



SEL-5045 Software

Instruction Manual

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SEL SCHWEITZER ENGINEERING LABORATORIES

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Overview of TEAM

The ACCELERATOR TEAM® SEL-5045 Software consists of the ACCELERATOR Database, an Open Database Connectivity (ODBC)-compliant database, used to store normalized event report data; TEAM device data collection (DDC), a Microsoft® Windows® service that automatically retrieves event reports; TEAM event data translator (EDT), a Windows service that translates event report files into normalized device data and records this information in the database; an Event Data Viewer, a component that provides event data visualization; TEAM translator manager service (TMS), a Windows service that manages device data translation; device configuration via the Connection Explorer in the ACCELERATOR QuickSet® SEL-5030 Software Device Manager; and the TEAM Web Server, a web-based, read-only viewer for TEAM Event and TEAM Profile collected data.

About TEAM Architecture

ACCELERATOR Database

NOTE: To ensure the highest possible data integrity, disable write caching on the hard drive where the ACCELERATOR Database is located.

The ACCELERATOR Database is an ODBC-compliant structured query language (SQL) database that stores all data used by the QuickSet Device Manager and TEAM Software. The database is the central component in the TEAM Software.

TEAM Device Data Collection Service (DDC)

The TEAM DDC is a Windows service that runs unattended and retrieves device data from SEL intelligent electronic devices (IEDs) and other supported devices. The DDC uses a direct serial, modem, or Ethernet connection to communicate with devices. Based on your custom installation, the DDC will retrieve event reports and run commands on any supported device, including non-SEL devices. It can be programmed to retrieve virtually any data from any device that uses ASCII communication and store those data on a computer or network drive.

Device data retrieval is triggered by a polling frequency (see *Polling on page 2*) or as the result of a listening operation (see *Listening on page 2*) that is executed in response to new event notification from a communications processor, or an endpoint device such as the SEL-734. The TEAM DDC has no user interface: its configuration is accomplished through the use of the TEAM node in the Device Manager Connection Explorer.

The TEAM DDC has been designed to use input/output (I/O) completion ports, which means that all I/O is performed by the operating system via dedicated threads. This permits the DDC to connect to hundreds of devices at once and perform simultaneous communication with all connected devices.

Multiple instances of the TEAM DDC can be installed on separate personal computers (PCs) to allow for the retrieval of data from thousands of devices simultaneously.

A TEAM DDC communicates with the ACCELERATOR Database, recording event report retrievals and the names of files containing user command results.

Polling

The TEAM DDC can be configured to call SEL devices periodically to check for new events or run customized user-based commands. During this operation, the DDC always initiates the connection.

Listening

When the TEAM DDC is configured for listening, it monitors modem, serial, or Ethernet communications channels, looking for the notification that occurs when a device (SEL communications processor, for example) detects a new event. Upon notification, the DDC queries the device to discover the set of communications ports that have reported new events to the communications processor. The DDC queries devices connected to those ports and retrieves any new event reports meeting event retrieval conditions. If configured, user commands also run, and the DDC saves the results. The ACCELERATOR Database records event reports and file names for user command results.

Listening jobs must be configured through the use of the classic workflow (see *Classic and Auto-Configure Workflows on page 16*).

TEAM Event Data Translator (EDT)

The TEAM EDT is a Windows service that runs unattended, translates event report data collected by a TEAM DDC, and stores these data in the ACCELERATOR Database. When a DDC retrieves an event report, it records the report location in the ACCELERATOR Database and copies the file to the user-specified event report directory. The EDT periodically queries the ACCELERATOR Database to discover newly retrieved event reports. When it discovers a new event report, the EDT opens the event report file, translates the file, normalizes the data, and records the data in the ACCELERATOR Database.

While it is usually unnecessary to have more than one PC on which you have installed the TEAM EDT service, you can install one copy of the service on each of several PCs.

TEAM Translator Manager Service (TMS)

The TEAM TMS is a Windows service that runs unattended. It discovers the load data profiling (LDP), Sequence of Events (SOE), Sequential Events Recorder (SER), and voltage, sag, swell, interrupt (VSSI) data that the TEAM DDC collects, and it then parses the device data and records this information in the ACCELERATOR Database.

TEAM Web Server

The TEAM Web Server is a Windows service that runs unattended. It hosts a read-only web-based dashboard for viewing TEAM Event and TEAM Profile collected data as well as TEAM job configuration and status information.

Device Manager

Device Manager is a device asset management system with two types of configuration views. The device view is a top-level view of where devices are located (e.g., in a region, area, substation); the connection view includes the

connection hops to the device for communication. Device Manager manages devices and connection information, stores the information in the ACCELERATOR Database, and facilitates viewing of device data.

Deployment Sequences

The general sequence of events for deploying TEAM Software can be as follows:

1. Install all the necessary components for your configuration (refer to *Install ACCELERATOR Software on page 8*).
2. Use Device Manager to add new devices and configure communication.
3. Use the TEAM node in Device Manager to define jobs that need to be done throughout the system.
4. Assign one or many jobs to devices that have been created in Device Manager.
5. Fine tune the system configuration and any related parameters (refer to *Install ACCELERATOR Software on page 8*).

System Requirements

Operating system requirements to install TEAM software are as follows:

- 2 GHz dual-core or faster processor
- Microsoft® Windows® 7, Windows Server 2008, Windows Server 2012, Windows 10, Windows Server 2016
- 4 GB RAM
- 40 GB hard disk space
- Google Chrome version 56 or greater
- VGA 1024 x 768 or higher resolution monitor
- Mouse or other pointing device
- Administrative privileges required for installation
- Serial or Ethernet connection to allow communication to SEL devices

Given the flexibility, scalability, numerous system designs (such as various installation options), quantity of endpoint devices, and network architectures a TEAM system provides, performance can vary. Effective implementation requires deliberate planning and testing of the system to optimize the collection parameters for your system. This can require the prioritization of data types and adjustments in the duration of data storage and frequency of data collection to ensure that the performance of TEAM is not hampered by too frequent collection rates. The hardware on which TEAM is installed also heavily impacts performance of the TEAM system.

TEAM-collected data are stored in a Postgres database. It is best for the majority of setups that the end user be responsible for a database administrator (DBA) that can configure, maintain, and manage database performance, size, backup, and recovery. If you must shut down services when managing your TEAM installation, we recommend shutting the services down in the following order: TEAM Web Server, TEAM Sync, TEAM TMS, TEAM EDT, and lastly the TEAM DDC. When restarting the services, start them in the following order: TEAM DDC, TEAM EDT, TEAM TMS, TEAM Sync, and lastly the TEAM Web Server service. An upgrade to the ACCELERATOR Database requires that your hard disk drive has approximately three times the ACCELERATOR Database

size available prior to the upgrade. This allows the creation of temporary backups during the upgrade process. The upgrade cleans up any temporary files, and the resulting freed disk space becomes available for other use.

To find the ACCELERATOR Database size on disk, perform the following steps:

- Step 1. Navigate to
C:\ProgramData\SEL\AcCELERATOR\MasterDatabase\
DatabaseServer\Database
- Step 2. Right-click the data folder and select **Properties**.
- Step 3. Select the **Size on disk** field.

Optimize performance of the TEAM collection and translation services and storage of data in the ACCELERATOR Database through the use of the information in *Table 1*. This table shows the minimum hardware specifications necessary for use in a TEAM system when collecting compressed event report (CEV) and COMTRADE events, SOE data, and VSSI reports. This table is a guideline; performance of each tier depends on system variables. *Table 1* assumes an average customer system collecting five reports per device per day and storage of one year, where all devices have Ethernet communications.

Table 1 also displays the minimum hardware specifications necessary for use in a TEAM system when collecting security logs. However, security product functionality heavily influences the variables that impact system performance during the collection of security logs. For optimal system performance, we recommend maintaining the latest SEL security device firmware to take advantage of continuously enhanced functionality. Refer to *Appendix A: Firmware and Manual Versions* in the *SEL-3610 Port Server, SEL-3620 Ethernet Security Gateway, and SEL-3622 Security Gateway Instruction Manual* for information on enhanced features.

Table 1 Minimum Hardware Requirement for Collecting Data

	0-25 Devices	26-50 Devices	51-150 Devices	151-250 Devices ^a
Operating System	Windows 7, 64 bit	Windows 7, 64 bit	Windows 7, 64 bit	Windows 7, 64 bit
Hard Disk Drive	250 GB	450 GB	1.25 TB SSD	2 TB SSD
CPU	i3 (dual core)	i5 (dual core)	i7 (dual core)	i7 (quad core)
Processor Speed	2 GHz	2 GHz	2.5 GHz	2.5 GHz
RAM	4 GB	4 GB	8 GB	8 GB
Other Considerations	VM allowed	VM allowed	Dedicated hardware required	Dedicated hardware required

^a If you require a single installation with more than 250 devices or different device specifications from the assumed average system, contact SEL for assistance with evaluating the appropriate hardware and system configuration.

System variables that most significantly impact performance for the data types of *Table 1* include the size of collected reports, frequency of device report generation, quantity of endpoint devices per collection instance, frequency of interaction with the endpoint devices for data querying, and connection quality. For example, setting the TEAM polling interval to an unnecessarily high frequency may reduce the ability for TEAM to efficiently service the devices in your system.

Table 2 shows the minimum hardware specifications necessary for use in a TEAM system when collecting billing level load data profiling (LDP) data. This table is a guideline; performance of each tier depends on system

variables. *Table 2* assumes an average metering system connected via Ethernet that is polling eight recorders at a 15-minute acquisition rate per device every hour and storing data for one year.

Table 2 Minimum Hardware Requirement for Collecting Billing Profile Data

	0-10 Devices	11-50 Devices	51-150 Devices	151-250 Devices^a
Operating System	Windows 7, 64 bit			
Hard Disk Drive	250 GB	450 GB	1.25 TB SSD	Six 500 GB SSD (RAID 1+0)
CPU	i7 (quad core)	i7 (quad core)	Xeon E7 (quad core)	Xeon E7 (quad core)
Processor Speed	2.5 GHz	2.5 GHz	2.8 GHz	2.8 GHz
RAM	8 GB	8 GB	16 GB	16 GB
Other Considerations	Dedicated hardware required	Dedicated hardware required	Dedicated hardware required	Dedicated hardware required

^a If you require a single installation with more than 250 devices or a higher recorder quantity, sample rate, or acquisition rate, contact SEL for assistance with evaluating the appropriate hardware and system configuration.

System variables that most significantly impact performance for LDP data include load data profile settings (specifically more frequent LDAR rates), TEAM collection rate and recorder quantities from which to collect, additional applications or interactions with the machine that consume disk I/O, non-TEAM native read access to the ACCELERATOR Database (including SQL queries to the database, API access, and report software access), and machine hardware. As an example, increasing the number of configured recorders will likely reduce the overall number of devices TEAM can efficiently service within the assumed polling interval. Making such a change may require modifications to the minimum hardware necessary to maintain efficient service for each specified device count range.

Table 3 shows the minimum hardware specifications necessary for use in a TEAM system when collecting advanced power quality metering data. Advanced power quality meters place a greater load on the data collection and storage system than billing level meters because the load data recording rate for the advanced power quality meters is set to a much higher frequency, which creates more samples to record, collect, and store. This table is a guideline. We recommend contacting your local technical support to discuss your specific system needs. Maximum device count is 50 advanced power quality meters (SEL-735 R200 and greater) per TEAM installation.

Table 3 assumes an average advanced power quality metering system connected via Ethernet. This system uses default SEL-735 R200 and greater settings, polls five recorders at a 3-second acquisition rate per device every two hours and stores data for 90 days. Twenty recorders in the system are set to a 10-minute acquisition rate per device every two hours, and these recorders store data for 90 days.

Table 3 Minimum Hardware Requirements for Collecting Advanced Power Quality Data

	0-50 Devices^a
Operating System	Windows 7, 64 bit
Hard Disk Drive	Four 500 GB SSB (RAID 1+0)
CPU	Xeon E7 (quad core)
Processor Speed	2.8 GHz
RAM	16 GB
Other Considerations	Dedicated hardware required

^a If you require a single installation with more than 50 devices or a higher recorder quantity, sample rate, or acquisition rate, contact SEL for assistance with evaluating the appropriate hardware and system configuration.

System variables that most significantly impact performance for LDP data include load data profile settings (specifically more frequent LDAR rates), TEAM collection rate and recorder quantities from which to collect, additional applications or interactions with the machine that consume disk I/O, non-TEAM native read access to the ACCELERATOR Database (including SQL queries to the database, API access, and report software access), and machine hardware. As an example, extensive read access to the ACCELERATOR Database may reduce the efficiency of TEAM data translation efficiency and consequently reduce overall performance.

Supported Devices

Table 4 lists the SEL devices TEAM supports and the TEAM functions available from each.

Table 4 SEL Devices Supported by TEAM (Sheet 1 of 2)

SEL Devices	Event Collection	SOE Data	Load Profile Data
RTAC Recorder			•
SEL-300G	•	•	
SEL-311A, B, C, C-1, C-2, C-3	•	•	
SEL-311L, L-1, L-6, L-7	•	•	
SEL-321, -1, -2, -5	•		
SEL-321-3, -4	•	•	
SEL-351, -1, -2, -3, -4, -5, -6, -7	•	•	
SEL-351A, A-1, D, D-1, J, P, P-2, P-3	•	•	
SEL-351R, R-1, R-2, R-3, R-4	•	•	
SEL-351RS	•	•	
SEL-351S-5, S-6, S-7	•	•	
SEL-352, -1, -2, -3	•	•	
SEL-387-5, -6	•	•	
SEL-387A, E, L	•	•	
SEL-401	•	•	
SEL-411L, L-1	•	•	
SEL-421, -1, -2, -3, -4, -5, -7	•	•	
SEL-451-1, -2, -4, -5	•	•	

Table 4 SEL Devices Supported by TEAM (Sheet 2 of 2)

SEL Devices	Event Collection	SOE Data	Load Profile Data
SEL-487B, B-1, E, E-2, E-3, E-4, V, V-1	•	•	
SEL-501 ^a	•		
SEL-547	•	•	
SEL-551 ^a	•		
SEL-551C	•		
SEL-587Z	•		
SEL-651R, R-1, R-2, RA	•	•	
SEL-700G	•	•	
SEL-701, -1	•	•	
SEL-710, -5	•	•	
SEL-734 ^b	•	•	•
SEL-734P	•	•	•
SEL-735	•	•	•
SEL-749M	•	•	
SEL-751	•	•	
SEL-751A	•	•	•
SEL-787	•	•	
SEL-787-4	•	•	
SEL-849	•	•	
SEL-2411, P	•	•	
SEL-2414	•	•	
SEL-2431	•	•	
SEL-T400L ^c	•		

^a ASCII Event Collection Only.^b VSSI collection does not support firmware versions R200 and R201.^c Events collected from the SEL-T400L are in COMTRADE 2013 format, which can only be opened and analyzed in SYNCHROWAVE® Event SEL-5601-2 Software.

TEAM also supports event and Sequence of Events (SOE) collection from the following intelligent electronic devices (IEDs) by other manufacturers.

Alstom P544 ^a	GE C70	GE G60	GE T35
GE B30	GE F35	GE G650	GE T60
GE B90	GE F60	GE L30	
GE B95Plus	GE F650	GE L60	
GE C60	GE G30	GE L90	

^a Does not support Sequence of Events (SOE) collection

Installation

Install ACCELERATOR Software

TEAM and QuickSet components need to be installed on a server or client machine and then configured. You can customize the configuration to suit your needs. The architecture you choose at the time of installation determines subsequent access to each individual component.

This section describes the possible install components of TEAM and QuickSet applications. You can install these components on the same system or on multiple systems.

Possible installed components on any given machine include the following:

- QuickSet: A front-end interface for the configuration of devices in the **Connection Explorer** window.
- QuickSet TEAM Plug-in: A plug-in application for configuring TEAM options.
- TEAM DDC Service: A back-end service that manages communications and the execution of jobs created by the end user.
- TEAM EDT Service: A back-end service that runs unattended, translates data collected by a TEAM DDC, and stores these data in the ACCELERATOR Database.
- TEAM TMS Service: A back-end service that runs unattended, translates device data, and records this information in the ACCELERATOR Database.
- TEAM Web Server: A back-end service that runs unattended and hosts a read-only web dashboard with TEAM Event and TEAM Profile collected data.
- ACCELERATOR Database: A back-end server for the SQL database used by TEAM products.
- QuickSet Device Manager Plug-in: Enable QuickSet to host the Device Manager interface.
- ACCELERATOR Database Device Manager Support: Store Device Manager configuration within the ACCELERATOR Database.
- TEAM Sync: A back-end service that pushes data to destination stations. Note that the installation of the TEAM Sync configuration application occurs upon installation of the service.

The following installed components run as services, which you can monitor, start, and stop with Windows services.

- TEAM DDC
- TEAM EDT
- TEAM TMS
- ACCELERATOR Database
- TEAM Web Server
- TEAM Sync

General Prerequisites

NOTE: If you have a remote connection to an ACSELERATOR Database, then you will have read-only access. You will be able to view location, device, and connection information, and TEAM location and device options. You will also be able to view event reports. However, you will be unable to define system incidents, import events, or enter or modify information in the TEAM forms or wizards.

NOTE: SEL recommends stopping TEAM services during an upgrade of QuickSet and ACSELERATOR Database. Navigate on your computer to **Services.msc**, right-click on the TEAM DDC, EDT, TMS, and Sync Services, and then select **Stop**. After completion of the upgrade, restart the TEAM services.

- All the machines on which the components are to be installed should match the hardware and software requirements listed under *System Requirements on page 3*.
- Ensure that Microsoft .NET 4.5.1 is installed properly.
- Ensure that your PC is turned on and that all other applications are closed.
- Once you have reached the User Information window (see *Figure 1*), enter your License Authorization Code (LAC) number printed on the case label. The installation will contact the license web service automatically. The web service will generate a license file for the application and distribute it to your machine.

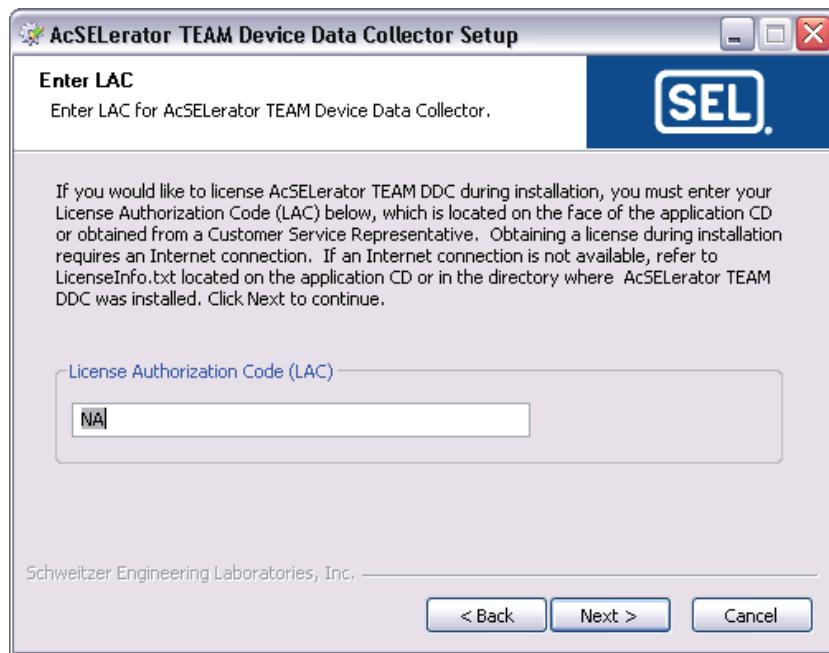


Figure 1 Enter LAC Dialog

- Automated licensing requires an internet connection. If you do not have an internet connection, or have difficulties during the licensing process, read the LicenseInfo.txt file located in the directory where the application was installed.
- Manual licensing requires sending your Machine Host ID and LAC to licensing@selinc.com. The Host ID can be found in the LicenseInfo.txt files or, if running TEAM version 1.25.0.0 or newer, in the TEAM node licensing tab. Once you receive your license file, ensure that it is named DDC.lic and save it to the bin directory of the DDC install file location.

- If a license already exists in the installation directory, the application will load the file automatically and continue with the installation.
- If you have any difficulties installing or licensing the software, contact your customer service representative or the SEL factory for assistance.

Compatibility Matrix

Table 5 shows the minimum QuickSet version that is compatible with a given TEAM version.

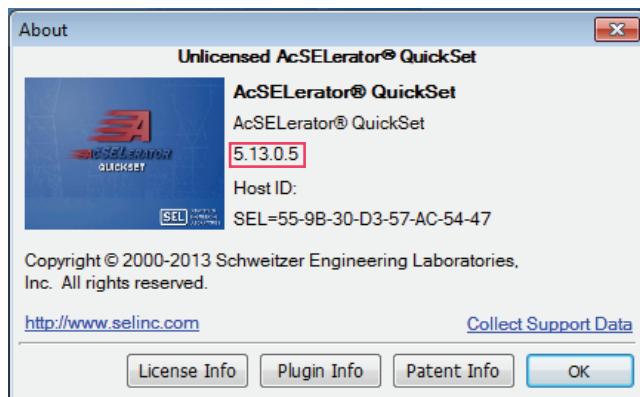
Table 5 QuickSet and TEAM Compatibility (Sheet 1 of 2)

TEAM Version	Minimum QuickSet Version
1.43.5.0	6.8.0.0
1.43.3.0	6.8.0.0
1.43.1.0	6.8.0.0
1.43.0.0	6.7.2.2
1.40.0.0	6.7.2.2
1.38.2.0	6.6.1.1
1.38.1.0	6.6.1.1
1.37.13.5	6.6.1.1
1.37.12.2	6.5.3.1
1.37.11.4	6.5.3.1
1.37.10.0	6.4.0.2
1.37.8.0	6.4.0.2
1.37.7.0	6.3.0.7
1.37.3.0	6.2.0.0
1.37.1.0	6.0.2.3
1.27.7.0	5.18.1.0
1.27.2.0	5.16.0.2
1.27.0.0	5.16.0.2
1.25.2.0	5.16.0.2
1.25.0.0	5.16.0.2
1.22.1.0	5.15.1.2
1.22.0.0	5.15.0.4
1.20.0.0	5.14.2.1
1.16.5.0	5.14.2.1
1.16.4.0	5.14.1.1
1.15.0.2	5.14.0.13
1.14.3.0	5.13.7.6
1.14.2.0	5.13.5.4
1.13.0.0	5.13.4.2
1.11.0.1	5.13.3.5
1.10.0.0	5.13.0.5

Table 5 QuickSet and TEAM Compatibility (Sheet 2 of 2)

TEAM Version	Minimum QuickSet Version
1.6.0.0	5.12.3.2
1.5.2.0	5.12.1.0
1.4.6.0	5.11.1.0
1.4.5.0	5.9.0.2
1.4.1.0	5.6.0.2

To find QuickSet version information, open QuickSet and select **Help > About**.

**Figure 2 Determine QuickSet Version**

To find TEAM version information, right-click on any of the TEAM executable files and then select the **Details** tab. After installation, navigate to **Windows > Control > Panel > Programs > Programs and Features** to see each installed service version.

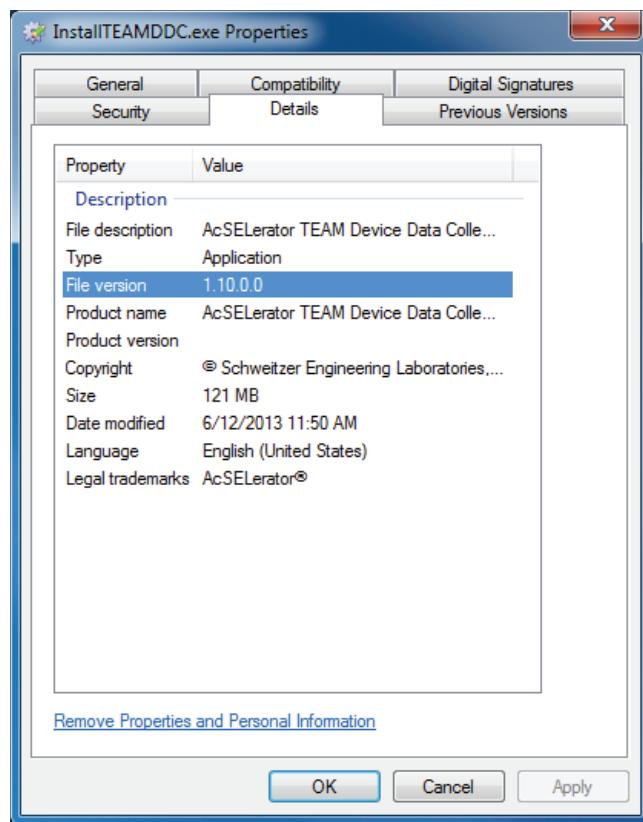


Figure 3 Determine TEAM Version

Service Accounts

During the installation of all the TEAM services, a Windows-managed service account (sel_service) is created. This account is a Windows user identity that is associated with a service executable for the purpose of providing security. A system administrator can create accounts and reset passwords.

In the setup wizard, for a new install, you will be prompted to add a service account password for the sel_service account. Note that this password must meet the password policy requirements set in your computer.

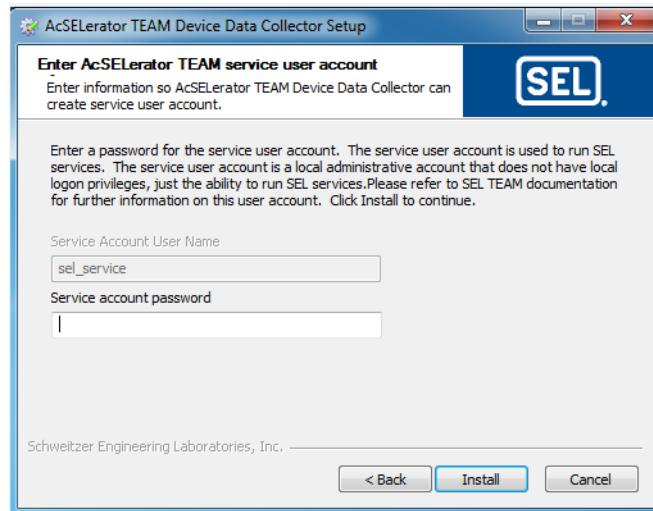


Figure 4 Add a Service Account Password

Enter a password and complete the setup wizard. This password must be used to install the rest of the TEAM services.

For an upgrade installation, the software will prompt you to use either the default password or enter a new password. This same password is necessary for upgrading all the TEAM services.

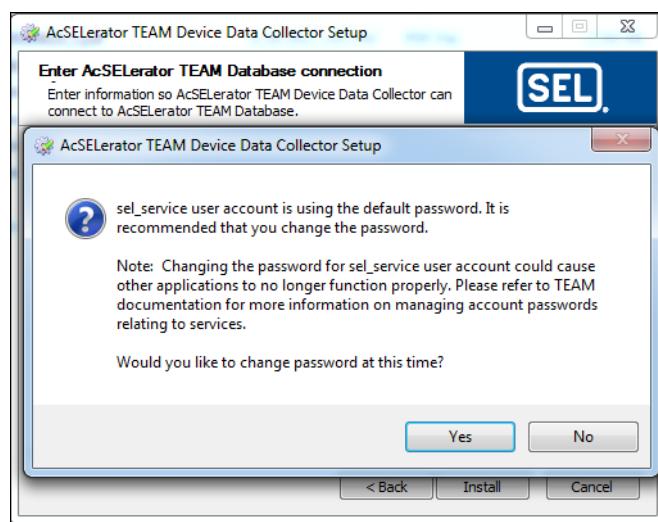


Figure 5 Change the Service Account Password

To change or update the passwords directly for all the TEAM services, go to **Control Panel > All Control Panel Items > Administrative Tools** and select **Services.msc**. Select the **AcSELerator TEAM DDC** service, right-click,

then select the option to stop the service. Right-click again, select **Properties**, and then select the **Log On** tab to obtain a window from which you can change passwords. Restart the service. Repeat this process for the TEAM EDT, TMS, and Sync services.

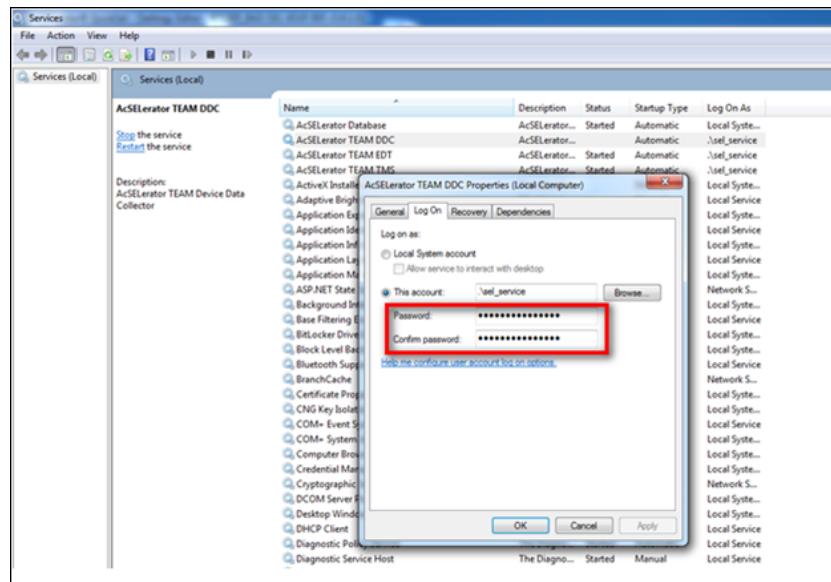


Figure 6 Change Passwords for All TEAM Services

Install a Single-Node Configuration

In a single-node configuration, all components are installed on a single PC or server. This configuration can be used for applications that have a limited number of users or for systems that do not require failover or load balancing.

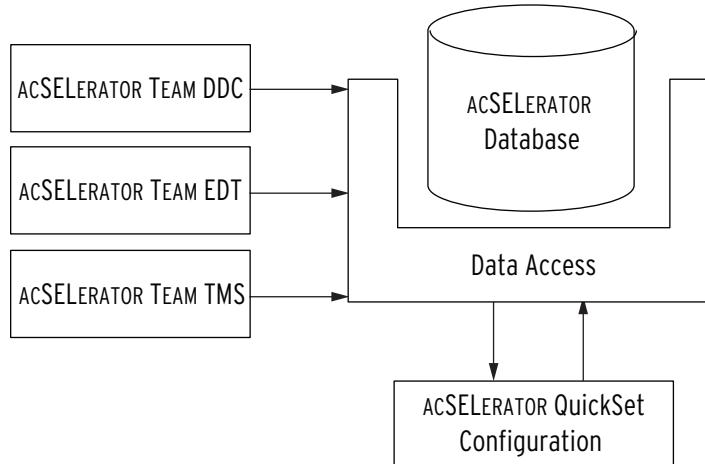


Figure 7 Single-Node Configuration

Install a Multinode Configuration

In this configuration, front-end servers and configuration tools are installed on one server, and the back-end servers are installed on one or multiple servers or PCs. A multinode installation facilitates load-balanced and failover configurations.

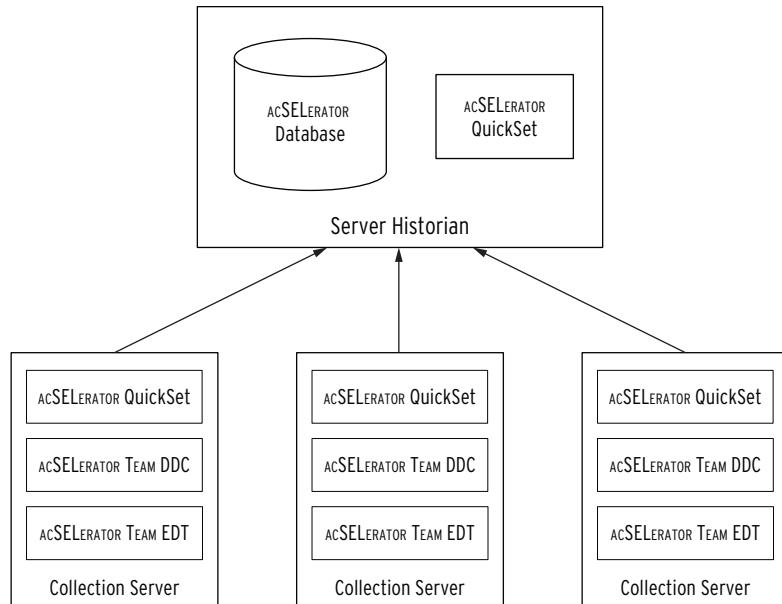


Figure 8 Multinode Configuration

Get Started With TEAM

Overview

TEAM automates the collection and reporting of power system data from multiple devices to a central location for easy access. By using TEAM, engineers and technicians can continuously monitor an entire system and quickly gather event or metering data. TEAM integrates with QuickSet so that you have all the tools you need for device management and monitoring in one convenient interface. Through the use of this software, you can perform the following:

- Using the features of TEAM Event, automate the collection of CEV and COMTRADE files from supported SEL devices and other supported vendors. Collect Sequence of Events (SOE) records from SEL relays, SEL meters, and the SEL Real-Time Automation Controller (RTAC) family of IEDs.
- Through TEAM Profile, retrieve energy, demand, voltage, current, harmonics, and frequency data. Also collect voltage sag, swell, and interruption (VSSI) data from SEL meters.
- Use SEL security devices in conjunction with TEAM Security to automate IED password generation and security log collection.

- Accurately pinpoint the location of a fault by using TEAM Transmission Fault Location and the built-in double-ended fault location algorithm.
- Back up your data by replicating the ACCELERATOR Database into designated archive servers. Use TEAM Sync to synchronize data by delivering up-to-date information among several TEAM services, regardless of location.

When the QuickSet TEAM plug-in is installed in QuickSet, you will see the **TEAM** node in the Connection Explorer. To configure global TEAM options, navigate to and double-click the **TEAM** node in the Connection Explorer to display licensing details, TEAM communications channel information, and the global archiving options. In addition, the **TEAM** node will expand to show Event Collection Tasks and User Command Tasks under the **Jobs** node, along with Metering Points and Transmission Fault Location.

Double-clicking a specific device or folder node in the Connection Explorer displays the device or folder in the Device Manager Workspace with various tabs for associating additional information. The **TEAM** tab is where the DDC service and corresponding collection jobs are assigned for that device or folder. For information on the other tabs available in the device or folder Workspace, refer to the *ACCELERATOR QuickSet SEL-5030 Software Instruction Manual*.

For information on how to use Device Manager, Script Manager, or Password Manager, refer to the *ACCELERATOR QuickSet SEL-5030 Software Instruction Manual*.

Classic and Auto-Configure Workflows

Throughout this instruction manual, you will see references to the classic workflow and the auto-configure workflow. The classic workflow is how TEAM has always functioned, and will continue to function, to configure data collection jobs. The classic workflow provides ease of customization for all configurable features of a data collection job, while the auto-configure workflow uses default assigned values to save you polling job configuration time.

The classic workflow structure is as follows:

- Create a DDC connection in the **TEAM** node
- Add the communications channel to the device
- Configure the polling or listening job for the device

The auto-configure workflow automatically creates the DDC connection in the **TEAM** node and the communications channel for the device upon configuration of the device polling job.

Global Configuration

Double-click on the **TEAM** node in the Connection Explorer to display the **TEAM** tab. Select the **Global Options** tab on the left to display four additional tabs where you can define TEAM options that apply throughout the application.

File Name Templates Tab

Use the **File Name Templates** tab to define date and time formats, specify the directory location for event reports (EARCHIVE) and user command results (UARCHIVE), and define the file name template to use when creating event report and user command result files.

Select **Configure** to display the **Global Options Wizard**. The wizard will guide you through the process of defining global options. Select **Apply** when finished.

Communications Processor Tab

The **Communications Processor** tab lets you define the parameters necessary for communication with a communications processor such as the SEL-2032. The parameters you can define are as follows:

- WhoAreYou String: The text sent to a communications processor during listening operations.
- Logic Bit String: Identifies the logic bit that the communications processor will use during listening operations.
- Fault Label: Identifies the name of the fault label the communications processor will use.
- New Event String: The actual string communications processors send to notify the TEAM DDC of a new event.

Email Server Tab

The **Email Server** tab lets you define the parameters that are used for email notifications. They include the usual: SMTP Server, SMTP Port, and SMTP From Address.

If you choose to use POP3 authentication, the usual parameters are POP3 Host, User Name, and Password.

When you choose to use the emailing capability, TEAM will only send out an email if *all* of the following items are set:

- SMTP Server
- SMTP Port
- Email Recipient

If the server is unreachable, TEAM will log a message to the Windows Event Viewer and continue attempting to send the email periodically for the following 24 hours. After 24 hours, the email attempt will fail. The log item will remain in the Windows Event Viewer, providing notification of the issue.

Advanced Tab

In the **Advanced** tab, you can select a date before which event reports will not be collected. You can also choose to save your character encoding (.CEV) event files as COMTRADE files following TEAM EDT translation of event report files.

TEAM DDC Configuration

TEAM DDC is a Windows service that begins operating at installation. The primary responsibility of a DDC is to run device data collection jobs. You can install the DDC service on multiple computers, but only one per computer. The DDC instances work together to retrieve event reports and the results of user commands.

Double-click the **TEAM** node in the Connection Explorer to display the **TEAM** tab. Select the **DDC Instances** tab to display all instances of the TEAM DDC that have been installed. The host computer name displays for each DDC service installation. Right-click on a DDC instance to remove it from TEAM.

When you select a TEAM DDC service, you can use the tabs at the bottom of the TEAM DDC Instances Workspace to define or modify service communications connections and archive directories.

Select the **Archive Directories** tab to specify where you want the selected TEAM DDC to save event reports and user command results.

Licensing Information

TEAM licensing information is provided in the **Licensing** tab of the **TEAM** node. Double-click on the **TEAM** node in the Connection Explorer to display the **TEAM** tab. Select the **Licensing** tab to display your installation licensing information. This tab provides the available service names, details on license validity including the Host ID used in the license file and the machine Host ID, and license entitlements for each feature of TEAM.

TEAM Data Collection

TEAM collects power system data through the use of either a listening job or a polling job. You can perform both listening and polling operations on a supported device (see *Table 4 on page 6*) that has an event fault registry, while you can perform only polling operations on all other supported devices.

Listening Operation

A listening operation can be used when the end device has an event fault registry. Listening jobs, when applicable, provide more efficient event collection than do polling jobs. When you create a listening job for a device in the Connection Explorer, TEAM connects to the device and runs an event collection task only after detecting a notification from the event fault registry. You must configure listening jobs through the use of the classic workflow.

Polling Operation

Polling jobs run on an interval you specify during configuration. At each specified interval, TEAM connects to the device and runs the configured data collection job. You can specify that polling jobs occur just once, or you can set such polling intervals as minutely, hourly, daily, and monthly. You can also assign polling jobs at the folder level, which means that the configured polling job will run on all **In Service** devices in your selected folder node.

Example 1: Ethernet Event Collection

This example configures TEAM to poll an SEL-351-6 for quarter-cycle events over a Telnet connection once every minute.

TEAM Configuration

The following steps configure TEAM global options for Ethernet event collection. If you have already configured TEAM global options, proceed to *Device Manager Configuration on page 21*. This example uses the **Archive Directories** tab and does not address event file nomenclature. For an example of how to configure all Global settings, including event file-naming structure, refer to the *Job Done Example: Classic Workflow Overview on page 23*.

- Step 1. Open and log in to QuickSet **Device Manager**.
- Step 2. Double-click the **TEAM** node in the Connection Explorer. In the **DDC Instances** tab, select the **Archive Directories** subtab.
- Step 3. Select () for the **Event Report Directory (EARCHIVE)** to open the **Browse for Folder** window. Select an appropriate folder location for the EARCHIVE files and select **OK**. For this example, save to C:\TEAM\Events\.
- Step 4. Select () for the **User Command Directory (UARCHIVE)** to open the **Browse for Folder** window. Select an appropriate folder location for the UARCHIVE files and select **OK**. For this example, save to C:\TEAM\UserCommands\.

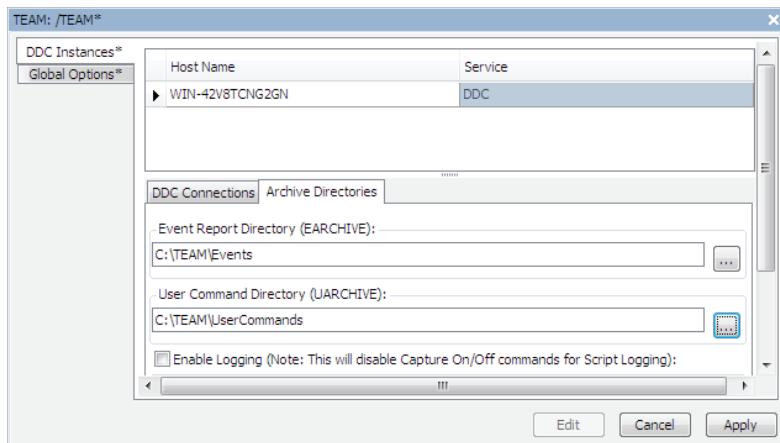


Figure 9 Set Archive Directories

Step 5. Navigate to the **DDC Connections** subtab and select **Add**, as shown in *Figure 10*. This starts the **Device Data Collection Wizard**.

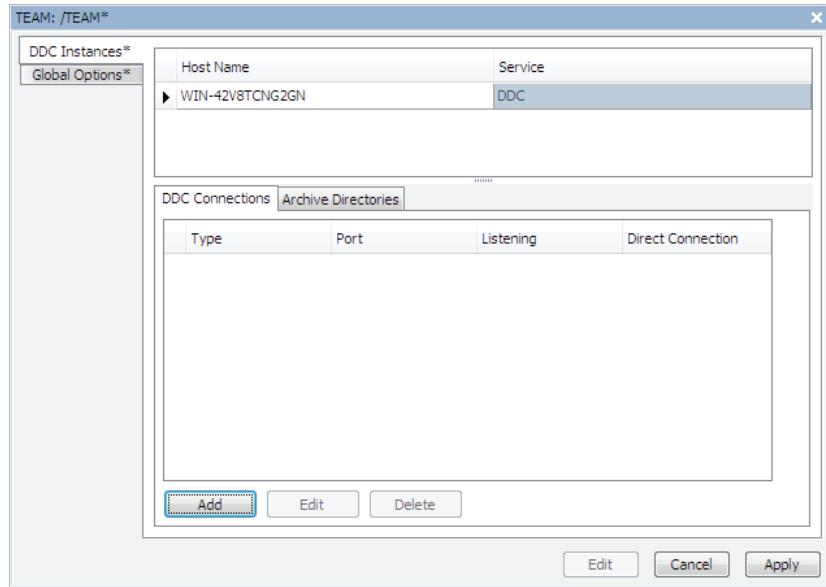


Figure 10 Add DDC Connection

Step 6. Select **Next** and choose **Telnet** as the Select Communication Method. As shown in *Figure 11*, do not enable listening.

Step 7. Select **Next** and then **Finish**.

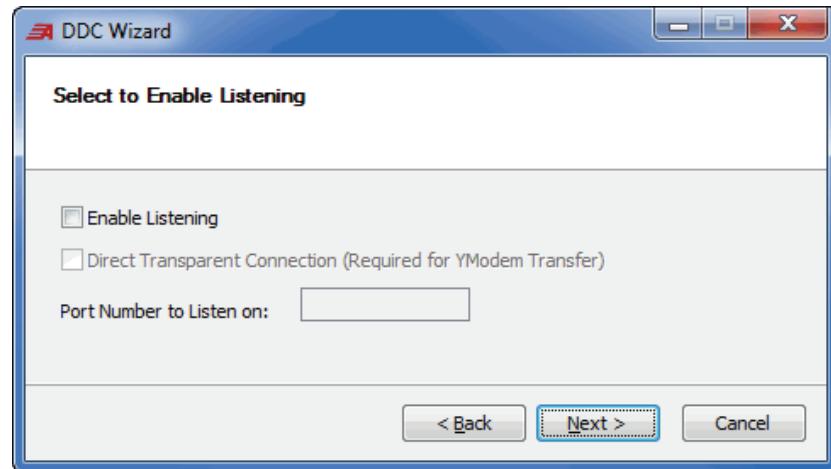


Figure 11 Enable Listening Window

Device Manager Configuration

- Step 1. Right-click in the Connection Explorer and select **Add > Folder**.
- Step 2. Right-click the new folder and select **Rename**. Change the name to **Ethernet Event Collection**, as shown in *Figure 12*, and select **OK**.

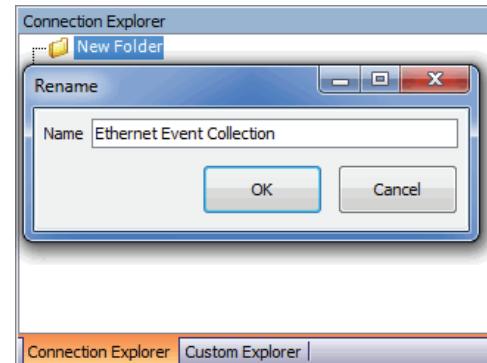


Figure 12 Rename the New Folder

- Step 3. Right-click the **Ethernet Event Collection** folder and select **Add > Device**. Select **SEL-351-6** and select **OK**. *Figure 13* shows SEL-351-6 selected in the **Select Device Type** window.

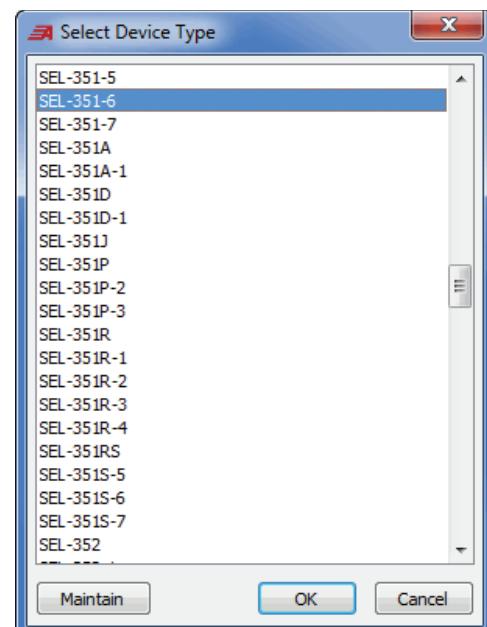


Figure 13 Select the SEL-351-6

- Step 4. Double-click **SEL-351-6** and select the **In Service** check box in the **Device** tab.
- Step 5. Switch to the **Connection** tab and choose **Network** as the connection type.
- Step 6. For this example enter the following connection information for your relay (see *Figure 14*).
 - a. Set the **Host IP Address** to **192.168.1.25**.
 - b. Set **User Port Number** to **23**.
 - c. Set **File Transfer Option** to **Telnet**.

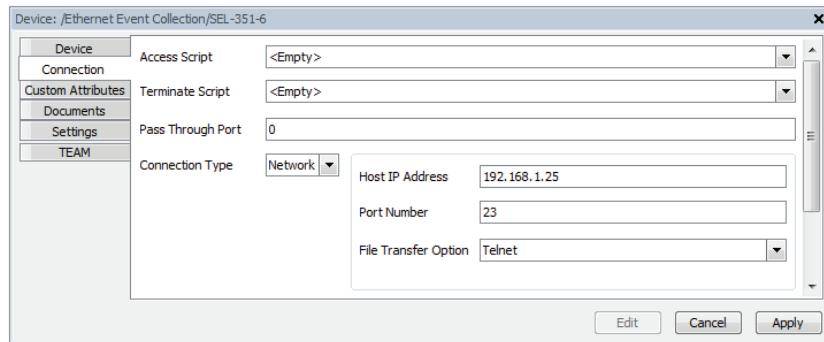


Figure 14 Connection Settings

TEAM Device Configuration

- Step 1. Move to the **TEAM** tab and select **Add** under **Communication Channel** to start the **Server Configuration Wizard**.
- Step 2. Select **Add** under the **Polling Jobs** section to start the **Polling Job Assignment Wizard**.
- Step 3. Select **SEL Default Event Collection Job** from the drop-down menu on the **Polling Job** page and select the **Enable Job** check box, as shown in *Figure 15*.

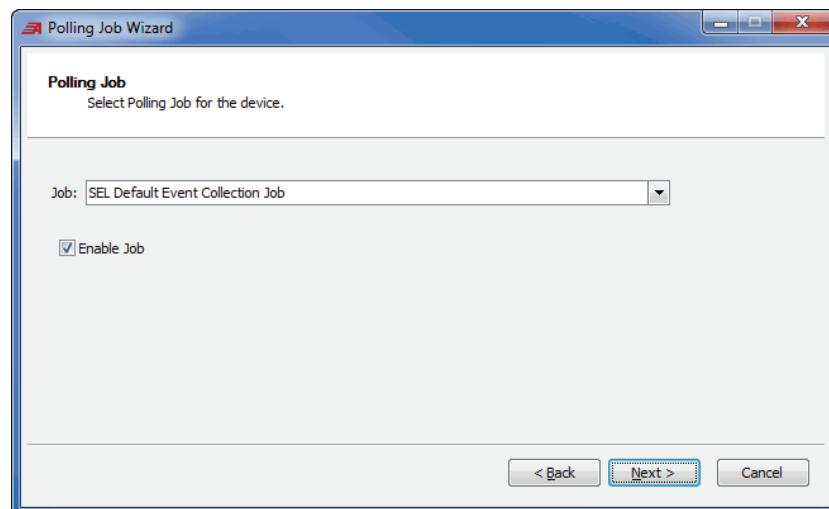
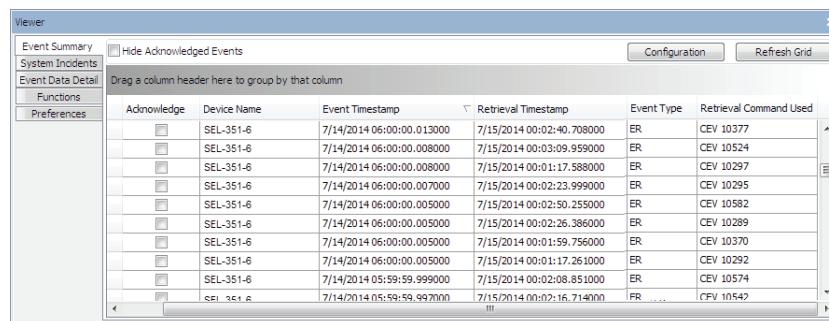


Figure 15 Choose SEL Default Event Collection Job

- Step 4. Choose **Minutely** in the **Polling Frequency** window and select **Next**.
- Step 5. Enter **Every 1 Number of Minutes** as the poll period of in the **Polling Interval** window.
- Step 6. Select **Next** and then **Finish**.
- Step 7. Select the **Save All button** () to save the SEL-351-6 configurations.
- Step 8. After giving the software time to collect events, right-click in the Connection Explorer and select **View Events**. A new window will display the retrieved event report, as shown in *Figure 16*.



The screenshot shows a software interface titled 'Viewer' with a tab bar at the top. The 'Event Data Detail' tab is selected. Below the tabs, there are buttons for 'Event Summary', 'System Incidents', 'Functions', and 'Preferences'. A checkbox labeled 'Hide Acknowledged Events' is checked. On the right side of the window, there are 'Configuration' and 'Refresh Grid' buttons. The main area is a data grid with the following columns: Acknowledge, Device Name, Event Timestamp, Retrieval Timestamp, Event Type, and Retrieval Command Used. The data grid contains approximately 15 rows of event data, each corresponding to a SEL-351-6 device. The data includes various timestamps from July 14, 2014, and event types like ER, CEV, and FR.

Figure 16 View Event Window

Job Done Example: Classic Workflow Overview

This Job Done® example provides instructions on how to configure a connection directory and TEAM global options before setting up a default event collection job. The TEAM global options only need to be configured once. Therefore, future examples will exclude steps for configuring TEAM global options and will focus only on specific job configuration steps.

Configure Device Manager

First, configure the Connection Explorer in Device Manager. This stores and organizes all devices from which TEAM collects data. Name the devices and organizational folders according to substation arrangement and device placement. This is important because there are multiple devices across different physical locations from which TEAM can poll data, and this step provides further organization for the data that TEAM collects and stores.

- Step 1. Select the **Device Manager** icon at the QuickSet Welcome screen, as shown in *Figure 17*. This opens the **Log on to AcSELerator Database** window shown in *Figure 18*.



Figure 17 Device Manager Icon

Step 2. Enter the proper credentials in the **User Name** and **Password** fields.

If this is the first time that ACSELERATOR Database is being used, then the default user is admin with no password.

