in use today in the field and their connected SEL IEDs continue to generate valuable event records, but memory and processing limitations of these products do not allow them to directly participate in many automatic event retrieval systems, such as ACSELERATOR TEAM[®] SEL-5045 Software or the SEL Blueframe[™] Data Management and Automation (DMA) application suite. This feature enhancement allows you to configure the RTAC to communicate to SEL-2020 or SEL-2030 series-connected IEDs (referred to as “child” IEDs) through the existing communications processor by using transparent connections to automatically collect event CEV and COMTRADE event records, as shown in the following figure. These records are made available in the RTAC web interface, SFTP file system, and direct database connections (for reporting to TEAM and DMA) as if the RTAC was directly connected to these IEDs without an intermediate communications processor in place. Detailed instructions and application notes for configuring this system can be found in *SEL Protocol* in *Section 2: Communications* in the ACSELERATOR RTAC instruction manual.



Added support for user-defined primary and backup DNS servers.

Previously, DNS server definitions were only accessible via Dynamic Host Configuration Protocol (DHCP) configured Ethernet interfaces. Now users can define a primary and backup DNS server via the global interface settings in the RTAC web interface. User-defined DNS settings take precedence over DHCP discovered DNS settings. The primary feature that interacts with DNS is the Email Plus library extension package.

Network Settings

[List Interface Settings](#) [Edit Global Settings](#)

Edit Global Settings

Enable HTTP Redirect:

Hostname:

Socket TCP Keep Alive Time (seconds):

Socket TCP Keep Alive Interval (seconds):

Socket TCP Keep Alive Probes:

DNS Suffix:

Primary Nameserver:

Secondary Nameserver:

[Submit](#) [Cancel](#)

Enhanced SEL Client to support the SEL-851.

The newly available SEL-851 Feeder Protection Relay uses a new Relay Word bit naming structure, which required some enhancements to SEL Client to successfully integrate and take advantage of all the features in SEL Protocol. Please note that use of other protocols from the SEL-851 (DNP3, etc.) are supported in earlier versions of RTAC firmware.



Added support to Modbus Client to support COMTRADE and SOE collection when communicating with IEDs using GE UR firmware versions 8.0 and later.

Adjustments made by GE to the Modbus Register map in UR firmware versions 8.0 and greater required that a different set of addresses be used when retrieving COMTRADE and SOE collection from the IED. If these collection options are enabled, the Modbus Client will autodetect UR firmware versions of < 7.9, 7.9, 8.0, and later upon startup and use the appropriate register map for this process.

MMS Client/SEL Client COMTRADE Recollection.

Previously, MMS and SEL COMTRADE collection would search the target devices file system, identify a COMTRADE file name that had not been previously collected, and then collect that file and make it available via file system services on the RTAC. After the initial collection, the file name would be internally recorded so each file was only collected once. However, some devices may clear their file system and then generate new COMTRADE files with the same names as previously generated files. In this case, the RTAC would not collect them.

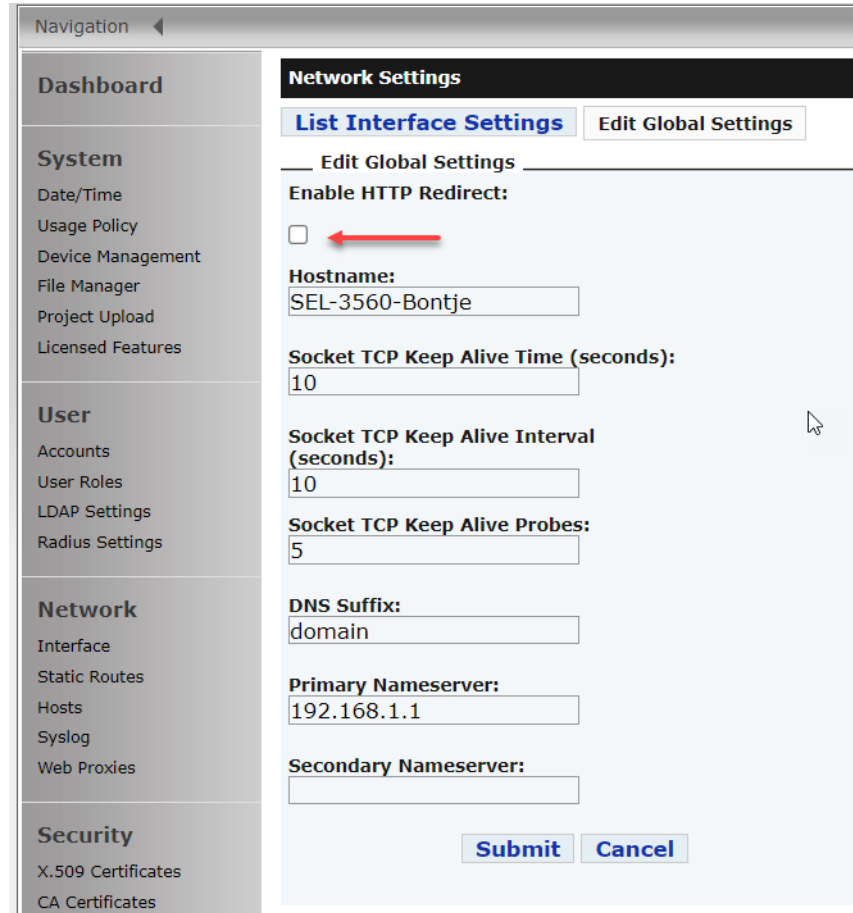
With R149-V0 and later, if this setting is enabled, the RTAC will record the associated time stamp of a COMTRADE file name when collected, then monitor the server for changes to the time stamp of that COMTRADE file name. When the time stamp changes, the RTAC will re-collect that COMTRADE file. It is worth noting that some third-party IEDs do not report a consistent time stamp with their MMS file system listing requests. If this setting is enabled and the RTAC is communicating with one of these devices, it will continuously detect changed time stamps and re-collect the COMTRADE records.

Added a setting to Global network settings which enables automatic redirect from http port 80 to https port 443 for web server connections. Setting defaults to false.

Since R100, the RTAC has only supported HTTPS (“Secure” HTTP) communications. Prior to R149-V0, the RTAC responded to any traffic requests on Port 80 for HTTP communications with a redirect telling the requester to use Port 443. This caused web browsers to automatically bring users to the HTTPS login page of the RTAC.

As web browsers start their transition to deprecating the use of insecure HTTP by not using this connection type by default, R149-V0 has started to transition the RTAC platform away from Port 80 entirely. This redirect behavior is now a Global interface setting, Enable HTTP Redirect, on the RTAC web interface, as shown in the following figure. The default for this setting is unchecked (i.e., false), meaning that Port 80 will not redirect to Port 443. If users would like to continue this redirect, this setting can be selected (i.e., set to true) to return to this

previous behavior. This means that, when accessing the RTAC web interface, users may need to specifically type in https:// prior to the IP address of the RTAC, depending on the browser’s default behavior regarding HTTP vs. HTTPS. While this is a relatively small change in functionality, it may not be straightforward for some customers who are not familiar with the differences between HTTP and HTTPS and the transition occurring in the industry.



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SCHWEITZER ENGINEERING LABORATORIES, INC.

2350 NE Hopkins Court • Pullman, WA 99163-5603 U.S.A.
Tel: +1.509.332.1890 • Fax: +1.509.332.7990
selinc.com • info@selinc.com