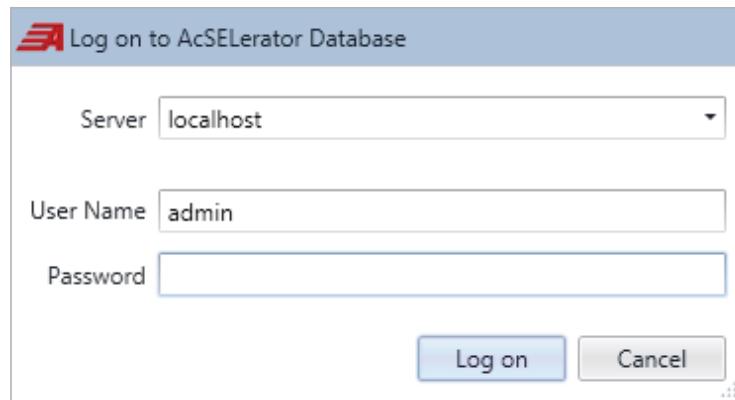


Figure 18 AcSELERATOR Database Log On Window

Step 3. Right-click in the Connection Explorer and select **Add > Folder** as shown in *Figure 19*.

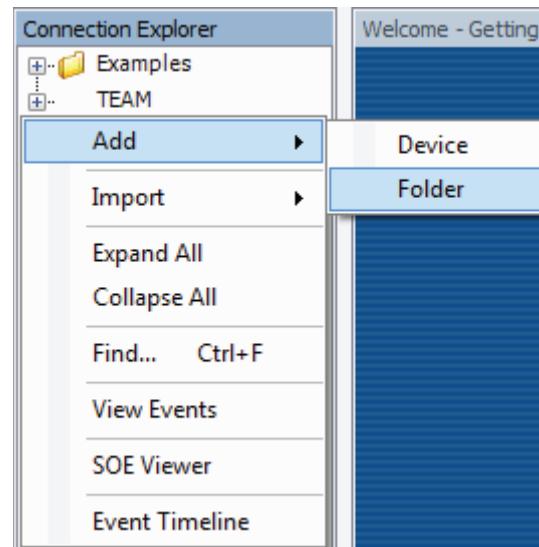


Figure 19 Add Folder in Connection Explorer

Step 4. Double-click the newly added folder and, in the **Folder** tab, select **Edit**. For the purpose of this example, set **Folder Type** to **Substation** and **Folder Name** to **Substation A**. *Figure 20* shows the folder configuration screen with the parameters from this example. Select the **Save All** (disk) icon in the toolbar.

The **Folder Type** parameter gives the folder a category that the file name template references in *Step 9 on page 28*.

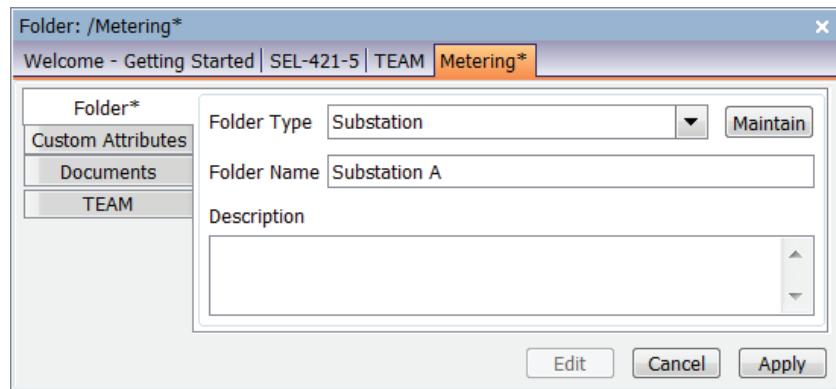


Figure 20 Rename Folder

Step 5. Right-click on the **Substation A** folder and select **Add > Device**, as shown in *Figure 21*.

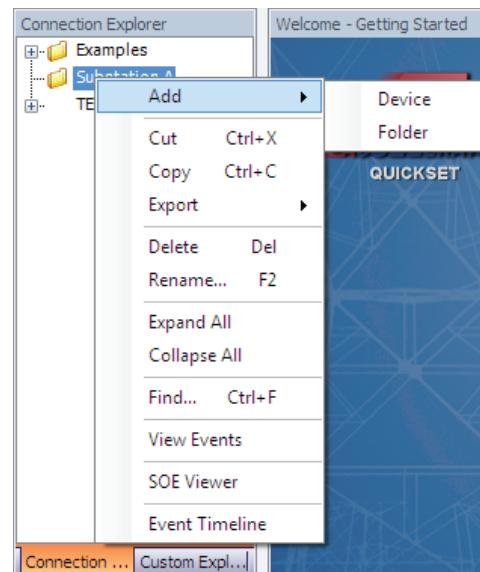


Figure 21 Add Device in Connection Explorer

- Step 6. Scroll down, select **SEL-2032** in the **Select Device Type** window of *Figure 22*, and select **OK**.

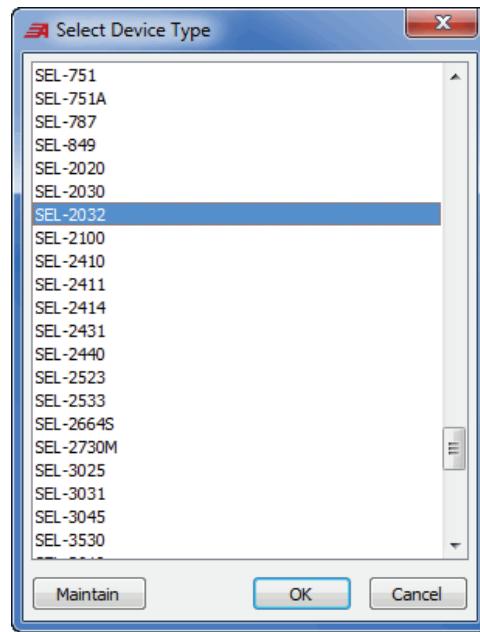


Figure 22 Device Selection Window

- Step 7. Right-click **SEL-2032** in the Connection Explorer and select **Rename** to enter a unique name for the SEL device. In this example, rename the communications processor **Substation A SEL-2032**. Select **OK** to accept the name change.
- Step 8. Right-click **Substation A SEL-2032** in the Connection Explorer and select **Add > Device**.
- Step 9. Scroll down and select **SEL-351S-7** in the **Select Device Type** window.
- This creates a hierarchy where the SEL-2032 is the “parent” device and the SEL-351S-7 is the “child” device. Use this architecture for any devices behaving as port servers that require ASCII interfaces.
- Step 10. Rename the **SEL-351S-7 Breaker 1 SEL-351S-7** as shown in *Figure 23*. Select **OK** to accept the name change.

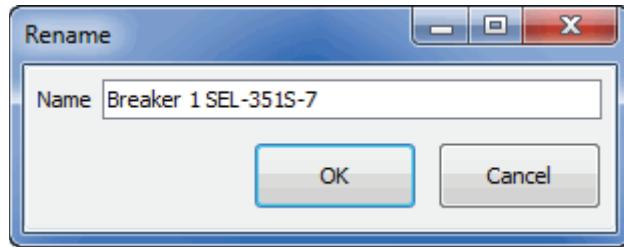


Figure 23 Rename Connection

You now have one substation that contains the SEL-2032 Communications Processor and, in a lower level, the SEL-351S-7. You can continue to develop, define, and manage your system by adding more devices to your substation. To do so, right-click the **Substation A** folder in the **Connection Explorer**

window and select **Add > Device** (*Figure 21*). To add a new substation, right-click in the **Connection Explorer** window (*Figure 19*) and select **Add > Folder**.

Configure TEAM Software

Configure TEAM Global Options

Device Manager, within QuickSet, provides TEAM global options. These options define file save locations and file-naming format.

- Step 1. Double-click the **TEAM** node in the **Connection Explorer** window to open the **TEAM** Workspace.
- Step 2. Select the **Global Options** tab in the **TEAM** Workspace and select **Edit**.
- Step 3. Select the **Configure** button, highlighted in *Figure 24*, under the **File Name Templates** tab. This opens the **Global Options Wizard**.

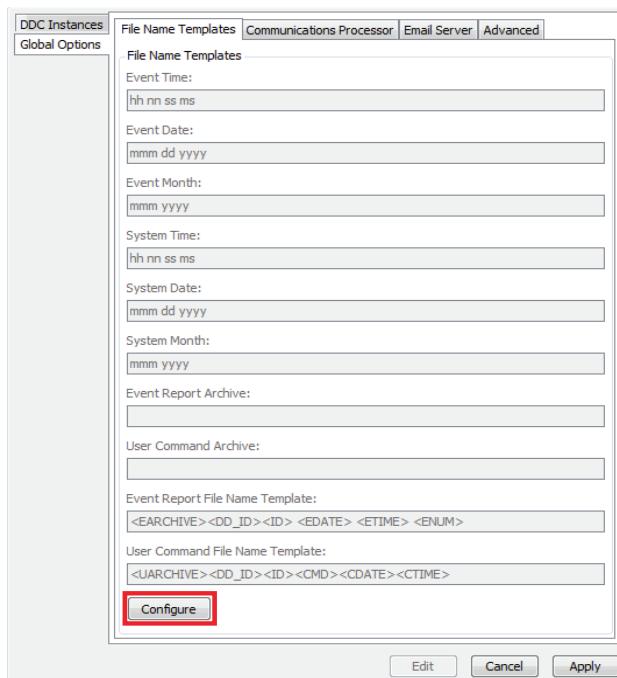


Figure 24 TEAM Global Options Window

Step 4. Select **Next** to open the Date and Time Format window. Ensure that all date and time formats use the two digit representation. With this formatting, January is represented as 01 and the year 2015 as 15. Select **Next** to open the **Date and Time Settings** window.

Step 5. Change the **Event Date** and **System Date** to the following:

<YEAR><MONTH><DAY>

and the **Event Time** and **System Time** to the following:

<HOUR><MINUTE><SECOND><MILLISECOND>

Figure 25 shows date and time settings with the modified format. Select **Next** to move to the **Archives Directories** window.

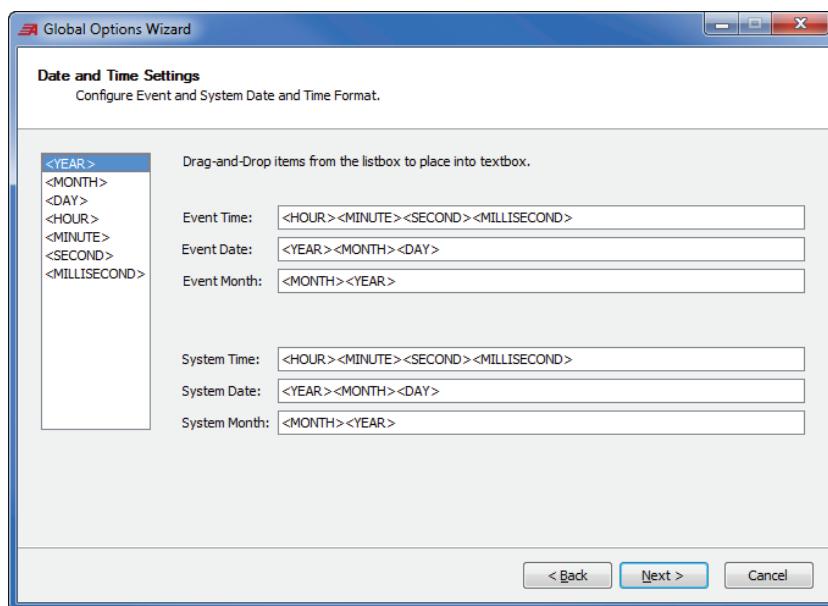


Figure 25 Modify the Event and System Date and Time

Step 6. Select () for the **Event Report Directory (EARCHIVE)** to open the **Browse for Folder** window. Select an appropriate folder location for the EARCHIVE files and select **OK**. For this example, save to “C:\TEAM\Events\.”

Step 7. Select () for the **User Command Directory (UARCHIVE)** to open the **Browse for Folder** window. Select an appropriate folder location for the UARCHIVE files and select **OK**. For this example, save to “C:\TEAM\UserCommand\.”

Step 8. Select **Next** to open the **Event Report File Name Template** window, as shown in *Figure 26*.

The **Global Options Wizard** provides three levels to assist with assigning a file folder location and file name: starting folder, subfolders, and file name.

Step 9. Set the **Starting folder** field to <EARCHIVE> and the **Sub-folders** fields to <SUBSTATION> and <DD_ID>, as shown in *Figure 26*.

The <SUBSTATION> parameter references the folder type established at the time the folder was created. The <DD_ID> parameter represents the device identification.

Step 10. Set the **File name** field parameters as shown in *Figure 26*; these settings include the required file name contents of *Step 8 on page 28*.

The value <EDATE> is the event date, <ETIME> is the event start time (using the formatting from *Step 4* and *Step 5*), and <ID> is the device identification. Use the drop-down menu to assign these values. For all other **File name** field parameters, including [,], [0,], [SUB_A,], and [,UTILITY], type the entries in manually. The value 0 is used to designate the time zone offset, SUB_A is the substation identification, and UTILITY is the company name.

Each file name parameter depends upon the prior setting. Therefore, if an earlier parameter of the file name is changed, the other parameters will reset.

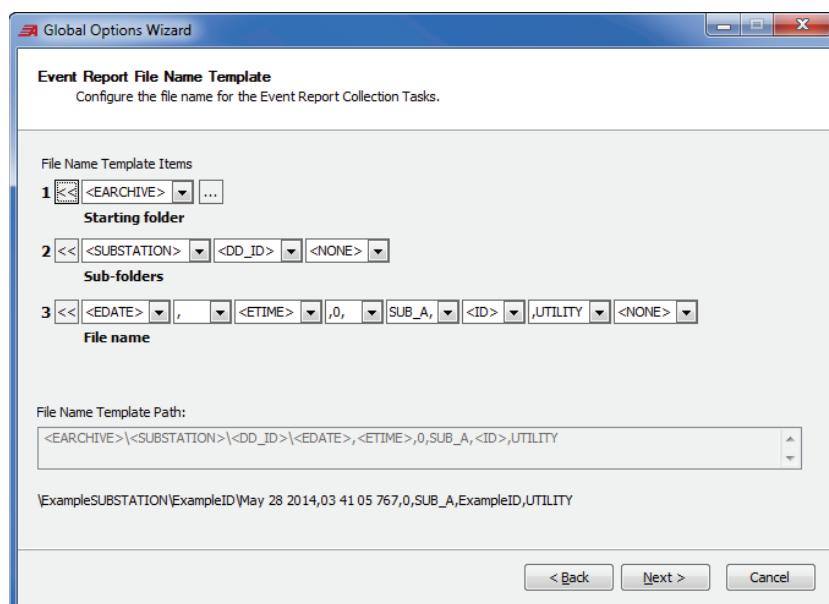


Figure 26 Event Report File Name

Step 11. Select **Next** to open the **User Command File Name** window and accept the default settings. Select **Next** and then **Finish** to complete the **Global Options Wizard**. Select the **Save All** (icon) in the toolbar.

Configure TEAM DDC Instances

The Device Data Collection (DDC) connection determines the type of connections the DDC service makes. Create a separate DDC connection for serial, network, and modem connections. For network connections, TEAM

requires only one DDC connection. For serial and modem connections, TEAM requires a DDC connection for each serial port in use. For this example, you define a single Telnet connection.

- Step 1. Select the **DDC Instances** tab in the TEAM window and select **Edit**. Select **Add**, as shown in *Figure 27*, to open the **Device Data Collection Wizard**.

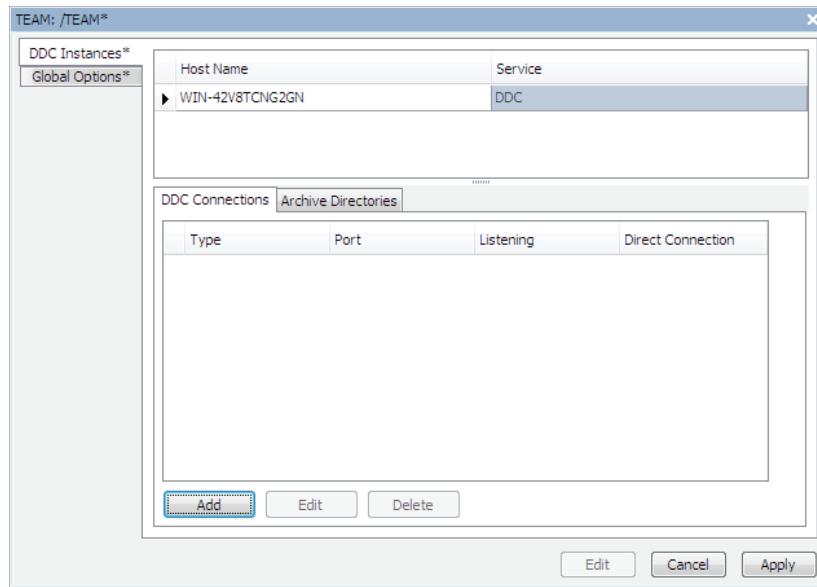


Figure 27 TEAM DDC Instances Window

- Step 2. Once you are operating in the **Device Data Collection Wizard**, select **Next** to open the **Select Communication Method** window and select **Telnet**, as shown in *Figure 28*.

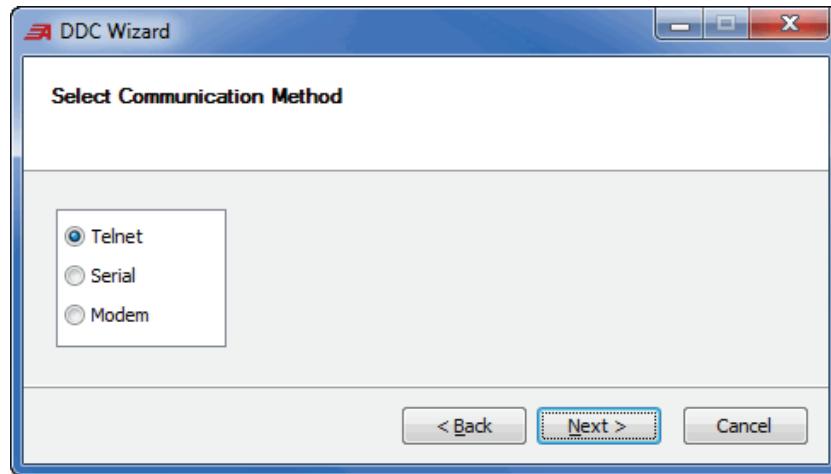


Figure 28 Select Communication Method Window

Step 3. Select **Next**, leaving **Enable Listening** clear, as shown in *Figure 29*, and select **Next**.

This example configures TEAM for polling, so listening does not need to be enabled.

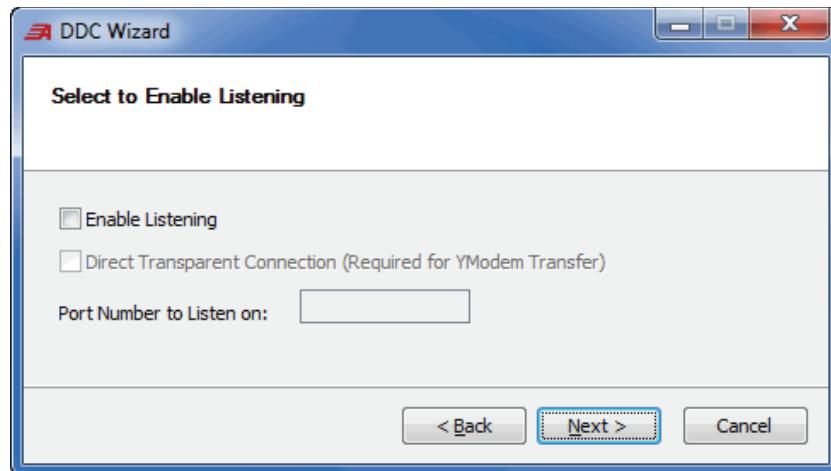


Figure 29 Select to Enable Listening Window

Step 4. Select **Finish** to save the DDC instances you configured and close the wizard.

These global options enable you to assign communications channels and then polling jobs to your devices. The following section discusses the connection parameters for the SEL-2032 and the settings necessary to collect events through it.

Configure TEAM for Event Polling Job

Configure the connection and communication parameters to provide a connection path for TEAM.

- Step 1. Double-click **Substation A SEL_2032** in the Connection Explorer, select the **Connection** tab and then the **Edit** button.
- Step 2. Set the **Connection Type** to **Network**. Set the **Host IP Address**, the **Port Number**, and the **File Transfer Option** to match the network settings on the communications processor. For this example, set the **Host IP Address** to **192.168.1.2**, the **Port Number** to **23**, and the **File Transfer Option** to **Telnet**. Select the **Save All** (disk icon) in the toolbar.

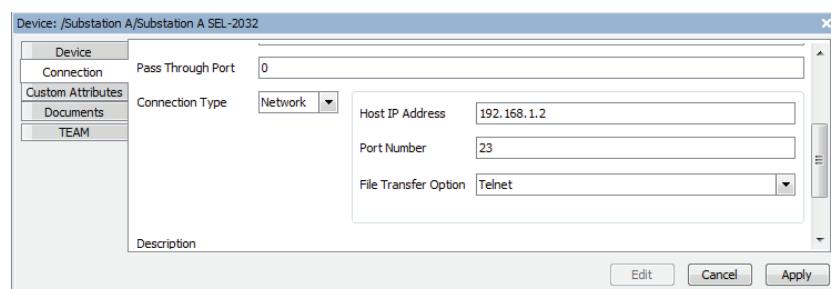


Figure 30 Device Connection Parameters

Step 3. Switch to the **TEAM** tab and select **Edit**. Select the **Add** button under the **Communication Channel** box in *Figure 31* to start the **Server Configuration Wizard**.

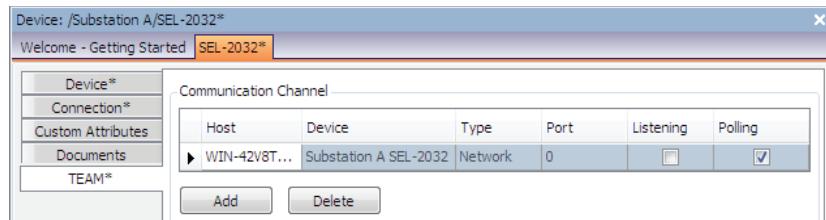


Figure 31 Communications Processor TEAM Selection

Step 4. Select the DDC service with your computer's hostname from the list shown in *Figure 32*. Unless other DDC services are reporting to your database, this is the only option you see. Select **Next** to open the **Service Connection** window shown in *Figure 33*.

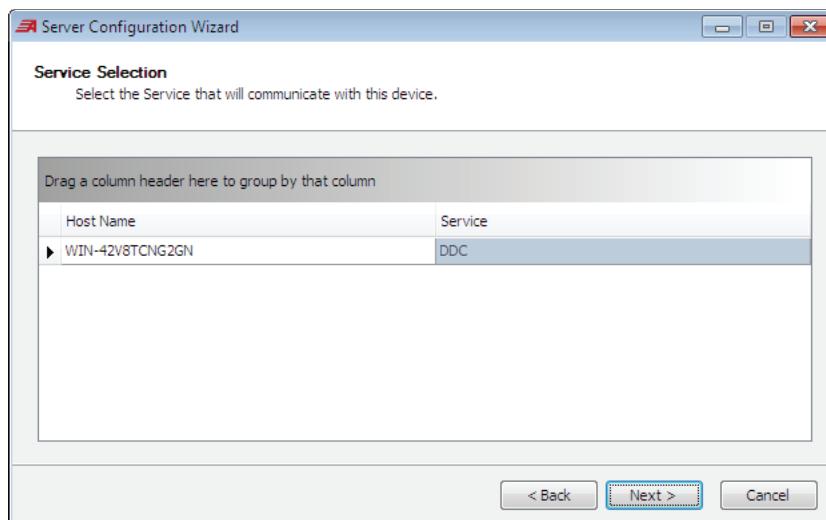


Figure 32 TEAM Service Selection Window

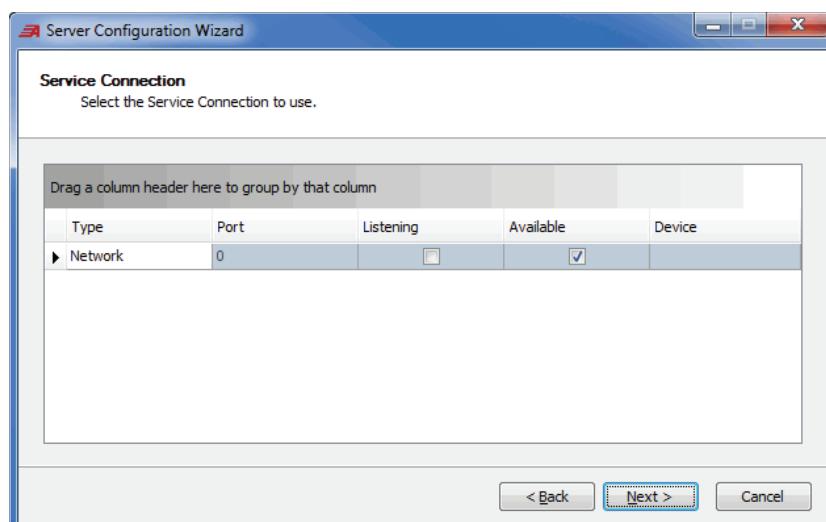


Figure 33 TEAM Network Service Connection Window

- Step 5. Select the available service, select **Next**, and then select **Finish** on the final window to complete the **Server Configuration Wizard**. Select the **Save All** (disk icon) in the toolbar.

Configure TEAM Polling

- Step 1. Double-click **Substation A SEL-2032** in the Connection Explorer to open the **Device** window.
- Step 2. Select the **Edit** button to modify device parameters. Select the **In Service** check box displayed in *Figure 34*.

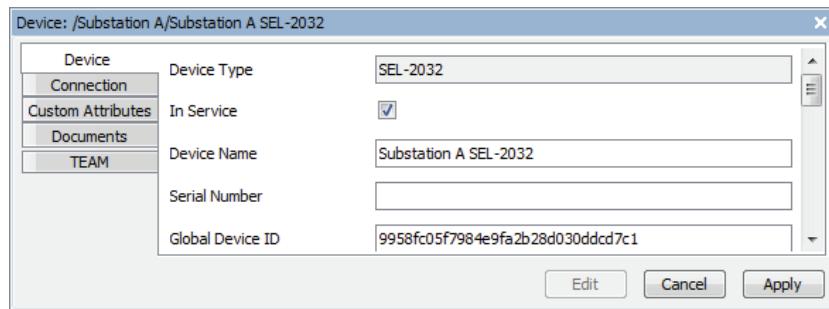


Figure 34 Communications Processor Device Tab

- Step 3. Change the **Number of Ports** field to **16**.

This is purely for reference and does not affect TEAM functionality.

- Step 4. In the **Device Passwords** field, shown in *Figure 35*, the default passwords are **OTTER** and **TAIL** for **ACC** and **2AC** respectively; these automatically appear in these fields. Select the **Save All** (disk icon) in the toolbar.

Device Passwords		
Access Level	Password	Set Password Script
ACC	*****	2032_ACC_DEFAULT_SET...
2AC	*****	2032_2AC_DEFAULT_SET...
CAL	*****	2032_CAL_DEFAULT_SET...

Figure 35 Default Access Passwords

- Step 5. Double-click **Breaker 1 SEL-351S-7** in the Connection Explorer to open the **Device** tab.
- Step 6. Select the **Edit** button in the lower right to modify the device parameters and select the **In Service** check box as we did for the SEL-2032.
- Step 7. Select the **Connection** tab in the **SEL-351S-7** window shown in *Figure 36* and match the options to the following listing.

Access Script: **GENERAL_20XX_ACCESS_SCRIPT**

Terminate Script: **GENERAL_20XX_TERMINATE_SCRIPT**

Pass Through Port: **1**

The access script provides TEAM instructions for creating a tunneled connection on Port 1 (the Pass Through Port) of the communications processor. The terminate script provides instructions for TEAM to disconnect from the tunneled connection.

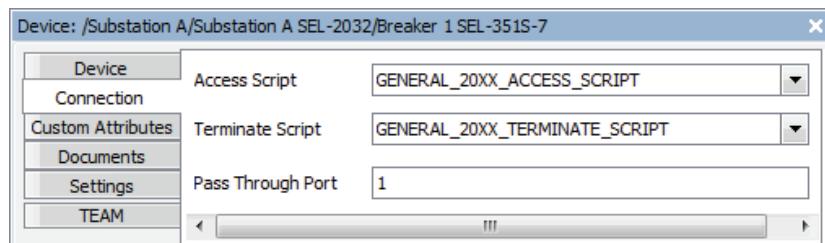


Figure 36 Relay Connection Window

- Step 8. Select the **Save All** (disk icon) in the toolbar.
- Step 9. Return to the **Substation A SEL-2032** window and select the **TEAM** tab, as shown in *Figure 37*. Select **Edit** and then the **Add** button, also shown in *Figure 37*, to start the **Polling Job Wizard**.

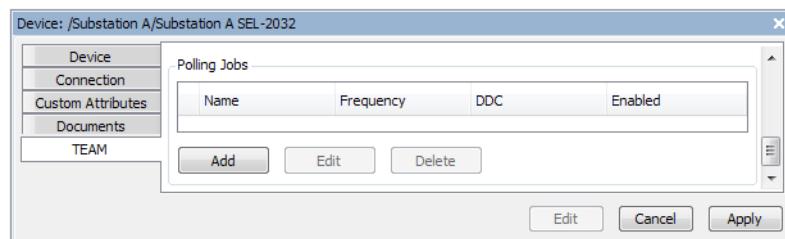


Figure 37 Add TEAM Polling Job

Step 10. Select **Next** after the **Polling Job Wizard** opens to go to the **Service Selection** window. Select the available service from the drop-down menu shown in *Figure 38* and select **Next**.

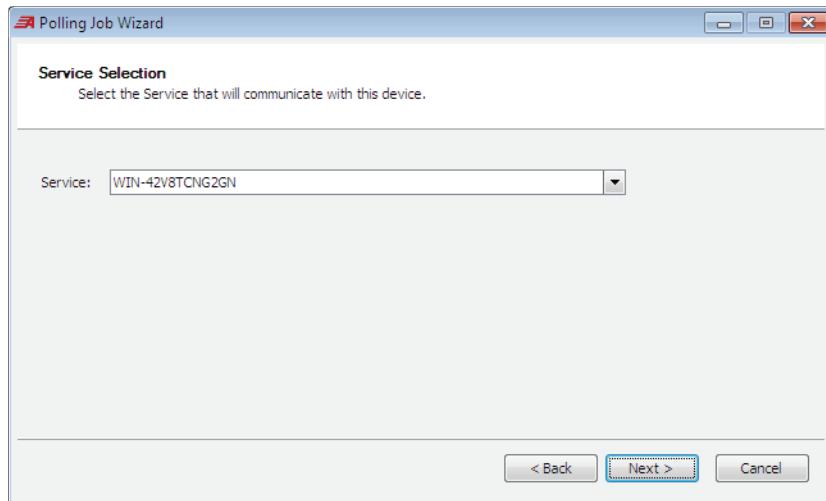


Figure 38 Service Selection Window

Step 11. In the **Polling Job** window, select **SEL Default Event Collection Job** and then **Next**.

Step 12. Define the **Polling Frequency** as **Minutely** and set **Number of Minutes** to **1** in the next window that displays.

Step 13. Select **Finish** to complete the **Polling Job Wizard** and select the **Save All (S)** icon in the toolbar.

You have configured TEAM to collect events from an SEL-351S by tunneling through a communications processor. To expand this example, add devices below the communications processor and modify the Pass Through Port to match the serial port on the communications processor. Right-click **Substation A** and select **View Events** to see the events TEAM collected from Substation A.

Job Done Example: Auto-Configure Workflow Overview

This Job Done® example provides instructions on how to configure a connection directory and TEAM global options before setting up a default event collection job. This workflow differs from the classic workflow in that it uses default assigned values to save you configuration time. The TEAM global options only need to be configured once. Therefore, future examples will exclude steps for configuring TEAM global options and will focus only on specific job configuration steps.

Configure Device Manager

First, configure the Connection Explorer in Device Manager. This stores and organizes all devices from which TEAM collects data. Name the devices and organizational folders according to substation arrangement and device

placement. This is important because there are multiple devices across different physical locations from which TEAM can poll data, and this step provides further organization for the data that TEAM collects and stores.

- Step 1. Select the **Device Manager** icon at the QuickSet Welcome screen, as shown in *Figure 39*. This opens the **Log on to AcSELerator Database** window shown in *Figure 40*.



Figure 39 Device Manager Icon

- Step 2. Enter the proper credentials in the **User Name** and **Password** fields.

If this is the first time that ACSELATOR Database is being used, then the default user is admin with no password.

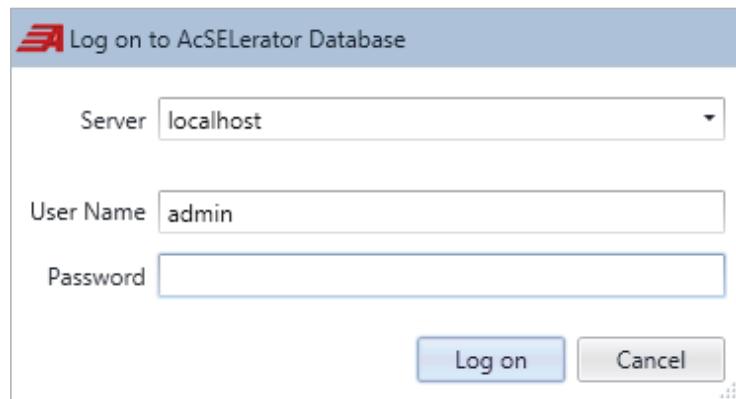


Figure 40 ACSELATOR Database Log On Window

- Step 3. Right-click in the Connection Explorer and select **Add > Folder** as shown in *Figure 41*.

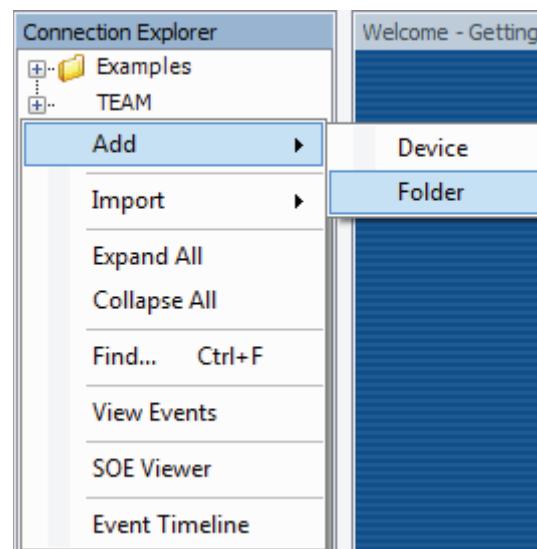


Figure 41 Add Folder in Connection Explorer

Step 4. Double-click the newly added folder and, in the **Folder** tab, select **Edit**. For the purpose of this example, set **Folder Type** to **Substation** and **Folder Name** to **Substation A**. *Figure 42* shows the folder configuration screen with the parameters from this example. Select the **Save All** (disk) icon in the toolbar.

The **Folder Type** parameter gives the folder a category that the file name template references in *Step 9 on page 40*.

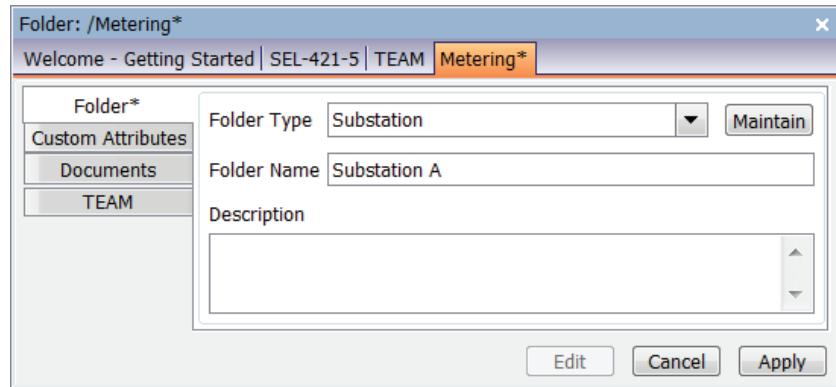


Figure 42 Rename Folder

Step 5. Right-click on the **Substation A** folder and select **Add > Device**, as shown in *Figure 43*.

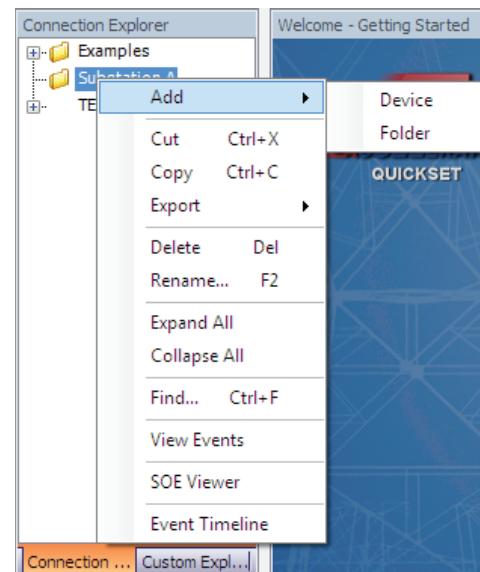


Figure 43 Add Device in Connection Explorer

- Step 6. Scroll down, select **SEL-2032** in the **Select Device Type** window of *Figure 44*, and select **OK**.

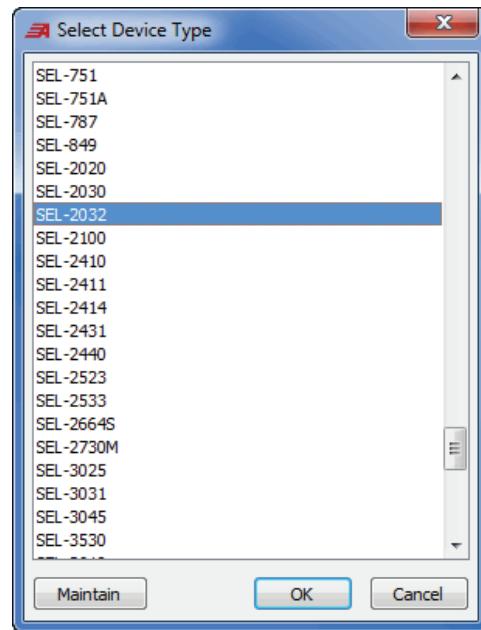


Figure 44 Device Selection Window

- Step 7. Right-click **SEL-2032** in the Connection Explorer and select **Rename** to enter a unique name for the SEL device. In this example, rename the communications processor **Substation A SEL-2032**. Select **OK** to accept the name change.
- Step 8. Right-click **Substation A SEL-2032** in the Connection Explorer and select **Add > Device**.
- Step 9. Scroll down and select **SEL-351S-7** in the **Select Device Type** window.

This creates a hierarchy where the SEL-2032 is the “parent” device and the SEL-351S-7 is the “child” device. Use this architecture for any devices behaving as port servers that require ASCII interfaces.

- Step 10. Rename the SEL-351S-7 Breaker 1 **SEL-351S-7** as shown in *Figure 45*. Select **OK** to accept the name change.

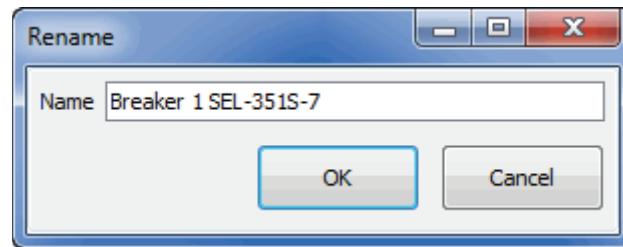


Figure 45 Rename Connection

You now have one substation that contains the SEL-2032 Communications Processor and, in a lower level, the SEL-351S-7. You can continue to develop, define, and manage your system by adding more devices to your substation. To do so, right-click the **Substation A** folder in the **Connection Explorer**

window and select **Add > Device** (*Figure 43*). To add a new substation, right-click in the **Connection Explorer** window (*Figure 41*) and select **Add > Folder**.

Configure TEAM Software

Configure TEAM Global Options

Device Manager, within QuickSet, provides TEAM global options. These options define file save locations and file-naming format.

- Step 1. Double-click the **TEAM** node in the **Connection Explorer** window to open the **TEAM** Workspace.
- Step 2. Select the **Global Options** tab in the **TEAM** Workspace and select **Edit**.
- Step 3. Select the **Configure** button, highlighted in *Figure 46*, under the **File Name Templates** tab. This opens the **Global Options Wizard**.

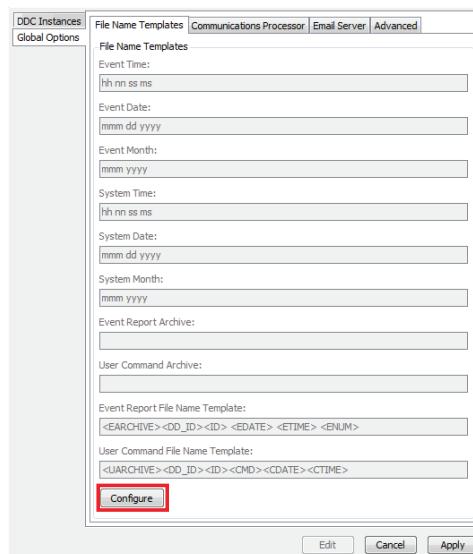


Figure 46 TEAM Global Options Window

- Step 4. Select **Next** to open the Date and Time Format window. Ensure that all date and time formats use the two digit representation. With this formatting, January is represented as 01 and the year 2015 as 15. Select **Next** to open the **Date and Time Settings** window.
- Step 5. Change the **Event Date** and **System Date** to the following:
 $<\text{YEAR}><\text{MONTH}><\text{DAY}>$

and the **Event Time** and **System Time** to the following:

$<\text{HOUR}><\text{MINUTE}><\text{SECOND}><\text{MILLISECOND}>$

Figure 47 shows the **Date and Time Settings** window with the modified format. Select **Next** to move to the **Archives Directories** window.

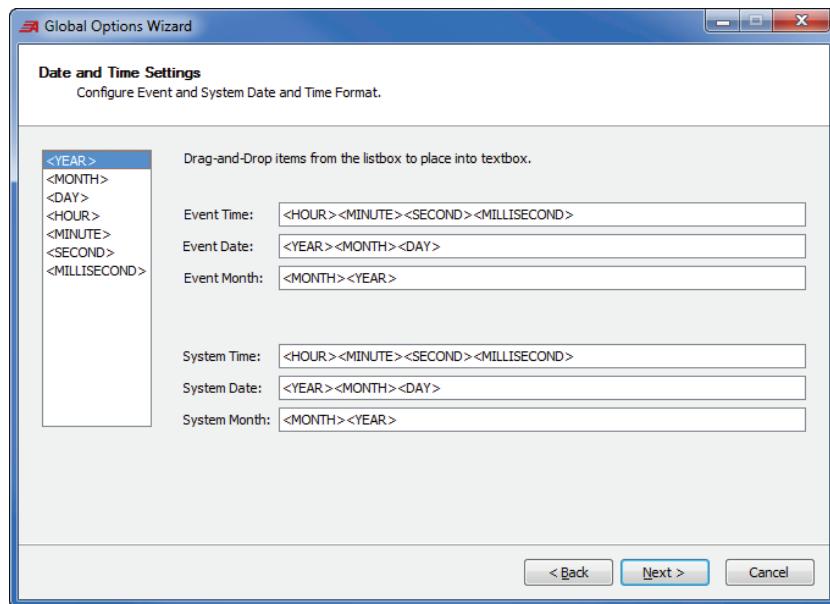


Figure 47 Modify the Event and System Date and Time

Step 6. Select () for the **Event Report Directory (EARCHIVE)** to open the **Browse for Folder** window. Select an appropriate folder location for the EARCHIVE files and select **OK**. For this example, save to “C:\TEAM\Events\.”

Step 7. Select () for the **User Command Directory (UARCHIVE)** to open the **Browse for Folder** window. Select an appropriate folder location for the UARCHIVE files and select **OK**. For this example, save to “C:\TEAM\UserCommand\.”

Step 8. Select **Next** to open the **Event Report File Name Template** window, as shown in *Figure 48*.

The **Global Options Wizard** provides three levels to assist with assigning a file folder location and file name: starting folder, subfolders, and file name.

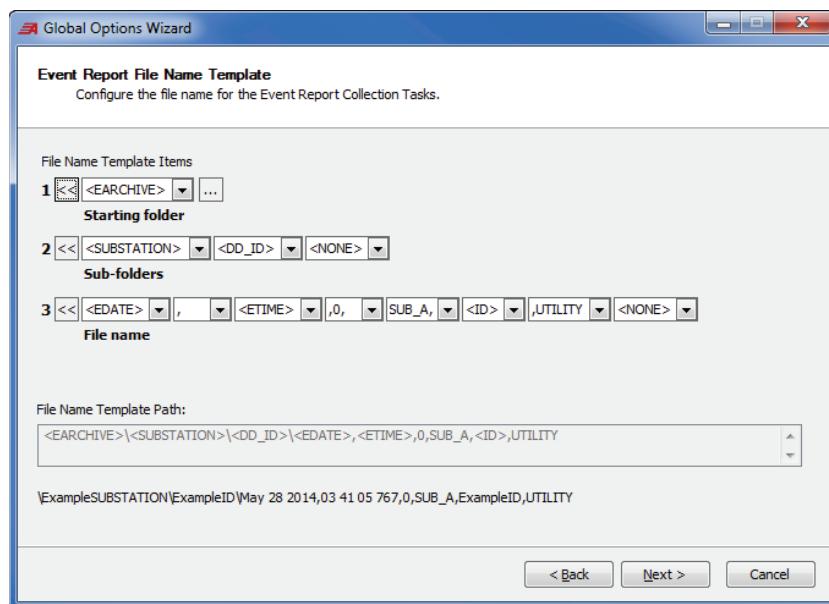
Step 9. Set the **Starting folder** field to <EARCHIVE> and the **Sub-folders** fields to <SUBSTATION> and <DD_ID>, as shown in *Figure 48*.

The <SUBSTATION> parameter references the folder type established at the time the folder was created. The <DD_ID> parameter represents the device identification.

Step 10. Set the **File name** field parameters as shown in *Figure 48*; these settings include the required file name contents of *Step 8*.

The value <EDATE> is the event date, <ETIME> is the event start time (using the formatting from *Step 4 on page 39* and *Step 5 on page 39*), and <ID> is the device identification. Use the drop-down menu to assign these values. For all other **File name** field parameters, including [,], [,0 ,], [SUB_A,], and [,UTILITY], type the entries in manually. The value 0 is used to designate the time zone offset, SUB_A is the substation identification, and UTILITY is the company name.

Each file name parameter depends upon the prior setting. Therefore, if an earlier parameter of the file name is changed, the other parameters will reset.

**Figure 48 Event Report File Name**

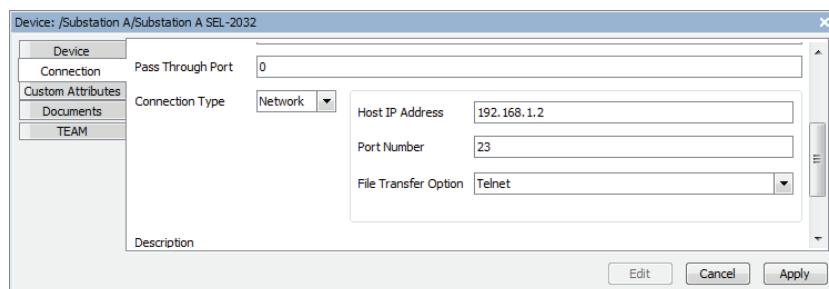
Select **Next** to open the **User Command File Name** window and accept the default settings. Select **Next** and then **Finish** to complete the **Global Options Wizard**. Select the **Save All** (floppy disk) icon in the toolbar.

Configure TEAM for Event Polling Job

Configure the connection and communication parameters to provide a connection path for TEAM.

Double-click **Substation A SEL_2032** in the Connection Explorer, select the **Connection** tab, and then select the **Edit** button.

Set the **Connection Type** to **Network**. Set the **Host IP Address**, the **Port Number**, and the **File Transfer Option** to match the network settings on the communications processor. For this example, set the **Host IP Address** to **192.168.1.2**, the **Port Number** to **23**, and the **File Transfer Option** to **Telnet**. Select the **Save All** (floppy disk) icon in the toolbar.

**Figure 49 Device Connection Parameters**

Configure TEAM Polling

Step 1. Double-click **Substation A SEL-2032** in the Connection Explorer to open the **Device** window.

Step 2. Select the **Edit** button to modify device parameters. Select the **In Service** check box displayed in *Figure 50*.

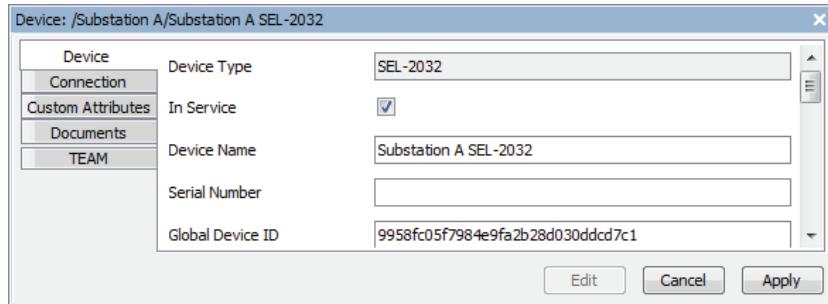


Figure 50 Communications Processor Device Tab

Step 3. Change the **Number of Ports** field to **16**.

This is purely for reference and does not affect TEAM functionality.

Step 4. In the **Device Passwords** field, shown in *Figure 51*, the default passwords are **OTTER** and **TAIL** for **ACC** and **2AC** respectively; these automatically appear in these fields. Select the **Save All** (disk icon) icon in the toolbar.

Device Passwords		
Access Level	Password	Set Password Script
ACC	*****	2032_ACC_DEFAULT_SET...
2AC	*****	2032_2AC_DEFAULT_SET...
CAL	*****	2032_CAL_DEFAULT_SET...

Figure 51 Default Access Passwords

Step 5. Double-click **Breaker 1 SEL-351S-7** in the Connection Explorer to open the **Device** tab.

Step 6. Select the **Edit** button in the lower right to modify the device parameters and select the **In Service** check box as we did for the SEL-2032.

Step 7. Select the **Connection** tab in the **SEL-351S-7** window shown in *Figure 52* and match the options to the following listing.

Access Script: **GENERAL_20XX_ACCESS_SCRIPT**

Terminate Script: **GENERAL_20XX_TERMINATE_SCRIPT**

Pass Through Port: **1**

The access script provides TEAM instructions for creating a tunneled connection on Port 1 (the Pass Through Port) of the communications processor. The terminate script provides instructions for TEAM to disconnect from the tunneled connection.

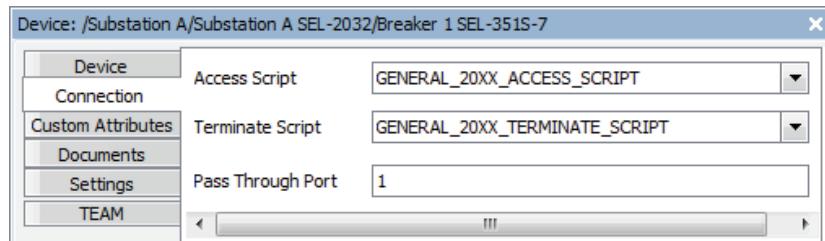


Figure 52 Relay Connection Window

Step 8. Select the **Save All** (disk icon) in the toolbar.

Step 9. Return to the Substation A SEL-2032 window and select the **TEAM** tab, as shown in *Figure 53*. Select **Edit** and then **Add**, also shown in *Figure 53*, to start the **Polling Job Wizard**.

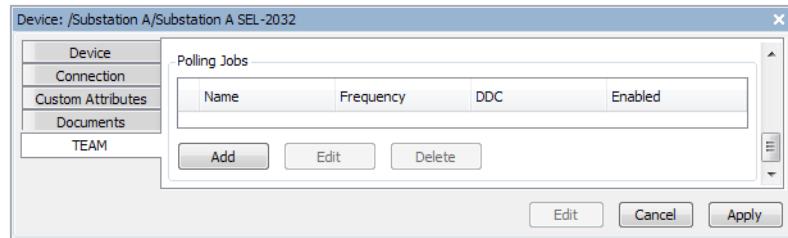


Figure 53 Add TEAM Polling Job

Step 10. In the **Polling Job** window, select **SEL Default Event Collection Job**, ensure that the **Enable Job** check box is selected, and then select **Next**.

Step 11. Define the **Polling Frequency** as **Minutely** and set **Number of Minutes** to **1** in the next window that displays.

Step 12. Select **Finish** to complete the **Polling Job Wizard** and select the **Save All** (disk icon) in the toolbar.

You have configured TEAM to collect events from an SEL-351S by tunneling through a communications processor. To expand this example, add devices below the communications processor and modify the Pass Through Port to match the serial port on the communications processor. Right-click **Substation A** and select **View Events** to see the events TEAM collected from Substation A.

Events

TEAM Jobs and Tasks

The TEAM DDC processes user-defined jobs. All jobs run independently, thus allowing the software to optimize data collection from supported devices. Each job consists of one or many tasks that can collect event reports and run user-based commands. You can set up event collection jobs to poll devices at specific date and time intervals, or listen for incoming calls from communications processors or Ethernet connections.

A TEAM job consists of a list of device tasks that run to carry out polling or listening operations on IEDs. There are two types of device tasks: 1) data collection, and 2) user command. A device data collection task is an operation to collect specific types of device data from IEDs.

Included among device data types are the following:

- Event reports
- Sequential Events Recorder (SER) reports
- Load profile reports
- Voltage sag, swell, and interruption (VSSI) reports
- Metering data

An event collection task can be defined to collect standard .CEV quarter cycle, standard .CEV long, and COMTRADE event reports.

A user command task issues a user command to a device. Types of user commands include **STA**, **SET**, **PASSWORD**, **SER**, **TRI**, and **BRE**. Use the TEAM Device Scripting Language to define user commands in user command scripts. A script editor lets you easily create a script of user commands and verify the syntax.

The following sections will take you through the process of defining jobs, defining event collection tasks and user command tasks, associating tasks with devices, and assigning tasks to jobs.

Define TEAM Jobs

Select the **TEAM > Jobs** node to display the Jobs tab. TEAM ships with a default event report listening job for every supported device. Select **Create** to create a new job. The **Jobs Wizard** will step you through the process of naming the job, adding event collection or user command tasks, and setting up the file name templates.

The **Edit** button lets you edit an existing job, and **Delete** will delete the selected job.

Example 2: Configure TEAM for Event Collection From a GE B90

NOTE: Rather than repeating information, the following example omits Device Manager and TEAM global option configuration steps. For procedural details omitted here, refer to the relevant section(s).

Step 1. Right-click in the Connection Explorer and select **Add > Device**. As shown in *Figure 54*, select **GE B90**.

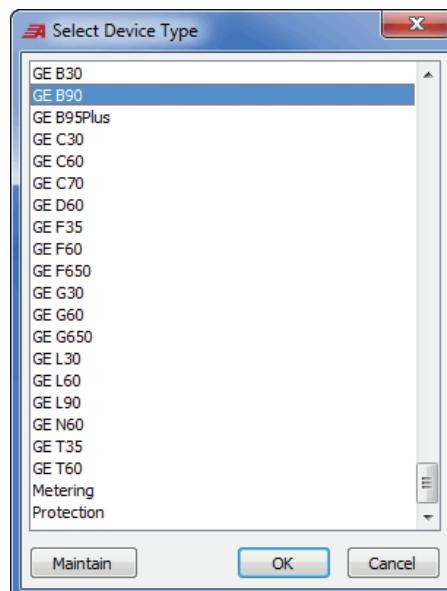


Figure 54 Add GE Device

- Step 2. Right-click and select **Rename**. Change the name from **New Device** to **GE B90** and select **OK**.
- Step 3. Double-click **GE B90** in the Connection Explorer to open the device window.
- Step 4. Select the **Device** tab, press **Edit**, and select the **In Service** check box, as shown in *Figure 55*.

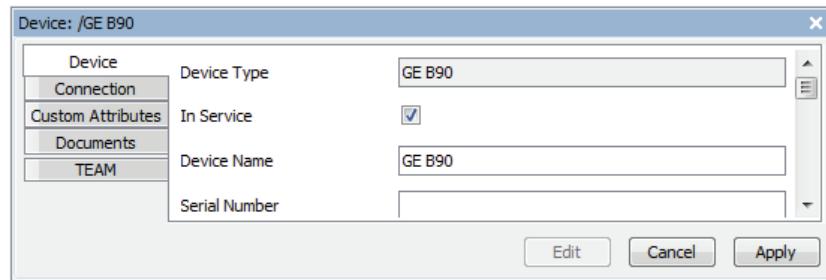


Figure 55 Device in Service

- Step 5. Under the **Connection** tab, specify the **Connection Type** as **Network** and **Protocol** as **Modbus TCP**. Enter the IP address and port number of the IED (the port number is usually 502 for Modbus connections) and set the **File Transfer Option** to **Telnet**. Set the **Unit ID** to that of the IED (254 is the default), as shown in *Figure 56*. Select **Save All** (disk icon).

The **Unit ID** can also be set in the **Polling Job Wizard** and it will automatically be updated in this connection setting window.

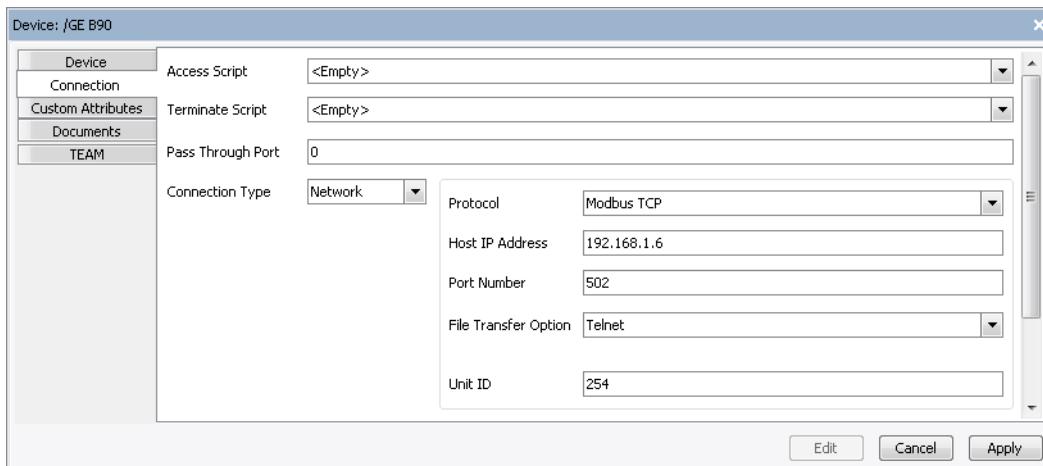


Figure 56 Connection Settings

- Step 6. Switch to the **TEAM** tab and select **Edit**. In the **Communication Channel** box, select **Add** to start the **Server Configuration Wizard**. In the **Server Configuration Wizard**, select **Next** at the Service Selection window, **Next** at the Service Connection window, and then **Finish**.
- Step 7. Remain in the **TEAM** tab. Select **Add** under the **Polling Jobs** section to start the **Polling Job Wizard**. On the **Polling Job** window, select **GE Modbus Event Collector Job** from the drop-down menu, as shown in *Figure 57*. Select **Next** to open the **Configure Job** window.

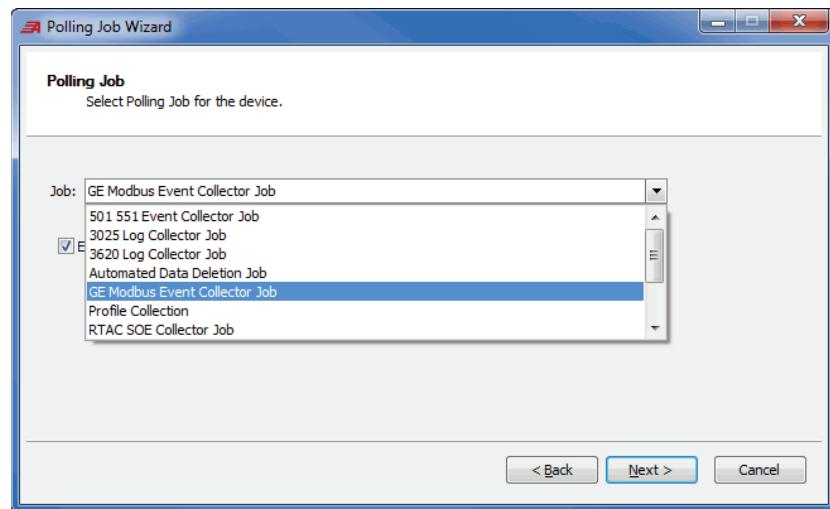


Figure 57 Polling Job Wizard

- Step 8. In the **Configure Job** window, validate that the GE Modbus Unit ID Number matches the **Unit ID** of *Step 5* and select **Next**.
- Step 9. Set the Polling Frequency to be once a minute and select **Finish** to exit the wizard. Once you complete your testing process, adjust this polling frequency to a larger interval.
- Step 10. Select the **Save All** button (disk icon) to save all changes.
- Step 11. To view the events, right-click on the device in the Connection Explorer and select **View Events**, as shown in *Figure 58*.

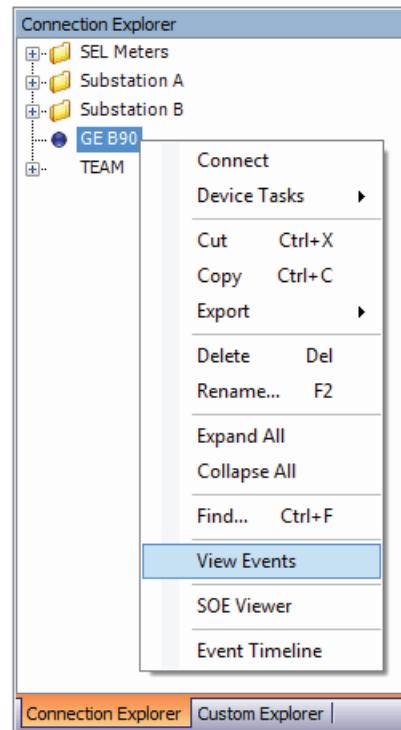


Figure 58 View Events

Example 3: Configure TEAM for Event Collection From an Alstom P544

Step 1. Right-click in the Connection Explorer and select **Add > Device**. As shown in *Figure 59*, select **Alstom P544**.

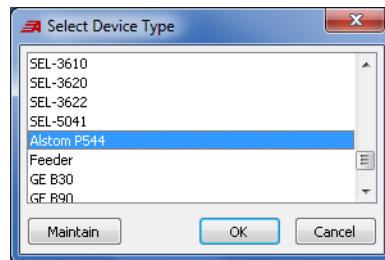


Figure 59 Add Alstom Device

Step 2. Right-click and select **Rename**. Change the name from **New Device** to **Alstom P544** and select **OK**.

Step 3. Double-click **Alstom P544** in the Connection Explorer to open the device window.

Step 4. Select the **Device** tab, press **Edit**, and select the **In Service** check box, as shown in *Figure 60*.

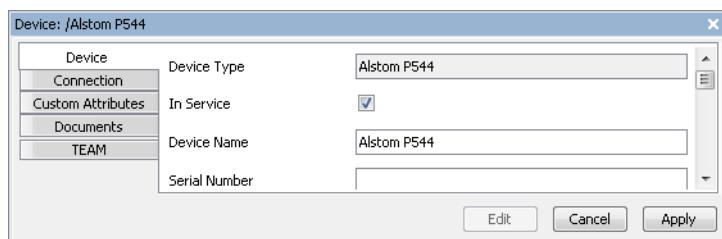


Figure 60 Device in Service

Step 5. Under the **Connection** tab, specify **Network** as the **Connection Type** and **Courier** as the **Protocol**. Select **IEC870** for **Protocol Interface**. Enter the IP address and port number of the IED, and set the **File Transfer Option** to **Telnet**. Set the **Slave Device ID** and **Master Device ID** to that of the IED (254 is the default), as shown in *Figure 61*. Select **Save All** ().

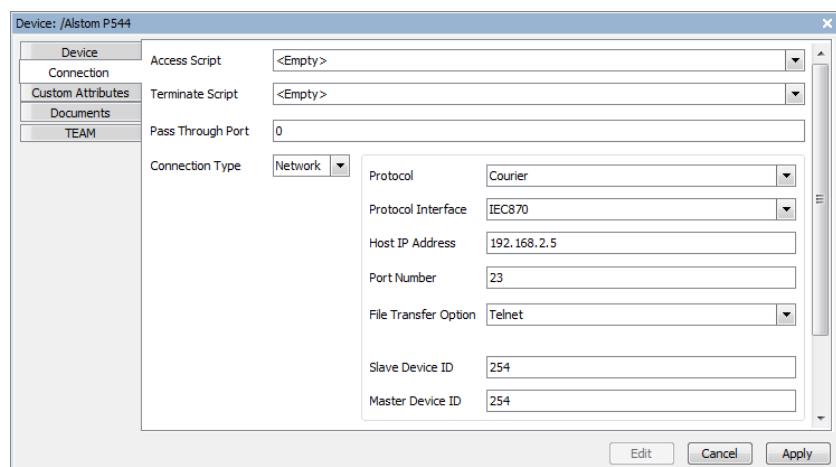


Figure 61 Connection Settings

Step 6. Switch to the **TEAM** tab and select **Edit**. In the **Communication Channel** box, select **Add** to start the **Server Configuration Wizard**. In the **Server Configuration Wizard**, select **Next** at the **Service Selection** window, **Next** at the **Service Connection** window, and then **Finish**.

Step 7. Remain in the **TEAM** tab. Select **Add** under the **Polling Jobs** section to start the **Polling Job Wizard**. On the **Polling Job** window, select **Alstom Event Collector Job** from the drop-down menu, as shown in *Figure 62*. Select **Next** to open the **Polling Frequency** window.

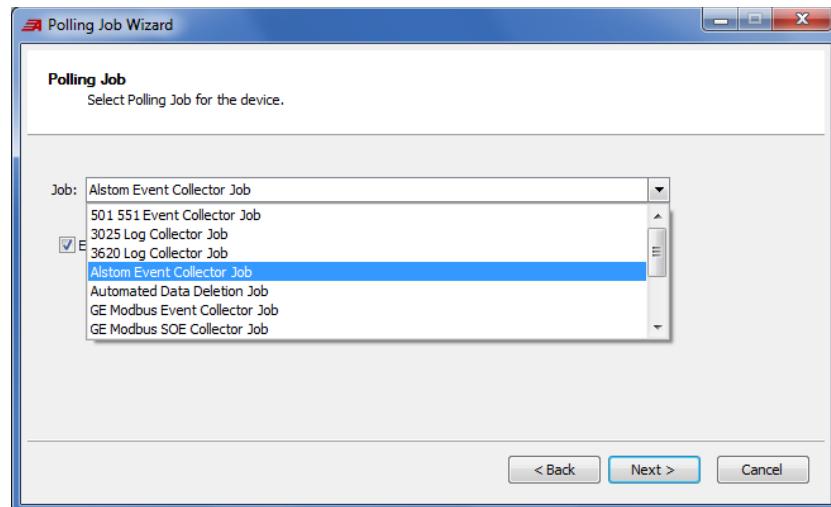


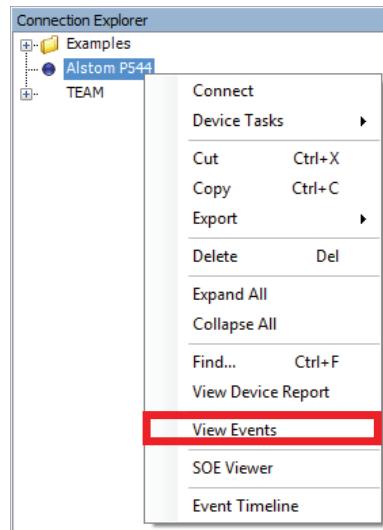
Figure 62 Polling Job Wizard

Step 8. In the **Polling Frequency** window, select **Minutely** and then **Next**. Once you complete your testing process, adjust this polling frequency to a larger interval.

Step 9. Finish the **Polling Job Wizard** by selecting **Next** on the **Minutely Polling** window and then **Finish**.

Step 10. Select the **Save All** button (disk icon) to save all changes.

Step 11. To view the events, right-click on the device in the Connection Explorer and select **View Events**, as shown in *Figure 63*.

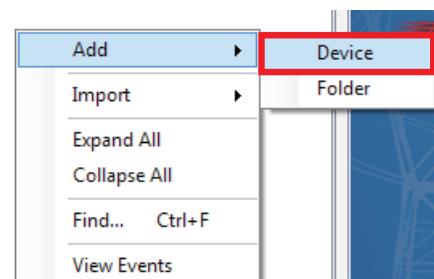
**Figure 63 View Events**

Example 4: Secured Event Collection Through an SEL-3620

NOTE: Rather than repeating information, the following example omits the finer points of procedures discussed elsewhere in these instructions. For procedural details omitted here, refer to the relevant section(s).

SEL security devices provide single sign-on functionality to protected intelligent electronic devices (IEDs) and cryptographic message protection across untrusted Ethernet or serial communications links. This adds yet another secure method for collecting event reports while using TEAM. The following example details the steps required to configure secure event collection via an SSH connection.

- Step 1. Use the username **TEAM** and the password you created in *Step 5 under Create a Secure Password and User on page 151* to log in to the ACCELERATOR Database.
- Step 2. In Device Manager, right-click in the Connection Explorer and select **Add > Device**.

**Figure 64 Add a Device to the Connection Explorer**

Step 3. Select **SEL-3620** and select **OK**.

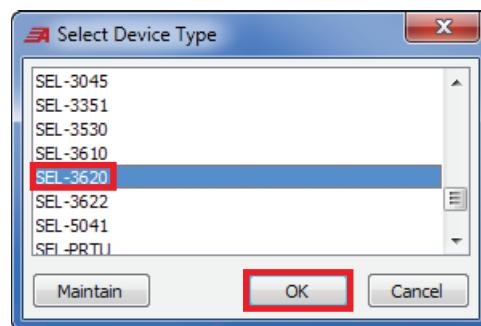


Figure 65 Select the SEL-3620

Step 4. Right-click the newly added **SEL-3620** and select **Add > Device**.

Step 5. Select **SEL-300G** and select **OK**.

Step 6. Double-click **SEL-3620** to open its Workspace, and select **Edit**.

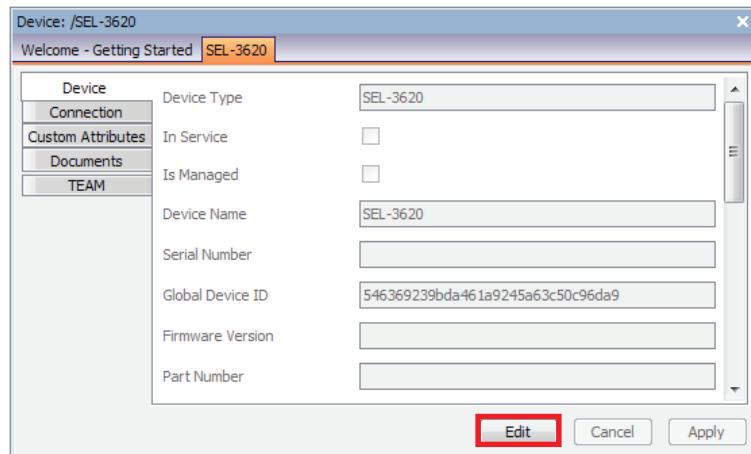


Figure 66 Edit the SEL-3620 Workspace

Step 7. Select the check boxes to the right of **In Service** and **Is Managed**.

Step 8. Select the **Connection** tab and change parameters as follows:

Access Script:	GENERAL_362X_ACCESS_SCRIPT
Terminate Script:	GENERAL_362X_TERMINATE_SCRIPT
Termination String:	\017
Connection Type:	Network
Host IP Address:	192.168.1.2
Port Number:	22
Port Number (HTTPS):	443
File Transfer Option:	SSH
Credential Source:	Titled Password
Credentials:	TEAM

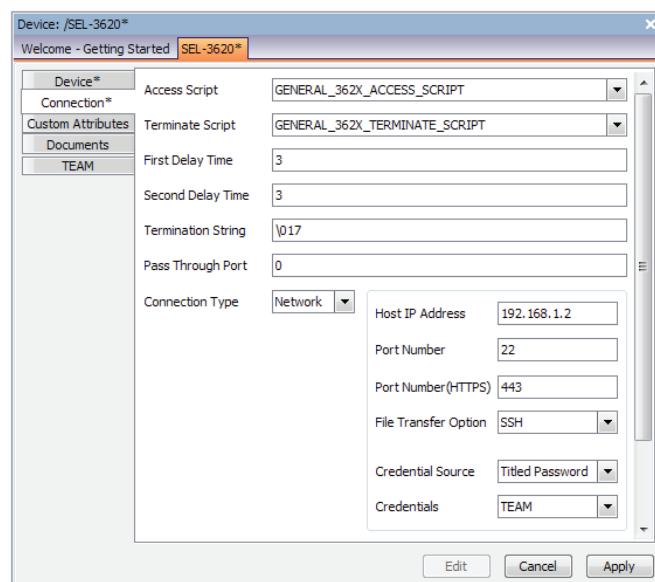


Figure 67 Configure the SEL-3620 for an SSH Connection

Step 9. Select the **TEAM** tab and select **Add** under the **Communication Channel** section.

Step 10. Navigate through the **Server Configuration Wizard** without making changes.

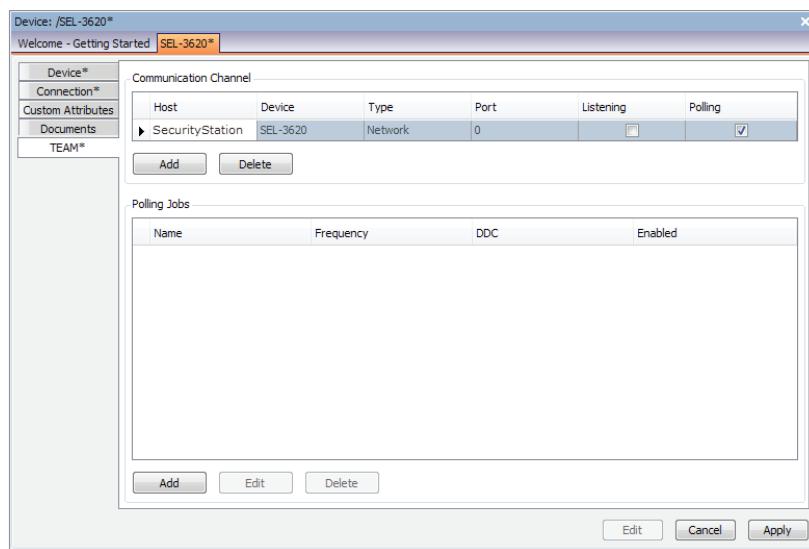


Figure 68 Network Communication Channel Added

Step 11. Select **Add** under the **Polling Jobs** section.

Step 12. Continue through the **Polling Job Wizard** until the **Polling Frequency** window displays.

Step 13. Select **Daily** and then **Next**.

Step 14. Set the Daily Polling interval to **Every 7 Number of Days**, set the **Time of Day** to **01:00 AM**, and select **Next**.

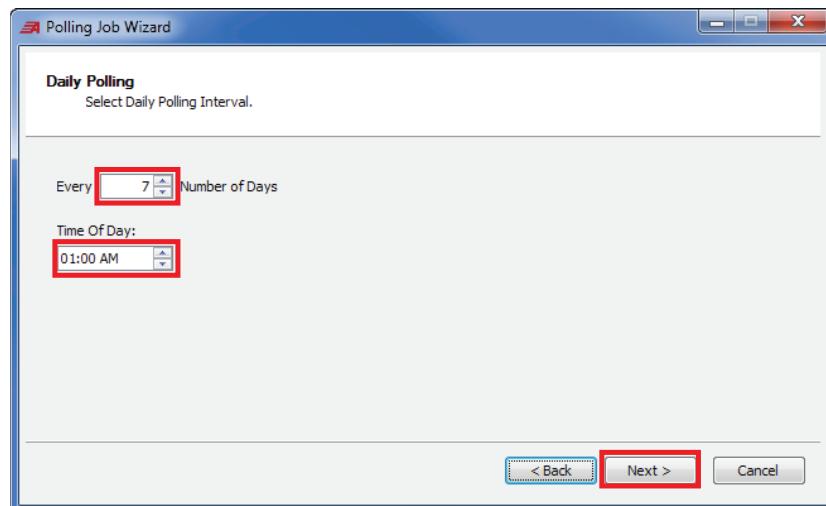


Figure 69 Set the Daily Polling Interval

Step 15. Select **Finish** to close the **Polling Job Wizard**.

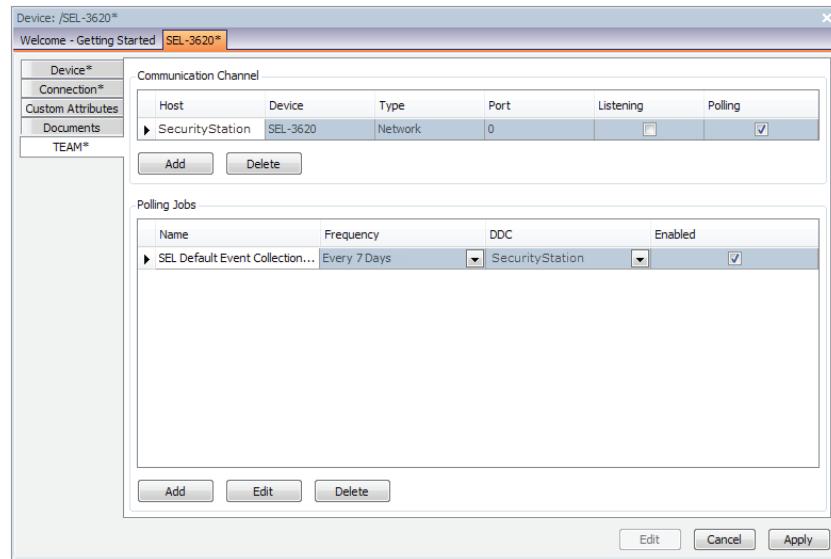


Figure 70 Event Collection Configured

Step 16. Double-click SEL-300G and select **Edit**.

Step 17. Select the check box to the right of **In Service**.

Step 18. Select the **Connection** tab and change the **Pass Through Port** value to **1** and the **Data Speed** value to **19200**.

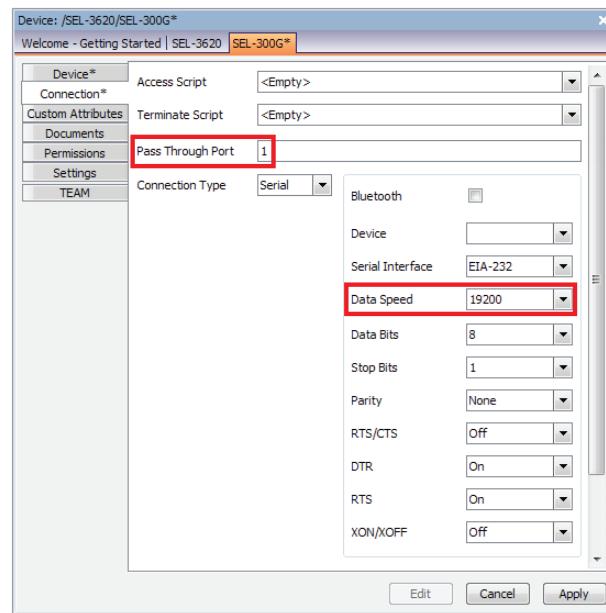


Figure 71 Configure the SEL-300G Connection Parameters for Event Collection

Step 19. Select the **Permissions** tab and select **Add**.

Step 20. Highlight the group with the correct permissions and select **OK**.

NOTE: Refer to the Create a Secure Password and User on page 151 for instructions on how to create the Technician group.

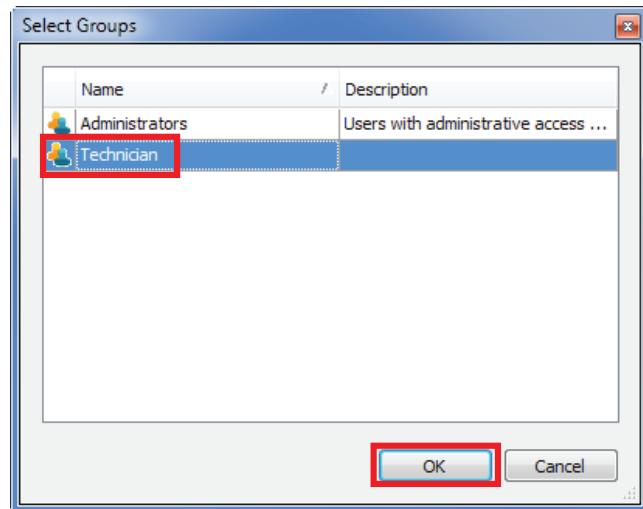


Figure 72 Select Group Technician

Step 21. Select **Apply** to add the group and then **Edit** to associate the access level permissions.

Step 22. Select the check boxes under the **Allow** column for both **Connect** and **ACC**.

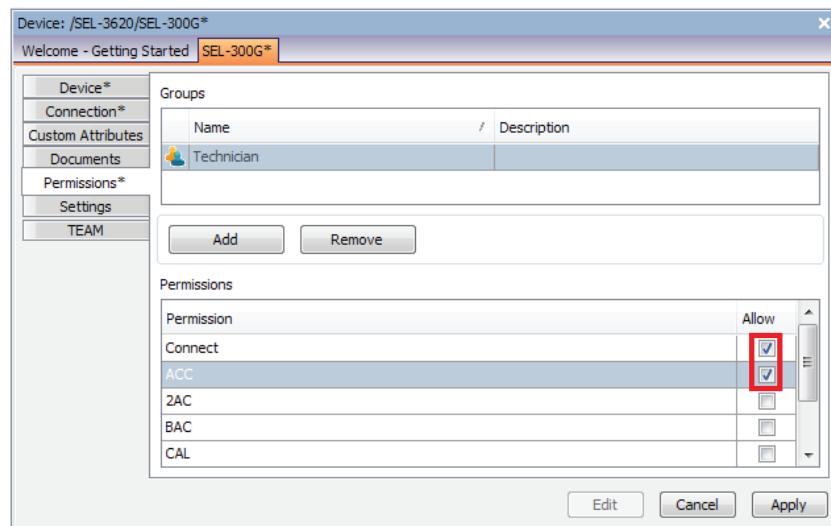


Figure 73 Associate Access Level Permission

Step 23. Select **Save All** (disk icon) to apply the changes.

Step 24. Right-click **SEL-3620** and select **Device Tasks > Send**.

Step 25. View collected events by right-clicking **SEL-300G** and selecting either **View Events** (provides grid style view) or **Event Timeline** (visual timeline style view).

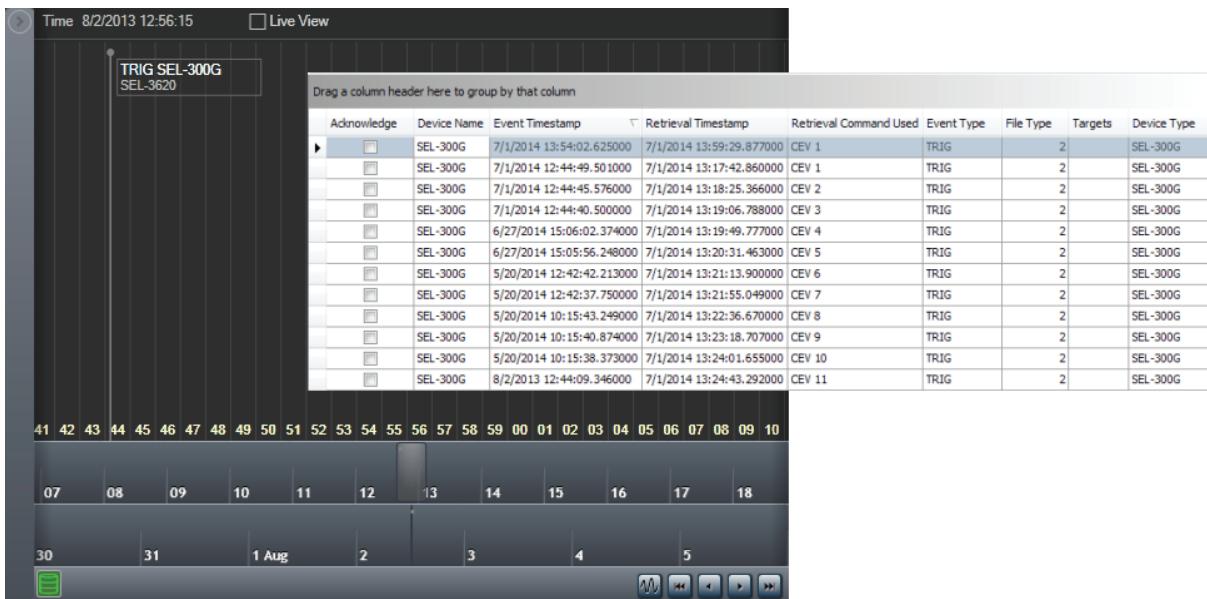


Figure 74 Event Timeline (Left) Versus View Events (Right)

Example 5: Configure TEAM for Event Collection From the SEL-T400L

Step 1. Right-click in the Connection Explorer and select **Add > Device**. Select SEL-T400L, as shown in Figure 75.

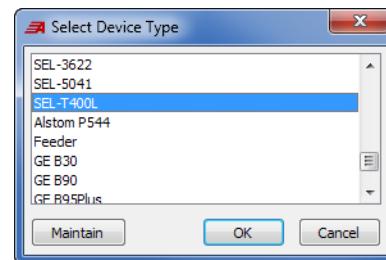


Figure 75 Add SEL-T400L

Step 2. Double-click SEL-T400L in the Connection Explorer to open the device window.

Step 3. Select the **Device** tab, select **Edit**, and select the **In Service** check box, as shown in Figure 76.

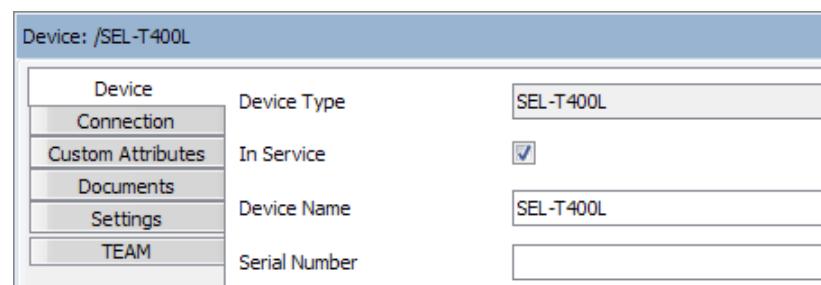


Figure 76 Set Device to In Service

Step 4. Under the **Connection** tab, specify **Network** as the **Connection Type** and enter the appropriate **Host IP Address**, **Port Number**, and **File Transfer Option**. The connection

defined in the **Connection** tab can be either Telnet or FTP. TEAM uses FTP, and the connection is defined when you create your job later in this example.

- Step 5. Select **Save All**.
- Step 6. Select **Tools > Device Manager > Passwords**.
- Step 7. Right-click the white space on the left and select **Add > Password**.
- Step 8. Double-click **New Password** in the white space and select **Edit** in the lower right corner.
- Step 9. Change the Password Title to **SEL-T400L**, the User Name to **2AC**, and the Password to **TAIL**. Select **Save All**.

NOTE: SEL recommends changing all device passwords to secure, unique passwords.

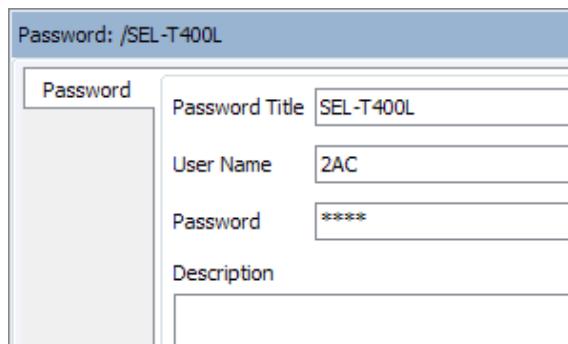


Figure 77 Setting the FTP Password

- Step 10. Select **Windows > Device Manager**
- Step 11. In the SEL-T400L workspace, select **Edit**. Select the TEAM tab within the SEL-T400L workspace.
- Step 12. Under **Polling Jobs**, select **Add**.
- Step 13. Under the **Job** drop-down menu, select **T400L COMTRADE Collector Job**. Leave the job enabled and select **Next**.

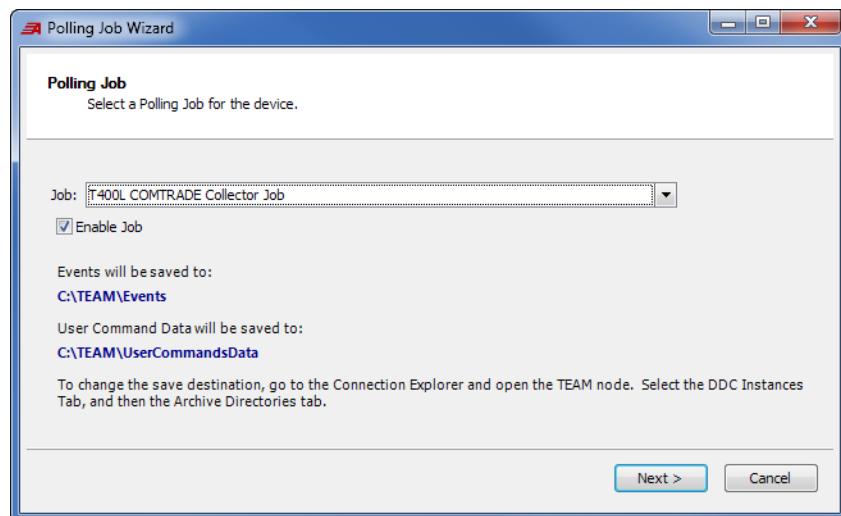


Figure 78 COMTRADE Collector Job

Step 14. In the **Configure Job** window, use the drop-down menu to change the value for the **T400L FTP Credentials** to **SEL-T400L**. Ensure that the **FTP Port Value** is correct, and select **Next**.

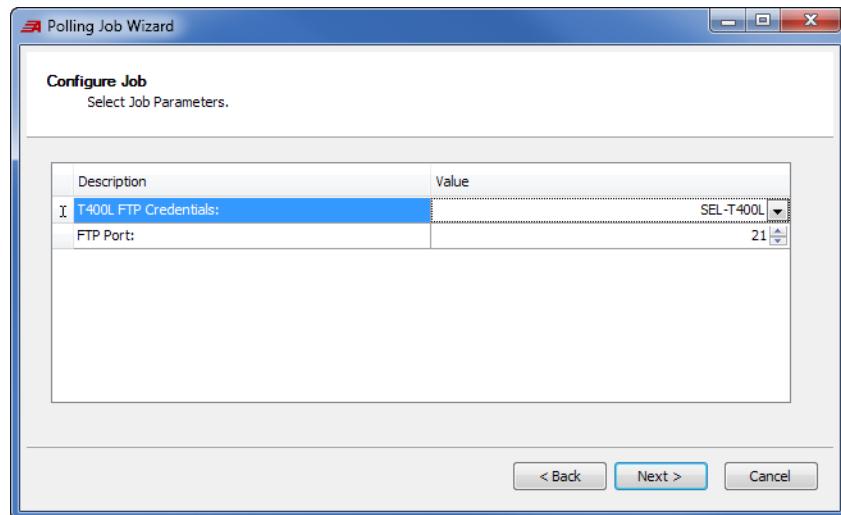


Figure 79 Configuring the SEL-T400L Job

Step 15. Set the **Polling Frequency** and continue to select **Next** until the completion message appears. Then select **Finish**.

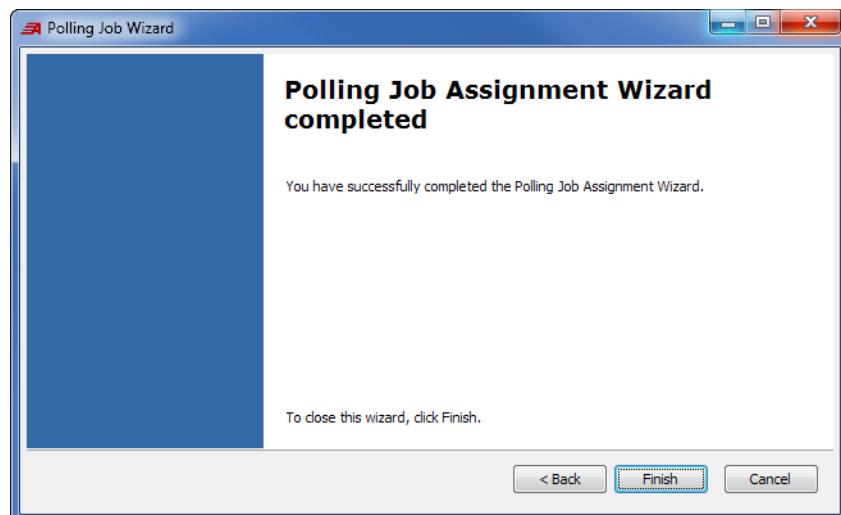


Figure 80 Polling Job Completion

Step 16. Select **Save All**.

Event Collection Tasks

Define Event Collection Tasks

You can define an event collection task by navigating to the **Event Collection Tasks** node under the **TEAM > Jobs** node. Double-click to display the **Event Collection Tasks** tab. In this tab, you will define your event collection tasks, the device-specific commands that the task will execute, and the device types

that can accept the commands. For example, the default **1/4-Cycle Task** has the command **Standard CEV Quarter Cycle** that defines the **CEV #** command that can read compressed event reports from an SEL device.

Event Collection Task Choices

In the left column, you can select or define a task. There are four defined default tasks that apply to three types of event reports. You can select the **Edit** button to change a task name or the **Create** button to add a new task. You can delete a task by selecting the task and selecting the **Delete** button.

Event Collection Commands

After you have selected a task, you can then define the commands for that task to execute in the center column. When you select a command name, the actual command displays in the area immediately below. For example, for the default command named **Standard CEV Quarter Cycle** the specific device command **CEV #** displays in the **Command** area.

Select the **Create** button to create a new command or the **Edit** button to modify an existing command. The **Event Collection Command Wizard** will help you to define an event collection command (see *Event Collection Command Wizard*).

Device Type Assignment

After you have defined a task and its commands, you need to specify the device types that support each command. In the right column, you can define the device types to assign to your command names.

First, select a task and then a command name. Then select the **Edit** button (in the Device Types column) to display the **Event Command Assignment** dialog box.

Use the arrows or cursor to locate the devices you want to assign. Select **>>** to assign a device to the event command name. You can remove a device by selecting **<<**. You can make multiple selections by using the **<Ctrl>** and **<Shift>** keys.

Select **OK** when you have finished making assignments.

Now the event collection task and command name you selected will execute on the device types you defined here.

Event Collection Command Wizard

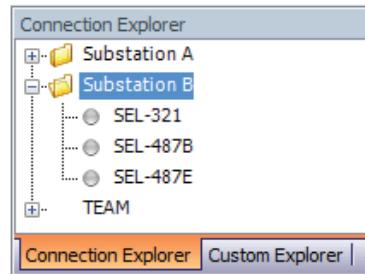
In the middle column of the **Event Collection Tasks** tab, select **Create** or **Edit** to display the **Event Collection Command Wizard**. This wizard helps you create an event collection command based on the options you select. After you create the command, you can modify it. After you select the **Finish** button and return to the tab, the new event command will display. You still need to assign that command to a device type (see *Device Type Assignment*).

Example 6: Create a TEAM Job to Collect High-Resolution Event Files

NOTE: Rather than repeating information, the following example omits the finer points of procedures discussed elsewhere in these instructions. For procedural details omitted here, refer to the relevant section(s).

The default SEL event collection job collects events with a filter of four samples per cycle. This example creates a new, customized job that collects unfiltered events.

Prior to defining a new job, create a new folder, rename it **Substation B**, and add **SEL-321**, **SEL-487B**, and **SEL-487E** to the folder as shown in *Figure 81*.

**Figure 81 Connection Explorer**

Assign connection parameters and DDC connections to your device (for information on how to do this, see *Job Done Example: Classic Workflow Overview on page 23*). For this example, create a connection for the SEL-321 on Port 13, the SEL-487B on Port 6, and the SEL-487E on Port 1. Create connections for these serial ports as *Figure 82* illustrates.

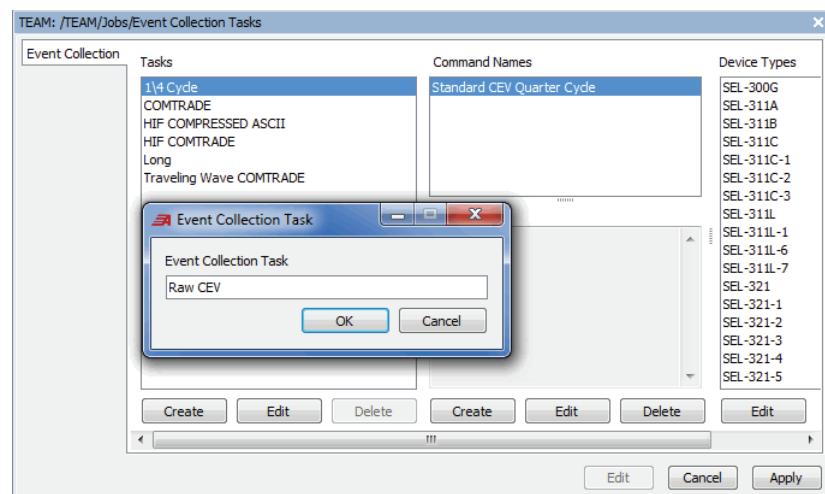
DDC Connections Archive Directories				
Type	Port	Listening	Direct Connection	
Serial	COM1	<input type="checkbox"/>	<input type="checkbox"/>	
Serial	COM13	<input type="checkbox"/>	<input type="checkbox"/>	
Serial	COM6	<input type="checkbox"/>	<input type="checkbox"/>	

Add Edit Delete

Figure 82 Creating Connections

Create a New Event Collection Task

- Step 1. Expand the **TEAM** node and **Job** node in the Connection Explorer and double-click **Event Collection Tasks**.
- Step 2. Select **Edit** and then **Create** under the **Tasks** column and name the tasks ‘Raw CEV,’ as shown in *Figure 83*.

**Figure 83 Create a New Event Collection Task**

Step 3. Select **OK** and then, with **RAW CEV** highlighted, select **Create** under the **Command Names** column to open the **Event Command Wizard** as shown in *Figure 84*.

Step 4. Enter **CEV # R** in the **Command Name** field and then select **Next**.

The **CEV # R** command prompts the device for an unfiltered CEV file. For an SEL-321, this unfiltered event contains 16 samples per cycle. For an SEL-487B, this unfiltered event contains 24 samples per cycle. The default event collection job, which uses the 1/4 cycle event collection task, collects CEVs with four samples per cycle.

Step 5. Select **Next** at the **Event Collection Command Parameters** window.

This window provides automatic command creation. For this example, we already know the command parameters to use (**CEV # R**), so we proceed to the next window.

Step 6. Select **Edit Command**, as shown in *Figure 84*, and modify the command to be **CEV # R**. Select **Next** and then **Finish**.

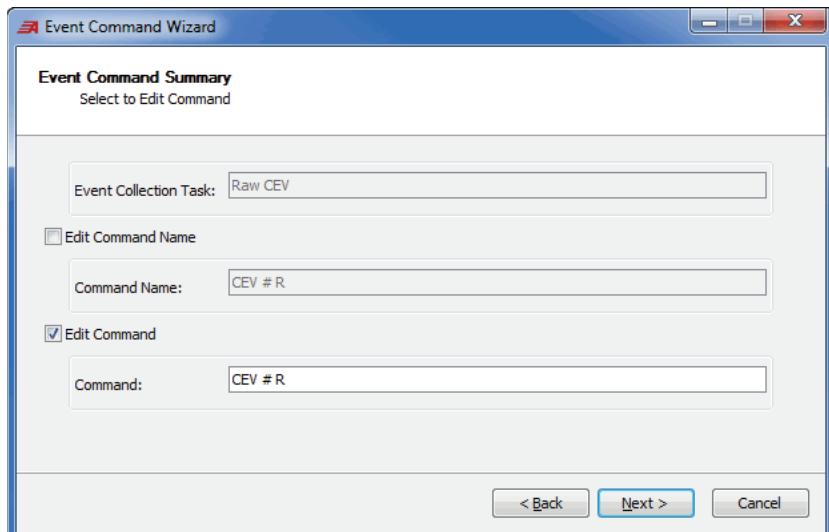


Figure 84 Command Name

Step 7. Under the **Device Types** column, select **Edit** to open the **Event Command Assignment** window. Select the SEL-321 family and SEL-487B family. To select a group of devices, hold down the **<Ctrl>** key and select multiple Device Types entries. Transfer the selected families to the **Devices Assigned** column by selecting the double-chevron (**>>**) button as shown in *Figure 85*.

The **Event Command Assignment** window specifies the devices for which the Raw CEV task runs. If a device does not support the **CEV # R** command, do not include it in the list of assigned devices. The SEL-487E that is part of the **Substation B** folder does not support Raw CEV, so we *do not* add it to the **Devices Assigned** column. Find details on supported event collection commands in the device instruction manual.

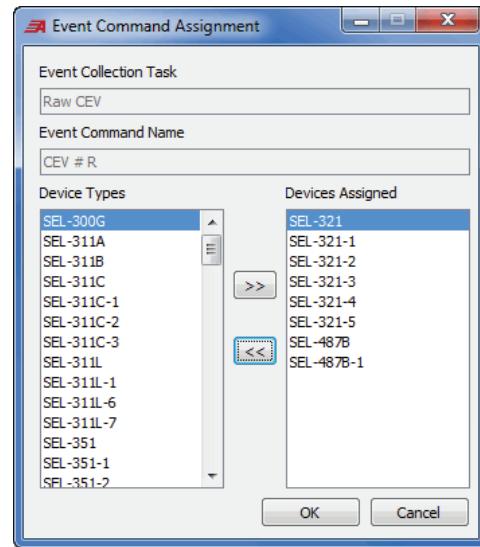


Figure 85 Event Command Assignment

- Step 8. Select **OK** to complete the event command assignment.
- Step 9. Select **Apply** in the lower right to save the assignments for Event Collection Tasks.

Create a New Job

Now that the event collection task has been created, we can assign it to a new job.

- Step 1. Expand the **TEAM** node and double-click **Jobs**.
- Step 2. Select **Edit** and then **Create** under the **Define TEAM Jobs** box, as shown in *Figure 86*, to display the **Jobs Wizard**.
- Step 3. Select **Next** and then name the job ‘Unfiltered Events.’

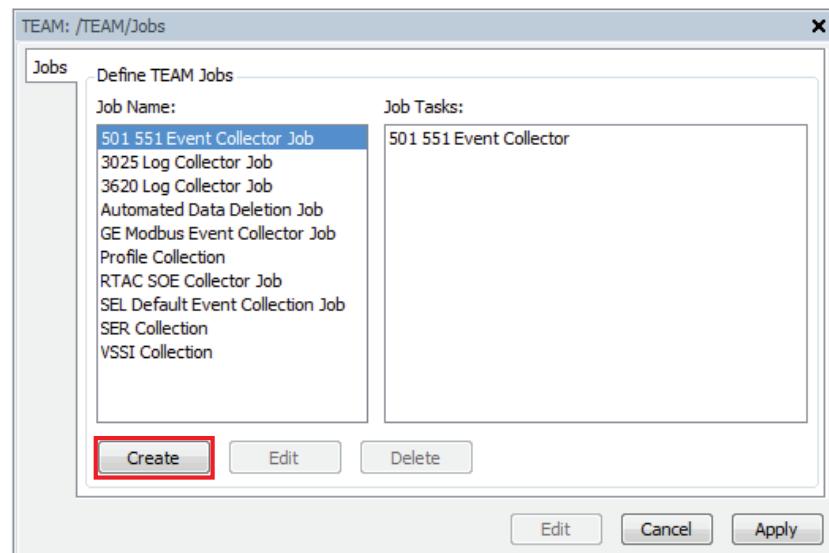


Figure 86 Create and Name New TEAM Job

- Step 4. Select **Next** to open the **Event Collect Tasks** window. Select **COMTRADE** and **Raw CEV** from the **Tasks** column, use the (\rightarrow) arrow to transfer them to the **Assigned Task** box (as shown in *Figure 87*), and then select **Next**.

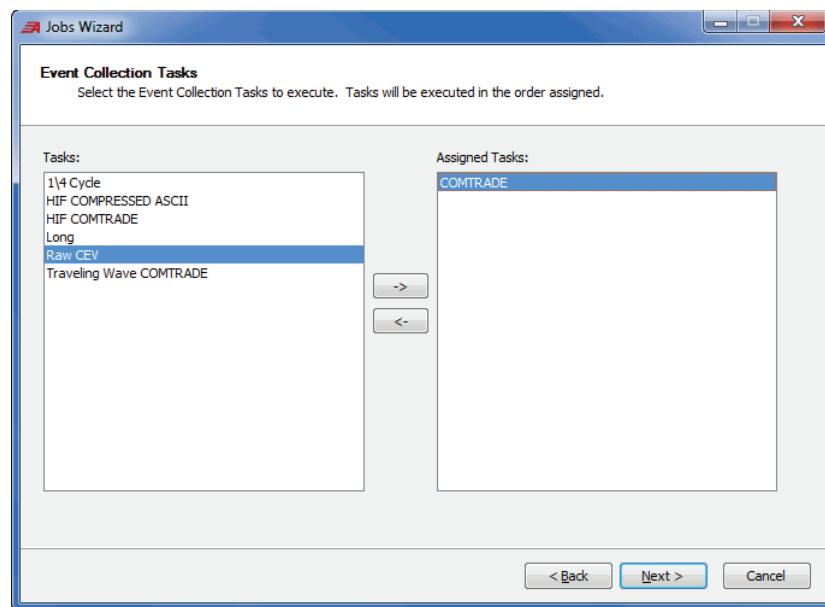


Figure 87 Event Collection Task Assignment

- Step 5. Select **Next** to navigate through the remaining windows and then select **Finish**.
- Step 6. Confirm that the previous tasks were successfully assigned to the Unfiltered Events job by selecting **Unfiltered Events** and observing that COMTRADE and Raw CEV appear in the **Job Tasks** column as shown in *Figure 88*. Select the **Save All** (icon) in the toolbar.

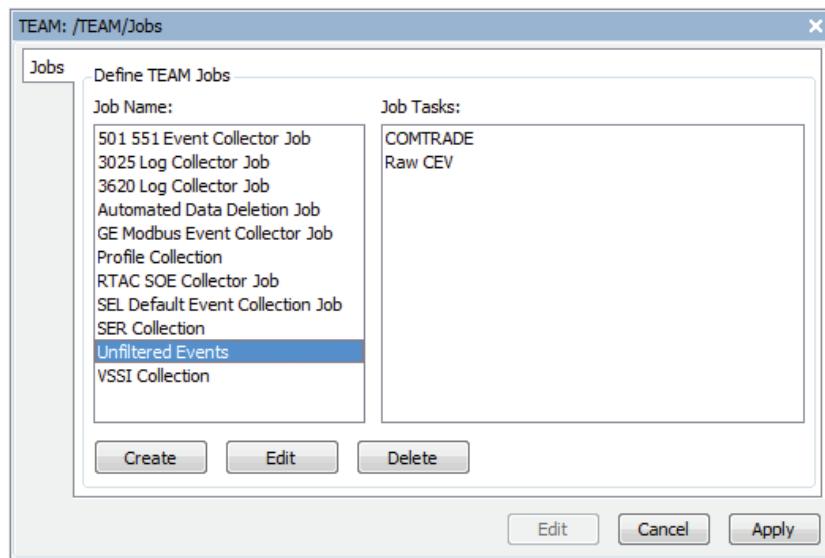


Figure 88 Define TEAM Job With TEAM Task

Assign a New Job to a Folder

The Unfiltered Events job you created has two tasks associated with it: COMTRADE and Raw CEV. The ability to associate multiple tasks with one job assists you with assigning different tasks to devices in the same folder. Perform the following steps to assign the new job to the **Substation B** folder.

- Step 1. Double-click **Substation B** and select the **TEAM** tab.
- Step 2. Select **Edit** and then **Add** under **Polling Jobs** to start the **Polling Job Wizard**. Select **Next** until you see the **Polling Job** window and then select **Unfiltered Events** from the drop-down menu, as shown in *Figure 89*.

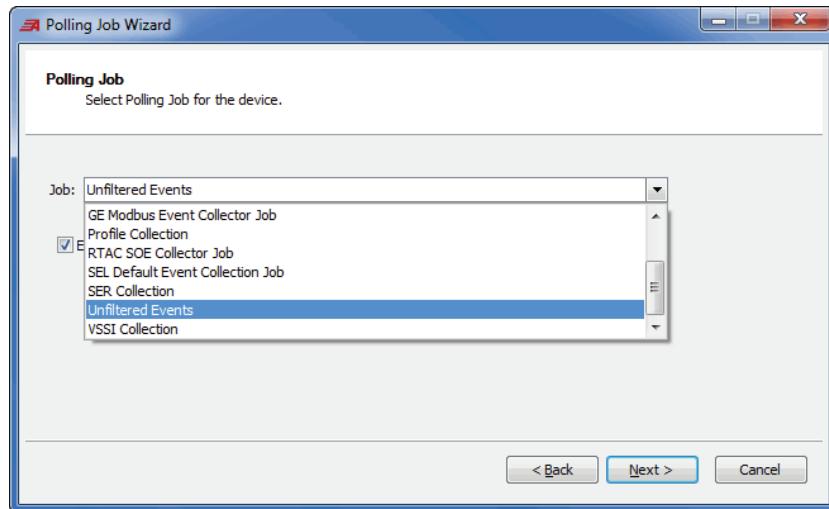


Figure 89 Assign a Newly Created Job to a Device

- Step 3. Select the Polling Frequency and Polling Interval as 1 every minute, and then select **Next**.
- Step 4. At the **DDC Service Connections** window, select **Assign device connections individually** and assign the connections shown in *Figure 90*.
- Step 5. Select **Finish** and then **Save All** (blue icon).

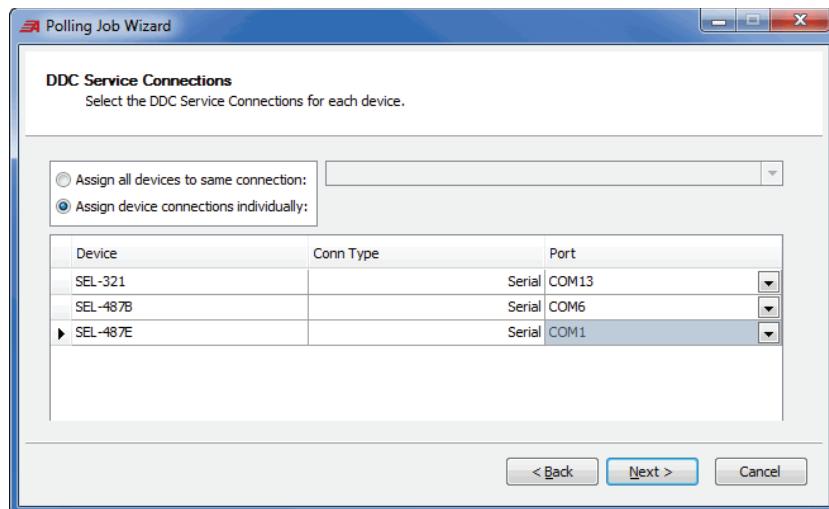


Figure 90 DDC Service Connections Window

NOTE: This example shows how to configure a folder level job for serial connections, but if all devices under a folder use a network connection, choose **Assign all devices to same connection:** and then choose **0** for the port.

When you assign the Unfiltered Events job to the **Substation B** folder, the software automatically filters the tasks so that they only run on the devices defined in the **Event Command Assignment** wizard. For example, TEAM only runs the RAW CEV event collection task for the SEL-321 and the COMTRADE event collection task for the SEL-487E. Alternatively, TEAM runs both the Unfiltered Events and COMTRADE event collection tasks for the SEL-487B.

User Command Tasks

Define User Command Tasks

You can define a user command task by navigating to the **User Command Tasks** node under the **TEAM > Jobs** node. Double-click the node to display the **User Command Tasks** tab. In this tab, you will define your user command tasks, the user command scripts the task will execute, and the device types on which the scripts can run. For example, the default **BRE** task has the script **BRE** that defines a script that can execute the **Breaker Wear** command on an SEL device.

User Command Task Choices

In the left column, you can select or define a task. There are several defined default tasks that can execute a variety of user commands. You can select **Edit** to change a task name or **Create** to add a new task.

You can delete a user command task by selecting the task and selecting the **Delete** button.

User Command Scripts

After you have selected a task, you can then define the scripts for that task to execute. In the center column, when you select a script name, the actual script displays in the area immediately below. For example, for the default script named *MET BAT* the specific script displays in the **Script** area in the center column of the **User Command Tasks** tab:

```
SEL.GotoLevel('ACC')
SEL.WriteLine('MET BAT',[‘=>’], 45)
SEL.Save()
```

Select **Create** to create a new script or **Edit** to modify an existing script. Performing either act launches the **User Command Script** editor.

Select **Edit** to activate the editor. Enter a name for the script. In the **Script Text** window, type **SEL.** exactly as shown to display a list of allowable SEL scripting language commands. Select the command you want by double-clicking on the command. Select **Enter** to move to the next line.

You can select **Check Syntax** at any time to check the syntax of your script. You can also enter a description for your script. Select **Apply** when finished. You return to the **User Command Tasks** tab with the script displayed with its associated script name.

User Command Script Assignment

After you have defined a task and its scripts, you need to specify the device types for which the scripts are targeted. In the right column, you define the device types to assign to your script names.

You first select a task (from the first column) and then a script name. Then select **Edit** (in the right column) to display the **User Command Assignment** dialog box.

Use the arrows or cursor to locate the devices you want to assign. Select **>>** to assign a device to the **User Command Script Name**. You can remove a device by selecting **<<**. You can make multiple selections by using the **<Ctrl>** and **<Shift>** keys.

Select **OK** when you have finished making assignments.

Now the user command task can execute the script name you selected on the device types you defined here.

Example 7: Create a User Command Task

NOTE: Rather than repeating information, the following example omits the finer points of procedures discussed elsewhere in these instructions. For procedural details omitted here, refer to the relevant section(s).

This example shows how to create and deploy a user command task that clears a bit on an SEL-651R-2 to confirm TEAM has collected an event. In this example, an SEL-651R-2 sets a latch bit every time a new event occurs. TEAM uses a user command script to clear this bit when it successfully finishes its collection job. Event collection commands run before user commands so, if TEAM clears the latch bit, we know the event has been collected. If the latch bit remains set, then we know the events have not yet been collected.

Perform the following procedure to configure the SEL-651R-2.

1. Configure the logic setting as follows:
 - a. $ELAT := 10$
 - b. $SET10 := TRIP3P \text{ OR } TRIPA \text{ OR } TRIPB \text{ OR } TRIPC$
 - c. $RST10 := RB01$
2. Add LT10 to the SEL-651R-2 Sequential Events Recorder (SER).

For details on how to configure the SEL-651R-2, see the device instruction manual.

Create a New User Command

Step 1. In the Device Manager Connection Explorer, navigate to **TEAM > Jobs > User Command Task**, as shown in *Figure 91*. Double-click **User Command Tasks**, select **Edit** in the lower right corner, select **Create** under the **Tasks** column, and name the task **RB01 Pulse**, as shown in *Figure 91*.

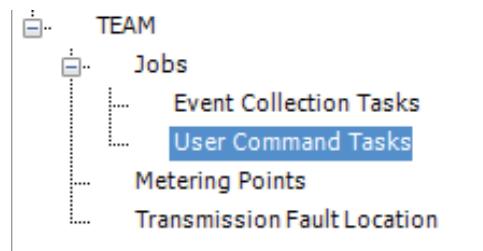


Figure 91 Create User Command Task

- Step 2. Select **Create** under the **Script Names** column to open the **User Command Script** window, name the script **RB01 Pulse**, enter the script text shown below, and then select **Apply**.

```
SEL.GotoLevel('ACC')
SEL.GotoLevel('2AC')
SEL.Writeln('CON 01', ['RB01: '], 60)
SEL.Writeln('PRB 01', ['=>>'], 60)
```

The script logs in to Access Level 2, then begins issuing remote bit control commands. The command **CON 01** begins remote bit control, and **PRB 01** pulses the remote bit.

- Step 3. Select **Edit** under the **Device Types** column, select the SEL-651R family of devices, and select the double-chevron (») icon. *Figure 92* shows the SEL-651R family added to the **Device Types** section for the task.
- Step 4. Select **Save All** (💾) to apply the changes.

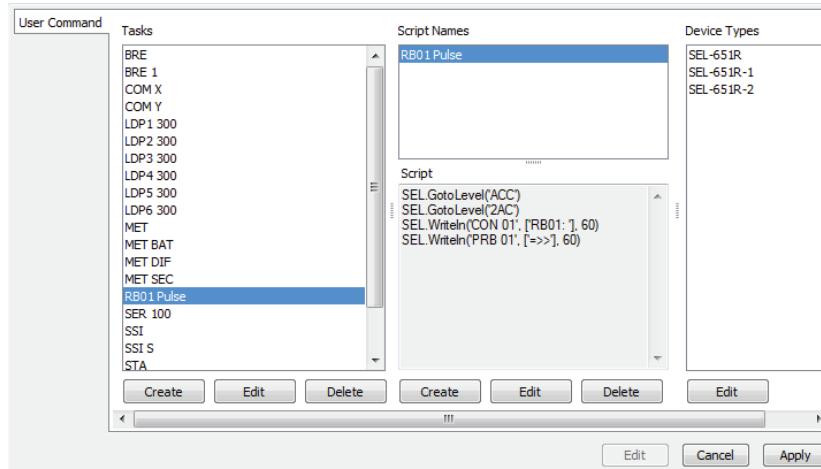


Figure 92 Devices Assigned

- Step 5. Double-click **Jobs** under the **TEAM** node, as shown in *Figure 93*. Select **Edit** to activate the **Jobs** window. From the **Job Name** box, choose **SEL Default Event Collection Job**, then select **Edit**. This starts the Job Wizard.

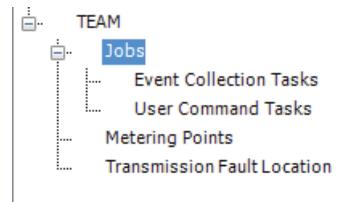


Figure 93 Define TEAM Jobs

- Step 6. Select **Next** until the **User Command Tasks** window displays. Scroll down and select **RB01 Pulse**. Use the arrow button () to transfer this selection to the Assigned Tasks listing. *Figure 94* shows the SEL Default Event Collection Job with RB01 Pulse added as a task.

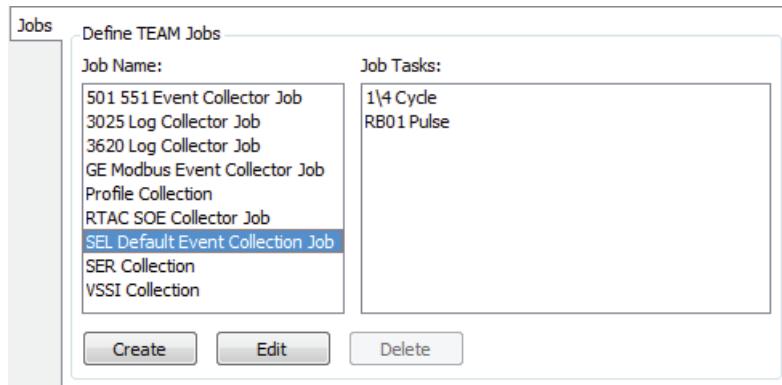


Figure 94 Assigned Tasks

- Step 7. Select **Next** to navigate through the remaining Job Wizard windows and then select **Finish** to complete the edits to SEL Default Event Collection Job.
- Step 8. Add an SEL-651R-2 to the Connection Explorer. Double-click the SEL-651R-2, select **Edit**, and select the **In Service** check box in the **Device** tab.
- Step 9. Switch to the **Connection** tab and enter the connection information for the SEL-651R-2. For this example, use the following information:

Connection Type:	Network
Host IP Address:	192.168.1.5
Port Number:	23
File Transfer Option:	Telnet

- Step 10. Switch to the **TEAM** tab and add a **Communication Channel** and then a **Polling Job**.
- Step 11. In the **Polling Job** window shown in *Figure 95*, select **SEL Default Event Collection Job** from the drop-down menu, and then select **Next**.

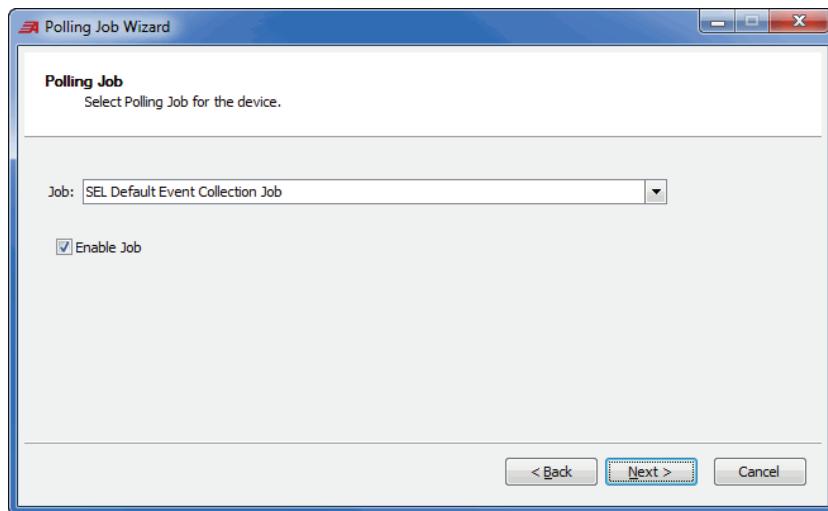


Figure 95 Polling Job Wizard

Step 12. Select **Minutely** for the Polling Frequency and enter **1** for the Polling Interval.

Step 13. Select **Next** and then **Finish** to exit the **Polling Job Wizard**.

Step 14. Select **Save All** (💾) to apply the changes.

Verify User Command Functionality

The previous steps configured a user command that pulses RB01 on an SEL-651R-2. Confirm that the user command is running correctly by performing the following steps to examine TEAM communication logs and the SER output of the relay.

Step 1. Double-click the **TEAM** node in the Connection Explorer. Select the **Archives Directories** tab shown in *Figure 96* and select the **Enable Logging** check box. Select the ellipsis (...) to define the file location for the **Debug Logging Directory**.

Step 2. Select **Save All** (💾) to apply the changes.

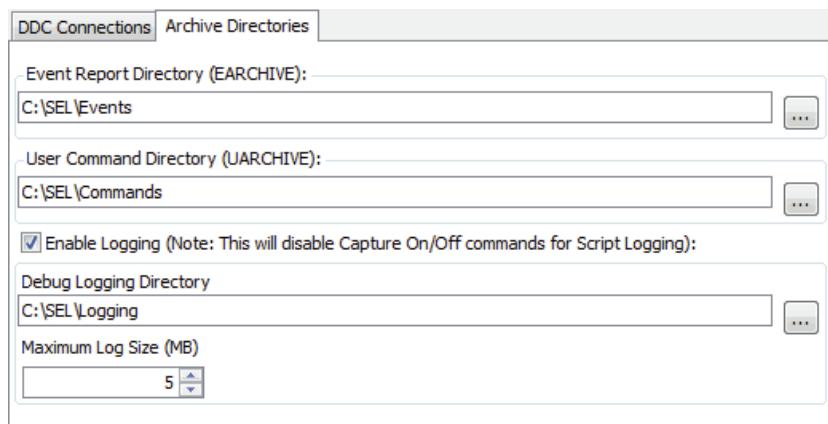
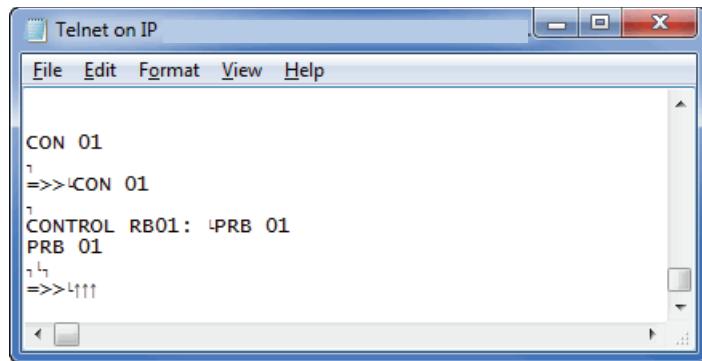


Figure 96 Archive Directories

Step 3. Navigate to the **Debug Logging Directory** folder and open the communication log file named after the device IP address. For this example, open the file **Telnet on IP 192.168.1.5 port number 23_capture.log** in a text editor.

Step 4. Verify that the user command ran successfully. For this example, verify that the SEL-651R-2 responds to the first command with CONTROL RB01 and echoes PRB 01 for the second command. *Figure 97* shows the text from the communication log after successful operation of the user command.

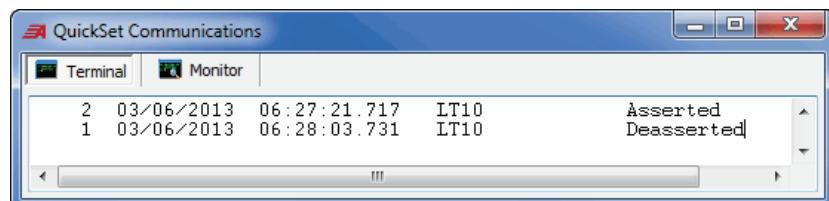


```
CON 01
^=>>CON 01
^
CONTROL RB01: <PRB 01
PRB 01
^<
=>><^>
```

Figure 97 Successful Operation of the RB01 Pulse Command

To view the collected events and verify the user command script ran successfully, use the view events feature and **SER** command in the Terminal window according to the following steps.

- Step 5. In the Connection Explorer, right-click **SEL-651R-2** and select **Connect**.
- Step 6. Select the terminal icon (Terminal) to open the relay command terminal.
- Step 7. Go to Access Level 1 and issue an **SER 10** command in the communications terminal. In this example (see *Figure 98*), the final two lines from the **SER 10** command show LT10 asserting when an event occurs and deasserting when TEAM collects the event.



Event ID	Date	Time	Event	Status
2	03/06/2013	06:27:21.717	LT10	Asserted
1	03/06/2013	06:28:03.731	LT10	Deasserted

Figure 98 The SER Output Following Event Occurrence and TEAM Collection

This example shows how to manually check the SER from a relay. For best results, configure TEAM to run an SER collection job and automatically retrieve SER data.

View Event Reports

With the TEAM Event Viewer, you view, organize, import and export, and print event report data from the ACCELERATOR Database. To view collected event reports, right-click on a device node or folder node from within Device Manager and select **View Events**. The events associated with the selected device are displayed. Use the several subtabs within the **Viewer** tab to view and organize your event report data. Alternatively, view collected event reports with the TEAM Web Server. Refer to *TEAM Web Server on page 160* for more information.

Event Summary

In the **Event Summary** tab, you can view summary information about an event report. The data are displayed in a grid format, with each row representing data from one event report. You can organize the data easily to suit your preferences by ordering columns (left-click and move) and ordering rows (sort by column heading). Additional options are available by right-clicking on a column header. Select the **Configuration** option to **Retrieve Data by Dates** or to **Retrieve Data by Number**. The data in the specified range will automatically refresh to account for any new records. Configure the **Connection Timeout** setting to dictate how long the Event Viewer will wait for a response from the server before timing out. This configuration will persist for the duration of the current viewing session.

In the **Event Summary** tab, you can acknowledge an event report to indicate that you have viewed it. Note that you can hide acknowledged events by selecting the **Hide Acknowledged Events** check box at the top of the **Event Summary** tab.

Several options are available by right-clicking on a selected row in the **Event Summary** tab. They include the following:

- **View Event Data:** Takes you to the detailed data view for that event report.
- **Create System Incident:** Lets you define a new system incident (see *System Incidents on page 71*).
- **Export as COMTRADE:** Creates an ASCII COMTRADE file from the event report data.
- **Save Copy of Original Report:** You will be prompted for a directory location.
- **Save Copy of Original Reports As Single File:** Saves multiple event reports into a single file when you select multiple rows. You will be prompted for a file name to save as.
- **Print All Summaries:** Prints all event summaries in the summary view.
- **Print Selected Summaries:** Prints selected event summaries in the summary view.
- **Export All Summaries:** Exports all summaries that appear in the summary view in Microsoft Excel® format (.xls), or another format of your choice.
- **Export Selected Summaries:** The selected summaries will be exported in Microsoft Excel format (.xls), or another format of your choice.
- **Import Events:** Prompts you for the location of event report files you want to import.

- **Refresh Grid:** Necessary after import operations that added new data to the database.
- **Delete Event:** Removes specified event data from the database.

System Incidents

The **System Incidents** tab is a powerful feature of the TEAM Event Viewer that lets you define a system incident, e.g., a tornado, and select event reports to associate with that system incident.

The top of the tab displays defined system incidents. Selecting an incident displays information about that incident to the right. The **Filter Incidents** dialog box lets you choose incidents to view by type, date, and location. For example, you can choose to see outages between June 1 and September 1 for a specific area.

There are several buttons that let you define system incidents, view their event data, and print reports.

- **Define New:** Displays the **Define New System Incident** dialog box, in which you name the incident, define or select the type and location, give a description, and define the start/end date/time of the incident. From the **Device Events** grid view, you can check which events to associate with the incident. You can also associate a document with a system incident by selecting the **Select Document** button and selecting a file to associate.
- **Edit:** Lets you edit a system incident that you defined previously.
- **Print:** Prints a system incident report. A print preview displays the formatted report and a menu bar with additional options. For example, from the **File** menu, you can choose **Export Document** to save the file in a variety of file formats. You can also choose to email the report.
- **View Event Data:** Takes you to the **Event Data Detail** tab (described in the following section) with the events associated with the selected system incident.
- **Remove:** Deletes the selected system incident.
- **Open Document:** When you select a system incident and it has an associated document, the file name path will be displayed. Select the **Open Document** button to open the document for display.

Event Data Detail

This tab presents detailed data from the selected event report. The top grid displays summary data for each event report. When you select a row, the lower grids display detailed data for that report. The **Min/Max Analog Values** grid displays the minimum and maximum values for each analog channel. Left-clicking on the column headers will toggle the row order (ascending/descending). Right-clicking on a column header presents more advanced sorting and grouping options.

By right-clicking on a selected row, you can choose to view the data sample that has that minimum or maximum value. The row in the **Sample Data** grid to the right will be highlighted. The specific value (min or max) will not be

highlighted. If multiple analog samples have the same minimum or maximum value, a pop-up dialog box will appear that allows you to select the row sample to display.

The **Sample Data** grid displays all the data for the selected event report. Each row represents one sample time. You cannot reorder these columns, but you can toggle the row order by left-clicking on a column heading. You can expand an unexpanded column heading by moving your mouse cursor over the heading. Right-clicking on a column header presents more advanced sorting and grouping options.

Several options are available by right-clicking on a selected row in the **Event Summary** tab. They include the following:

- **Launch Waveform Analysis:** Launches an analysis application such as the ACCELERATOR Analytic Assistant® SEL-5601 Software or SYNCHROWAVE® Event SEL-5601-2 Software with the selected event report. Note that you must first use the **Preferences** tab to select a viewer you want to use.
- **Create System Incident:** Lets you create a system incident and add this event to that incident.
- **Export as COMTRADE:** Creates an ASCII COMTRADE file from the event report data.
- **Save Copy of Original Report:** You will be prompted for a directory location.
- **Print All Summaries:** Prints all event summaries in the summary view.
- **Print Selected Summaries:** Prints selected event summaries in the summary view.
- **Export All Summaries:** Exports all summaries that appear in the summary view in Microsoft Excel® format (.xls), or another format of your choice.
- **Export Selected Summaries:** The selected summaries will be exported in Microsoft Excel format (.xls), or another format of your choice.

Functions

From the **Functions** tab, you can invoke special TEAM functions. Import event reports (.CEV or COMTRADE files). Selecting **Import Event Reports** displays a dialog box that lets you locate the file to import. After selecting the file, another dialog box lets you associate the event report with a specific device. Selecting **OK** will import the file and return you to the viewer.

If the file to import contains multiple event reports (.CEV files only), TEAM will import them as separate files. To view the event summaries for these reports, right-click on the associated device and select **View Events**, or, if not associated, right-click below the device tree and select **View Events** (the software may need you to close the viewer first).

To further identify files imported from a multiple events file, right-click on a column heading and select the **Column Chooser**. In the **Column Chooser**, select **Event Number**. This will display a new column containing the order of the event report in the file.

Use the **Delete Event Report Data** function to remove event report data from the database. Select a Start Date and End Date and then select **Delete** to remove all events in the specified date interval.

Preferences

In the **Preferences** tab, you can restore the default layout view and select the waveform viewer to use when launching a waveform analysis application such as SYNCHROWAVE Event. Note that if you have not selected a waveform viewer before attempting to launch it, you will receive a warning in the status window. **Enable Auto Refresh** will auto refresh the data shown in the Event Summary window based on the interval (in seconds) that you specify.

Event Timeline Viewer

The TEAM **Event Timeline Viewer** provides a powerful and effective graphical interface for accessing event reports stored in the ACCELERATOR Database. Determining time relationships from viewing events as a list in a grid is difficult. A graphical display lets you see these events in time-aligned positions along a timeline. Through the use of scrollable time bands, you can quickly and easily locate event reports at the point in time you want. On the graphical display, you can choose to view detailed event information and launch a waveform viewer for event oscillography.

Installation of the Event Timeline Viewer plug-in occurs upon your installation of the ACCELERATOR QuickSet TEAM Plug-in.

Access the Event Timeline Viewer

To view events with the Event Timeline Viewer, right-click anywhere in the Connection Explorer area and select **Event Timeline** from the pop-up menu. The Event Timeline Viewer will appear in the **Event Timeline** tab.

The layout of the Event Timeline Viewer display is as follows.

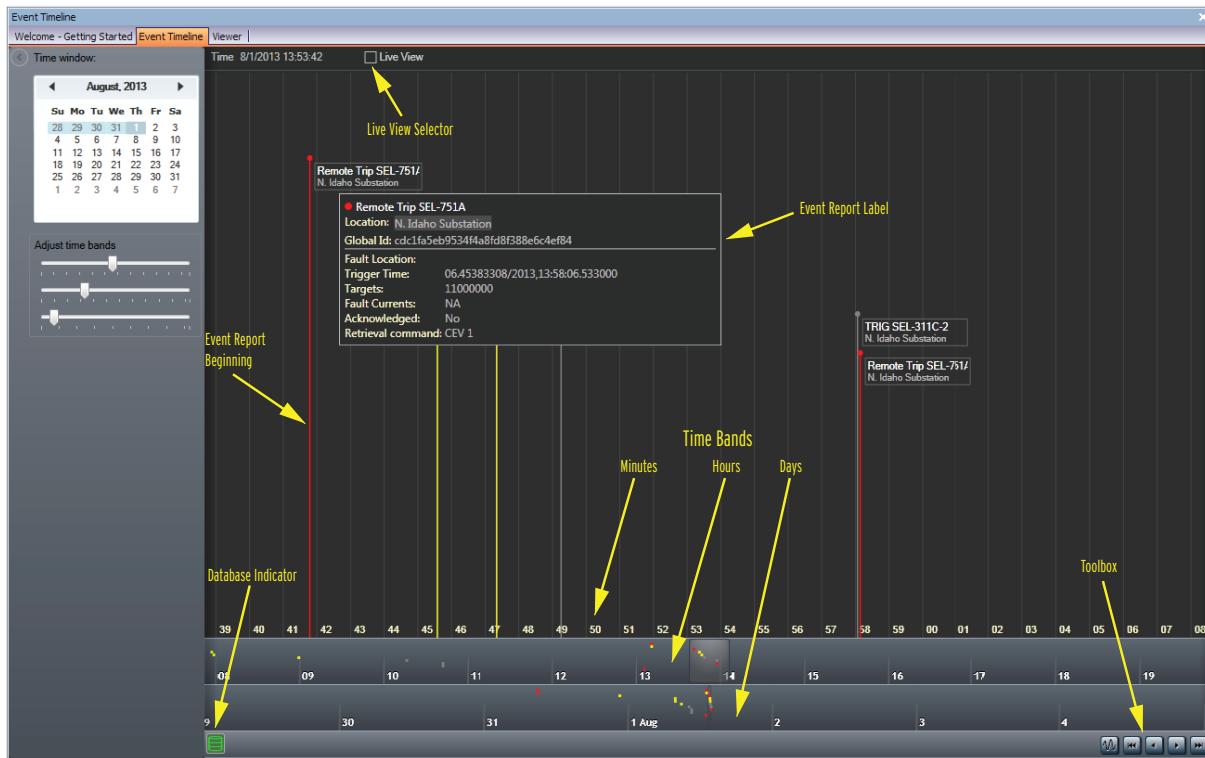


Figure 99 Event Timeline Functionality

The Event Timeline Viewer display is divided into several horizontal bands. The first (topmost) band displays the time at the center of the timeline. The next three bands are scrollable timeline bands, one each for minutes, hours, and days. The last toolbox band contains toolbox controls and the database status indicator.

Live View Band

From within the Live View band at the top, you can select the check box to display event reports as they are added to TEAM (subject to filtering). The Event Timeline Viewer updates time bands approximately once per second.

When you are in Live View, the date for filtering events will range from the present time minus seven days to the present time plus three hours. The date range filter applies to new events as soon as they are added to the database.

Time Bands

The three middle bands following the Live View band indicate the date and time at which an event report occurred. The top band displays minutes, the middle band displays hours, and the lower band displays days. You can scroll within these time bands to locate events at any specific time.

Toolbox Band

Use the toolbox controls in the bottom-most band to scroll backward and forward to view the next/previous/first/last event. Use these controls also to launch a waveform viewer from which you can view event oscillography.

The database indicator at the bottom left of the viewer shows the status of your database connection.

Placing your cursor anywhere in the toolbox band will display the count of events in the timeline.

Event Display

The Event Timeline Viewer display represents events by colored vertical lines in the minute time band and by dots in the hour and day time bands. Each event line displays a label identifying the event type, device ID, and device location.

Bars (and dots) are color coded as follows:

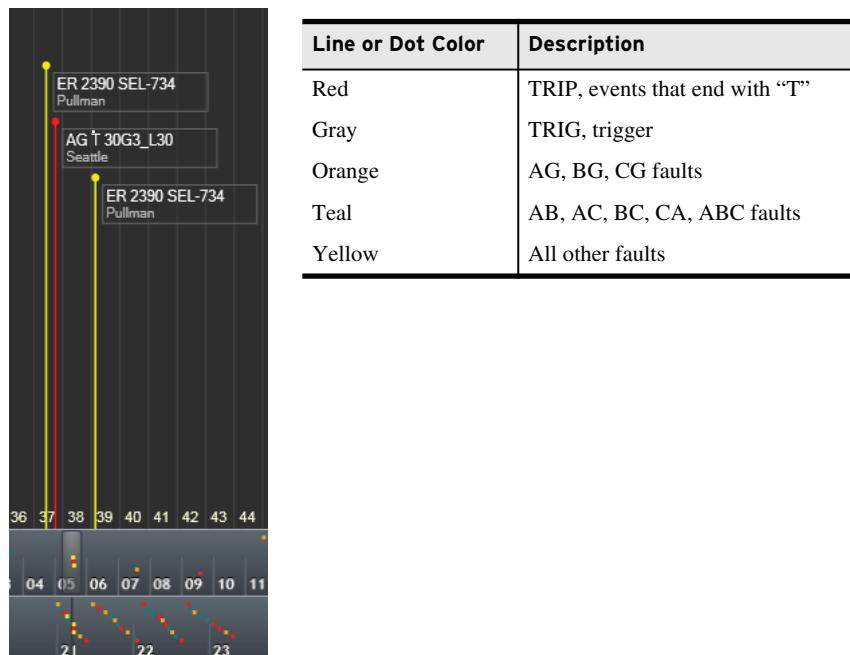


Figure 100 Flag Color Coordination

Event Box

When you place your cursor over an event line label, or over a dot in the lower time bands, an event information box such as the following displays.

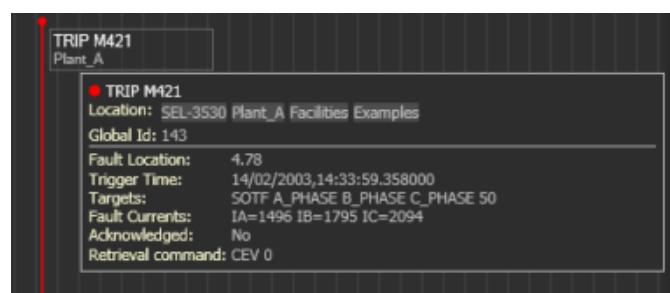


Figure 101 Event Box Detail

The event box title shows the event type (e.g., TRIP) followed by the device name (e.g., M421). The viewer truncates the text if it is too wide for the event box and adds a period at the end (The full text displays in the tooltip.) The

device location displays below the title. If the location text extends beyond the border of the event box, the viewer truncates the location text. Event reports provide the following information:

- Fault location
- Trigger time
- Targets
- Fault currents
- Acknowledged state event report
- Retrieval command

Scrolling Time Bands

Event reports appear in the time bands at the date and time an event began. The ability to quickly locate event reports is a powerful feature of the viewer. To scroll through time, select and hold the left mouse button in any time band and drag the time band left or right. The time bands remain synchronized as you scroll. You can also scroll by using the scroll wheel on the mouse.

When you scroll in Live View, the Event Timeline Viewer returns to one-second updating/scrolling after approximately five seconds without mouse activity.

Event Time Indicator

Bars in the center of the timeline, such as those indicated by the circled area in the following figure, show the mapping of the minutes time span (39 minutes in this example) to the hour and day time bands. The width of these bars varies to provide a proportional representation of the minutes window in relation to the hour and day. For an event to be visible, its dot representations must appear in both the hour and day time indicators. In the example below, an event occurred on the 11th of the month at 12:56.

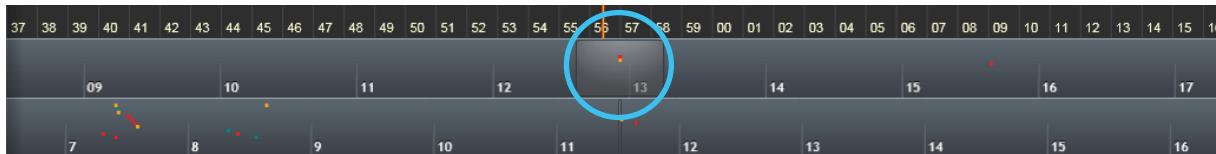


Figure 102 Timeline Event Indication

When you are in Live View, the time bands will always be centered at the present date/time.

To display an event in the center of the Event Timeline Viewer window, first locate the day during which the event occurred. Then scroll the hour and minute bands to home in on it precisely. (Note that if you are in Live View, the time bands will reset within five seconds to the present time.)

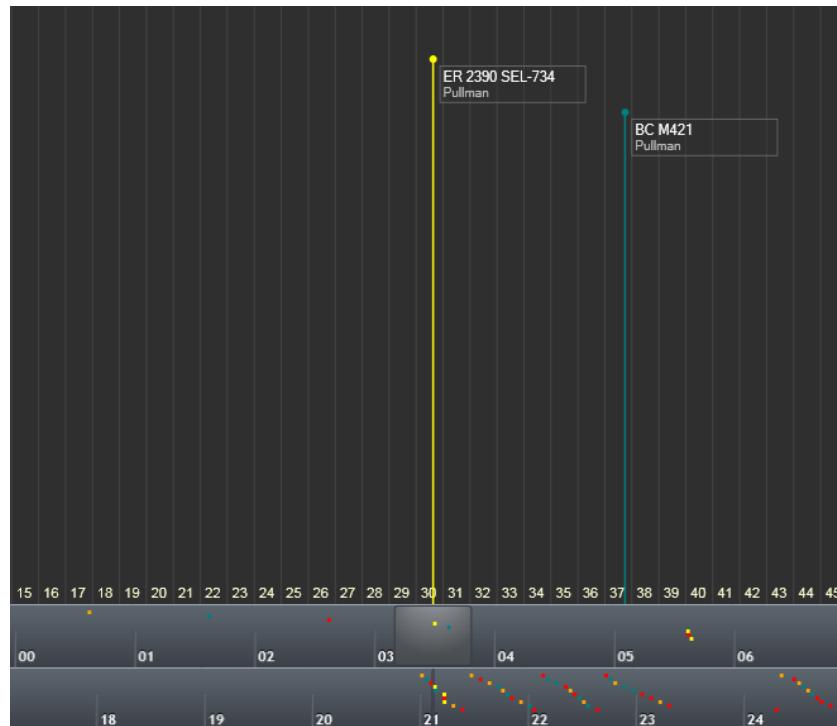


Figure 103 View Event Timeline

Set Time Options

Left-click anywhere in the left margin of the Event Timeline Viewer to display the Time Window, in which you can select various time options.

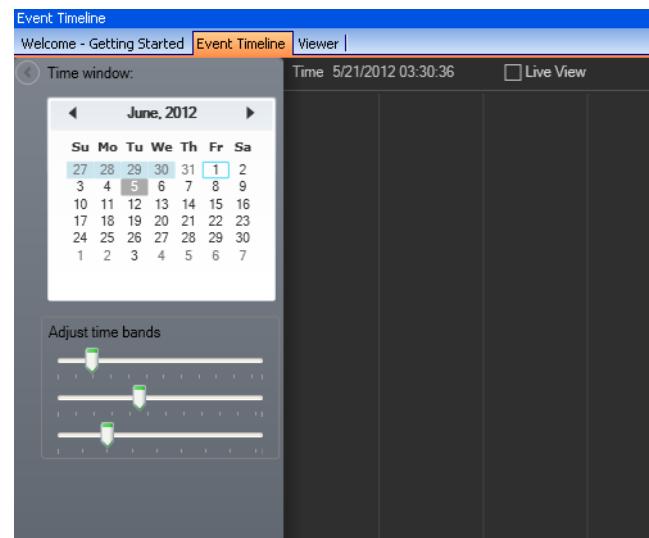


Figure 104 Event Timeline Time Window Adjustment

Event Date Range

From the calendar in the Time Window, you can select a range of dates from which you want Event Timeline Viewer to read event reports. Select a date range by left-clicking the start day, holding down the <Shift> key, and selecting the end day. Within the same month, you can left-click on the start day and hold and then drag to the end day.

Adjust Time Bands

Use the slider bars to adjust the granularity of the time bands. Note that if you move each slider bar all the way to the left, you will display two days, two hours, and two minutes. Moving the sliders to the right increases the number of days, hours, or minutes for each band to a maximum of 60 days, 60 minutes, and 36 hours. Note that the time span indicator in the center changes as you adjust a band to reflect the new range.

Close the time options window by selecting in the left margin.

Event Timeline Viewer Toolbox

The Event Timeline Viewer toolbox is located in the lower right of your display.



Figure 105 Event Timeline Viewer Toolbox Icons

Waveform Viewer

Through the use of the first control, you can launch a waveform viewer (e.g., SYNCHROWAVE Event 2015) to view the oscillography of the selected event report(s). To select an event report to view, perform the following:

1. Select the event line label. The label border will be highlighted.

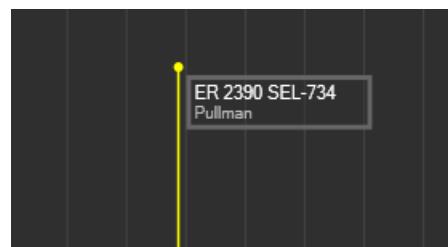


Figure 106 Highlighted Event Flag

2. Select the waveform viewer button (leftmost button) to launch the viewer. To view multiple events, select an event, hold down the <Ctrl> key, and select another event. While holding the <Ctrl> key, scroll the time bands to obtain all the reports you want to graph.

This control uses the event report path, if available. Otherwise, the Event Timeline Viewer exports the event report to COMTRADE format and launches the associated waveform viewer. If you select more than ten events, the Event Timeline Viewer launches the waveform viewer for the first ten events.

Go To Event Controls

With the < and > controls, you can easily go to the previous or next event report. Through the use of the |<< and >>| controls, you can go to the first or last event report in the defined time range. The events are always centered in the event time indicator at the event time.

Database Status Indicator



Figure 107 Database Status Indicator Icon

The database connection indicator shows the status of your database connection. This status indicates when the application is connected (green), disconnected (gray), or failed (red). When you are not in Live View, the Event Timeline Viewer does not display new events as TEAM collects these. The number of events awaiting addition to the Event Timeline Viewer will display in the database indicator. The Event Timeline Viewer adds these upon your selecting Live View. When you are in Live View, remember that you can only view events for the previous seven days. You must exit Live View to view events that may have been added prior to the previous seven days.

Sequence of Events (SOE) Data

TEAM offers the ability to collect Sequence of Events (SOE) data from any TEAM-configurable relay or meter, supported GE devices, and the SEL Real-Time Automation Controller (RTAC). The SOE data can be viewed by using the SOE Viewer inside the Device Manager. SEL monitored binary events are stored in a location known as a Sequential Events Recorder (SER), so SOE collection from relays in TEAM is referred to as SER collection. Collection of SOE from supported GE devices is referred to as a GE Modbus SOE collector job. SOE collection from the RTAC is referred to as an RTAC SOE collector job (see *RTAC SOE Data on page 111*).

Classic Workflow—Collect SOE Data

A metering point must be assigned to every relay before configuring the SER Collection job. *TEAM Profile on page 112* provides a detailed explanation of metering points. To add a metering point, double-click the **Metering Points** node in the Connection Explorer to display the **Metering Points** tab. To define a new metering point, select **Create** to display the **Metering Points Wizard**. You first need to provide a unique name. Then select a **Metering Point Time Zone**, the time zone in which the metering device is located.

TEAM references this time zone when converting all sample times to UTC before storing information in the ACCELERATOR Database. Note that when you select a time zone in the drop-down menu, autocomplete quickly provides you the time zone name after you type the first few characters.

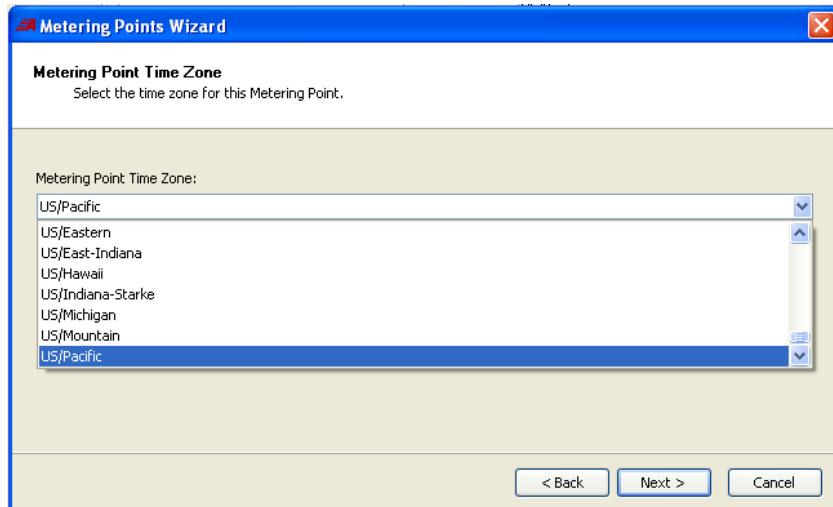


Figure 108 Select Metering Point Time Zone

Finally, you can add notes for association with the metering point. When you complete the wizard, the information you provided will display on the right side of the **Metering Points** tab. Select **Edit** if you need to make changes.

You next need to identify the metering device(s) you want to assign to the metering point. Recall that you can assign multiple metering devices to the same metering point. Select **Edit** to display the **Metering Point Device Assignment**.

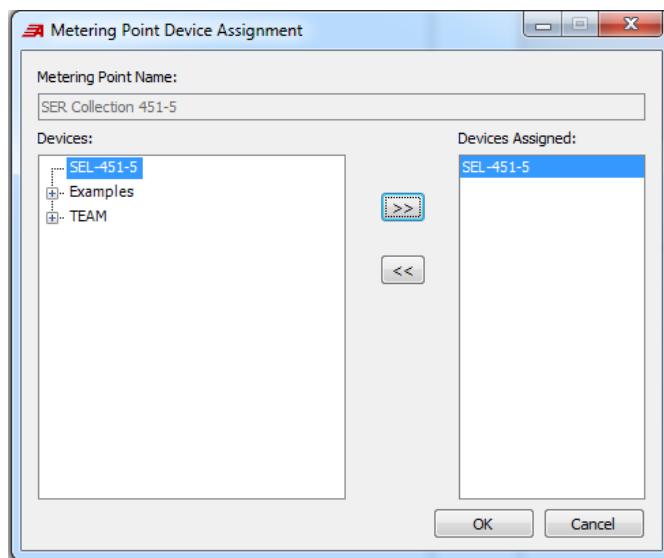


Figure 109 Assign Device to Metering Point

To configure an SOE collector job for an SEL device, right-click in the Connection Explorer. Select **Add > Device**, and then select the appropriate SEL device from the **Select Device Type** dialog box. Double-click on the device node in the Connection Explorer. Then select the **TEAM** tab at the left of the device tab. Select **Edit** (lower right of the device tab) to activate the tab. The metering point that you assigned to this device will automatically populate in the **Metering Point** section.

Select **Add** to display the **Polling Job Wizard**. Under **Polling Job**, choose **SER Collection** polling job. Specify the desired **Collection Start Date**. The metering point will be assigned automatically. Select the **Polling Frequency**. Define when you want to start collecting SER data by choosing the **Job Start Date and Time**. Finish the **Polling Job Wizard**.

To configure a GE Modbus SOE collector job for a GE device, right-click in the Connection Explorer. Select **Add > Device**, and then select an appropriate GE device from the **Select Device Type** dialog box. Double-click the device node in the Connection Explorer. On the **Device** tab, select **Edit** and then select the **In Service** check box. Select the **Connection** tab and enter the corresponding device connection parameters. Select the **TEAM** tab, select **Add** under **Communication Channel**, and navigate through the **Server Configuration Wizard**. Select **Add** under **Polling Job** to display the **Polling Job Wizard**, select **Next** to select the default Service, choose the **GE Modbus SOE Collector Job** and select the **Enable Job** check box. Specify the desired collection start date. Select the polling frequency. Define when you want to start collecting SER data by choosing the job start date and time. Finish the **Polling Job Wizard**.

View SOE Data

To view the SOE data from the SER Collection job, right-click on the device in the Connection Explorer. Select **SOE Viewer**.

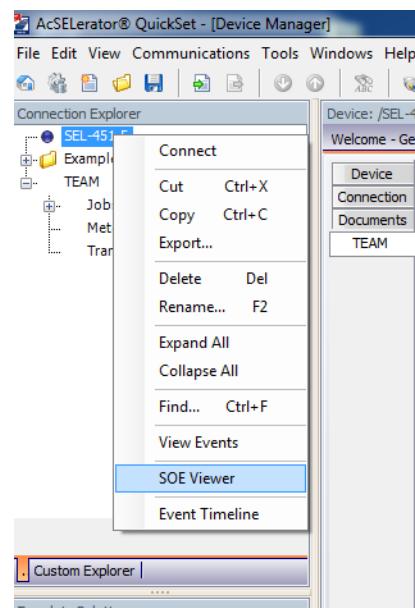


Figure 110 View SOE Data

The SOE Viewer displays information for each record through the use of seven different fields:

Timestamp: This is the time stamp of the event that was recorded in the relay.

Sequence of Events Viewer							Page 1 of 52
	Timestamp	Priority	Category	Element	State	Acknowledged Time	Device Name
	2012/10/12 05:02:38.895 PM		Security	SystemTags.User...	admin logged off...		
	2012/10/12 05:02:29.537 PM		Security	SystemTags.U...	admin logged...		
	2012/10/12 05:00:20.827 PM		Security	SystemTags.User...	SEL logged off...		

Figure 111 Time-Stamped View

Time Delta: Select the down arrow next to **Timestamp** to view the time stamps as Time Delta. Select one record as a reference; the rest of the records will display the time in reference to the selected record. The difference is shown in milliseconds.

Time Delta	Priority	Category	Element	State	Acknowledged Time	Device Name
9358	Security	SystemTags.User_L...	admin logged off...			
Delta Reference	Security	SystemTags.User...	admin logged on...			
-128710	Security	SystemTags.User_L...	SEL logged off...			

Figure 112 Time Delta View

Priority: This refers to the priority tag that is set in the RTAC.

Category: This refers to the category tag that is set in the RTAC.

Element: For the RTAC, the element is the tag name. For the relay, the element is the Relay Word bit that caused an SER.

State: The occurrence that created the SOE record associated with the element mentioned above.

Acknowledged Time: Time that TEAM retrieved the record.

Device Name: This field displays the device associated with that SOE Record.

To export the SOE data into a CSV file, select **Export**, choose the desired record columns and order you want them displayed, enter a file name and **Save**.

To hide some records, select the records to be hidden by selecting the box, then select **Hide**. To unhide, select **Refresh**.

There are three tabs on the right-hand side of the viewer:

Details: Select an individual record to view more details.

Settings: The settings can be adjusted by selecting **Visible Columns**, **SOE Records Per Page**, and **SOE Record Text Size**.

Filters:

Custom Filter: Create any custom filter by selecting the column, comparison, and text value.

Saved Filters: Alarms Only and SOEs Only are predefined filters.

To view SOE data from all the devices that are configured for the SER collection job, select anywhere in the white space in the Connection Explorer and select **SOE Viewer**.

Example 8: Auto-Configure Configuration of Sequential Events Recorder Data Collection

This example provides the steps necessary to configure SER collection on an SEL-451-5 in TEAM. Before beginning, create a Substation B folder in the Connection Explorer and add an SEL-451-5, as shown in *Figure 113*.

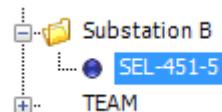


Figure 113 SOE Collection Setup

Configure the Device

- Step 1. Double-click **SEL-451-5** in the Connection Explorer to open the **Device** window.
- Step 2. Select **Edit** and select the **In Service** check box.
- Step 3. Select the **Connection** tab and set the **Connection Type** to **Network**. Configure the **Host IP Address** to match the address of your device. For this example, use **192.168.3.5**. Leave the **File Transfer Option** as **Telnet** and the **Port Number** as **23**. *Figure 114* shows the SEL-451-5 connection parameters.
- Step 4. Select **Save All** (disk icon) to apply the changes.

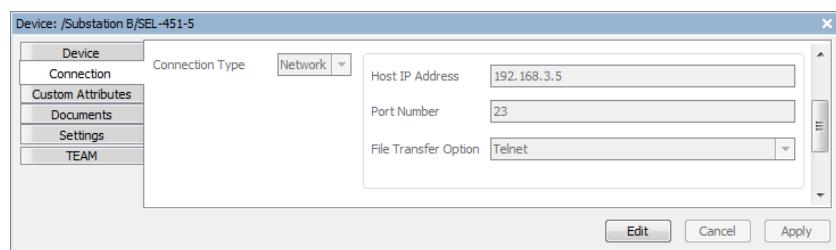
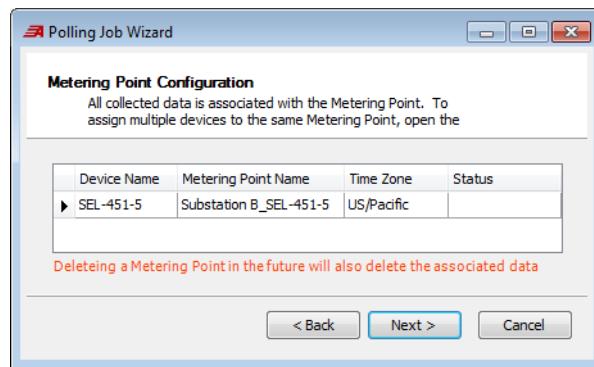


Figure 114 SEL-451-5 Connection Parameters

Configure Sequential Event Recorder Collection Job

- Step 1. Select the **TEAM** tab. Select **Edit** and then the **Add** button in the **Polling Jobs** section.
- Step 2. In the Polling Job Wizard select the **Job** drop-down arrow and select **SER Collection**. Ensure the **Enable Job** check box is selected. Select **Next**.
- Step 3. Set the **Collection Start Date** back one week. For this example, use **Mon, 08 December 2014**. Select **Next**.
- Step 4. The **Metering Point Configuration** window uses your system location to estimate the correct time zone. If you would like to change the time zone displayed, select once in the existing **Time Zone** column and then select the drop-down arrow. Select the correct time zone from the populated list. For this example, use **US/Pacific**.
- Step 5. Select once in the existing **Metering Point Name** column to change the default **Metering Point Name**. For this example, use the default name of **Substation B_SEL-451-5**. *Figure 115* shows the configured metering point.

Note: To assign a device to an existing metering point, use the classic workflow explained under *Classic Workflow—Collect SOE Data* on page 79.

**Figure 115 Configured Metering Point**

Step 6. Select **Next**. Set the Polling Frequency to **Minutely**, set the Minutely Polling Interval to **Every 1 Number of Minutes**, and then select **Finish**.

Reset this job to a slower poll rate once testing is complete. SEL recommends polling for SER data every 15 minutes.

Step 7. Select **Save All** (💾) to apply the changes.

Now that you have TEAM configured for SER collection, it will poll and store SER data at the specified interval. You can view the stored SER data by right-clicking on **SEL-451-5** in the Connection Explorer and selecting **SOE Viewer**.

RTAC Data

The SEL-3530 Real-Time Automation Controller (RTAC) can collect event reports from connected devices and store those event reports in its internal database. The RTAC, therefore, removes direct device event retrieval from a TEAM DDC, greatly accelerating the overall collection process. An RTAC can collect event reports from many devices without the DDC being connected or involved. And then at a specified time, the DDC will poll the RTAC to retrieve the event reports, or you can configure the RTAC to notify the TEAM DDC that event reports are available for retrieval.

NOTE: Listening jobs must be configured in the classic workflow. The auto-configure workflow does not apply because of the additional complexities associated with listening job configurations.

A TEAM DDC communicates with an RTAC via direct serial, modem, or Telnet. It can retrieve event reports from many RTACs simultaneously. Once connected over TCP/IP, a DDC needs only about two seconds to retrieve an event report from an RTAC (note that the RTAC has already retrieved the event report from the device).

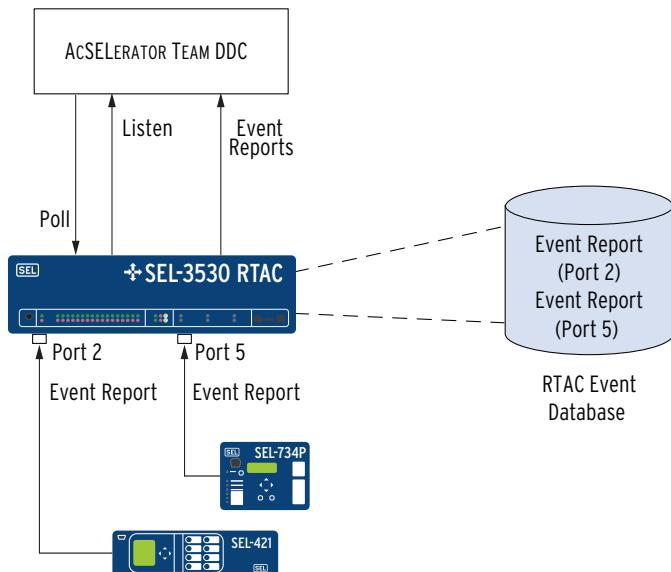


Figure 116 RTAC Event Collection

RTAC Polling

To configure a polling job for an RTAC device, right-click in the Connection Explorer. Select **Add > Device**, and then select **SEL-3530** from the **Select Device Type** dialog box. Double-click on the **SEL-3530** device node in the Connection Explorer. Then select the **TEAM** tab at the left of the **SEL-3530** tab. Select **Edit** (lower right of the **SEL-3530** tab) to activate the tab. In the middle section, **Poll RTAC**, select **Configure** to open the **RTAC Polling Job Assignment Wizard**. This wizard takes you through the process of defining the polling frequency. Upon your completion of this process, the polling job is assigned to the selected RTAC. Select **Apply** (lower right of the **SEL-3530** tab) to complete editing.

Example 9: Poll the RTAC SEL Server for Events Over SSH

NOTE: Rather than repeating information, the following example omits the finer points of procedures discussed elsewhere in these instructions. For procedural details omitted here, refer to the relevant section(s).

Devices within the RTAC family collect events over SEL protocol and save the events in their local databases. TEAM polls a fault register on the RTAC and determines which, if any, ports on the RTAC have unacknowledged events. If TEAM is configured to collect from one of these ports, it reads any unread events from the RTAC database and then acknowledges them. This example shows the steps required to configure TEAM to collect SEL-421 events from an RTAC over an SSH connection. The highlighted lines in *Figure 117* show the collection path TEAM uses in this example.

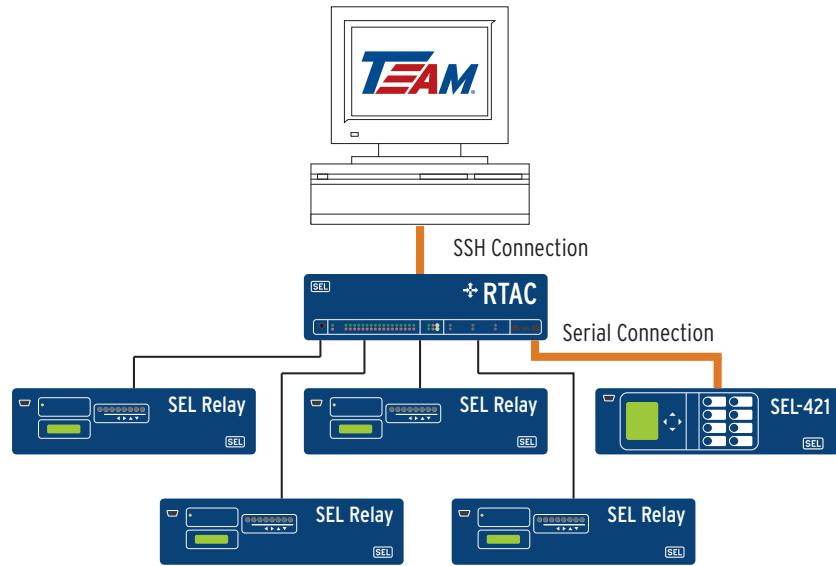


Figure 117 System Architecture

RTAC Configuration Overview

Perform the following procedure to configure the RTAC:

- Configure the RTAC to collect events from an SEL-421 on Serial Port 1.
- Add an SEL server with a Server IP Port of 3064 and a Serial Tunneling Mode of SSH.
- Enable unsolicited event report transmissions on the server.

For details on how to configure the RTAC for this specific application, see the RTAC instruction manual.

TEAM Configuration Steps

- Step 1. In QuickSet, select **Tools > Device Manager > Passwords**.
- Step 2. Right-click on empty space in the left pane and select **Add > Password**.
- Step 3. Double-click **New Password** and select **Edit** in the lower right corner.
- Step 4. Change the password title to **RTAC SSH**.

Step 5. Enter the username and password of the RTAC and select **Apply**.

Figure 118 shows the RTAC SSH password configuration.

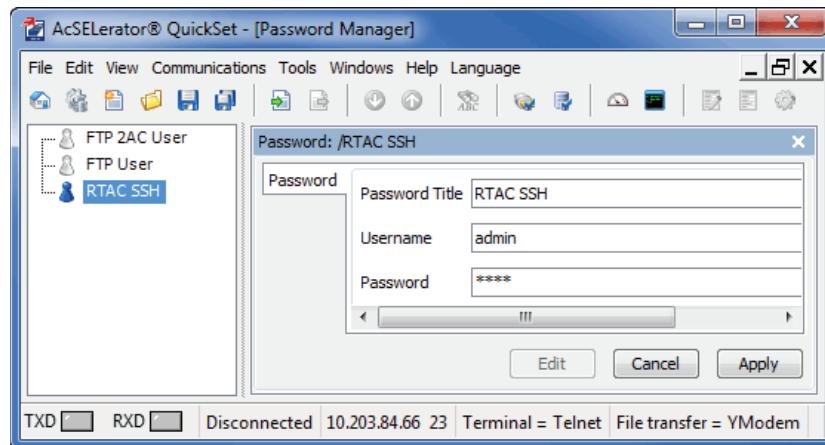


Figure 118 Create New Password

Step 6. Select **Tools > Device Manager > Devices**.

Step 7. In Device Manager, right-click in the Connection Explorer and select **Add > Device > SEL-3530**.

Step 8. Right-click **SEL-3530** and select **Add > Device > SEL-421**.

This is the device reporting events to the RTAC.

Step 9. Double-click **SEL-3530**, select **Edit** in the **Device** tab, and select the **In Service** check box.

Step 10. Switch to the **Connection** tab and set **Connection Type** to **Network**.

Step 11. Set the **Host IP Address** to that of the RTAC and the **Port Number** to that of the RTAC server (configured in ACSELERATOR RTAC). In this example, set the **Host IP Address** to **172.29.131.1** and the **Port Number** to **3064**. Set the **File Transfer Option** to **SSH**, **Credential Source** to **Titled Password**, and **Credentials** to **RTAC SSH** as shown in *Figure 119*.

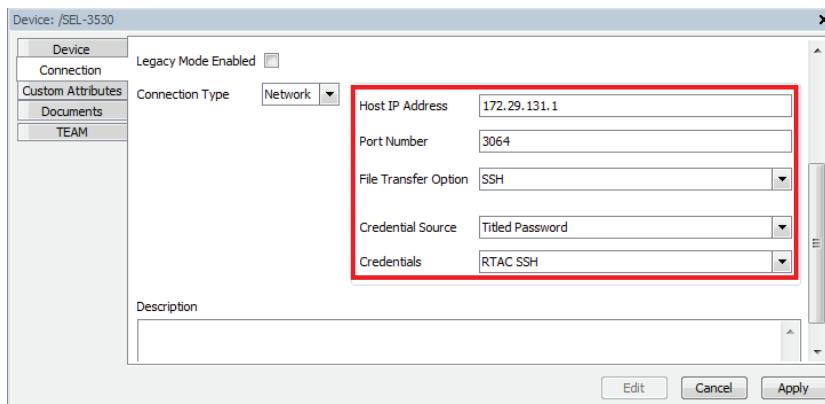


Figure 119 SEL-3530 Connection Parameters

Step 12. Select the **TEAM** tab and use the **Server Configuration Wizard** to add a communications channel. Then navigate through the remainder of the wizard without making further changes.

Step 13. Under **Poll RTAC**, select **Configure**, as shown in *Figure 120*, to open the **RTAC Polling Job Wizard**.

Step 14. Set the polling frequency to once a minute and select **Finish**.

Step 15. Select **Apply** from the SEL-3530 window.

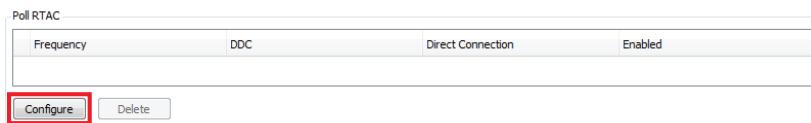


Figure 120 Configure TEAM Poll RTAC

Step 16. Double-click **SEL-421** in the Connection Explorer and select **Edit**. Select the **Connection** tab and configure **Pass Through Port** as shown in *Figure 121*. Match the pass through port to the serial communications port configured on the RTAC. In this example, set **Pass Through Port** to **1**. This is mainly necessary to assign a unique index to the relay in the TEAM database.

Step 17. Select **Apply** to save the SEL-421 connection settings.

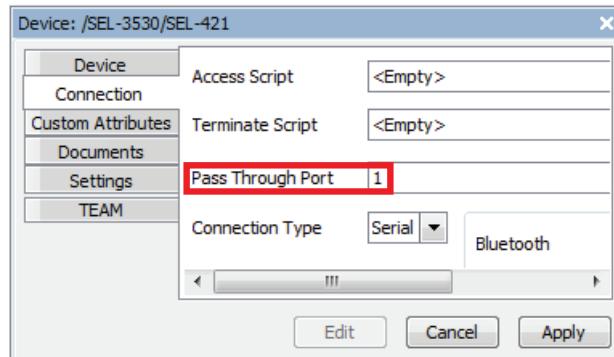


Figure 121 Configure Relay Port Connection

This concludes the configuration of TEAM for RTAC event collection. To view events, right-click **SEL-3530** in the Connection Explorer. Select **Event Timeline** for a live view, or **View Events** for a spreadsheet view of the collected events. Refer to the ACCELERATOR RTAC Instruction Manual for additional details on the RTAC configuration process.

RTAC Listening

You can configure the RTAC to notify a listening TEAM DDC when it receives an event report from a device. TEAM will continue to support listening via the fault registry notification as it always has; however, for RTACs with firmware R134 or greater, TEAM supports direct ACCELERATOR Database to RTAC Database listening. This enhancement increases the device limit from 64 devices to the RTAC limit for devices (this limit is based on protocol, refer to *ACCELERATOR RTAC SEL-5033 Software Instruction Manual* for more details) and also allows for the collection of SOE data and GE events via listening. To configure a fault registry notification listening job, refer to AG2013-06 for step-by-step instructions. *Example 11: Listening Via RTAC Legacy Server Connection on page 100* provides steps on configuring the database-to-database listening job.

Example 10: Listening Via RTAC Encrypted Database Connection

NOTE: COMTRADE events collected via RTAC Listening are only available when an Encrypted Database Connection methodology is deployed.

NOTE: To successfully configure the encrypted database connection, the minimum required TEAM version is 1.37.1.0 and the minimum required RTAC firmware is R136.

The SEL-3530 Real-Time Automation Controller (RTAC) can collect events from relays and store as many as 512 CEV events and 256 COMTRADE events in its own internal, nonvolatile memory. TEAM can directly connect to the RTAC and collect all of these events instead of making individual connections to each relay. This is a two-step configuration process. First, create a project for the RTAC and all the relays to be configured for event collection in the ACSELERATOR RTAC® SEL-5033 Software. Then configure the RTAC and relays in TEAM. This example illustrates how to configure the RTAC with a relay (an SEL-300G Generator Relay in this example) for both serial and Ethernet connections. Any events generated in the SEL-300G are collected in the RTAC, and TEAM then collects those events from the RTAC by making a connection to the RTAC Database.

The RTAC can be connected to the relays via an Ethernet or serial connection, as shown in *Figure 122*. This example explains the settings for both connection types.



Figure 122 Ethernet or Serial Connection of Computer Running TEAM, an RTAC, and a Relay

Part 1: Configuration in ACSELERATOR RTAC

The RTAC acts as a server for event collection to the computer running TEAM. The relay acts as a server to the RTAC. Perform the following steps to set up the server and client configuration in ACSELERATOR RTAC.

Step 1. Create a new project in ACSELERATOR RTAC from the main menu, as shown in *Figure 123*.

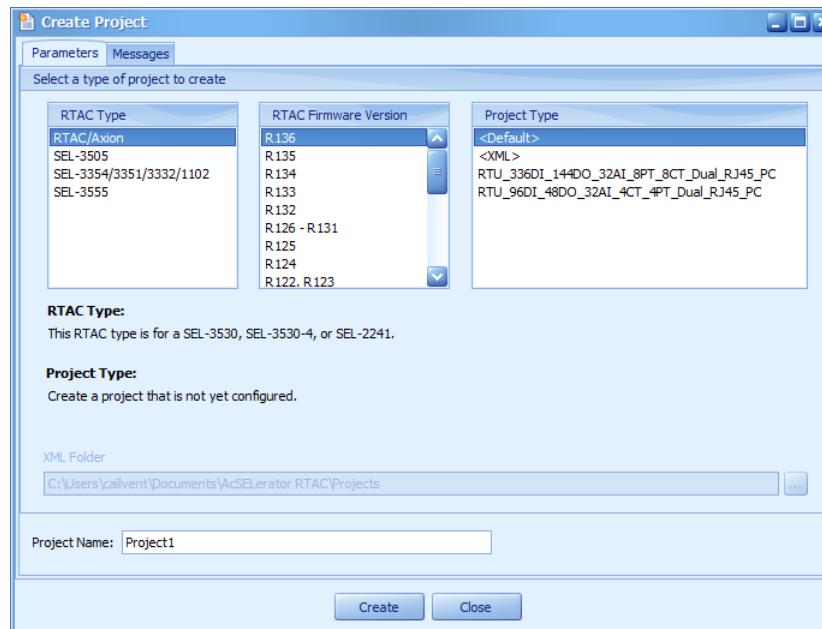


Figure 123 Create a New Project

Step 2. Add a **3530** with **SEL Protocol**, as shown in *Figure 124*.

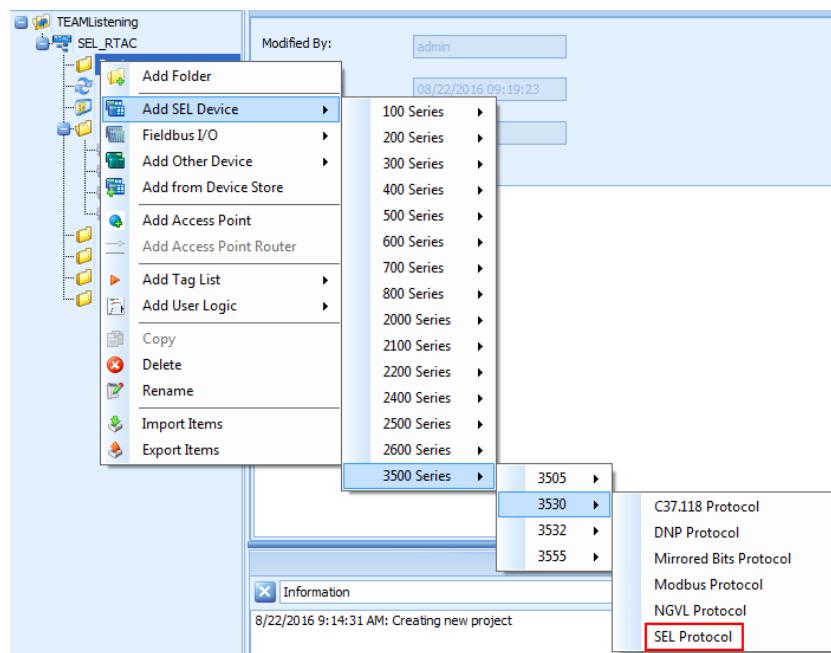


Figure 124 Add an RTAC

Step 3. In the window that appears, select **Server - Ethernet Tunneled Serial** as the **Connection Type**, as shown in *Figure 125*. Select **Insert**.

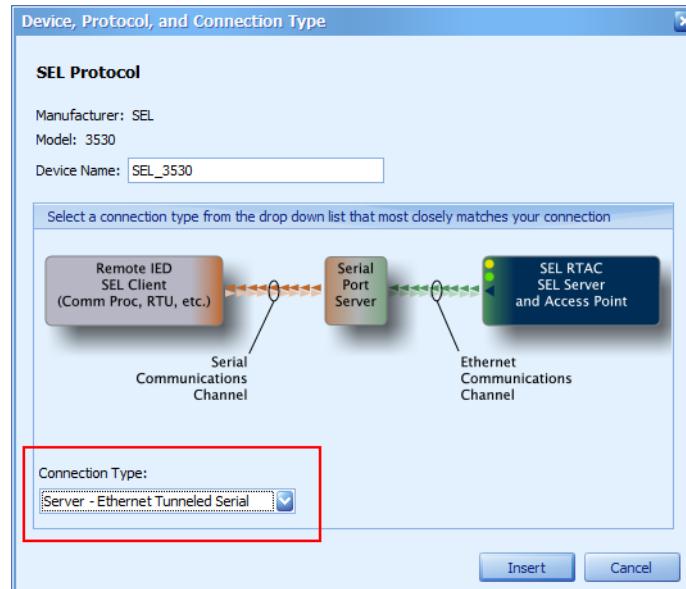


Figure 125 Connection Type for RTAC

Step 4. In the screen that appears, configure the settings for the server. The **Client IP Address** should be the IP address of the computer on which TEAM will be configured (see *Figure 126*). The **Client IP Port** can be any value. This is the port that the TEAM DDC (Device Data Collector) service uses for listening operations. The **Server IP Port** can be any value. The user must ensure that these two fields match the TEAM configuration described in *Part 2: Configuration in TEAM*.

NOTE: The **Serial Tunneling Mode** must be set to **Telnet**.

Setting	Value	Range	Description
Communications			
Serial Tunneling Mode	Telnet	Telnet,Raw TC...	Serial tunneling mode
Server IP Port			
Server IP Port	3254	0,23,1024-65535	Local RTAC TCP port
Date-Time			
UTC Offset	0	-720 to 840 min...	(minutes) Local Tir
DST Enabled	False	True,False	Enable Daylight Sa
SEL			
Allow Anonymous SEL IP ...	False	True,False	If set to FALSE, th
Client IP Address	192.168.0.3	Valid IPv4 Addr...	TCP/IP address of
Virtual Port Number	254	1-254	SEL protocol Virtua
Communications Offline Ti...	300000	0,100-100000000	(milliseconds) If no
Pre-Termination Timeout	1	0-600 (seconds)	The number of sec
Post-Termination Timeout	0	0-600 (seconds)	The number of sec
Termination String	<CTRL-D>	255 characters	The string of chara
Transmit Fast Unsolicited ...	False	True,False	Transmit Fast Uns
Client IP Port	5000	0-65535	Logical Ethernet po

Figure 126 SEL Server Settings

Step 5. In the upper right corner, select the **Advanced Settings** check box.

Step 6. Select the **New Event Notification** drop-down menu and select **Encrypted Database**.

Setting	Value	Range	Description
File Transfer			
DST Stop Month	November	January,Febru...	Month w
DST Stop Time	02:00	00:00 to 23:59	Time wh
SEL			
Allow Anonymous SEL IP ...	False	True,False	If set to
Client IP Address	10.202.21.89	Valid IPv4 Addr...	TCP/IP i
Virtual Port Number	254	1-254	SEL prot
Communications Offline Ti...	300000	0,100-100000000	(milliseconds) If no
Pre-Termination Timeout	1	0-600 (seconds)	The num
Post-Termination Timeout	0	0-600 (seconds)	The num
Termination String	<CTRL-D>	255 characters	The strin
Enable Port Command	True	True,False	Enables
New Event Notification	Encrypted Database	Legacy,Encrypt...	Select th
Transmit Fast Unsolicited ...	False	True,False	Transmi
Client IP Port	5000	0-65535	Logical E
Engineering Access IP Ad...		Valid IPv4 Addr...	List of u

Figure 127 New Event Notification

Step 7. Select the **POU Pin Settings** tab and set the **Default Value** for **Enable_Unsolicited_Event_Report_TX** pin to **TRUE**, as shown in *Figure 128*. This enables the RTAC to send event report notifications. (Optional: if you would like to enable SOE Listening, also set the **Default Value** for **Enable_Unsolicited_ASCII_SER_Notify_TX** pin to **TRUE**.)

Drag a column header here to group by that column				
Visible	Pin Name	Pin Type	Pin Point Type	Default Value
False	Authentication_Failure	Output	BOOL	FALSE
False	Authentication_In_Progress	Output	BOOL	FALSE
False	Authentication_Success	Output	BOOL	FALSE
True	Communications_Offline_Timer	Input	TIME	T#300000MS
True	Direct_Transparent_Connection	Output	BOOL	FALSE
True	Disable_Controls	Input	BOOL	FALSE
False	Disable_Remote_Access	Input	BOOL	FALSE
True	Disable_Tag_Updates	Input	BOOL	FALSE
True	EN	Input	BOOL	TRUE
False	Enable_File_Transfer_Monitor	Input	BOOL	TRUE
False	Enable_Unsolicited_ASCII_SER_Notify_TX	Input	BOOL	FALSE
False	Enable_Unsolicited_Event_Report_TX	Input	BOOL	TRUE
True	Enable_Unsolicited_SER_TX	Input	BOOL	TRUE
False	Enable_Unsolicited_Write_RX	Input	BOOL	FALSE
True	Engineering_Access_Connection_Count	Output	UDINT	0
True	ENO	Output	BOOL	FALSE

Figure 128 Enable Event Report Notifications

Step 8. Configure the settings of the relay (the SEL-300G in this example). From the **Insert** tab, add a **300G** with **SEL Protocol**, as shown in *Figure 129*.

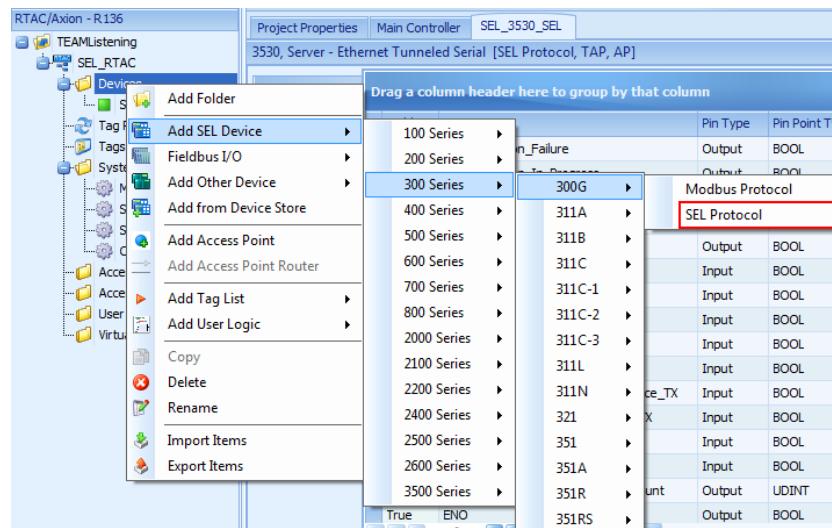


Figure 129 Add an SEL-300G With SEL Protocol

To set up a serial connection, complete *Step 9–Step 12*. For an Ethernet connection, skip to *Step 13* and *Step 14*.

Step 9. For a serial connection, set the **Connection Type** to **Client – Serial** in the window that appears, as shown in *Figure 130*. Select **Insert**.

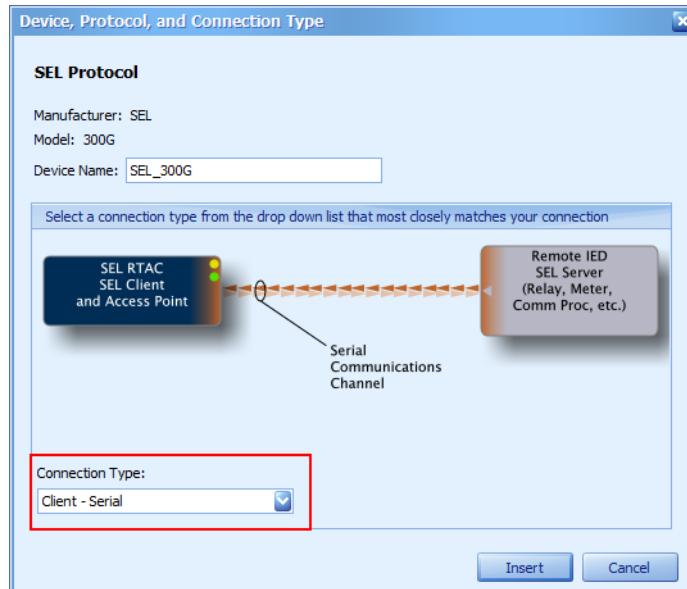


Figure 130 Add an SEL-300G

Step 10. Change the **Serial Communications Port** setting to the serial port of the RTAC that the relay is connected to, as shown in *Figure 131*.

300G, Client - Serial [SEL Protocol, TAP, AP, Com_02, 19200]				
Settings	Setting	Value	Range	Description
Message Settings	Serial Communications Port	Com_02	Unused,Com_0...	Number of the R
Check IED Configuration Commands	Serial Communications Por...	EIA232	EIA232,EIA485...	Serial communic
History	Baud Rate	19200	Auto-Baud,300...	Baud Rate
History - New Event	Data Bits	8	8	Data Bits
Status	Parity Bit	None	None	Parity Bit
Demand Meter	Stop Bit	1	1	Stop Bit
Meter	RTS_CTS	False	True,False	RTS Hardware H
Peak Meter	Xon / Xoff	True	True,False	Use Xon/Xoff So
	Level 1 Password	*****	0-32 (characters)	Server Logon St

Figure 131 Serial Settings for Client

Step 11. Enter the **Baud Rate** of the relay and all the appropriate passwords.

Step 12. (Optional, but recommended) For quick event reporting, enable automessaging on the relay serial port. This allows the relay to send out an event notification immediately when the event occurs. Use any terminal application to change this relay setting, as shown in *Figure 132*. Enable the **Send Automessage** port setting.

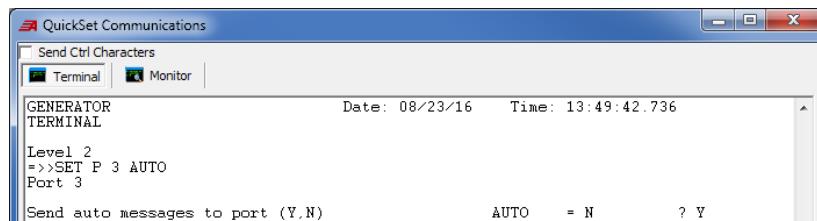


Figure 132 Enable Automessaging

Step 13. If you followed *Step 9* through *Step 12* to set up a serial connection, skip this step and *Step 14*. For an Ethernet connection, add the SEL-300G with SEL Protocol, as described in *Step 7*. In the window that appears, select **Client - Ethernet Tunneled Serial** as the **Connection Type** (see *Figure 133*).

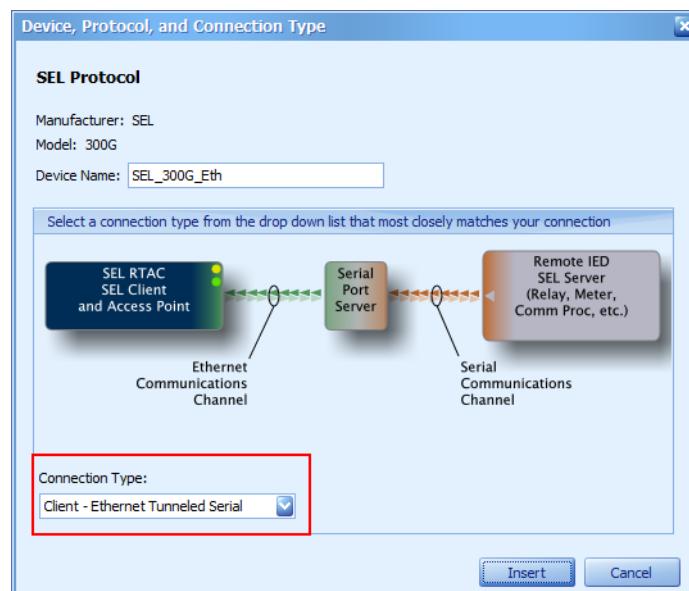


Figure 133 Client Ethernet Connection

Step 14. Enter the relay IP address in the Server IP Address parameter.

Step 15. For either type of connection, select the **Advanced Settings** check box, as shown in *Figure 134*.

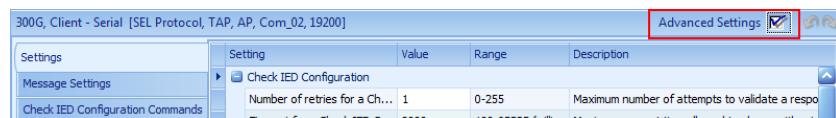


Figure 134 Advanced Settings

Step 16. Enter a unique **Device GUID** under the General subsection. This must match the **Global Device ID** setting in *Part 2: Configuration in TEAM.*

300G, Client - Serial [SEL Protocol, TAP, AP, Com_02, 19200]					Advanced
Settings	Setting	Value	Range	Description	
Message Settings	New Event Lockout Period	300000	0, 250-100000...	Minimum amount of time be	
Check IED Configuration Commands	New Event Reset Location...	NaN	NaN, IEEE Floa...	The value assigned to Loca	
History	New Event Reset Event V...	255 (characters)	255 (characters)	The value assigned to Ever	
History - New Event	Event Collection Parameter	255 (characters)	255 (characters)	Optional parameter to be u	
Status	ASCII SER Logging Comm...	100	0-10000	Count to be appended to th	
Demand Meter	ASCII SER Logging Date F...	MDY	MDY,YMD,DMY	Expected date format in th	
Meter	ASCII SER Logging Collect...	3600000	250-10000000...	Interval at which to issue t	
Peak Meter	Adjust ASCII SER Logging...	False	True, False	Convert SER timestamps, c	
Breaker Bits	<input checked="" type="checkbox"/> File Transfer				
Remote Bits	Enable File Transfer Monitor	True	True, False	Defines the default value o	
Fast Message Unsolicited SER	File Transfer Initiate Timeout	60	5-120 (seconds)	Timeout to receive the first	
Flex Parse Messages	File Transfer Terminate Ti...	10	1-60 (seconds)	Timeout to receive subsequ	
POU Pin Settings	File Transfer Retry	9	0-15	Maximum number of conse	
Tags	<input checked="" type="checkbox"/> General				
	Device GUID	SEL_300G		Unique device identifier to l	
	<input checked="" type="checkbox"/> SEL				
	Virtual Port Number	2	1-254	SEL protocol Virtual Port Nu	

Figure 135 SEL-300G Device GUID

Step 17. For either type of connection follow *Step a* if the RTAC firmware is R137 or earlier and *Step b* if the RTAC firmware is R138 or later.

- Select the **POU Pin Settings** tab, as shown in *Figure 136*. Set the **Enable_Event_Collection** pin to **TRUE**.

300G, Client - Serial [SEL Protocol, TAP, AP, Com_02, 19200]				
Drag a column header here to group by that column				
Visible	Pin Name	Pin Type	Pin Point Type	Default Value
True	Disable_Tag_Updates	Input	BOOL	FALSE
True	EN	Input	BOOL	TRUE
True	Enable_ASCII_SERLogging	Input	BOOL	FALSE
True	Enable_Event_Collection	Input	BOOL	TRUE
False	Enable_File_Transfer_Monitor	Input	BOOL	TRUE
True	Enable_New_Event_Filtering	Input	BOOL	FALSE
True	Enable_Unsolicited_SER_RX	Input	BOOL	TRUE
True	ENO	Output	BOOL	FALSE
True	Event_Collection_Count	Output	UDINT	0
True	Event_Collection_Enabled	Output	BOOL	FALSE
True	Event_Collection_Pending	Output	BOOL	FALSE
True	Event_Collection_Stored	Output	BOOL	FALSE
False	Fast_Meter_Failure	Output	BOOL	FALSE
False	Fast_Meter_Failure_Count	Output	UDINT	0
False	Fast_Meter_Success_Count	Output	UDINT	0

Figure 136 Client POU Pin Settings

- Select the **Settings** tab, as shown in *Figure 137*. Set **Enable Event Collection** to **True**.



Figure 137 Enable Event Collection Setting

Step 18. Save all the settings and select **Go Online** to send the settings to the RTAC, as shown in *Figure 138*.



Figure 138 Send Settings to RTAC

Part 2: Configuration in TEAM

The configuration interface of TEAM is within the Device Manager of QuickSet.

The following steps describe how to configure TEAM for RTAC Listening event collection.

Step 1. Launch Device Manager.

Step 2. Double-click the **TEAM** node and select the **DDC Instances** tab.

Step 3. Select **Edit** in the lower right corner and then **Add** under the **DDC Connections** tab, as shown in *Figure 139*.

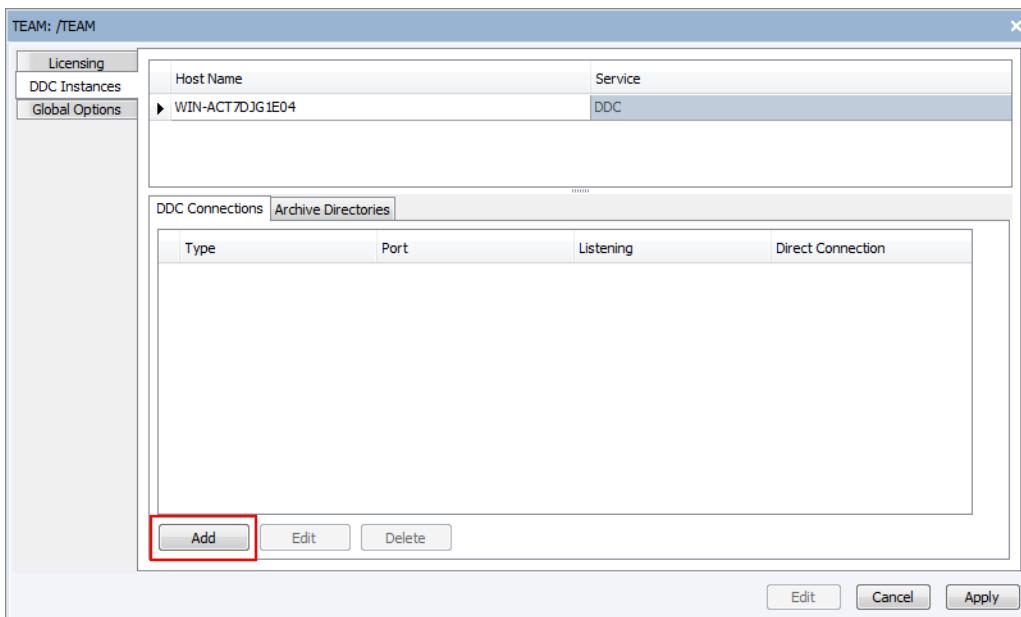


Figure 139 Add DDC Listening Connection

- Step 4. Once the DDC Wizard launches, select **Next**, choose a **Telnet** connection, and then select **Next** again. Select the **Enable Listening** check box as shown in *Figure 140*. In the **Port Number to Listen on** text box, enter 5000. This is the same port number entered ACCELERATOR RTAC for the **Client IP Port** in Step 3 of Part 1: Configuration in ACCELERATOR RTAC. Complete the DDC Wizard and save your changes.

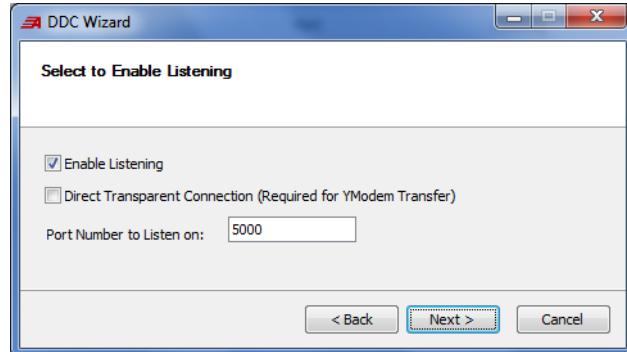


Figure 140 Enable Listening

- Step 5. Select **Tools > Device Manager > Passwords**, as shown in *Figure 141*.

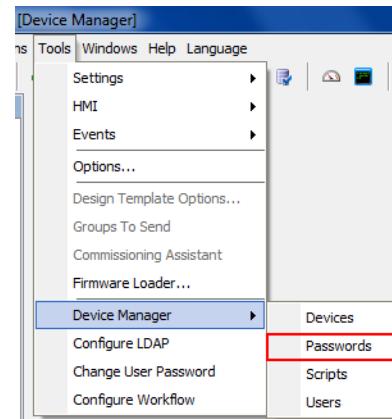


Figure 141 Password Manager

- Step 6. Right-click in the white space, as shown in *Figure 142*, and select **Add > Password**.



Figure 142 Add RTAC Password

- Step 7. Double-click **New Password** and select **Edit** in the lower right corner.
- Step 8. Change the **Password Title** to **SEL-3530** and enter the **User Name** and **Password** of an account on the RTAC, as shown in *Figure 143*. Select **Apply**.

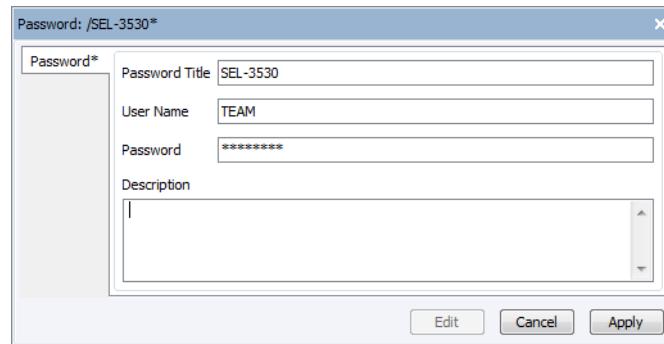


Figure 143 Configure the RTAC Password

Step 9. Select **Windows > 2 - Device Manager**.

Step 10. Right-click in the Connection Explorer and select **Add > Folder**.

Step 11. Right-click **New Folder** and select **Rename**, as shown in *Figure 144*.

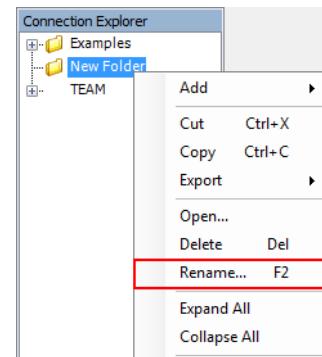


Figure 144 Rename Folder

Step 12. Rename the folder to **RTAC Listening** and select **OK**.

Step 13. Right-click the **RTAC Listening** folder, select **Add > Device**, and add the **SEL-3530**, as shown in *Figure 145*.

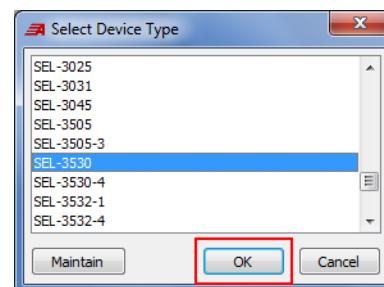


Figure 145 Add SEL-3530 Device Type

Step 14. Right-click on **SEL-3530** to add a relay by using the same process as in *Step 13*. Add the **SEL-300G**, as shown in *Figure 146*.

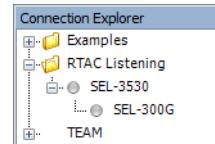


Figure 146 Connection Explorer

Step 15. Configure the relay (the SEL-300G in this case). Double-click **SEL-300G** and select **Edit** in the lower right corner. On the **Device** tab, select the **In Service** check box and change the **Global Device ID** to match the **Device GUID** (which was configured in ACCELERATOR RTAC in *Step 16* in *Part 1: Configuration in ACCELERATOR RTAC*), as shown in *Figure 147*. TEAM configuration does not distinguish between serial and Ethernet relay connections.

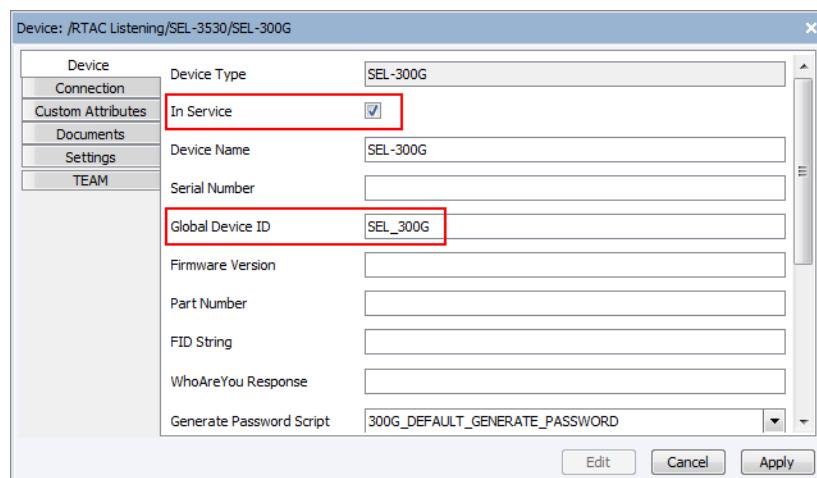


Figure 147 SEL-300G TEAM Configuration

Step 16. Configure the RTAC. Double-click on **SEL-3530** in the Connection Explorer. In the **Device** tab, select the **In Service** check box.

Step 17. Select the **Connection** tab, choose **Network** as the Connection Type, and enter the **Host IP Address** and **Port Number** of the RTAC, as shown in *Figure 148*. The Port Number should match the **Server IP Port** configured in ACCELERATOR RTAC in *Step 4* of *Part 1: Configuration in ACCELERATOR RTAC*.

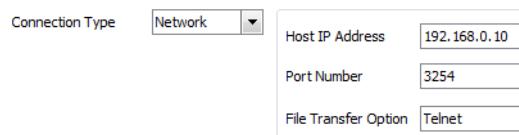


Figure 148 RTAC Connection

NOTE: The File Transfer Option must be set to Telnet.

Step 18. Select the **TEAM** tab. Select **Add** under **Communication Channel**. This opens the Server Configuration Wizard. Select through the wizard—no changes are required.

Step 19. Under **RTAC Listening**, change the RTAC Database Credentials by using the drop-down arrow to SEL-3530. Clear the **SOE Listening Enabled** check box. The **TEAM** tab should look similar to *Figure 149*.

(Optional: if you would like to enable SOE Listening, leave the **SOE Listening Enabled** check box selected. This also requires the optional setup in ACCELERATOR RTAC described in *Step 7 of Part 1: Configuration in ACCELERATOR RTAC*.)

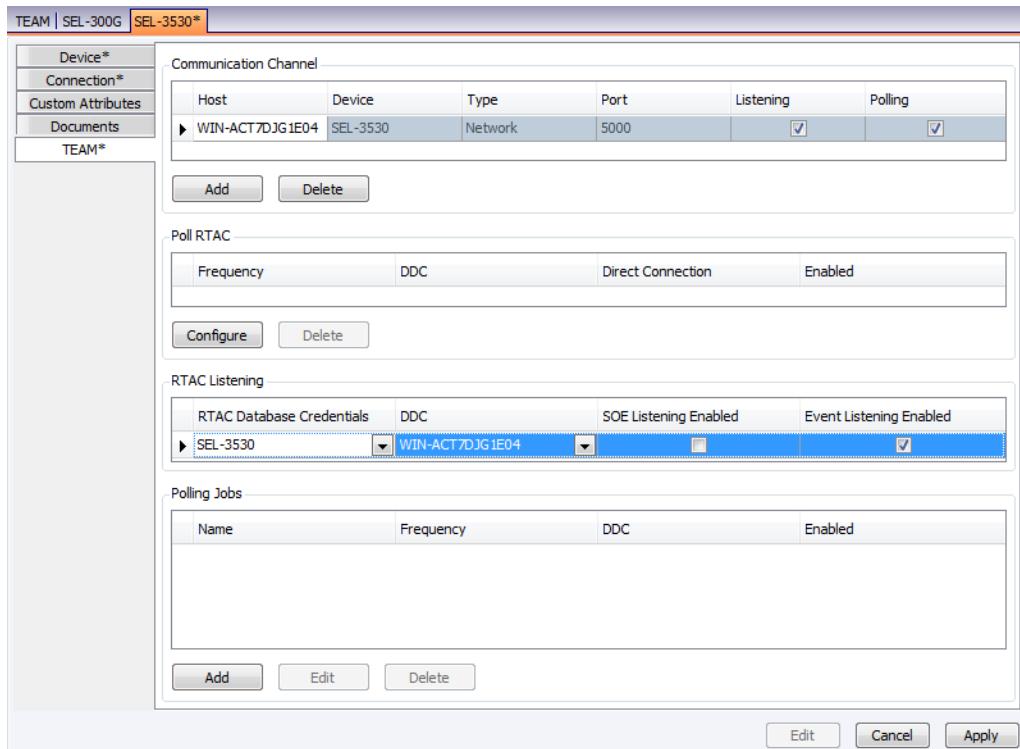


Figure 149 RTAC TEAM Tab

Step 20. Save all changes.

Example 11: Listening Via RTAC Legacy Server Connection

The RTAC can collect events from relays and store as many as 512 CEV events in its own internal, nonvolatile memory. TEAM can directly connect to the RTAC via the SEL Server and collect all of the CEV events instead of making individual connections to each relay. This is a two-step configuration process. First, create a project for the RTAC and all the relays to be configured for event collection in the ACCELERATOR RTAC® SEL-5033 Software. Then configure the RTAC and relays in TEAM. This example illustrates how to configure the RTAC with a relay (an SEL-300G Generator Relay in this example) for both serial and Ethernet connections. Any events generated in the SEL-300G are collected in the RTAC, and TEAM then collects those events from the RTAC by making a connection to the RTAC server and issuing the **CAR SUM** command.

The RTAC can be connected to the relays via an Ethernet or serial connection as shown in *Figure 150*. This example explains the settings for both connection types.



Figure 150 Ethernet or Serial Connection of Computer Running TEAM, an RTAC, and a Relay

Part 1: Configuration in ACSELERATOR RTAC

The RTAC acts as a server for event collection to the client computer running TEAM. The relay acts as a server to the RTAC, so an SEL client needs to be configured to connect to the relay's server. Perform the following steps to set up the server and client configuration in ACSELERATOR RTAC.

- Step 1. Create a new project in ACSELERATOR RTAC from the main menu, as shown in *Figure 151*.

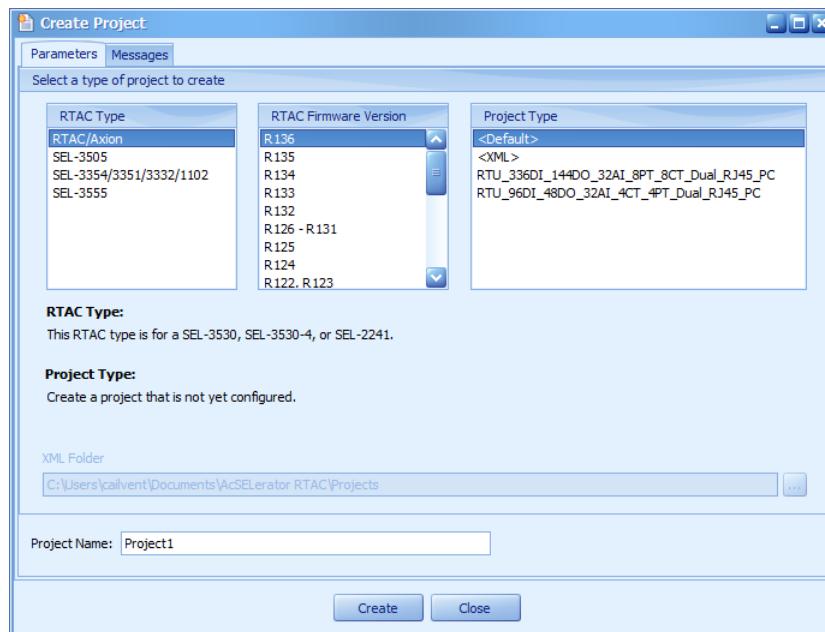


Figure 151 Create New Project

Step 2. Add a **3530** server device with **SEL Protocol**, as shown in *Figure 152*.

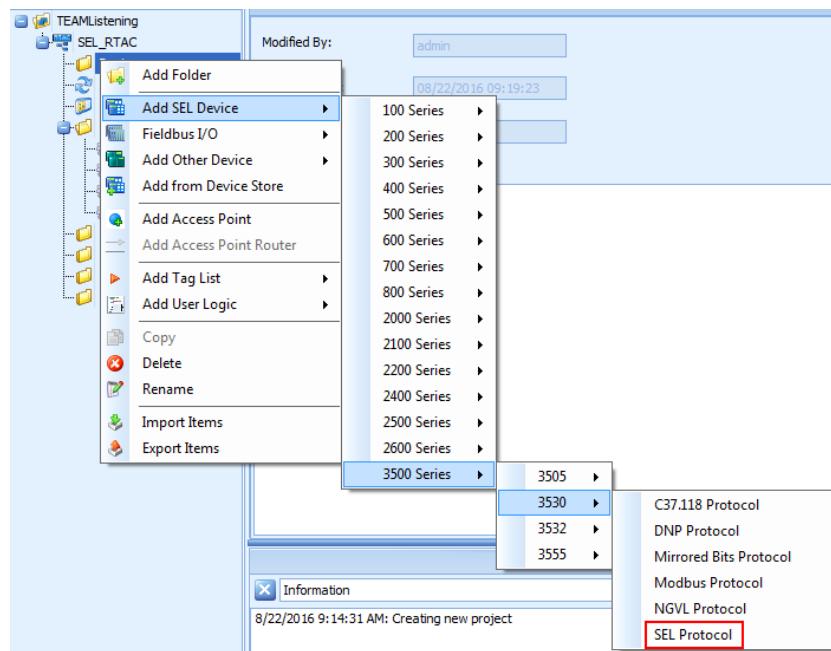


Figure 152 Add an RTAC

Step 3. In the window that appears, select **Server - Ethernet Tunneled Serial** as the **Connection Type**, as shown in *Figure 153*. Select **Insert**.

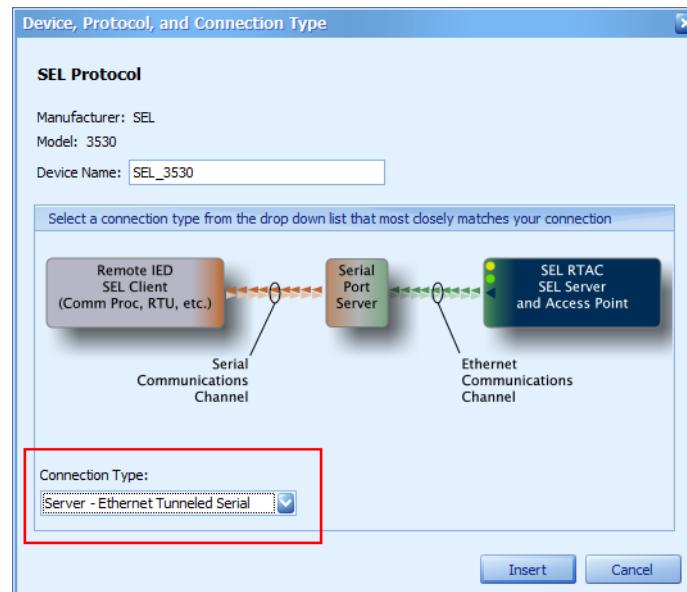


Figure 153 Connection Type for RTAC

Step 4. In the screen that appears, configure the settings for the server. The **Client IP Address** should be the IP address of the computer on which TEAM will be configured (see *Figure 154*). The **Client IP Port** can be any value. This is the port that the TEAM DDC (Device Data Collector) service uses for listening

operations. The **Server IP Port** can be any value. The user must ensure that these two fields match the TEAM configuration described in *Part 2: Configuration in TEAM*.

Setting	Value	Range	Description
Communications			
Serial Tunneling Mode	Telnet	Telnet,Raw TC...	Serial tunneling mode
SEL			
Client IP Address	192.168.0.3	Valid IPv4 Addr...	TCP/IP address of
Client IP Port	5000	0-65535	Logical Ethernet po

Figure 154 SEL Server Settings

- Step 5. In the upper right corner, select the **Advanced Settings** check box.
- Step 6. Select the **New Event Notification** drop-down menu and select **Legacy**.

Setting	Value	Range	Description
File Transfer			
DST Stop Month	November	January,Febru...	Month when
DST Stop Time	02:00	00:00 to 23:59	Time when
SEL			
Client IP Address	10.202.21.89	Valid IPv4 Addr...	TCP/IP addre
New Event Notification	Legacy	Legacy,Encrypt...	Select the n

Figure 155 New Event Notification

- Step 7. Select the **POU Pin Settings** tab and set the **Default Value** for **Enable_Unsolicited_Event_Report_TX** pin to **TRUE**, as shown in *Figure 156*. This enables the RTAC to send event report notifications.

Visible	Pin Name	Pin Type	Pin Point Type	Default Value
False	Authentication_Failure	Output	BOOL	FALSE
False	Authentication_In_Progress	Output	BOOL	FALSE
False	Authentication_Success	Output	BOOL	FALSE
True	Communications_Offline_Timer	Input	TIME	T#300000MS
True	Direct_Transparent_Connection	Output	BOOL	FALSE
True	Disable_Controls	Input	BOOL	FALSE
False	Disable_Remote_Access	Input	BOOL	FALSE
True	Disable_Tag_Updates	Input	BOOL	FALSE
True	EN	Input	BOOL	TRUE
False	Enable_File_Transfer_Monitor	Input	BOOL	TRUE
False	Enable_Unsolicited_ASCII_SER_Notify_TX	Input	BOOL	FALSE
False	Enable_Unsolicited_Event_Report_TX	Input	BOOL	TRUE
True	Enable_Unsolicited_SER_TX	Input	BOOL	TRUE
False	Enable_Unsolicited_Write_RX	Input	BOOL	FALSE
True	Engineering_Access_Connection_Count	Output	UDINT	0
True	ENO	Output	BOOL	FALSE

Figure 156 Enable Event Report Notifications

- Step 8. Configure the settings of the relay (the SEL-300G in this example). From the **Insert** tab, add a **300G** with **SEL Protocol**, as shown in *Figure 157*.

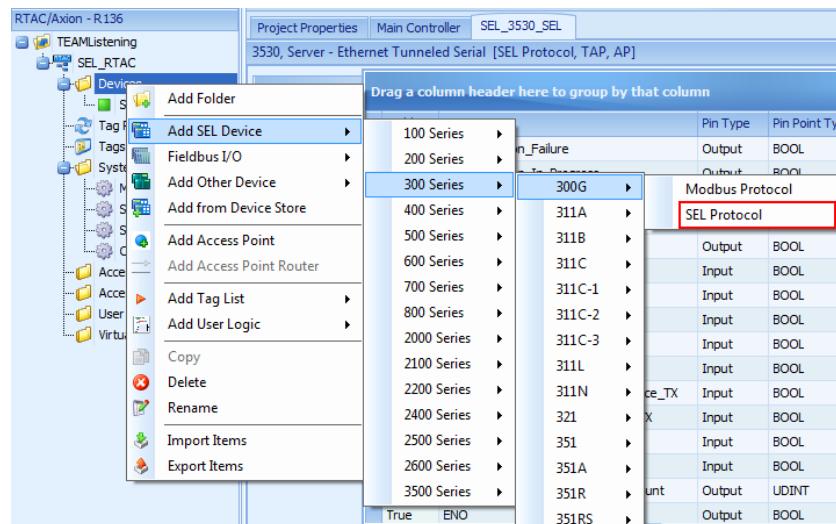


Figure 157 Add an SEL-300G With SEL Protocol

To set up a serial connection, complete *Step 9–Step 12*. For an Ethernet connection, skip to *Step 13* and *Step 14*.

- Step 9. For a serial connection, set the **Connection Type** to **Client – Serial** in the window that appears, as shown in *Figure 158*. Select **Insert**.

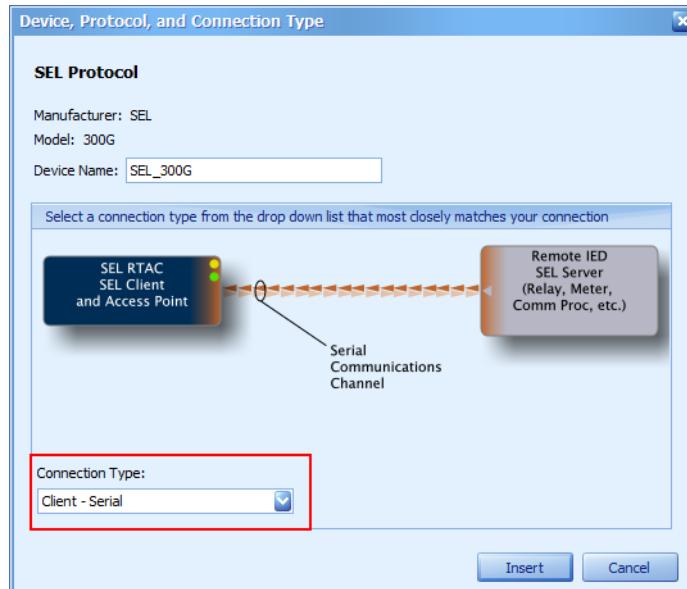


Figure 158 Add an SEL-300G

- Step 10. Change the **Serial Communications Port** setting to the serial port of the RTAC that the relay is connected to, as shown in *Figure 159*. This must match the **Pass Through Port** setting in *Part 2: Configuration in TEAM*.

300G, Client - Serial [SEL Protocol, TAP, AP, Com_02, 19200]				
Settings	Setting	Value	Range	Description
Message Settings	Serial Communications Port	Com_02	Unused,Com_0...	Number of the R
Check IED Configuration Commands	Serial Communications Por...	EIA232	EIA232,EIA485...	Serial communic
History	Baud Rate	19200	Auto-Baud,300...	Baud Rate
History - New Event	Data Bits	8	8	Data Bits
Status	Parity Bit	None	None	Parity Bit
Demand Meter	Stop Bit	1	1	Stop Bit
Meter	RTS_CTS	False	True,False	RTS Hardware H
Peak Meter	Xon / Xoff	True	True,False	Use Xon/Xoff So
	Level 1 Password	*****	0-32 (characters)	Server Logon St

Figure 159 Serial Settings for Client

- Step 11. Enter the **Baud Rate** of the relay and all the appropriate passwords.

- Step 12. (Optional, but recommended) For quick event reporting, enable automessaging on the relay serial port. This allows the relay to send out an event notification immediately when the event occurs. Use any terminal application to change this relay setting, as shown in *Figure 160*. Enable the **Send Automessage** port setting.

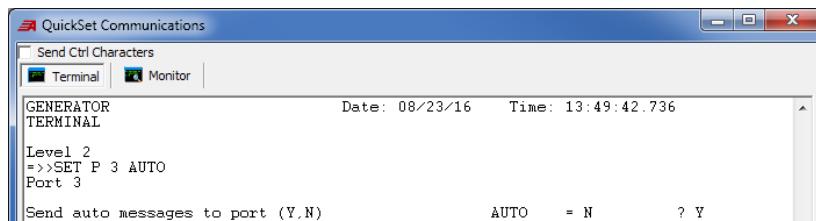


Figure 160 Enable Automessaging

Step 13. If you followed *Step 9* through *Step 12* to set up a serial connection, skip this step and *Step 14*. For an Ethernet connection, add the SEL-300G with SEL Protocol, as described in *Step 7*. In the window that appears, select **Client - Ethernet Tunneled Serial** as the **Connection Type** (see *Figure 161*).

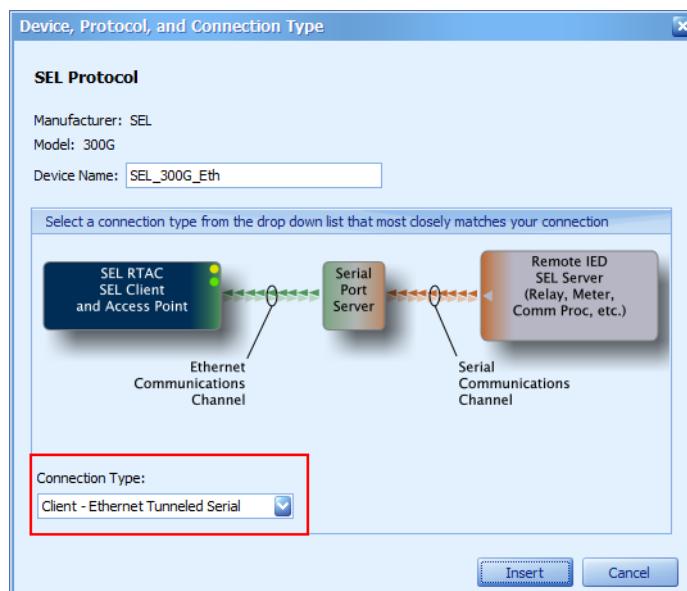


Figure 161 Client Ethernet Connection

NOTE: Only TEAM version 1.37.7.0 and RTAC R136 and higher support Virtual Port Numbers 65-254.

Step 14. Enter the relay IP address in the **Server IP Address** parameter and note the **Virtual Port Number** for use in *Step 11* of *Part 2: Configuration in TEAM*.

<input checked="" type="checkbox"/> SEL	Server IP Address	192.168.0.4	Valid IPv4 Addr...	TCP/IP address of the remote
	Virtual Port Number	252	1-254	SEL protocol Virtual Port Num

Figure 162 SEL-300G Ethernet Connection Parameters

Step 15. For either type of connection, select the **POU Pin Settings** tab, as shown in *Figure 163*. Set the **Enable_Event_Collection** pin to TRUE.



Settings		Drag a column header here to group by that column			
Visible	Pin Name	Pin Type	Pin Point Type	Default Value	
True	Disable_Tag_Updates	Input	BOOL	FALSE	
True	EN	Input	BOOL	TRUE	
True	Enable_ASCII_SERLogging	Input	BOOL	FALSE	
True	Enable_Event_Collection	Input	BOOL	TRUE	
False	Enable_File_Transfer_Monitor	Input	BOOL	TRUE	
True	Enable_New_Event_Filtering	Input	BOOL	FALSE	
True	Enable_Unsolicited_SER_RX	Input	BOOL	TRUE	
True	ENO	Output	BOOL	FALSE	
True	Event_Collection_Count	Output	UDINT	0	
True	Event_Collection_Edited	Output	BOOL	FALSE	
True	Event_Collection_Pending	Output	BOOL	FALSE	
True	Event_Collection_Stored	Output	BOOL	FALSE	
False	Fast_Meter_Failure	Output	BOOL	FALSE	
False	Fast_Meter_Failure_Count	Output	UDINT	0	
False	Fast_Meter_Success_Count	Output	UDINT	0	
Tags					

Figure 163 Client POU Pin Settings

Step 16. Save all the settings and select **Go Online** to send the settings to the RTAC, as shown in *Figure 164*.



Figure 164 Send Settings to RTAC

Part 2: Configuration in TEAM

The configuration interface of TEAM is within the Device Manager of QuickSet.

The following steps describe how to configure TEAM for RTAC Listening event collection.

Step 1. Launch Device Manager.

Step 2. Double-click the **TEAM** node and select the **DDC Instances** tab.

Step 3. Select **Edit** in the lower right corner and then **Add** under the **DDC Connections** tab, as shown in *Figure 165*.

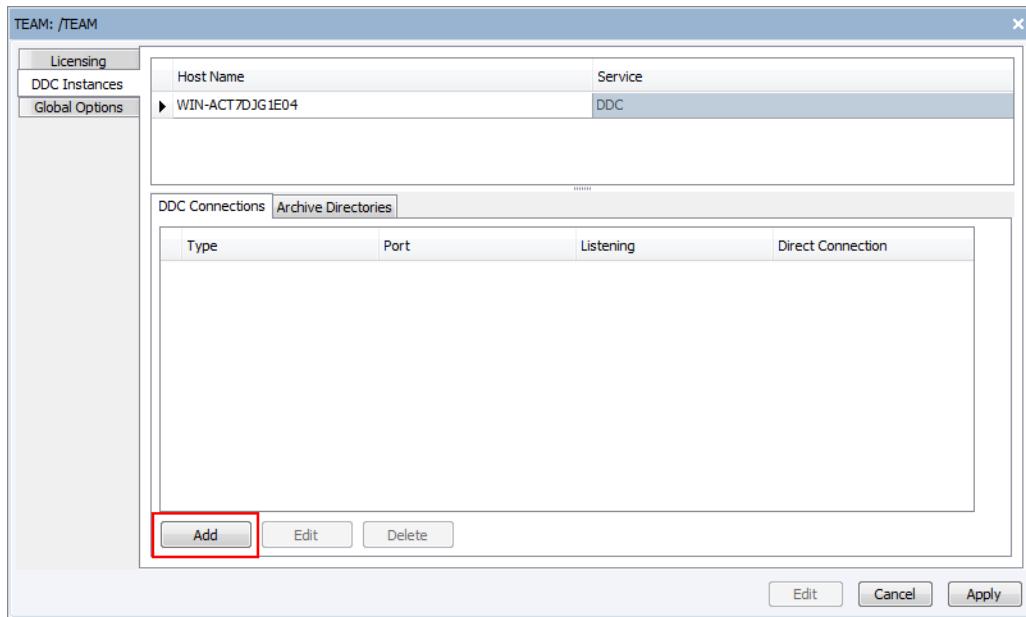


Figure 165 Add DDC Listening Connection

Step 4. Once the DDC Wizard launches, select **Next**, choose a **Telnet** connection, and then select **Next** again. Select the **Enable Listening** check box as shown in *Figure 166*. In the **Port Number to Listen on** text box, enter 5000. This is the same port number entered in ACCELERATOR RTAC for the **Client IP Port** in Step 4 of Part 1: Configuration in ACCELERATOR RTAC. Complete the DDC Wizard and save your changes.



Figure 166 Enable Listening

Step 5. Right-click in the Connection Explorer and select **Add > Folder**.

Step 6. Right-click **New Folder** and select **Rename**, as shown in *Figure 167*.

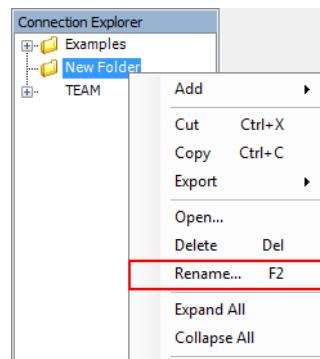


Figure 167 Rename Folder

- Step 7. Rename the folder to **RTAC Listening** and select **OK**.
- Step 8. Right-click the **RTAC Listening** folder, select **Add > Device**, and add the **SEL-3530**, as shown in *Figure 168*.

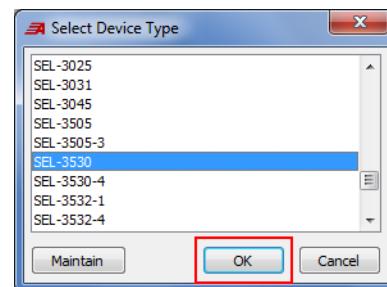


Figure 168 Add SEL-3530 Device Type

- Step 9. Right-click on **SEL-3530** to add a relay by using the same process as in *Step 8*. Add the **SEL-300G**, as shown in *Figure 169*.

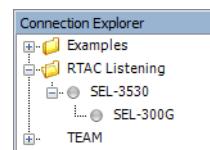


Figure 169 Connection Explorer

Step 10. Configure the relay (the SEL-300G in this case). Double-click **SEL-300G** and select **Edit** in the lower right corner. On the **Device** tab, select the **In Service** check box.

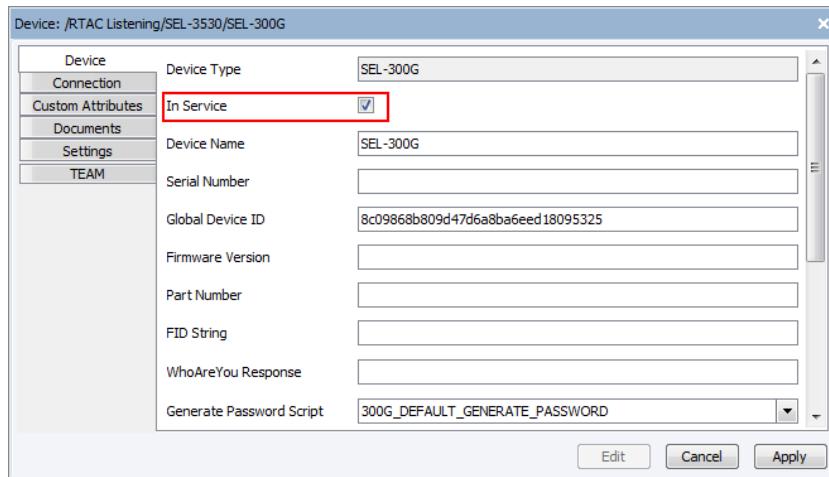


Figure 170 SEL-300G TEAM Configuration

Step 11. Select the **Connection** tab and enter the appropriate **Pass Through Port**. The Pass Through Port should match either the **Serial Communications Port** configured in *Step 10 in Part 1: Configuration in ACCELERATOR RTAC* or the **Virtual Port Number** configured in *Step 14 in Part 1: Configuration in ACCELERATOR RTAC*.

Step 12. Configure the RTAC. Double-click on **SEL-3530** in the Connection Explorer. In the **Device** tab, select the **In Service** check box.

Step 13. Select the **Connection** tab, choose **Network** as the Connection Type, and enter the **Host IP Address** and **Port Number** of the RTAC, as shown in *Figure 171*. The Port Number should match the **Server IP Port** configured in ACCELERATOR RTAC in *Step 4 of Part 1: Configuration in ACCELERATOR RTAC*.

The screenshot shows the 'Connection' configuration dialog for SEL-3530. The 'Connection Type' dropdown is set to 'Network'. Below it are three input fields: 'Host IP Address' (192.168.0.10), 'Port Number' (3254), and 'File Transfer Option' (Telnet).

Figure 171 RTAC Connection

Step 14. Select the **TEAM** tab. Select **Add** under **Communication Channel**. This opens the Server Configuration Wizard. Select through the wizard—no changes are required.

Step 15. Under **RTAC Listening**, clear the **SOE Listening Enabled** check box. The **TEAM** tab should look similar to *Figure 172*.

NOTE: The File Transfer Option configured for the RTAC in Device Manager should match the connection type configured on the SEL Server in the RTAC project.

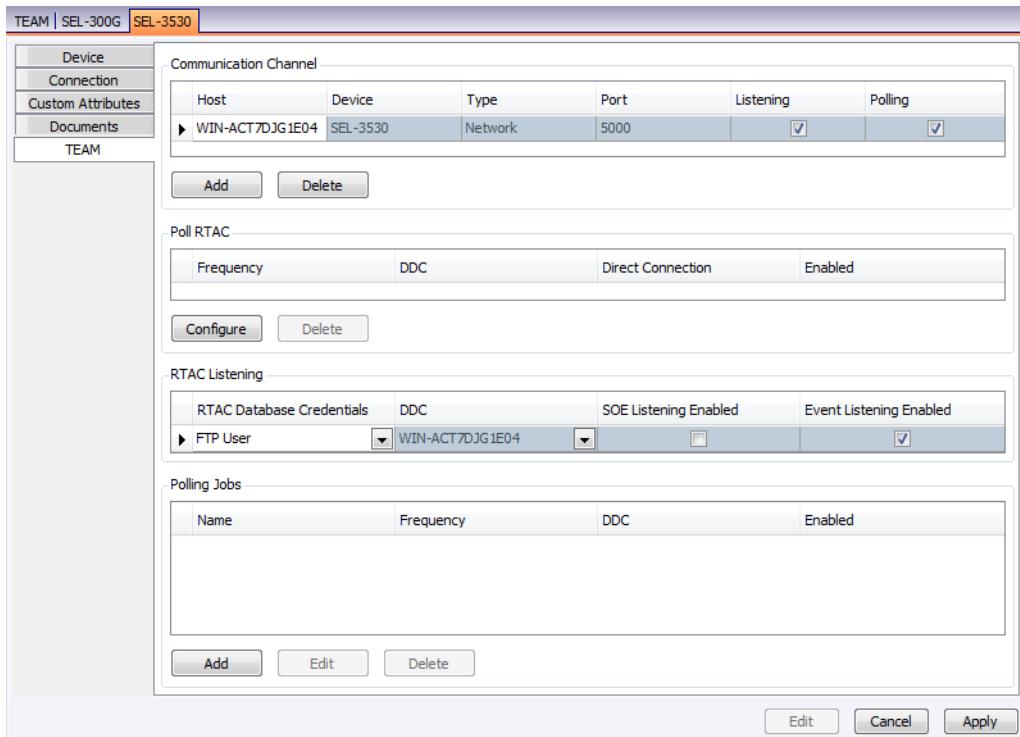


Figure 172 RTAC TEAM Tab

Step 16. Save all changes.

RTAC SOE Data

SOE data collected from the RTAC are also very important. Alarms within the RTAC can be set to trigger when any of its child devices experience changes, such as when users reach a certain access level within a relay, a relay failure alarm occurs, or relay settings have been changed. The RTAC may also be used to monitor communication or control failures.

To configure an RTAC SOE collector job, the credentials for the RTAC must be entered into Device Manager. To do this from the QuickSet toolbar, select **Tools > Device Manager > Password Manager**.

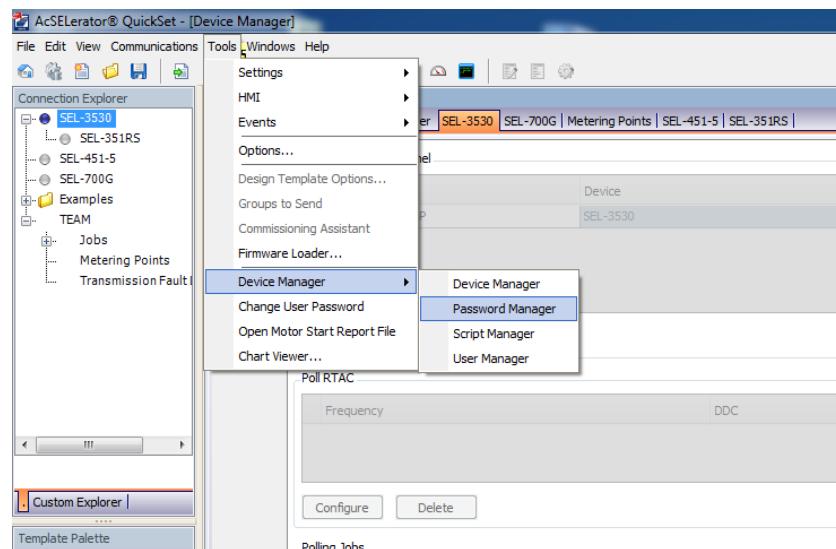


Figure 173 Select Password Manager

Right-click on the white space on the left side of the window. Select **Add > Password**. Double-click on the new password that you created. Select **Edit** (from the lower right of the window). Enter the **Username** and **Password** for the RTAC that you are configuring for the SOE collector job. Select **Apply** and save. Ensure a Metering Point is assigned to the RTAC and to all the child devices by adding them to a metering point in the **TEAM > Metering Points** node (see *Create a Metering Point* for explicit instructions). Additionally, ensure that each child device has the appropriate GUID set. Refer to *Example 10: Listening Via RTAC Encrypted Database Connection* for steps on how to assign a child device GUID. Completing these steps enables TEAM to associate the collected SOE data with the appropriate device.

To add an SOE collector job for the RTAC, right-click in the Connection Explorer. Select **Add > Device**, and then select **SEL-3530** from the **Select Device Type** dialog box. Double-click on the device node in the Connection Explorer. Then select the **TEAM** tab at the left of the device tab. Select **Edit** (lower right of the device tab) to activate the tab.

Select **Add** to display the **Polling Job Wizard**. Under **Polling Job**, choose **RTAC SOE Collector Job**.

Select the password title that was set up for the RTAC. Select the polling frequency you want. Finish the **Polling Job Wizard**. Select **Apply** and save.

To view the SOE data, right-click on **SEL-3530** and then select **SOE Viewer**. Refer to *View SOE Data on page 81* for additional details.

Security

You can configure the RTAC to prohibit all incoming TCP/IP connection requests and then to notify you automatically of all such requests. This provides a high level of security, because the RTAC initiates the communication to the TEAM DDC.

You can also configure the RTAC to require authentication, so you can configure TEAM to provide credentials when it runs a polling job. Use the Password Manager in QuickSet to create a titled password for an RTAC device. Then use the Script Manager to create a new access script that makes use of the new titled password (see *Create and Manage Custom Scripts* in *Section 4: Asset Management Using Device Manager* of the *ACCELERATOR QuickSet SEL-5030 Software Instruction Manual* for details on use of the Script Manager). You can then select this new access script on the RTAC (by double-clicking on the **SEL-3530** node and then selecting the **Connection** tab) to provide the username and password the titled password defines.

TEAM Profile

In addition to providing event data collection, TEAM now lets you retrieve and store profile, VSSI, and SER data in the ACCELERATOR Database through the use of TEAM Profile. The first release of TEAM Profile supports only the SEL-734 Advanced Metering System and SEL-735 Power Quality and Revenue Meter device families.

Metering Devices

In TEAM Profile, a metering device refers to a member of the SEL-734/735 device families. A metering device can generate profile, VSSI, and SER data, which you can retrieve through the use of TEAM and store in the ACCELERATOR Database.

SEL metering devices incorporate one or more internal device recorders to sample and record various analog quantities. A device recorder is an electronic component responsible for recording a single stream of data of a particular kind (i.e., profile). Many metering devices have a single device recorder for capturing a particular kind of data, but there are also devices that have multiple device recorders for different kinds of data. For example, members of the SEL-734/735 device family have several device recorders for capturing load profile data.

During QuickSet configuration, you can select a particular set of analog quantities a device recorder collected (also called a channel), along with the acquisition rate at which you want to capture data. The number of device recorders across SEL devices differs. For the SEL-734/735 device families, each device recorder can acquire data from as many as 16 channels.

Table 6 Metering Devices Supported by TEAM

Metering Device	Recorders	Channels
SEL-734	1	16
SEL-734P	12	16
SEL-735 (basic PQ)	1	16
SEL-735	12	16
SEL-751A	1	17

Table 7 Firmware Revisions Supported

SEL-734/734P	R1xx Series	Form 5 Meter	R134 and later
	R5xx Series	Form 9 Meter	R534 and later
	R2xx/R6xx Series	Form 5 and 9 Meter	R204 and later
SEL-735	R1xx Series	Form 5 and 9 Meter	R100 and later
SEL-751A	NA	NA	R100 and later

Over time, you can assign different metering devices to a metering point. This would be the case, for example, if you were to replace a failed metering device with a different device.

The specific types of metering devices you can assign to a metering point can also vary over time. For example, you could replace an SEL-734 with some other type of device capable of collecting load profile information (e.g., an SEL-351).

Metering Point

The concept of a metering point is fundamental to the process of collecting metering data (see *Metering Point Data on page 114*) from a metering device. Basically, a metering point is the system representation of the physical electrical element from which a metering device takes measurements. We can refer to the physical location on the electrical element where the metering device takes those measurements as a region of common measurement (RCM). We represent every RCM as a metering point in the system.

Examples of metering point measurements include values for load profile information, power quality data, or VSSI data. Examples of physical entities include power feeds, machinery connections, and current transformers. Conceptually, a metering point represents the end user's view of the physical entity from a particular perspective such as billing or protection. From the perspective of TEAM, a metering point is the mechanism that allows

association of measured values with a particular user perspective and provides an organizing principle for the aggregation and management of collected metering data across time and across metering devices.

The following diagram illustrates the concept of metering points in a bus of breakers. Note that the yellow circles represent metering points, and the shaded areas to which they point are RCMs.

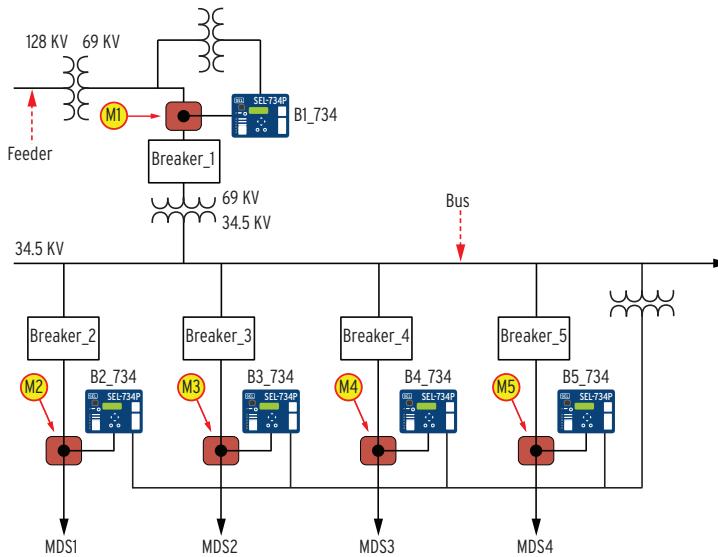


Figure 174 Metering Point Determination

A metering point corresponds to a physical location at which a metering device is installed and taking measurements. For example, an industrial facility purchases electricity from an electric utility. Physical delivery of electricity is through a number of feeder lines coming into the facility. The electrical interface to one of those feeder lines may be located in a specific building. An SEL-734 connects to that interface, and utility personnel use this meter periodically to take measurements of the voltage (and other quantities of interest) coming across that interface. A single metering device collects measurements at that interface, and that interface constitutes a single metering point.

The physical or geographic location of a metering point is a separate and distinct concept from the metering point itself. Neither the metering point nor the location identify one another; metering points are independent of both device and location. Any physical or geographic location may have multiple metering points, and all such metering points are mutually independent of one another.

Metering Point Data

The term metering data refers specifically to the profile, VSSI, and SER data a metering device assigned to a metering point collects. Collected data are associated with the specific metering point from which the information was collected; deletion of the associated metering point also deletes the collected data from the ACCELERATOR Database. Many SEL devices capture these kinds of data, but TEAM presently supports only certain families (refer to *Table 4* for a list of supported devices).

Metering Device Association

The metering data a metering device collects at a metering point are always associated with the identity of the metering device you use to collect those data. The metering data retain this association regardless of metering device longevity. Note, however, that while this relationship is invariant over the life of the data, it is not a primary access path to the data. Retention of the metering device identity helps in making after-the-fact corrective adjustments to the data (because of the discovery of some device anomaly, for example).

Metering Data Retention

Once you have established a metering point, its identity and longevity remain independent of any metering device you use for collecting measurements. For example, suppose that you needed to remove the presently installed metering device for repairs. Although you have removed that device and it is no longer collecting new measurements, the metering point still exists. The metering data the metering device collected at that metering point also still remain because this information has potential historical value. If you later reinstall the metering device at the same interface, TEAM adds newly collected metering data to those data you collected previously for that metering point.

The longevity of metering data a metering point collects depends upon the longevity of the metering point itself. If you remove a particular metering point from the system, you also remove any and all data that metering point collected.

Metering Data Ownership

Any data a metering device installed at a metering point collects belong to that metering point, and not to the metering device. For instance, if you install a metering device to replace an existing metering device, then any new metering data the new metering device acquires adds to any metering data you previously collected for that metering point. Additionally, moving a metering device to a different metering point in no way transfers the metering data from the original metering point.

Metering Data Collection

Run metering data collection jobs to collect metering data. TEAM translates and normalizes metering data from supported devices (e.g., the SEL-735) and stores this information in the ACCELERATOR Database. Metering data collection jobs include profile, VSSI, and SER collection jobs.

Before running a metering data collection job on a metering device, you must first use the **Metering Point Wizard** to define a metering point and associate it with the metering device. Access the wizard by double-clicking the **Metering Points** node in the Connection Explorer and then selecting **Create** in the **Metering Points** tab that displays.

Metering Data Storage

Make sure that your system has adequate disk space when configuring TEAM for profile collection. The following table shows the memory consumption of the ACCELERATOR Database after a varying number of recorded intervals. The approximate time range was calculated with an acquisition rate of one sample every 10 minutes and with six analog quantity elements per recorder. Because acquisition rate can vary between applications, consider comparing the table information to the intervals recorded in your application rather than to the time range.

Table 8 ACCELERATOR Database Memory Consumption for Various Recorded Intervals

Devices	Recorders Per Device	Intervals Recorded	Approximate Time Range	Size Of Database On Disk
1	1	20,000	3 months	73.6 MB
1	1	30,000	6 months	76 MB
1	1	60,000	1 year	99.5 MB
1	5	100,000	3 months	125 MB
1	5	150,000	6 months	137 MB
1	5	300,000	1 year	206 MB
1	10	200,000	3 months	197 MB
1	10	300,000	6 months	221 MB
1	10	600,000	1 year	310 MB
10	1	200,000	3 months	197 MB
10	1	300,000	6 months	221 MB
10	1	600,000	1 year	310 MB
10	5	1,000,000	3 months	407 MB
10	5	1,500,000	6 months	528 MB
10	5	3,000,000	1 year	908 MB
10	10	2,000,000	3 months	667 MB
10	10	3,000,000	6 months	911 MB
10	10	6,000,000	1 year	1.6 GB
50	1	1,000,000	3 months	407 MB
50	1	1,500,000	6 months	529 MB
50	1	3,000,000	1 year	893 MB
50	5	5,000,000	3 months	1.36 GB
50	5	7,500,000	6 months	1.93 GB
50	5	15,000,000	1 year	3.74 GB
50	10	10,000,000	3 months	2.53 GB
50	10	15,000,000	6 months	3.74 GB
50	10	30,000,000	1 year	7.32 GB

Note: Use this table for reference and estimates, but not as a strict guide. Different versions of ACCELERATOR Database, different operating systems, and different configurations of Device Manager all will affect the actual size of the ACCELERATOR Database.

Recommended TEAM Metering Settings

- Run profile collection once every 24 hours (daily).
- TEAM configuration must be such that collection of data from each recorder occurs at an interval less than the load profile maximum duration setting of that recorder.
- Use *Automated Data Management* on page 157 to minimize database footprint.

When using automated data management to manage metering data, set the minimum number of records to keep to the acquisition rate of the meter, scaled to days, multiplied by the

minimum number of days the records must remain in the database. For example, if the lowest acquisition rate in the meter is configured for 10 minutes, and at all times 30 days of data must be preserved in the database, then, as shown in the following equation, the minimum number of records to keep setting should be more than 4230 samples.

$$30 \text{ days} \cdot \frac{24 \text{ hr}}{1 \text{ day}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} \cdot \frac{1 \text{ sample}}{10 \text{ min}} = 4320 \text{ samples}$$

Recommended Meter Settings

Observe the following constraints to ensure complete load profile collection and translation during use of TEAM. Failure to observe these constraints means that there can be no guarantee that data collection and the translation process will discard duplicates or skip records.

- For a given meter, there can be no clock change resulting in the date/time of the meter being set backward beyond one minute past midnight for the present day. If, for example, the clock for a meter is set presently for May 10, 2013 at 3:00 p.m., the date/time of the meter cannot be set earlier than May 10, 2013 at 00:01 a.m. Similarly, there can be no backward adjustment of the meter date without clearing the load profile data from the meter.
- Load profile maximum duration (LDAR) must be equal to or greater than two days.
- For replacement of an in-service meter with a new meter or initial use of a new meter, the following conditions are in effect in the following order:
 - a. The meter completes any running collections and then collection is disabled.
 - b. As defined previously, the time on the meter adjusts to the “correct” time.
 - c. All load profile recorders on the meter are cleared if the time zone for the new location of the meter differs from that for the previous location.
- The meter must be associated with a single metering point within Device Manager.
- The time source for the meter MUST respect daylight-saving time (DST) according to the time zone for the metering point of the device.

Time Zones

When creating a metering point, you must select the time zone in which the metering point and metering device are located. TEAM uses the time zone information to convert all time stamps to coordinated universal time (UTC) before recording information in the ACCELERATOR Database.

Daylight-Saving Time (DST)

Some metering devices record profile data in the load profile (LDP) binary file. For these devices, it is important to know whether DST was in effect at the time of sample acquisition. The LDP binary file indicates whether the

sample time is in DST, if it is known. TEAM cannot know if DST was in effect if you use an external time source, or if you have the device's DST function disabled while using the internal clock as the time source.

Create a Metering Point

Before you can run a metering data collection job to collect metering data, you must create a metering point and assign a metering device to it.

Double-click on the **Metering Points** node in the Connection Explorer to display the **Metering Points** tab. To define a new metering point, select **Create** to display the **Metering Points Wizard**. You first need to provide a unique name. You then select a **Metering Point Time Zone**, the time zone in which the metering device is located. TEAM references this time zone when converting all sample times to UTC before storing information in the ACCELERATOR Database. Note that when you select a time zone in the drop-down menu, autocomplete quickly provides you the time zone name after you type the first few characters.

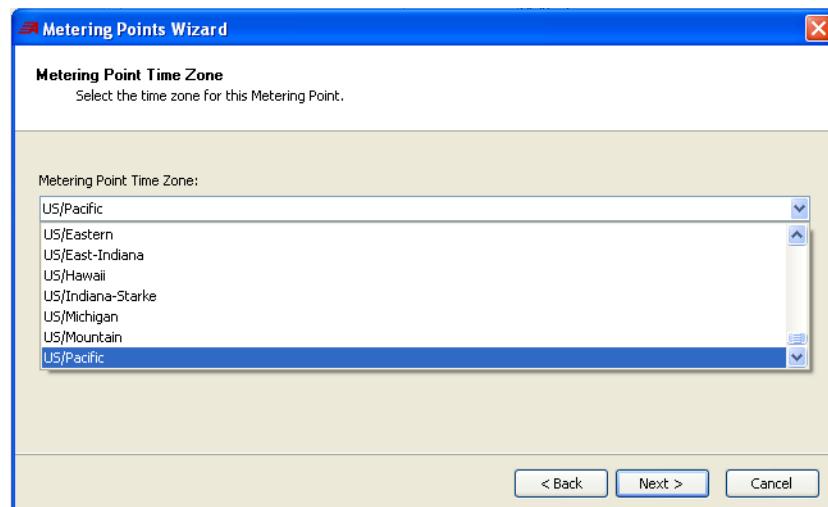


Figure 175 Select Metering Point Time Zone

Finally, you can add notes for association with the metering point. When you complete the wizard, the information you provided will display on the right side of the **Metering Points** tab. Select **Edit** if you need to make changes.

You next need to identify the metering device you want to assign to the metering point. Recall that you can assign multiple metering devices to the same metering point, however, SEL recommends assigning metering devices to metering points on a 1:1 ratio. Although TEAM supports associating data from multiple devices to a single metering point, reporting software may not support this functionality, and, therefore, this recommendation is to enable optimal data handling. Select **Edit** to display the **Metering Point Device Assignment**.

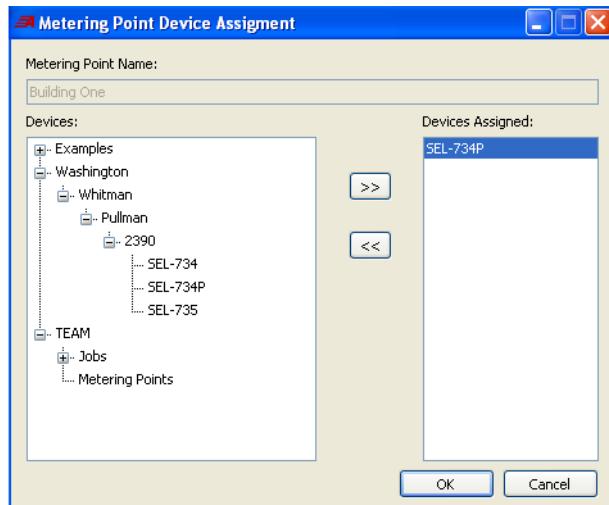


Figure 176 Assign Device to Metering Point

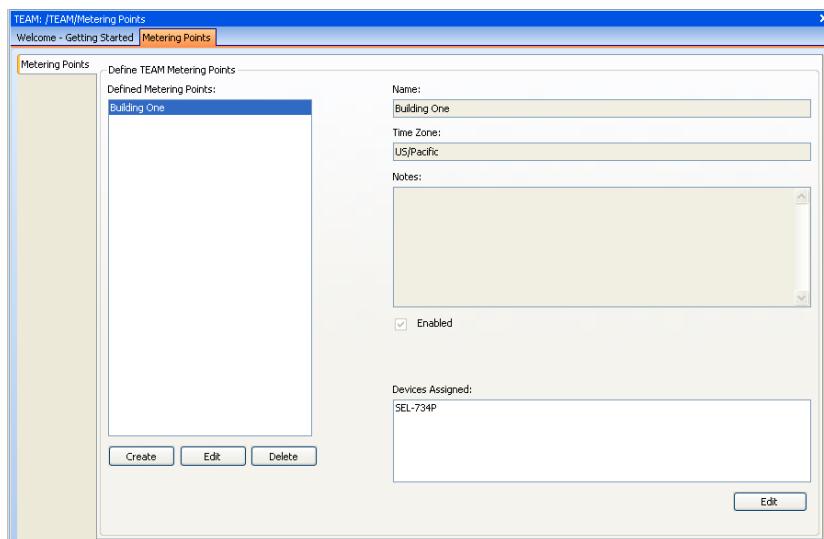


Figure 177 Metering Point Assigned

Metering Data Collection Jobs

TEAM Profile includes three default metering data collection jobs: profile collection, VSSI collection, and SER collection. Each job contains just one predefined task and is noneditable. TEAM Profile presently supports only TEAM polling jobs. To retrieve metering data, all you need to do is assign a metering polling job to a metering device TEAM supports (e.g., an SEL-734 or SEL-735).

Set Up Metering Data Collection Jobs

All TEAM data collection jobs run on a specific device or folder node. To set up these jobs to run on a particular device, you must first select a metering point (that you have already created) and assign a device to it. Then double-click on the device to display the tab associated with that device. Select the **TEAM** tab to display the **Polling Jobs** area, from which you can assign polling jobs.

Select **Add** to display the **Polling Job Wizard**. Under **Polling Job**, you can choose a profile collection, VSSI collection, or SER collection polling job. Note that the device must support the collection job you select, or you will be unable to advance to the next page.

Profile Collection Polling Job

If you select a profile collection polling job, you can use the page that appears (as shown in the following figure) to configure the device recorders from which you want to retrieve data.

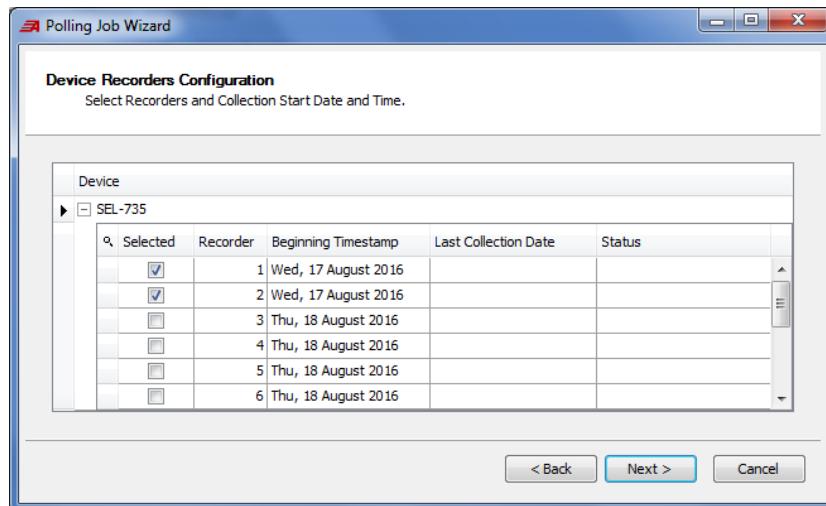


Figure 178 Configure Device Recorders

Also, use this page to select data collection start date and time. Note that the acquisition rate of the recorder determines how much, if any, data TEAM has collected for the time you chose. The next page to display, **Metering Point Configuration**, displays the metering point assigned to the device.

From remaining options within the wizard, you select a polling frequency and the job start date and time.

Example 12: Configure Profile Collection

NOTE: Rather than repeating information, the following example omits the finer points of procedures discussed elsewhere in these instructions. For procedural details omitted here, refer to the relevant section(s).

This example provides the steps necessary for setting up a metering point and profile collection job for use with an SEL-735 in TEAM. Before beginning, create an SEL Meters folder in the Connection Explorer and add an SEL-735. Rename the SEL-735 to **Metering Site**, as shown in *Figure 179*.

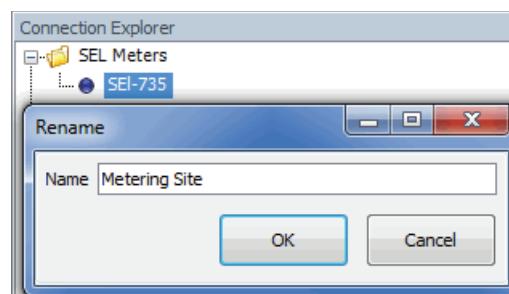


Figure 179 Rename Connection

Configure the Meter

- Step 1. Double-click **Metering Site** in the Connection Explorer to open the **Device** window.
- Step 2. Select **Edit** and select the **In Service** check box.
- Step 3. Select the **Connection** tab and set the **Connection Type** to **Network**. Configure the **Host IP Address** to match the address of your meter. For this example, use **192.168.1.5**. Leave the **File Transfer Option** as **Telnet** and the **Port Number** as **23**. *Figure 180* shows the SEL-735 connection parameters.

Step 4. Select **Save All** (💾) to apply the changes.

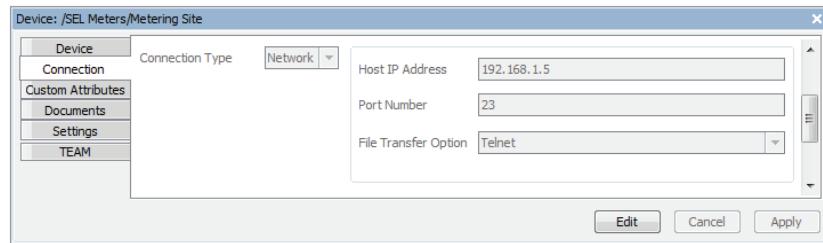


Figure 180 SEL-735 Connection Parameters

Configure Metering Points

Use QuickSet to configure a metering point and assign a device to that point. A metering point is a physical location where one meter connects for measurement. If you replace your metering device, metering points provide a way to correlate data collected from the initial meter to the new meter at the same physical location. Use descriptive naming to clarify different metering points.

- Step 1. Expand TEAM in the Connection Explorer to locate the **Metering Points** node. Double-click **Metering Points** to open the **Metering Points** window shown in *Figure 181*.

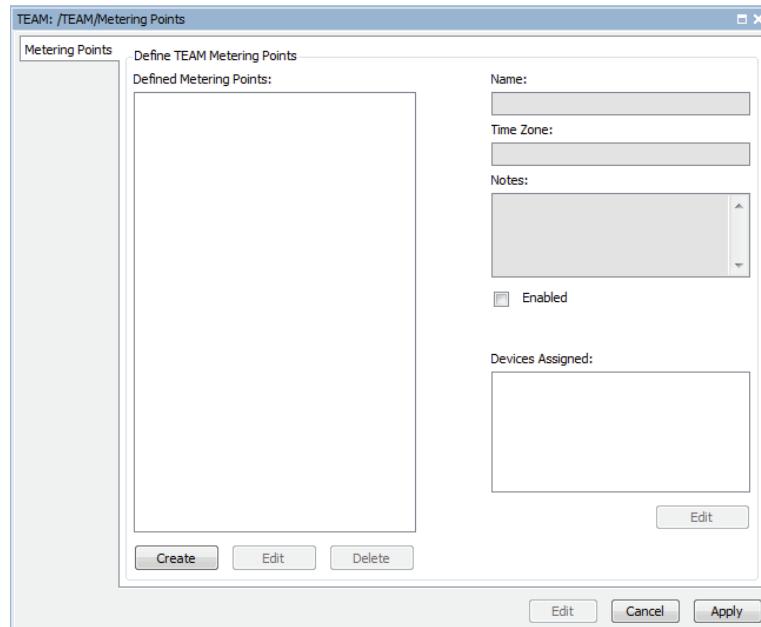


Figure 181 Select Metering Points

Step 2. Select **Edit** and then the **Create** button in the **Metering Points** window to open the **Metering Points Wizard**. Select the **Next** button to open the **Metering Point Name** window.

Step 3. Enter **Metering Site** in the **Metering Point Name** field. Ensure that the **Enable Metering Point** check box is selected as shown in *Figure 182*.

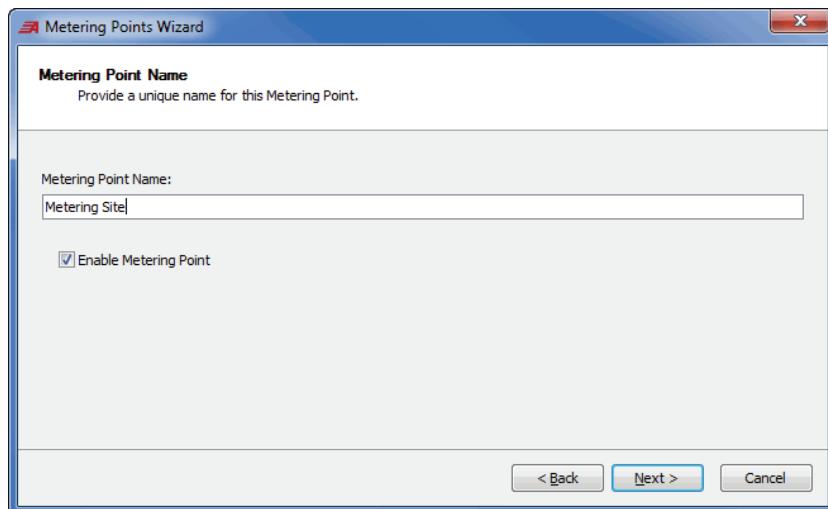


Figure 182 Metering Point Name Window

Step 4. Select the **Next** button to accept the metering point name and open the **Metering Point Time Zone** window.

Step 5. Scroll to select the appropriate time zone in the **Metering Point Time Zone** for the meter installation, as shown in *Figure 183*. In this example, choose the **US/Pacific** time zone. Select the **Next** button to open the **Metering Point Notes** window.

Step 6. TEAM uses the time zone setting to normalize data collected across different time zones.

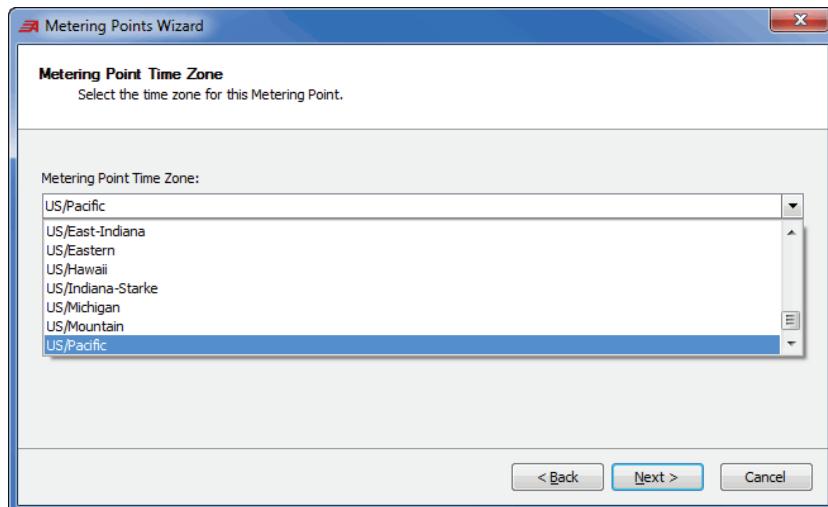


Figure 183 Metering Point Time Zone

- Step 7. Enter any notes about the meter in the **Notes** field of the **Metering Points Wizard**. Do not add notes for this example. Select the **Next** button to open the **Metering Points Wizard Complete** window.
- Step 8. Select **Finish** to complete the metering points setup process.
- Step 9. Select the **Edit** button, outlined in *Figure 184*, under the **Devices Assigned** section to open the **Metering Point Device Assignment** window.

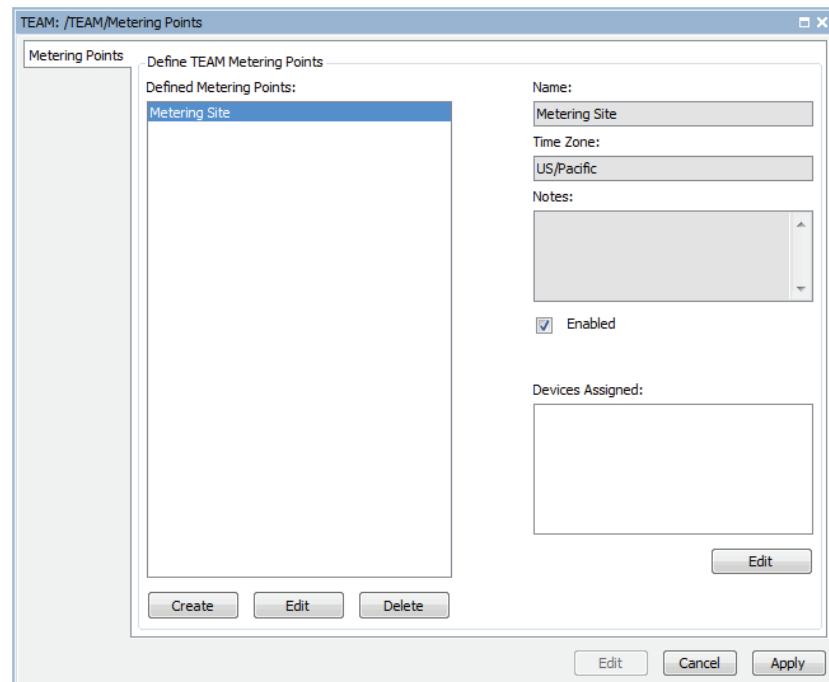


Figure 184 Devices Assigned Window

- Step 10. Select (+) to expand **SEL Meters** and select **Metering Site**, as shown in *Figure 185*.
- Step 11. Select (>>) to add the meter to the **Devices Assigned** box.

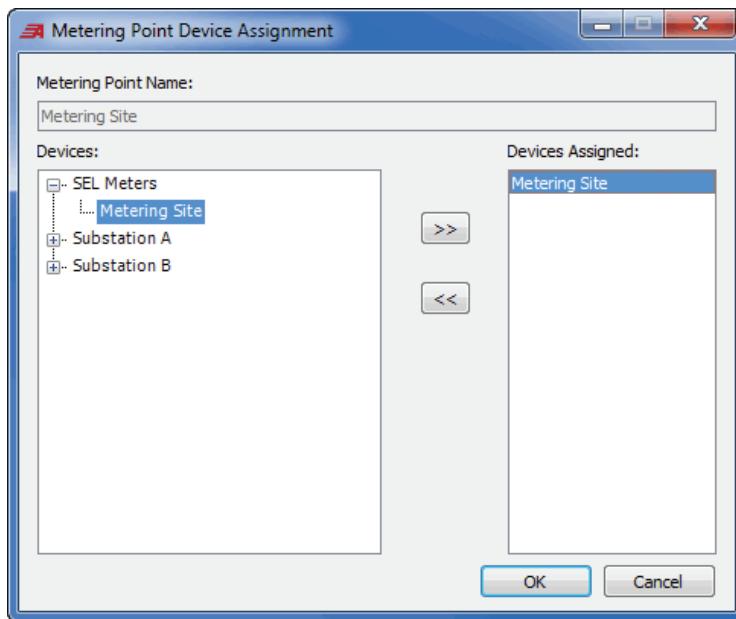


Figure 185 Metering Point Device Assignment Window

Step 12. Select **OK** to accept the changes and close the **Metering Point Device Assignment** window.

Step 13. Select **Save All** (disk icon) to apply the changes.

Configure Profile Collection Polling Job

Step 1. Double-click **Metering Site** in the Connection Explorer and select the **TEAM** tab. Select **Edit** and then the **Add** button in the **Communication Channel** section. Continue through the wizard without making changes.

If you are unable to progress through the wizard because no DDC connections display in the **Service Connection** window, you will need to add the proper DDC connection in the **TEAM** node. Refer to *Job Done Example: Classic Workflow Overview* on page 23 for an example on how to configure the DDC connections and other global options.

Step 2. Select the **Add** button under the **Polling Jobs** section shown in *Figure 186*. This causes the **Polling Job Assignment Wizard** to display.

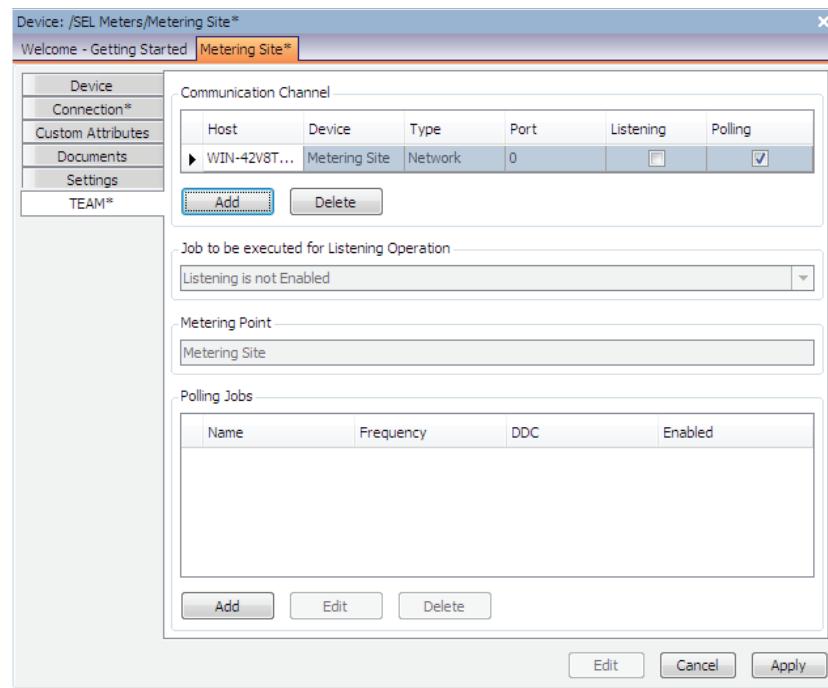


Figure 186 Add Polling Jobs

- Step 3. Select **Next** to open the Service Selection window. Select the service you want from the **Service** drop-down window. Select **Next** to open the **Polling Job Selector** window.
- Step 4. Select **Profile Collection** in the **Job** drop-down menu and ensure that the **Enable Job** check box is selected as shown in *Figure 187*.

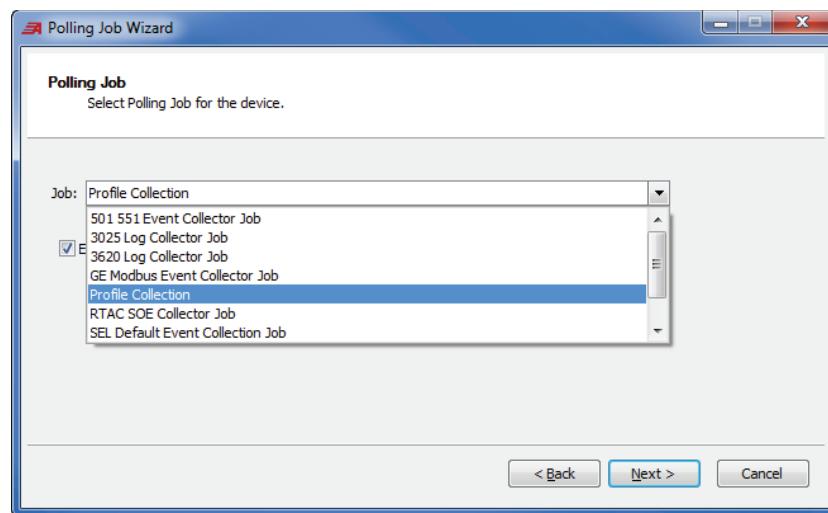


Figure 187 Polling Job Selection

- Step 5. Select **Next** to open the **Device Recorders Configuration** window.
- Step 6. Select (+) to expand the recorder view for the **Metering Site** device. Select the box under **Selected** for Recorder 1, set **Beginning Timestamp** to the previous day's date, and select **Next**. *Figure 188* shows the **Device Recorders Configuration** window.

Use only the minimum number of profile recorders required to poll the necessary data. Doing so optimizes the size of the TEAM database on the computer or server. Set the beginning time stamp to the earliest time stamp for which you want to archive profile data.

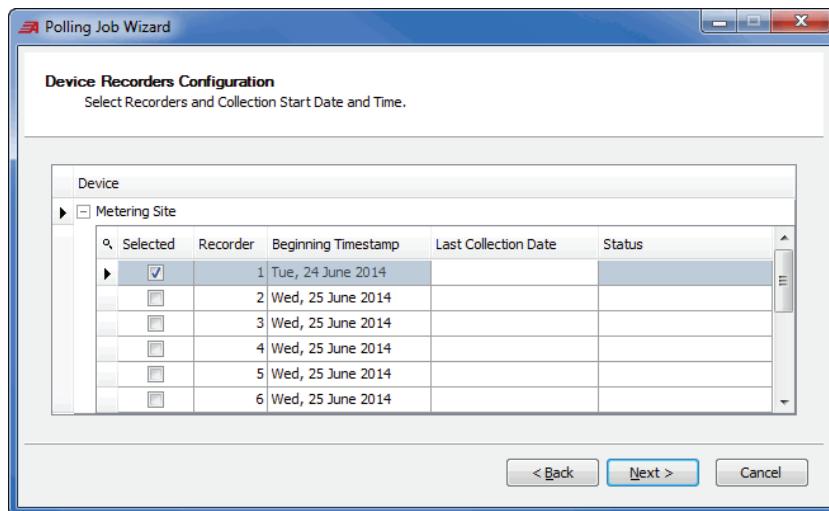


Figure 188 Device Recorders Configuration

- Step 7. No changes are necessary at the Metering Point Configuration window, so select **Next**. Set the Polling Frequency to minutely, set the Minutely Polling Interval to **Every 1 Number of Minutes**, and then select **Finish**.

Reset this job to a slower poll rate once testing is complete. SEL recommends polling for profile data once a day.

- Step 8. Select the **Apply** button to save the configurations in the **TEAM** tab.

Now that you have TEAM configured for profile collection, it will poll and store profile data at the specified interval. You can later retrieve the stored profile data as a report.

Example 13: Configure Profile Collection Auto-Configure Version

NOTE: Rather than repeating information, the following example omits the finer points of procedures discussed elsewhere in these instructions. For procedural details omitted here, refer to the relevant section(s).

This example provides the steps necessary for setting up a metering point and profile collection job for use with an SEL-735 in TEAM. Before beginning, create an SEL Meters folder in the Connection Explorer and add an SEL-735. Rename the SEL-735 to **Metering Site**, as shown in *Figure 189*.

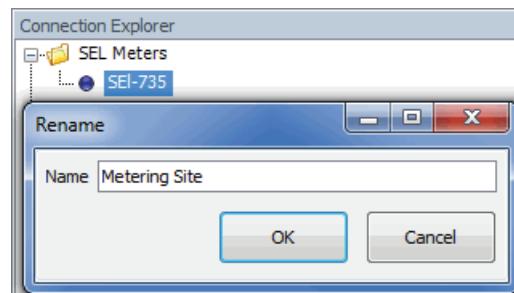


Figure 189 Rename Connection

Configure the Meter

- Step 1. Double-click **Metering Site** in the Connection Explorer to open the **Device** window.
- Step 2. Select **Edit** and select the **In Service** check box.
- Step 3. Select the **Connection** tab and set the **Connection Type** to **Network**. Configure the **Host IP Address** to match the address of your meter. For this example, use **192.168.1.5**. Leave the **File Transfer Option** as **Telnet** and the **Port Number** as **23**. *Figure 190* shows the SEL-735 connection parameters.
- Step 4. Select **Save All** () to apply the changes.

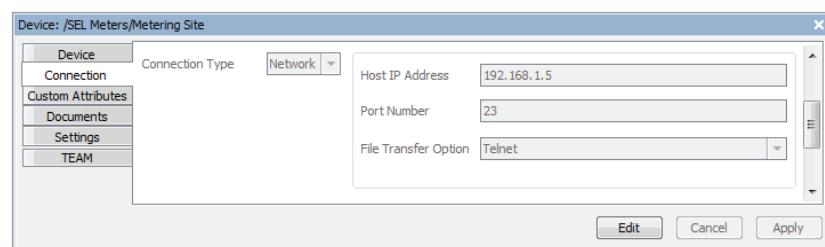


Figure 190 SEL-735 Connection Parameters

Configure Profile Collection Polling Job

- Step 1. Select the **TEAM** tab. Select **Edit** and then the **Add** button in the **Polling Jobs** section. Select **Next** to open the Service Selection window. Select the service you want from the **Service** drop-down window. Select **Next** to open the **Polling Job Selector** window.
- Step 2. Select **Profile Collection** in the **Job** drop-down menu and ensure that the **Enable Job** check box is selected as shown in *Figure 191*.

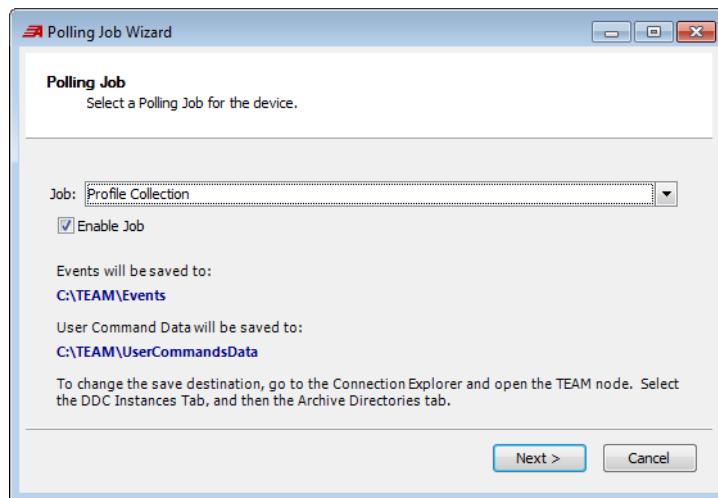


Figure 191 Polling Job Selection

- Step 3. Select **Next** to open the **Device Recorders Configuration** window.
- Step 4. Select (+) to expand the recorder view for the **Metering Site** device. Select the box under **Selected** for Recorder 1, set **Beginning Timestamp** to the previous day's date, and select **Next**. *Figure 192* shows the **Device Recorders Configuration** window.

Use only the minimum number of profile recorders required to poll the necessary data. Doing so optimizes the size of the TEAM database on the computer or server. Set the beginning time stamp to the earliest time stamp for which you want to archive profile data.

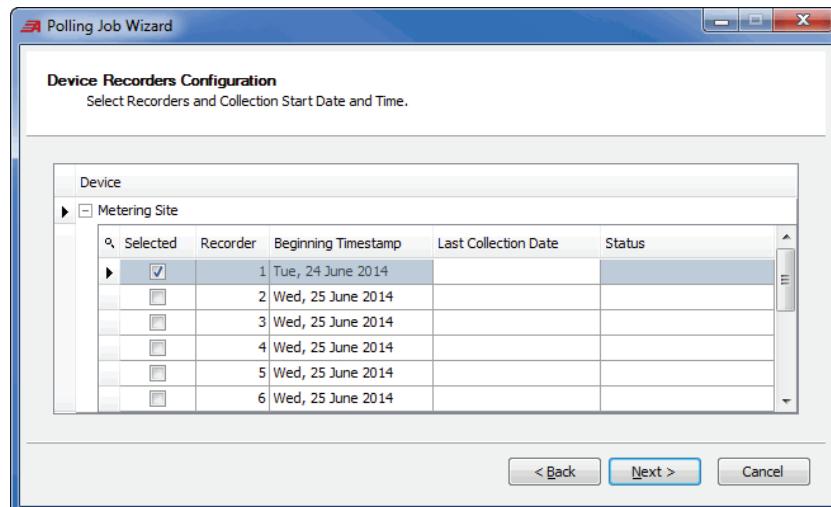


Figure 192 Device Recorders Configuration

- Step 5. The **Metering Point Configuration** window uses your system location to estimate the correct time zone. If you would like to change the time zone displayed, select once in the existing

Time Zone column and then select the drop-down arrow. Select the correct **Time Zone** from the populated list. For this example, use **US/Pacific**.

- Step 6. Select once in the existing **Metering Point Name** column to change the default **Metering Point Name**. For this example, use the default name of **SEL Meters_Metering Site**.

Figure 193 shows the configured metering point.

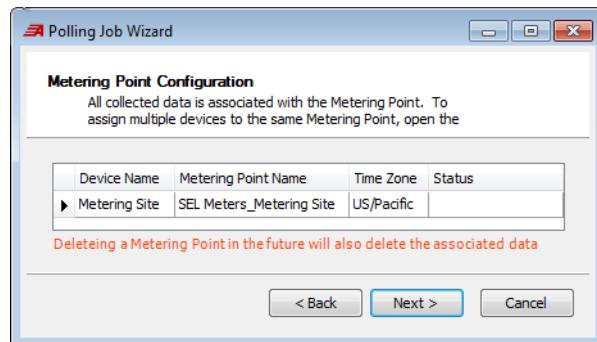


Figure 193 Configured Metering Point

- Step 7. Select **Next**. Set the Polling Frequency to **Minutely**, set the Minutely Polling Interval to **Every 1 Number of Minutes**, select **Next**, and then select **Finish**.

- Step 8. Reset this job to a slower poll rate once testing is complete. SEL recommends polling for profile data once daily.

- Step 9. Select the **Apply** button to save the configurations in the **TEAM** tab.

Now that you have TEAM configured for profile collection, it will poll and store profile data at the specified interval. You can later retrieve the stored profile data as a report.

Example 14: Profile Recorder Solution

The RTAC family of devices gains additional functionality when the TrendRecorder IEC 61131 Library is used in ACCELERATOR RTAC Projects. This library provides flexible and scalable trend-recording capability in the RTAC. We can provide trend information to TEAM via a load profile (LDP) file and view this information with ACCELERATOR® Meter Reports SEL-5630 Software. For detailed information on the uses and limitations of the TrendRecorder Library, refer to the TrendRecorder Instruction Manual.

Using the TrendRecorder Library requires a two-step configuration process. First, create a project for the RTAC that uses the TrendRecorder Library in ACCELERATOR RTAC. Then configure the RTAC Recorder device type in TEAM. This example illustrates how to configure the RTAC with the TrendRecorder Library. Devices connected to the RTAC can use either an Ethernet or serial connection, but the connection between the RTAC and TEAM must be an Ethernet connection.

Part 1: Configuration in ACSELERATOR RTAC

The RTAC saves incoming analog data from a connected device and formats these data into a file TEAM can use. The following steps describe the procedure for setting up the library data in ACSELERATOR RTAC.

- Step 1. Create a new project in ACSELERATOR RTAC from the main menu, as shown in *Figure 194*, and select **Create**.

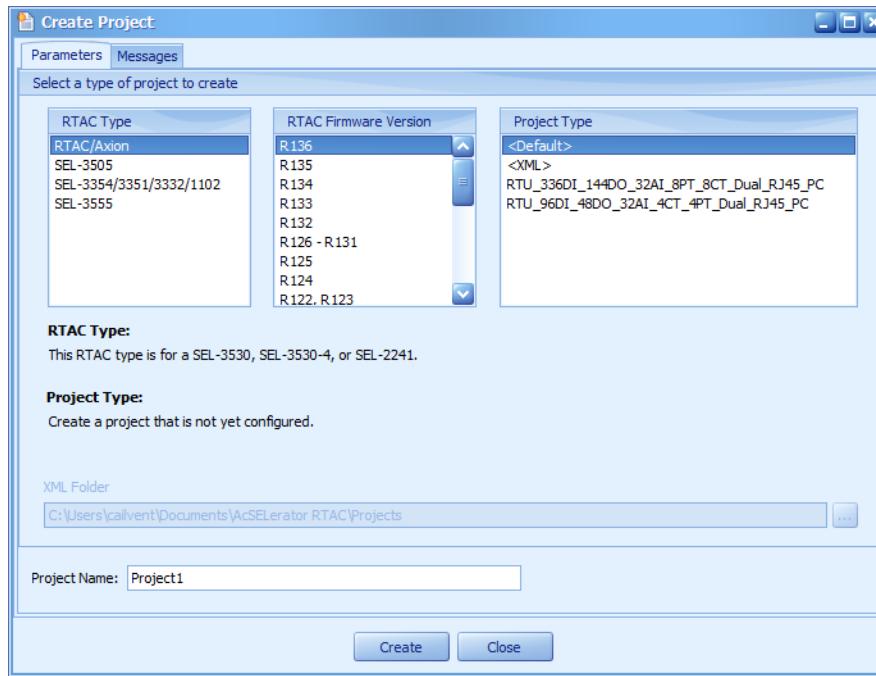


Figure 194 Create New Project

- Step 2. From the window that displays, add the TrendRecorder Library by selecting **Insert** and then the drop-down menu for **IEC 61131-3 User Logic**. Select **Library** under this menu.

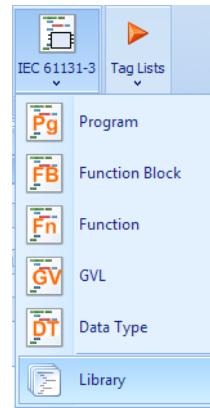


Figure 195 Add Library

Step 3. Select the **SEL TrendRecorder** Library, and select **Insert**.

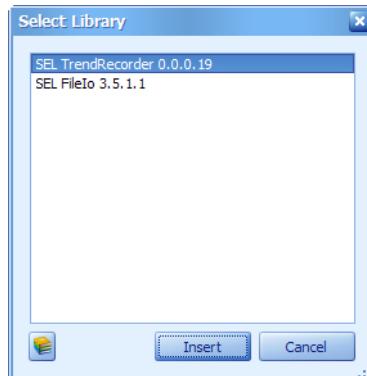


Figure 196 Select TrendRecorder Library

- Step 4. Right-click the **User Logic** folder in the project tree and then select **Add User Logic > Program** to display a window similar to *Figure 197*.
- Step 5. Enter **Recorder** for the **Name**, and select **CFC** (Continuous Function Chart) as the **Language**.

NOTE: The library was designed for use in CFC programs, but ST (Structured Text) may be used.

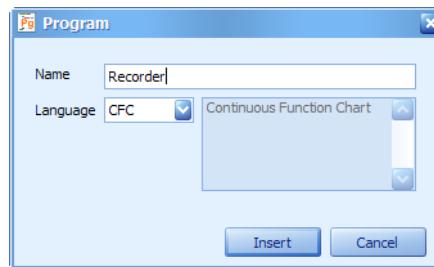


Figure 197 Insert Program

- Step 6. Select **Insert**.
- Step 7. Double-click the newly added **Recorder** program.
- Step 8. Add two **Box** elements to the diagram space by selecting them from the expandable ToolBox menu on the right-hand side.
- Step 9. Make one box a **ProfileManager** and one box a **ProfileIntervalRecorder**.
- Step 10. Initialize both elements.
- Step 11. Connect the **ConnectToRecorders** pin to the **ConnectToProfileManager** pin.
- Step 12. Fill in the remaining element pins with the appropriate context information or tag data. The final program setup should be similar to that of *Figure 198*.

NOTE: Only one ProfileManager is used regardless of the number of ProfileRecorder blocks. See the TrendRecorder Instruction Manual for more information. There may be as many as 12 ProfileRecorder blocks.

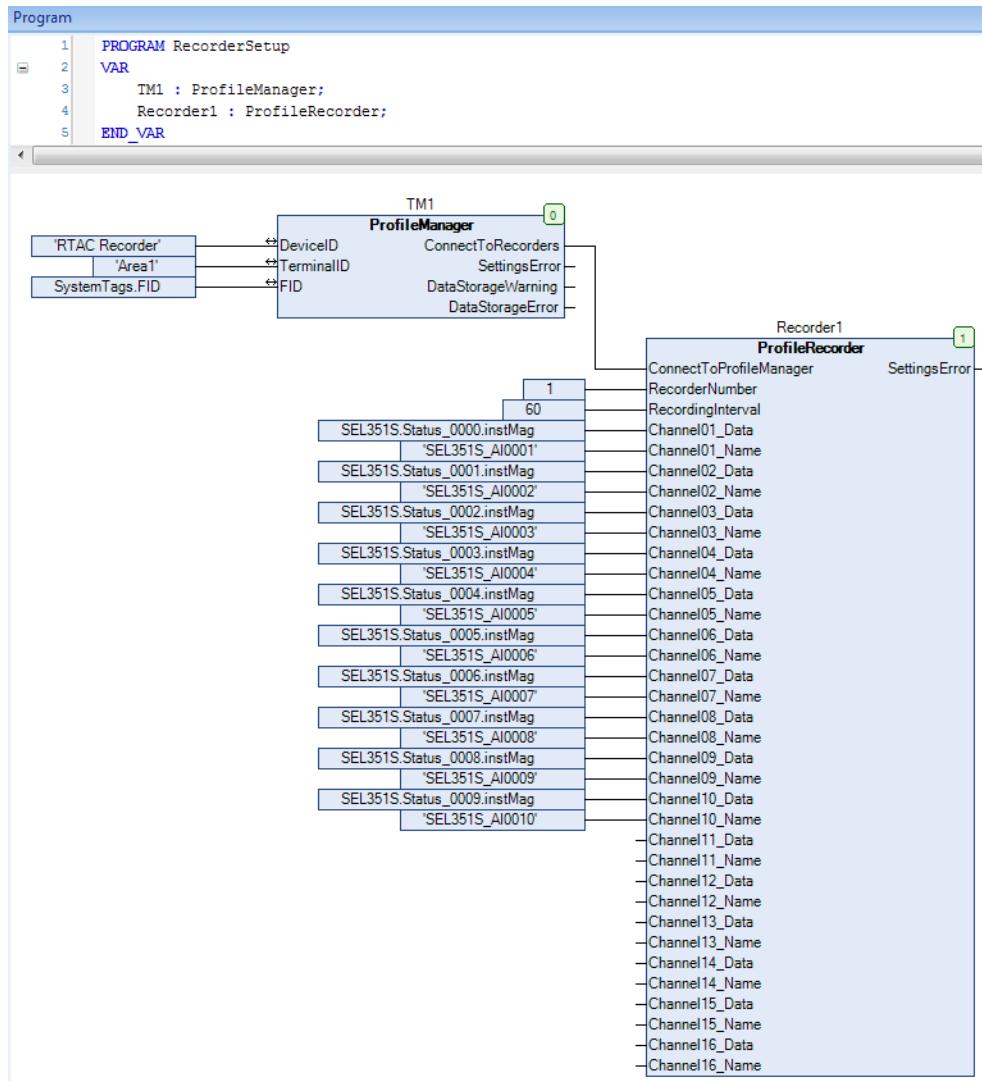


Figure 198 Configured Recorder Program

Step 13. Right-click in a blank area of the project tree and select **Add Access Point**.

Step 14. Enter **TEAM_Recorder** for the **Device Name** and set the **Connection Type** to **Ethernet Incoming (Listens for Connections)**.

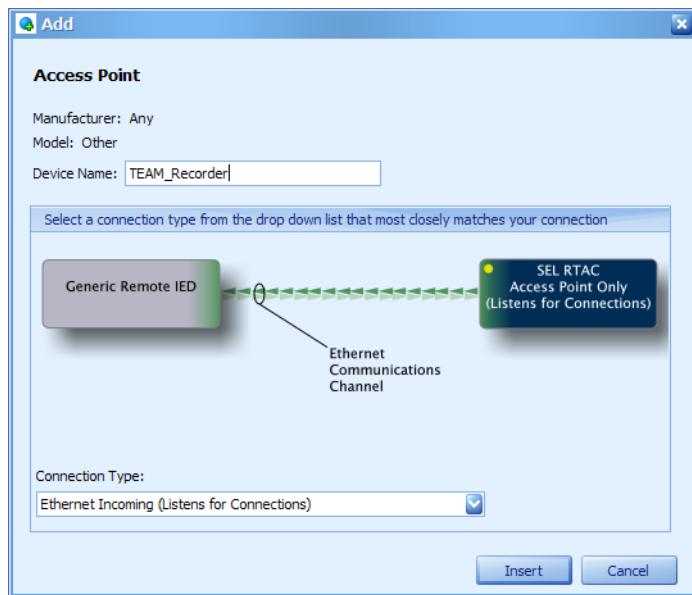


Figure 199 Add TEAM Access Point

Step 15. Set the **Network Connection Type** to **Telnet** and the **Local Port Number** to **23**.

TEAM_Recorder_AP				
Project Properties Recorder TEAM_Recorder_AP				
Other, Ethernet Incoming (Listens for Connections) [Access Point Protocol, AP]				
Settings	Setting	Value	Range	Description
	Network Connection Type	Telnet	Telnet,Raw TC...	Network Connection Type
	Local Port Number	23	1-65535	Local Port Number.

Figure 200 Access Point Settings

Step 16. Select the **Go Online** button.

Part 2: Configuration in TEAM

The configuration interface of TEAM is within Device Manager.

The following steps describe how to configure TEAM for RTAC Recorder profile collection.

- Step 1. Launch Device Manager.
- Step 2. Double-click the **TEAM** node and select the **DDC Instances** tab.
- Step 3. Select **Edit** in the lower right-hand corner of your display and then **Add** under the **DDC Connections** tab, as shown in *Figure 201*.

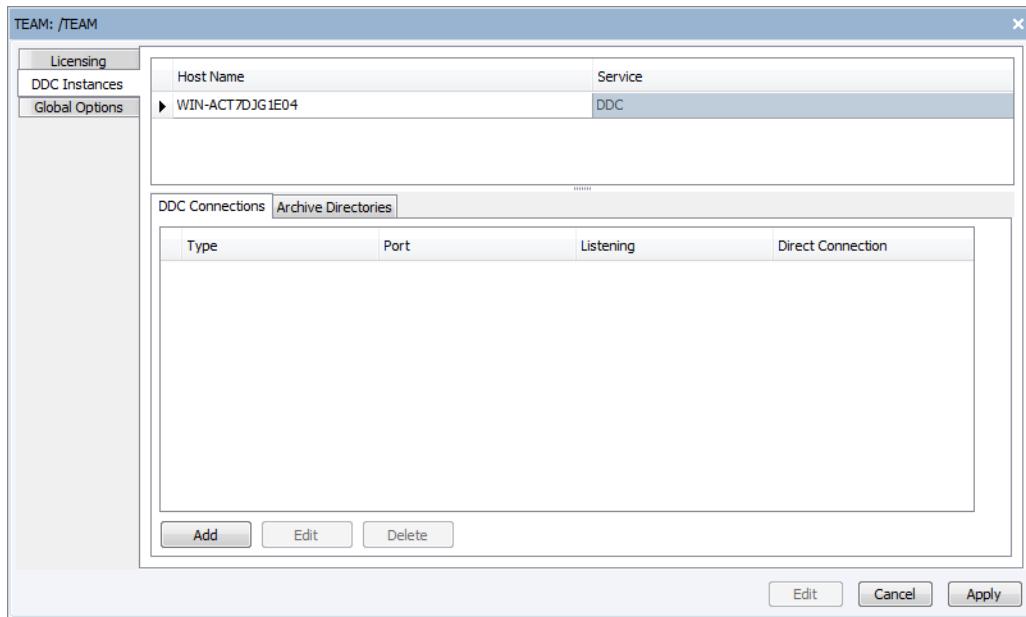


Figure 201 Add DDC Connection

- Step 4. Once the DDC Wizard launches, select **Next**, choose a **Telnet** connection, and then select **Next** two more times.
- Step 5. Select **Finish** to exit the wizard, and then select **Apply**.
- Step 6. Right-click in the Connection Explorer, select **Add > Device**, and add the **RTAC Recorder**, as shown in *Figure 202*.



Figure 202 Add RTAC Recorder Device Type

Step 7. Configure the RTAC Recorder by double-clicking **RTAC Recorder**, selecting **Edit** in the lower right corner, and then selecting the **In Service** check box on the **Device** tab.

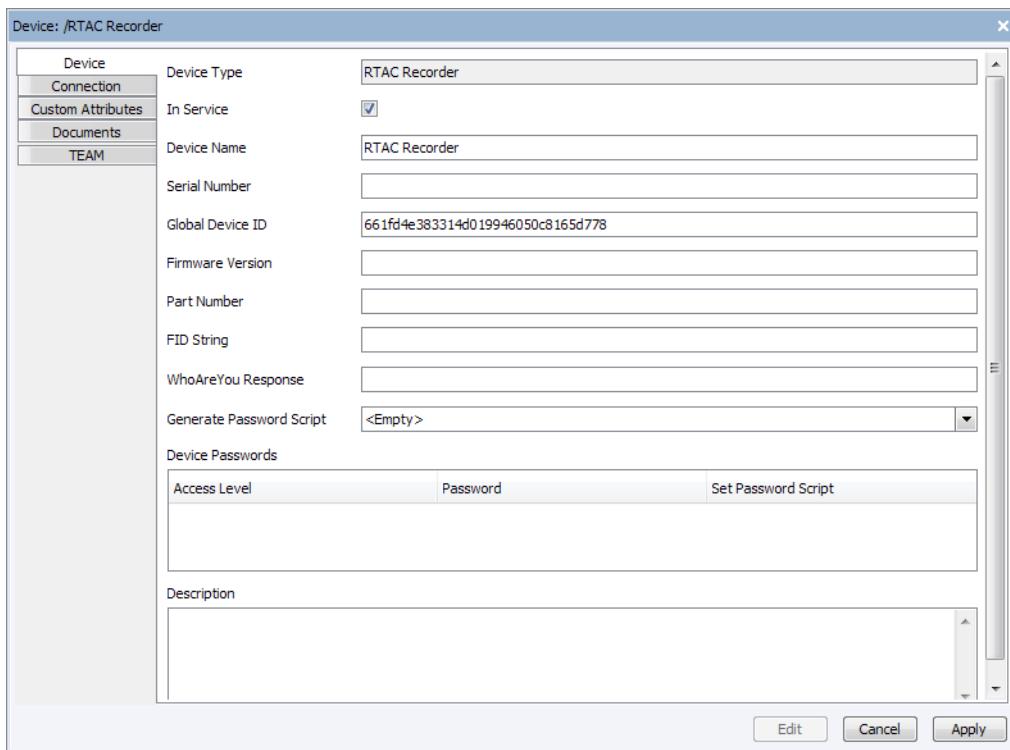


Figure 203 RTAC Recorder Device Tab Configuration

Step 8. Select the **Connection** tab, choose **Network** as the **Connection Type**, and enter the **Host IP Address** and **Port Number** of the RTAC, as shown in *Figure 204*. The Port Number must match the Access Point Telnet port, Port 23, configured in ACCELERATOR RTAC in Step 15 of *Part 1: Configuration in ACCELERATOR RTAC*.

Connection Type	Network	Host IP Address	192.168.0.10
		Port Number	23
		File Transfer Option	Telnet

Figure 204 RTAC Connection

Step 9. Select the **TEAM** tab. Select **Add** under **Communication Channel** to open the Server Configuration Wizard. Select through the wizard; no changes are necessary.

Step 10. Under **Polling Jobs**, select **Add** to open the Polling Job Wizard. Select the drop-down menu, change the **Job** to **Profile Collection** as shown in *Figure 205*, and select **Next**.

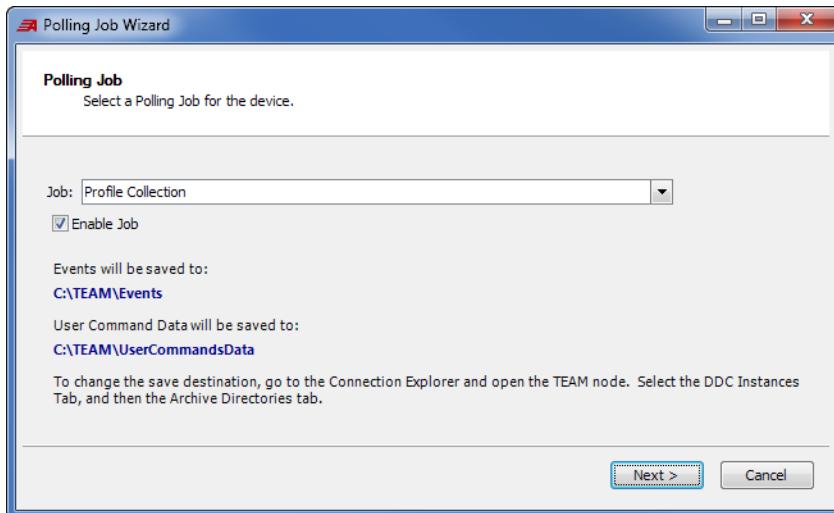


Figure 205 Profile Collection Job

Step 11. Enable the recorder(s) you configured in *Step 9 of Part 1: Configuration in ACCELERATOR RTAC* by selecting the **Selected** box, setting the **Beginning Timestamp**, and selecting **Next**.

Step 12. Configure the metering point (changing the default values if necessary) and select **Next**.

Step 13. Set the polling frequency (for testing purposes, set it to **Minutely**) and select **Next**.

Step 14. Set the polling interval (for testing purposes, leave the setting at **Every 1 Number of Minutes**), select **Next**, and then select **Finish**.

Step 15. Save all changes.

The TEAM-collected data are available for visualization with Meter Reports.

SER and VSSI Collection Polling Jobs

TEAM Metering Data Access

TEAM translates, normalizes, and stores in the ACCELERATOR Database all metering data it collects. You can access Profile, SER, and VSSI data through the use of the TEAM Web Server. If purchased, Meter Reports enhances the visualization and analysis of data captured by SEL meters in your system.

TEAM Device Data Synchronization

With TEAM Sync, you can synchronize device data that you have collected at multiple TEAM stations into one ACCELERATOR Database. A TEAM station refers to an installation of TEAM components (DDC, EDT), including an ACCELERATOR Database. For example, you may have TEAM installed and configured at several TEAM stations to collect and store events in local ACCELERATOR Databases. You can also install TEAM in another location, such

as a control center. TEAM Sync provides you the ability to consolidate, or synchronize, data in one database by moving device data from TEAM stations to the control center.

TEAM presently supports only event data and SOE data synchronization. There is no transfer of other data (settings, for example) in the ACCELERATOR Databases, so you should not consider TEAM Sync a database replication or backup system.

Introduction

TEAM Sync has two components: the TEAM Sync configuration application and TEAM Sync, a Windows service. The service runs in the background and transfers, or “pushes,” event data among TEAM stations. The configuration software lets you create and/or remove destinations, as well as configure specific data synchronization options for destinations.

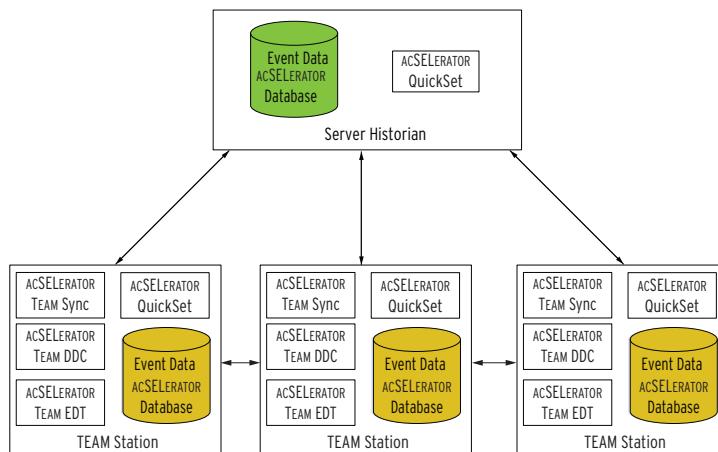


Figure 206 TEAM Event Data Synchronization

You can synchronize data among any ACCELERATOR Databases. A source database pushes data to destination databases. You can synchronize only data associated with a specific device, and TEAM will push data from a specific device (based on the Global Device ID you configure for the device in TEAM) to a given destination if a device with that same unique Global Device ID exists in the destination station’s ACCELERATOR Database.

Installation

TEAM Sync is on the ACCELERATOR TEAM SEL-5045 Software CD. You can install TEAM Sync on a single PC with one instance of the service and one ACCELERATOR Database. The TEAM Sync installer installs both the service and the application.

TEAM Sync Service

The TEAM Sync service is a Windows service that runs in the background and pushes data to destination stations. You can push data on demand or schedule the service to push data at regular intervals.

TEAM Sync Configuration

TEAM Sync configuration is a Windows application that lets you set up destination TEAM stations for data synchronization.

You can use the TEAM Sync graphical configuration tool for establishing your synchronization stations. You can use this tool to add and remove stations and easily establish connections from a local station to a destination station. The

application shows the stations and their interconnections on a diagram. A layout control lets you choose among several station layouts. A home symbol in the upper left corner of a diagram identifies the local station.

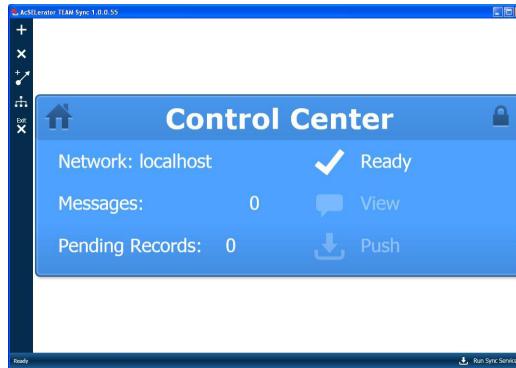


Figure 207 TEAM Sync Local Station

Allow Remote TEAM Station Access

If TEAM Sync attempts to connect to a station not configured for sharing the database, it displays an error message about a missing or erroneous pg_hba.conf file. You must edit the pg_hba.conf file on the destination station to grant access from other computers. If you do not grant remote access, you will be unable to use TEAM Sync to synchronize event data with other TEAM stations.

For Windows 7, it is in the following folder:

```
C:\ProgramData\SEL\AcSELerator\MasterDatabase\DatabaseServer\ 
Database\data
```

Uncomment the host entry that states **Remote TEAM Sync applications can connect**. Here is an example of an edited host entry:

```
host all team_sync 0.0.0.0/0      md5 # Remote TEAM Sync applications 
can connect.
```

After changing the file, restart the ACCELERATOR Database service.

First Run

Launch the TEAM Sync configuration application from the Windows **Start** menu. For the configuration application, you must have Windows administrative permissions. When you first run the application, it creates a local TEAM station name from your computer name. You can change the local station name by double-clicking the station in the diagram. In the dialog box, enter a unique station name and select the **Submit** button.

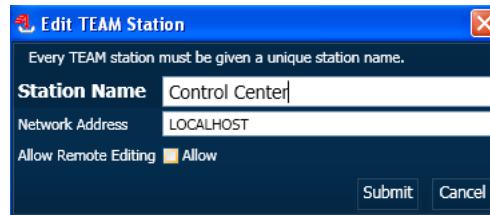


Figure 208 Configure Local Station

The local station will appear in the diagram with the home symbol. You can position the cursor over the header to view a tooltip for this station.

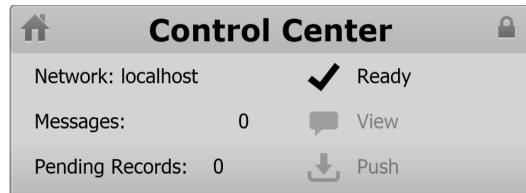


Figure 209 Example Local Station

This station node provides several indicators. The home symbol in the upper left corner of the diagram identifies this as the local station. The network address is localhost. The station is checked as Ready. There are no synchronization messages, and there are no pending records. If there are messages, the **View** button will be enabled and you can select this button to see messages. If there are pending records (data waiting to be synchronized), select the **Push** button to begin immediate synchronization.

Note the **Run Sync Service** button () in the lower right of the display. Select the **Run Sync Service** button to start the service when it is not operating.

The service must be stopped before you can edit TEAM Sync options. If the service is operating, select the **Stop Sync Service** button () to stop it.

Add and Connect to a Destination Station

Select the **Add Station** button () from the toolbar on the left of your display to add a new destination station. Import the connection key for the destination computer on which TEAM is installed. Refer to *Sharing Device Manager Database* in *Section 5: Manage Device Settings* in the *ACCELERATOR QuickSet SEL-5030 Software Instruction Manual* for information on how to create the connection key for the destination machine.

Press the **Connect** button to log in to this station. If the application cannot connect to this station, TEAM Sync replaces the checkmark next to the **Connect** button with a symbol indicating a connection failure. Position the cursor over this status area to view any error messages.

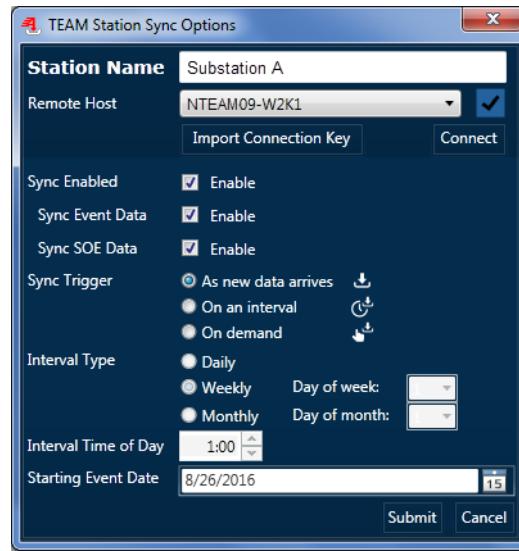


Figure 210 Add Remote Station

After you have entered a valid connection key for a destination TEAM station and connected to this station, select the **Submit** button to add a connection from the local station to this station.

TEAM Sync will log in to the destination station and add it and its associated synchronization stations in the diagram.

In the following example, our local station is named **Control Center**. TEAM Sync has connected to TEAM stations **Substation A** and **Substation B**. The arrows connecting the stations illustrate the direction in which synchronization data will flow. Position the cursor over a station to highlight the station and connected stations.

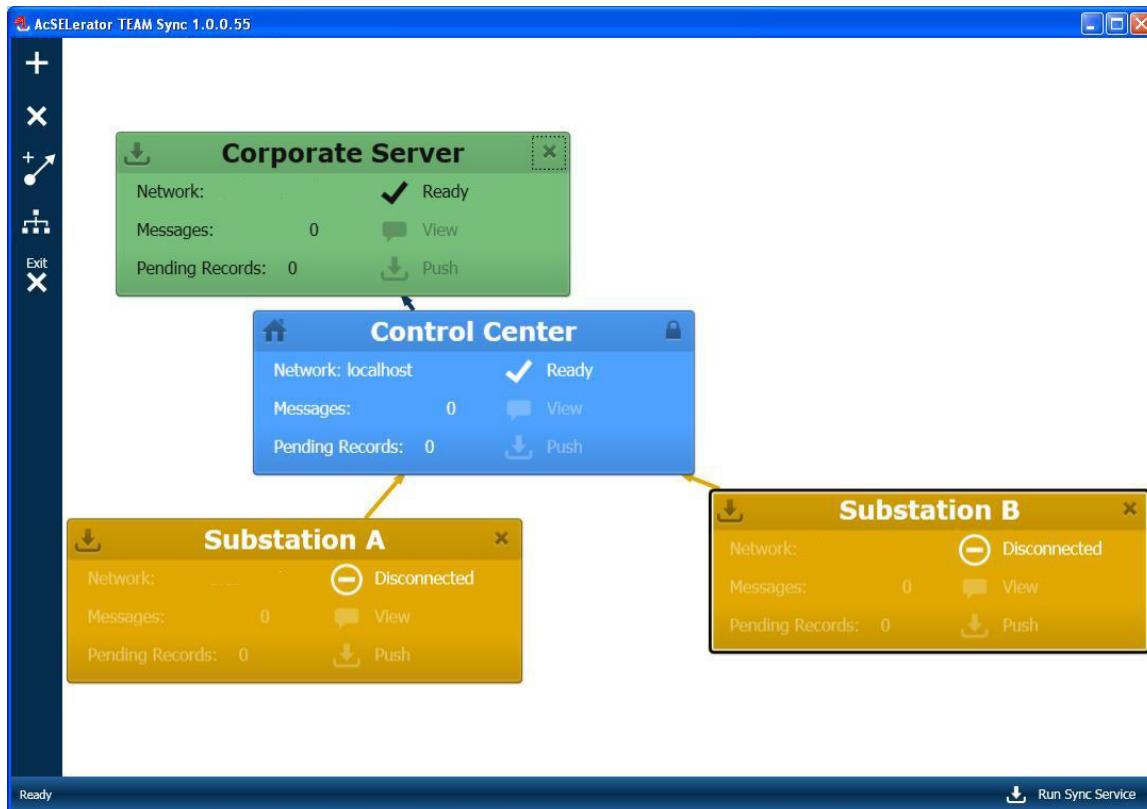


Figure 211 View TEAM Sync Status

The **Control Center** TEAM station is receiving event data from other TEAM stations. These stations (gold in the figure) are source stations for **Control Center**. The **Corporate Server** TEAM station is receiving device data from **Control Center**. In this example, TEAM Sync pushes device data from the substations to the **Control Center** and on to the **Corporate Server**.

You can change the layout display by selecting the **Layout** button (■). Each time you select this button, TEAM Sync cycles through several layouts based on your configuration.

TEAM Station Layout

The TEAM Sync graphical layout shows the network of TEAM stations and their connections. When you position your mouse cursor over a station, the color of that station turns blue to indicate that its relationship to the other stations is from its point of view. All TEAM stations pushing data to the focused station display in gold. Green stations indicate destination stations.

In the following diagram, the cursor is over the **Corporate Server**, which is receiving data from the stations shown in gold. The gold arrows indicate the direction of data flow.

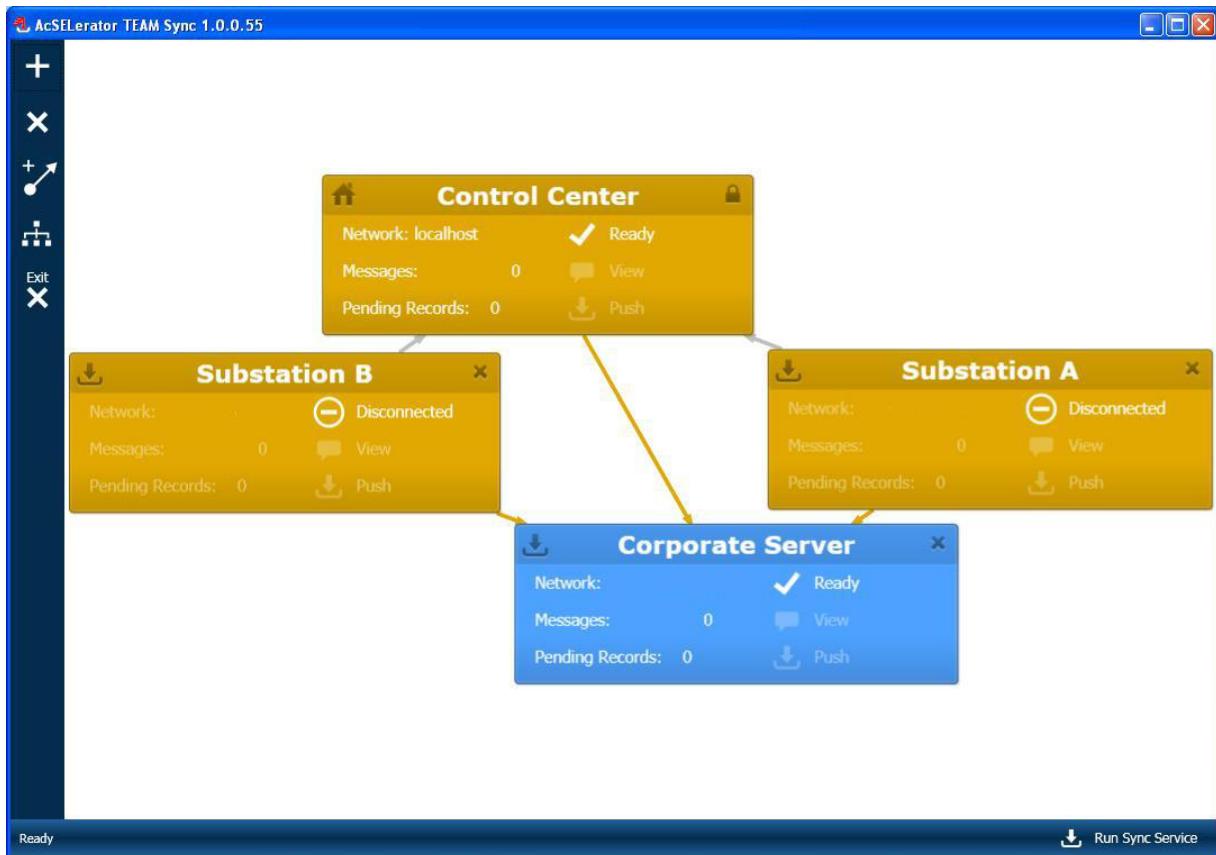


Figure 212 Push Data to Corporate Server

In the next example, the cursor is placed over the **Control Center** station. The diagram shows the two source stations (gold) pushing data (gold arrows) to the **Control Center** station. It also shows that the **Corporate Server** (green) is a destination station for data from the **Control Center**. The diagram always displays stations and data flow from the point of view of the station over which you have placed your mouse cursor.

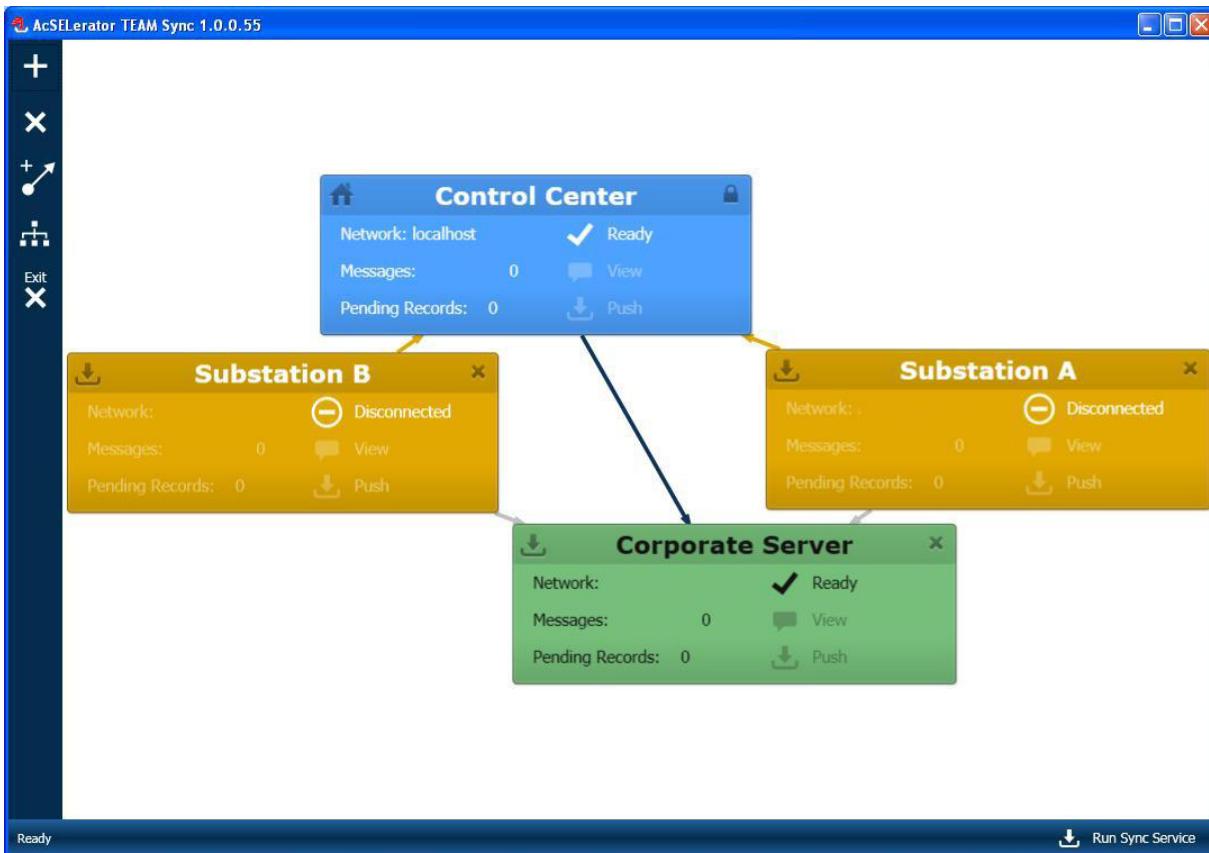


Figure 213 Station Data Sync Point of View

Add a Connection

You could add all your destinations by using the + button, but it is far easier to use the **Add Connection** button (checkbox) to connect to a station already on the diagram but which is not a destination for the local station. For example, you can select **Corporate Server** to select this station and then use the Add Connection button to add this as a new destination.

You will see the same dialog box as with the **Add Station** button. Select **Import Connection Key** and enter the connection key of the destination station. Adjust the synchronization options as needed, use the **Connect** button to connect to this station, and select the **Submit** button to make this a new destination.

Remove a Station

There are several ways to remove a station so that it is no longer a source or destination for the local station. You may also want to remove stations not directly connected to the local station but which exist in the diagram because they are connected to a station that is connected to the local station.

You can remove a station from the diagram by doing one of the following:

- Select the station and select the X toolbar button.
- Select the station and press the <Delete> key on your keyboard.
- Select the X in the upper right corner of the station (there is no need to first select the station).

In some circumstances, removing a station leaves formerly connected stations in the diagram. To remove these leftover stations, perform the following.

1. Select the station.
2. Press the <Delete> key on your keyboard, or select the X button in the upper right corner.

Use the same technique to remove stations not directly connected to the local station. This is useful for decluttering the diagram to display only stations in which you are interested.

If you attempt to remove a station that is a destination, TEAM Sync will prompt you for confirmation. If the station is both a destination and a source, the first removal operation removes it as a destination. If you select remove again, you also remove the station as a source station.

If you remove a source station, and this station is configured to push to your local station, the pushing station will restore the source.

Synchronization Options

When you add a destination for synchronizing event data, TEAM Sync presents you several options in the **TEAM Station Sync Options** dialog box.

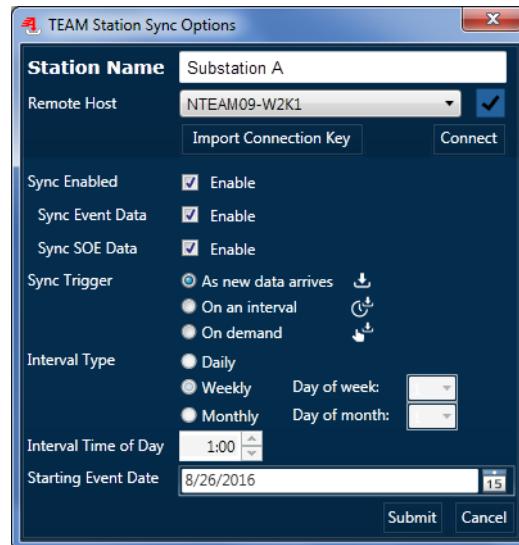


Figure 214 Station Synchronization Options

You must first check the options for **Sync Enabled** (enable/disable) as well as **Sync Event Data**. In the future, other types of data in addition to device events will be available.

The **Sync Trigger** options provide several mechanisms for triggering the pushing of device data from the local to remote stations. The default is to copy the data **As new data arrives**. You can also elect to perform synchronization **On an interval** or **On demand**. Selecting **On demand** results in TEAM Sync synchronizing data only when you explicitly tell it to push data from the source to the destination.

When you select **On an interval**, TEAM Sync presents you further options to specify when synchronization will take place. You can synchronize daily, weekly, or monthly at the time of day you select. For weekly and monthly options, you can also specify the day of the week or the day in the month.

Note that the time of day selection always forces a minimum of 10 minutes prior to midnight to give the TEAM Sync service the opportunity to catch this interval.

Local Station Name

Every TEAM station must have a unique name. TEAM Sync adds the local name when you first launch the application. Change this name at a later time by ensuring that the service is stopped and then double-clicking the local station to obtain a dialog box in which you enter the new name.

Edit a Destination

When the synchronization service is stopped, you can edit a destination's options by double-clicking on the station or by selecting the station and pressing <Ctrl+E>.

Key Bindings

The following are TEAM Sync keyboard shortcuts. Note that the TEAM Sync service must be stopped when you perform editing. Note also that the command applies to the station you have selected. To select a station for editing, left-click with your mouse on the station. A bold outline will appear around the station to indicate selection. To deselect the station, left-click with your mouse again on the station.

Key	Command
<Ctrl+N>	Add Station
<Ctrl+K>	Add Connection
<Delete>	Remove Station
<Ctrl+U>	Push Now (works when the service is operating)
<Ctrl+E>	Edit Station
<Ctrl+L>	Edit Local Station Name
<Ctrl+M>	View Synchronization Messages (works when the service is operating)
<Ctrl+R>	Reformat Diagram (works when the service is operating)
<Alt+F4>	Exit (works when the service is operating)

TEAM Transmission Fault Location

Accurate transmission line fault location information is very valuable to power utility companies. When these companies have accurate fault location information with minimal delay, they spend less time locating the fault and restoring service. Most power utility companies today rely on the fault location information they receive from digital protective relays or other IEDs that use local or single-end measurements. However, several factors such as fault resistance, the degree of nonhomogeneity of the power system, load flow, and mutual coupling between adjacent lines can affect the performance of the single-end measurement methods.

Multiterminal-based fault location methods that use information from all terminals of the transmission line increase the accuracy of the computed fault location. TEAM Transmission Fault Location (TFL) uses a two-terminal fault location method based on event information that relays collect at the transmission line's end terminals.

Two-Terminal Fault Location

TEAM TFL receives time-stamped event reports from IEDs, or digital fault recorders (DFRs), at either terminal of a transmission line, checks to see if the events are associated with any of the configured transmission lines, time-aligns the event records, and executes the two-terminal fault location algorithm. It then displays the computed fault location and, if configured, sends the result via email to subscribed users.

This version of TEAM TFL supports the following SEL relays:

SEL-311A	SEL-351	SEL-411L	SEL-421	SEL-451-1	SEL-487B
SEL-311B	SEL-351-1	SEL-411L-1	SEL-421-1	SEL-451-2	SEL-487E
SEL-311C	SEL-351-2		SEL-421-2	SEL-451-4	SEL-487E-2
SEL-311L	SEL-351-3		SEL-421-3	SEL-451-5	SEL-487V
SEL-311L-1	SEL-351-4		SEL-421-4		SEL-487V-1
SEL-311L-6	SEL-351-5		SEL-421-5		
SEL-311L-7	SEL-351-6				
	SEL-351-7				
	SEL-351S-5				
	SEL-351S-6				
	SEL-351S-7				

Note that the two end-terminal relays must be in the same time zone.

Configure TEAM TFL

Prior to configuring TEAM TFL, configure TEAM to retrieve event reports from the terminal devices. To set up TEAM TFL, you must first define and configure the transmission line and the two terminal devices.

Double-click on the **Transmission Fault Location** node in the Connection Explorer to display the **Terminal Fault Location** form shown in *Figure 215*.

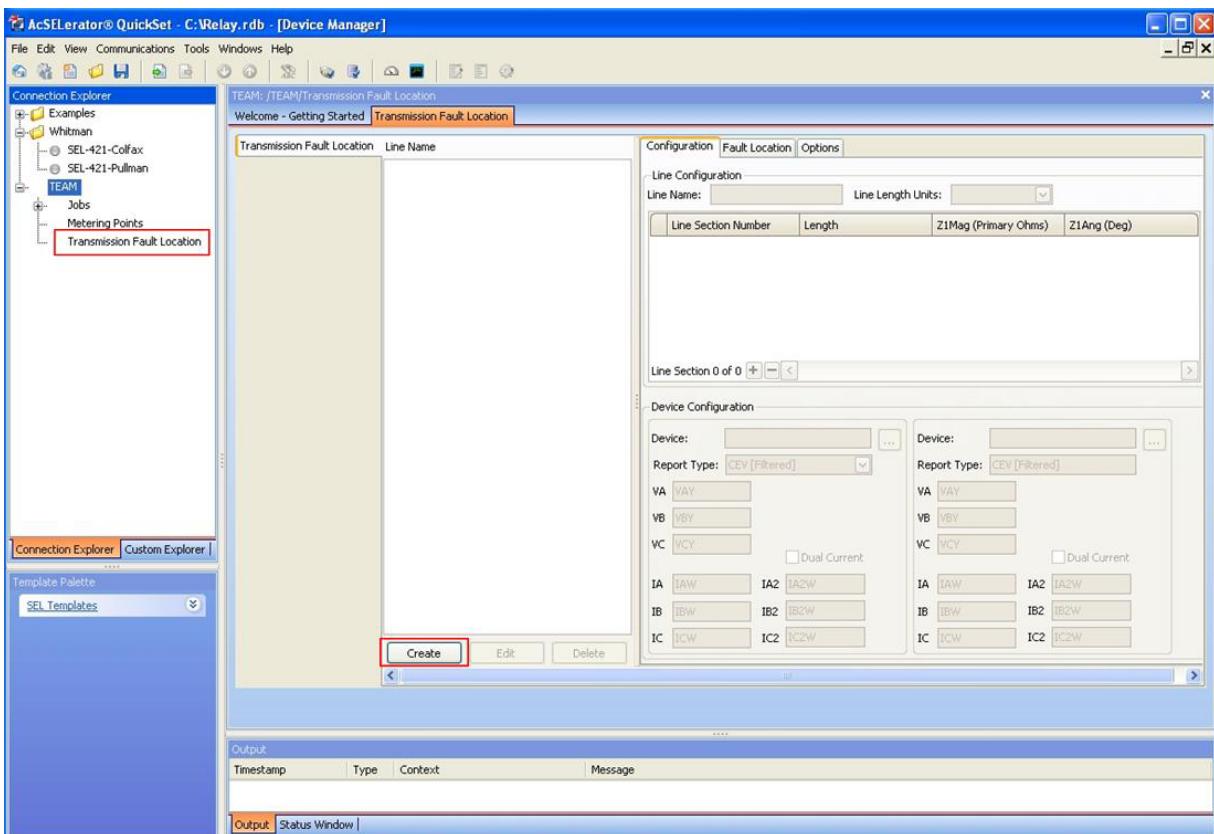


Figure 215 Transmission Fault Location Configuration Form

In the **Line Name** area, select **Create** and enter the name of the transmission line in the pop-up form.

Next, select the **Configuration** tab to define the characteristics of the transmission line and to configure the terminal devices.

TFL accommodates multiple sections, to account for nonhomogeneous transmission lines (sections with different X/R ratio). *Figure 216* shows one such transmission line with three sections, each with a different X/R ratio; sections 1 and 2 are overhead lines with different tower configurations, and the third section is an underground cable.

By defining the characteristics of each line section, the TFL can take the impedance variations into account and provide an accurate estimate of the fault location in the identified faulted section. For homogeneous transmission lines, you will add only one section.

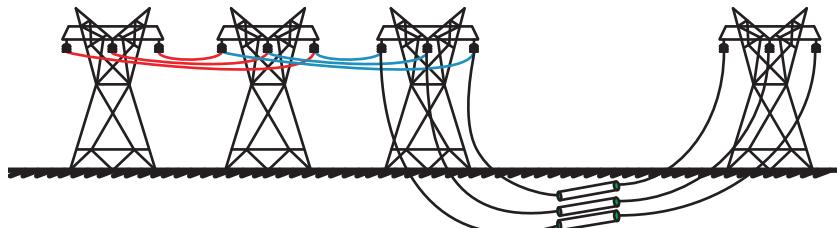


Figure 216 Two-Terminal Line With Three Sections

For each line section, specify its length and positive-sequence impedance magnitude ($Z1Mag$) and angle ($Z1Ang$) by editing the appropriate fields in the **Line Configuration** area of the form (see *Figure 217*).

Line Section Number	Length	Z1Mag (Primary Ohms)	Z1Ang (Deg)
1	19	10.6	84.8
2	4	1.52	82.6
3	3	0.49	86.6

Line Section 3 of 3 [+] [-] [<] [>]

Figure 217 Configuration of a Transmission Line With Three Sections

Select ([+]) to add a new line section. To delete a section, select the leftmost column of the row and then select ([-]).

Define and configure the end-terminal relays in the **Device Configuration** area of the form shown in *Figure 218*.

Figure 218 Configuration of the Event Recording Device

Select the ellipsis in the **Device** edit box to display the **Device Assignment** dialog. Select from the tree the device that you want as an end-terminal device. Then, in the **Report Type** edit box, select the type of event report (COMTRADE or CEV Filtered) you want that device to collect. Repeat for the other end-terminal device.

Finally, define the voltage and current labels for each device. These labels must match those that you will find within the collected event reports. TEAM TFL supports dual current configurations to accommodate breaker-and-a-half applications. In these applications, you must select the **Dual Current** check box and select six current channels when you use COMTRADE files.

After you have completed the TFL configuration, be sure to save your settings. You will now receive a notification when a fault occurs on the transmission line.

View Results

You can view a history of all calculated transmission fault locations by selecting the **Fault Location** tab. Each row of the fault location grid represents a summary of a line fault. The time of the fault, the fault location, the fault type, and the line section number in which the fault occurred display as shown in *Figure 219*.

Figure 219 Fault Location Events

Select the plus sign to display the **Event Reports** grid (see *Figure 220*). To view a display of the event waveform associated with the end-terminal device, double-click the path name under **View Waveform**.

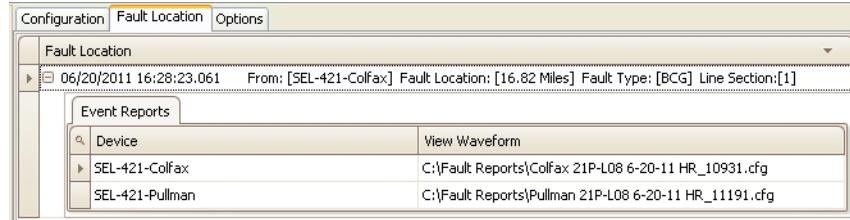


Figure 220 Event Reports

For example, double-click on the first event to display the waveform graph, shown in *Figure 221*, for the event report SEL-421-Colfax captured in the previous figure.

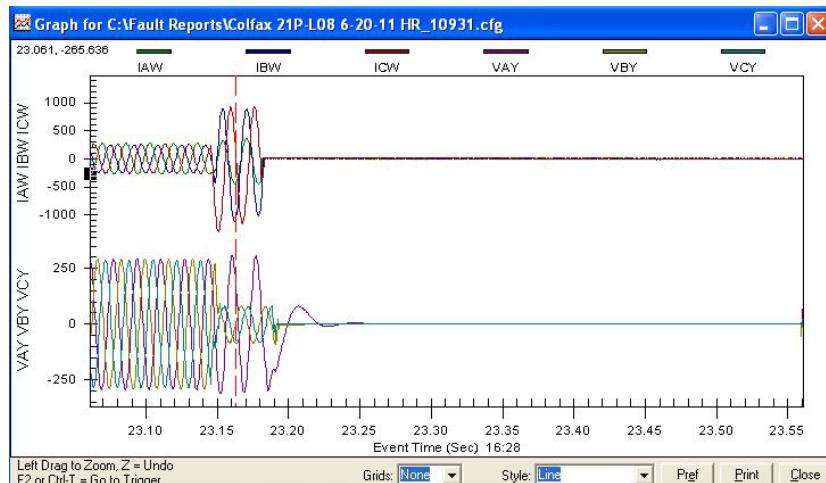


Figure 221 SEL-421 Colfax Event Report

TFL Options

Select the **Options** tab to open the options window shown in *Figure 222*. You can receive automatic email notifications of TFL fault location estimations for each line you configure. You must provide a list of recipients for each notification you set up. You can also check whether or not to include copies of the event reports as attachments.

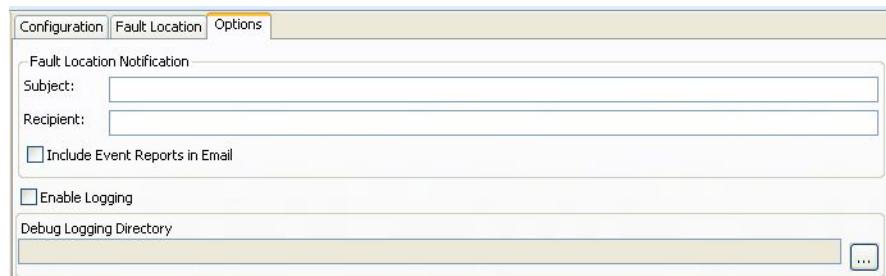


Figure 222 TFL Options

You must also provide information for accessing an email server from which you can generate emails (see *Email Server Tab on page 17*).

Check **Enable Logging** to create a log file for storing TFL log messages in a directory you specify.

Add Event Reports

You may have event reports available that TEAM did not collect. You can use the TEAM Event Viewer to import those event reports manually for the purpose of calculating transmission fault locations. Refer to *Functions on page 72*.

As soon as the import completes, TEAM calculates and displays the transmission fault locations.

TEAM Security

Integration of SEL security devices with TEAM provides an extra layer of protection when collecting events and managing passwords and devices. Through the use of TEAM Security, you can automate the generation and management of configured device passwords, secured event collection, and the collection of security logs. This automated functionality helps satisfy NERC CIP requirements.

Supported security devices include the SEL-3620 Ethernet Security Gateway, the SEL-3622 Security Gateway, and the SEL-3025 Serial Shield.

License TEAM Security

TEAM Security encompasses password management and collection of security logs for SEL security devices. Licensing is based upon the number of security devices from which you are collecting. This license can be combined with TEAM licenses for Events, Profile, or Transmission Fault Location. Licensing details for the different TEAM options are specified in their corresponding sections.

Configure TEAM Security

Configure TEAM to gather security logs or to generate device passwords on a specified interval. The following example describes the configuration of both scenarios.

Example 14: Gather Security Logs and Generate Device Passwords

This example configures TEAM to collect security logs from an SEL-3620 Ethernet Security Gateway and to automatically trigger password changes on devices configured under the SEL-3620.

Prerequisites

Perform the following before completing the example:

- Configure an SEL-3620 user account called **TEAM**.
- Configure an SEL-3620 user local group called **Technician** with **TEAM** as a local user.
- Set the SEL-3620 IP Address to **192.168.1.2**.
- Add a scripting-enabled Master port to the SEL-3620.

Create a Secure Password and User

NOTE: Lightweight Directory Access Protocol (LDAP) authentication may be used in place of a static user and password, for further security and user control. Refer to the SEL-3620 Instruction Manual for information on how to configure LDAP with the SEL-3620 and QuickSet Device Manager. Use of LDAP for authentication would not change configuration of TEAM. Configured LDAP users would be used in place of the static TEAM account throughout this example, so the Create a Secure Password and User section can therefore be skipped.

NOTE: This username and password must exactly match those in the SEL security device web interface.

The following steps configure the secure passwords that both TEAM and the SEL security device use for permissions and connections.

- Step 1. With Device Manager open, select **Tools > Device Manager > Passwords**.
- Step 2. Right-click in the white space on the left side and select **Add > Password**.
- Step 3. Double-click **New Password** and select **Edit**.
- Step 4. Change the **Password Title** and **Username** to **TEAM**.
- Step 5. Change the **Password** field to the credentials created in the SEL-3620 (see *Prerequisites*).
- Step 6. Select **Apply**.
- Step 7. Select **Tools > Device Manager > Users**.
- Step 8. Right-click **Local Users** and select **Add**.
- Step 9. In the **Create User** window, enter the following information into the **User** tab and select **OK**.

User Name:	TEAM
Password:	This should match the password you created in <i>Step 5</i> .
Reenter Password:	This should match the password you created in <i>Step 5</i> .

- Step 10. Right-click **Local Group** and select **Add**.
- Step 11. In the **Create Group** window, enter the following information into the **Group** tab.

Group Name:	Technician
-------------	------------

- Step 12. Select the box to the left of **Allow log on to the AcSELerator Database**.
- Step 13. Select the **Members** tab and select **Add**.
- Step 14. Add the **TEAM** user you created in *Step 9 on page 151*.
- Step 15. Select **OK**.
- Step 16. Select **Save All** (💾) to apply the changes.

Gather Security Logs and Automate Password Generation

This section explains how to use TEAM to automate the collection of security logs from SEL security devices. Security logs include a listing of all commands sent to the devices configured under the SEL security device. For SEL security device configuration, refer to the corresponding device instruction manual.

NOTE: This group must match exactly what was added in the SEL security device web interface.

Automate the management of connected device passwords according to a defined schedule. Both security log collection and password management use the same TEAM collection job.

- Step 1. Use the username **TEAM** and the password you created in *Step 5 of Create a Secure Password and User on page 151* to log in to the ACSELERATOR Database.
- Step 2. In Device Manager, right-click in the Connection Explorer and select **Add > Device**.

NOTE: If you are already logged into Device Manager, select the database icon (Database: Local) in the lower right corner of QuickSet to change users.

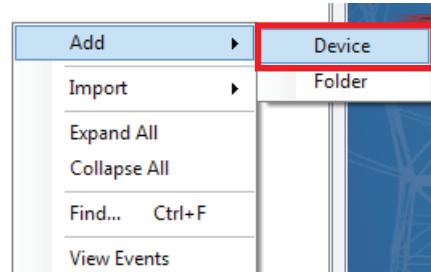


Figure 223 Add a Device to the Connection Explorer

- Step 3. Select **SEL-3620** and select **OK**.

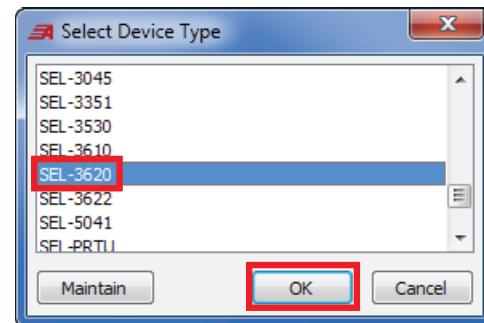


Figure 224 Select the SEL-3620

- Step 4. Right-click the newly added **SEL-3620** and select **Add > Device**.
- Step 5. Select **SEL-300G** and select **OK**.
- Step 6. Double-click **SEL-3620** to open its Workspace and then select **Edit**.

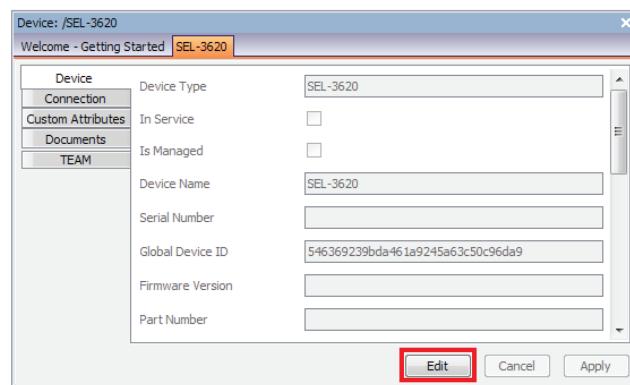


Figure 225 Edit the SEL-3620 Workplace

- Step 7. Select the check boxes to the right of **In Service** and **Is Managed**.

Step 8. Select the **Connection** tab and change parameters as follows:

Connection Type:	Network
Host IP Address:	192.168.1.2
Port Number:	22
Port Number (HTTPS):	443
File Transfer Option:	HTTPS

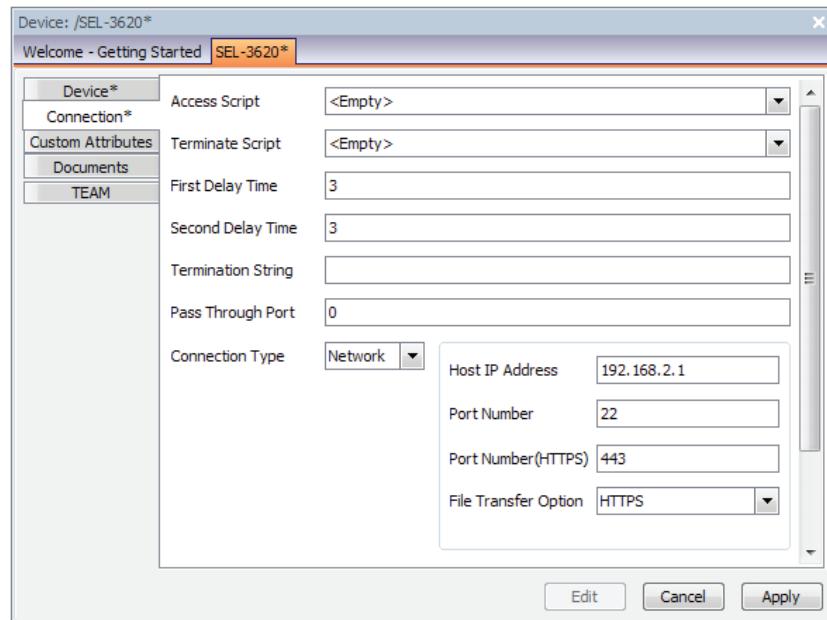


Figure 226 Assign the SEL-3620 Connection Parameters

Step 9. Select the **TEAM** tab and select **Add** under the **Communication Channel** section.

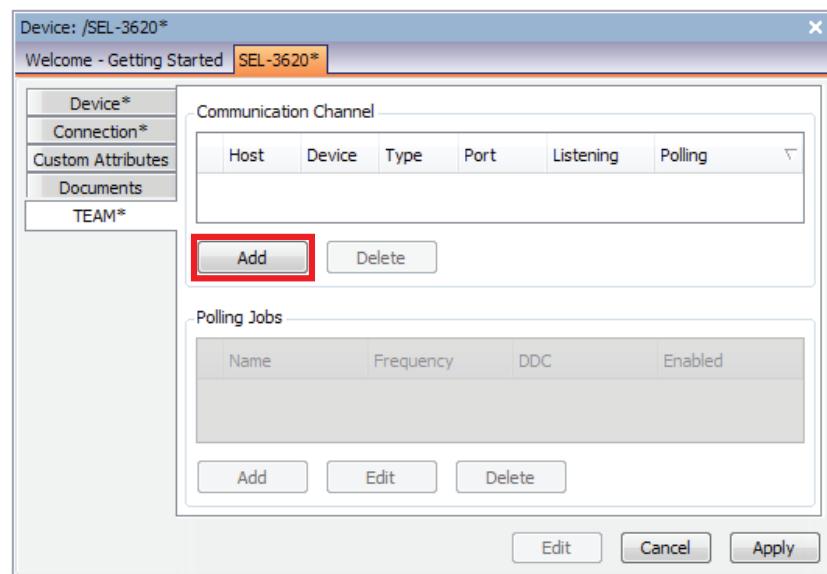


Figure 227 Add the Communication Channel

Step 10. In the **Server Configuration Wizard** that displays, select **Next**.

Step 11. Highlight the **Host Name** of the DDC service you want to use and select **Next**.

Step 12. Select a non-listening network service connection and select **Next**.

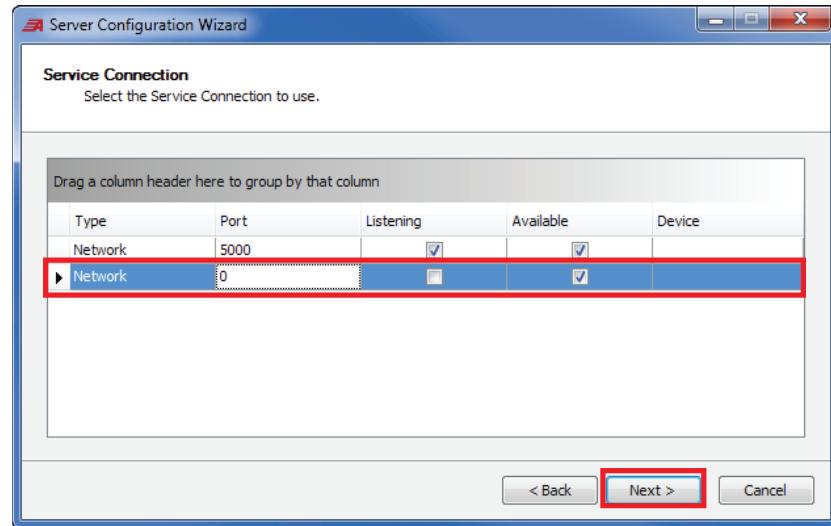


Figure 228 Select the Service Connection

Step 13. Select **Finish** to close the **Server Configuration Wizard**.

Step 14. Under the **Polling Jobs** section, select **Add**.

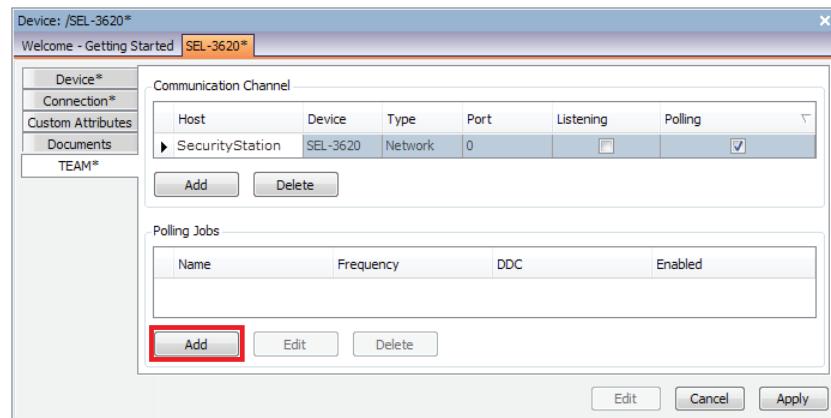


Figure 229 Add the Polling Job

Step 15. In the **Polling Job Wizard** that displays, select **Next** until the **Polling Job** window displays.

Step 16. In the **Job** drop-down menu select **3620 Log Collector Job**, ensure that the **Enable Job** check box is selected, and select **Next**.

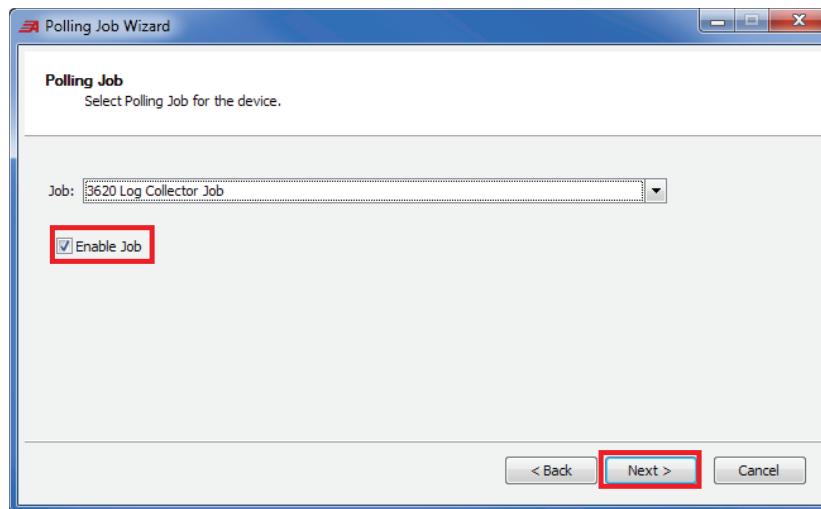


Figure 230 Configure the 3620 Log Collector Job

NOTE: This account must be configured both in the SEL-3620 and in the User Manager. Instructions for configuring this account on the SEL-3620 can be found in the SEL-3620 instruction manual.

NOTE: If you do not want to automatically manage passwords, do not select the check box next to **Generate and apply new passwords**.

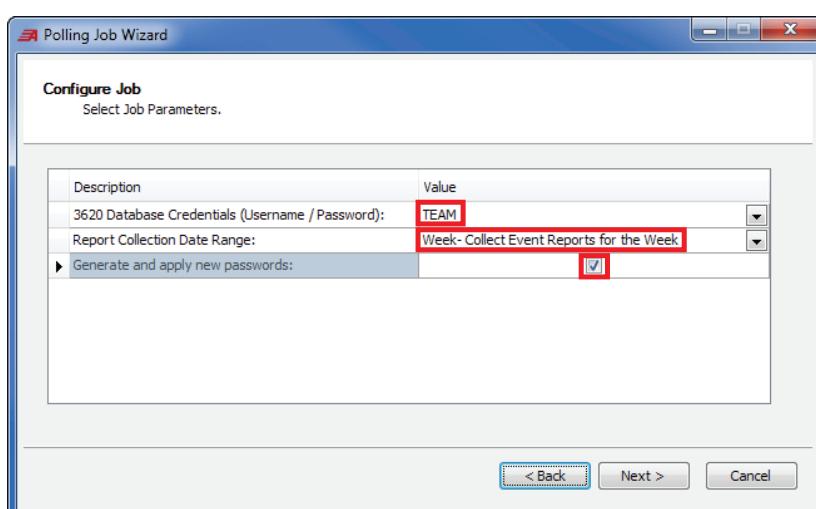


Figure 231 Configure the User Account, Collection Data Range, and Password Management

Step 17. In the drop-down menu to the right of **3620 Database Credentials (Username / Password)** select the **TEAM** user account.

Step 18. Change the value for the **Report Collection Data Range** to **Week – Collect Event Reports for the Week**, and select **Next**.

Select the check box to the right of **Generate and apply new passwords**, and then select **Next**.

Step 19. Set the **Polling Frequency** to **Daily**, and select **Next**.

Step 20. Set the Daily Polling Interval to **Every 7 Number of Days**, set the **Time of Day** to **01:00 AM**, and select **Next**.

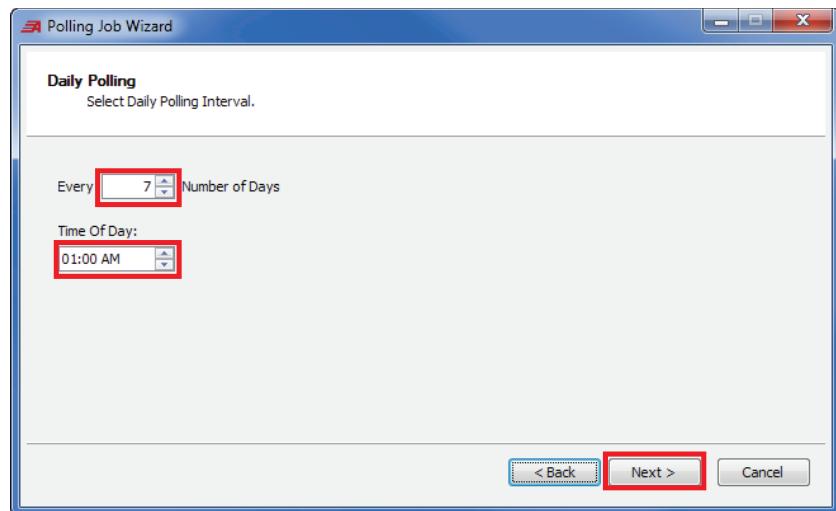


Figure 232 Set the Daily Polling Interval

Step 21. Select **Finish** to close the **Polling Job Wizard**.

Step 22. Select **Save All** (disk icon) to apply the changes.

Step 23. Double-click **SEL-300G** and select **Edit** in the lower right corner.

Step 24. Change the **Global Device ID** to **SEL-300G**.

Step 25. Select the **Connection** tab and enter a value of **1** for the **Pass Through Port**.

Step 26. Edit the connection parameters to match those in the device. In this example, **Data Speed** is **19200**.

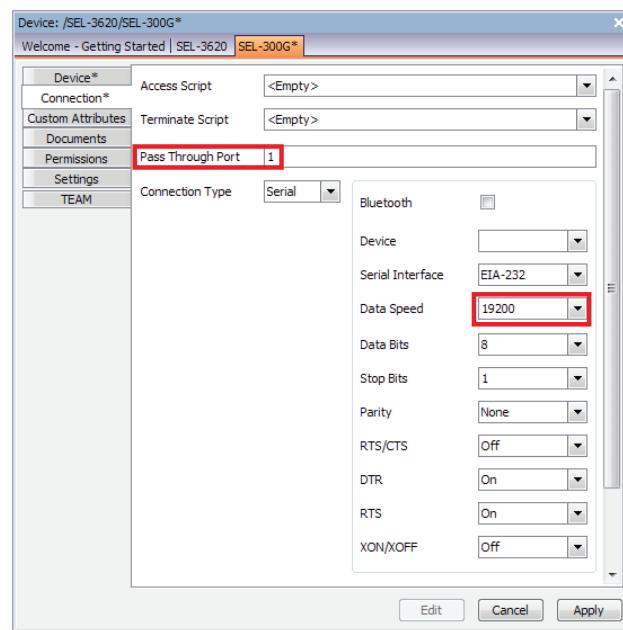


Figure 233 Configure the SEL-300G Connection Parameters

Step 27. Select **Save All** (disk icon) to apply the changes.

Step 28. Right-click **SEL-3620** and select **Device Tasks > Send**.

Automated Data Management

As the amount of information being collected from power systems increases and regulatory requirements for data retention continue to be introduced, memory management and data retention become very important considerations. TEAM provides an automated solution to help control memory usage, while adhering to customizable retention rules. TEAM uses a configurable job that deletes data at a defined interval from designated data ranges.

Configure a Device for Data Management

The automated data management job is similar to TEAM collection jobs in that it is assigned at a device level. This provides a way for different management settings to be used for different devices. To add an automated data management job to your device, perform the following steps.

- Step 1. Double-click the device in the Connection Explorer and then select the **TEAM** tab.
- Step 2. Select **Edit** (lower right of the device tab) to activate the tab.
- Step 3. Select **Add** to display the **Polling Job Wizard**.
- Step 4. Under **Polling Job**, choose **Automated Data Management Job**.
- Step 5. At the next window, configure the job parameters in the **Configure Job** window. The next section describes the parameters this window contains.
- Step 6. Configure your polling interval and select **Finish** to end the wizard and apply the job.

Data Management Parameters

The **Configure Job** window for the automated data management job, as shown in *Figure 234*, has five different configurable parameters to provide numerous permutations of different data management methods.

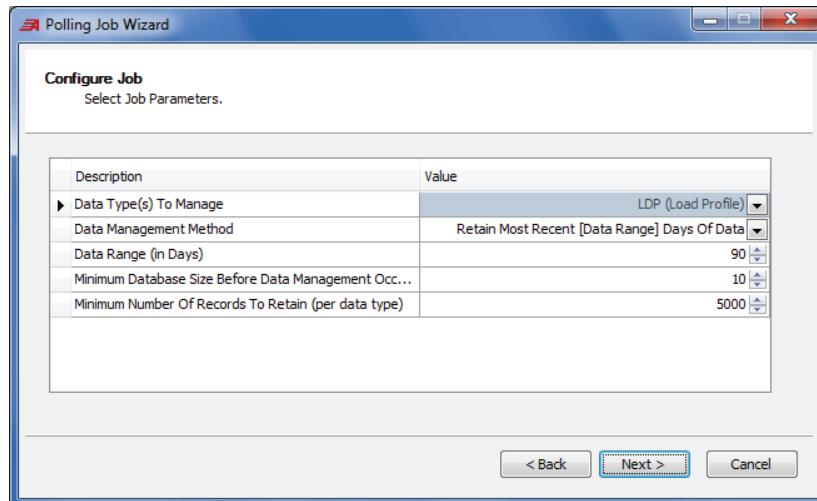


Figure 234 The Configure Job Window for the Automated Management Job

Data Type(s) to Manage

Use the automated data management job to manage the following data types:

- **LDP (Load Profile)**—Data gathered from the profile collection job
- **Oscillography (Event Reports)**—Data gathered from event collection tasks
- **SOE (Sequence of Events)**—Data gathered from the RTAC SOE collector and SER collection jobs
- **VSSI (Voltage Sag/Swell/Interrupt)**—Data gathered from the VSSI collection job

Additionally, the automated data management job has three combination options:

- **All**—All four data types previously listed
- **All Event Data**—Oscillography (event reports) and SOE
- **All Metering Data**—LDP and VSSI data

Data Management Method

Retain Most Recent [Data Range] Days of Data

This option will always retain the data designated by the configured data range. The automated data management job will delete any data that fall outside the specified range. Choose this option if you know the exact range of data you want to keep and do not necessarily want to consume all available disk space. If this option is selected, data will not be managed until three user-defined criteria are met:

- The Minimum Number of Records to Retain setting has been met.
- The Minimum Database Size Before Data Management Occurs setting has been met.
- The [Data Range] setting has been met.

Once all three criteria are met, all data outside the specified data range will be deleted as illustrated in *Figure 235*.

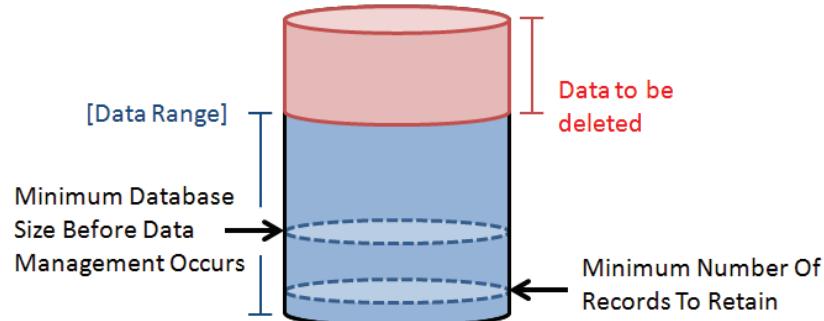


Figure 235 The Database Management That Occurs When Retain Most Recent [Data Range] Days of Data Option Is Used

Delete Oldest [Data Range] Days of Data

NOTE: Data in the database are organized into groups. Each group represents the set of new data collected at any given time. Because of these groups, use of the Delete Oldest configuration may cause deletion of more data than expected. This can occur if the oldest group of data points contains more days of data than the Data Range specified and the removal of this group of data points does not reduce the number of data points in the database to less than the Minimum Number of Records to Retain. In this case, the last group of data points will be deleted even though such deletion will remove more data than the Data Range parameter specified.

This option will begin deleting the oldest saved data once the minimum database size and minimum number of records have been reached. Use this option if you want to keep as much data as possible but do not want a designated retention period. If this option is selected, data will not be managed until two specified criteria are met:

- The Minimum Number of Records to Retain setting has been met.
- The Minimum Database Size Before Data Management Occurs setting has been met.

Once these two criteria are met, all data inside the specified data range will be deleted as illustrated in *Figure 236*.

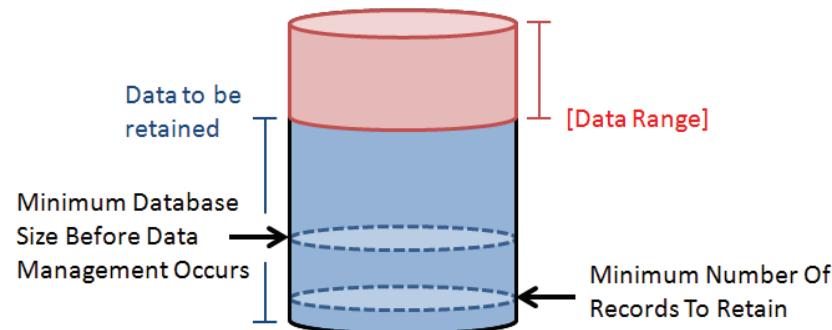


Figure 236 The Database Management That Occurs When Delete Oldest [Data Range] Days of Data Option Is Used

Numerical Settings

[Data Range]—Either the range of time to be deleted (when combined with the Delete Oldest [Data Range] Days of Data option) or the range of time to be retained (when combined with the Retain Most Recent [Data Range] Days of Data option). The data range is specified in days.

Minimum Database Size Before Data Management Occurs (GB)—Size that the database must reach before data management actions will begin. The size is specified in Gigabytes (GB).

Minimum Number of Records To Retain (per data type)—Number of records that must be obtained before data management actions will take place. Use this setting to prevent data from unnecessarily being deleted. For example, if you configure the automated data management job to retain one month of oscillographic event data and there is a month during which no events occur, this setting preserves a specified number of events and prevents all of your records from being deleted. This is not a cumulative setting; this setting is the number of records to be retained for each individual data type within the automated data management job.

Recommended Data Management Practices

SEL recommends the following data management practices:

- Run the automated data management job once a week, which is an hourly schedule of 144 hours.
- Retain the most recent 180 days of data.
- Perform data management when database size begins to be 80 percent of allowed maximum disk space size.

TEAM Web Server

NOTE: The TEAM Web Server shows only collected reports, whereas the TEAM viewers available in Device Manager may show instances of summary data in addition to collected reports. This may cause a visual difference between the different data viewers.

TEAM (versions 1.38.1.0 and newer) provides a read-only web server view of TEAM Event and TEAM Profile data stored in the ACCELERATOR Database, job configuration, and TEAM status information. Run the InstallTEAMWebServer.msi file from the installation package to install the web server service alongside the ACCELERATOR Database on which TEAM is storing data.

To view the data locally, open Google Chrome and navigate to <http://127.0.0.1:5632>, as shown in *Figure 237*. To view the data remotely, open Google Chrome and navigate to <http://IPADDRESS:5632>, where *IPADDRESS* is the network address of the TEAM instance.

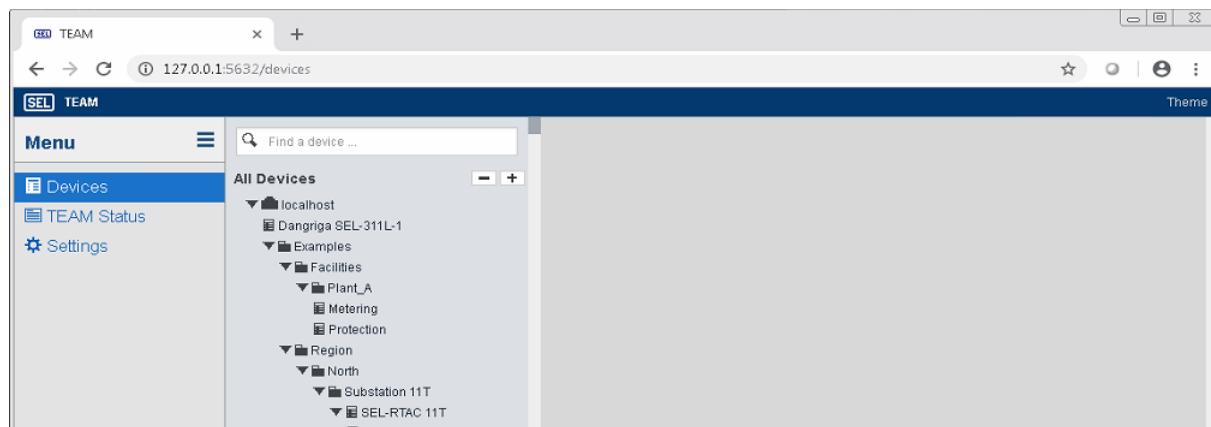


Figure 237 Navigate to <http://127.0.0.1:5632>

There are three menu options in the dashboard: **Devices**, **TEAM Status**, and **Settings**.

Devices

The **Devices** page provides a listing of all devices contained within the connected database(s) that match the structure of the Connection Explorer in Device Manager. From the dashboard, you can connect to one or more instances of the ACCELERATOR Database at a time to view all the information related to TEAM in one location. For details on adding or removing connected databases from the view, see *Settings on page 164*. When you select a folder or device, data for that level and those below it display in the right-hand portion of the dashboard. The data are categorized into six tabs: **Device Details**, **SOE**, **Event**, **VSSI**, **Profile**, and **TEAM Jobs**. The **Device Details** displays additional information about the selected folder or device, as shown in *Figure 238*. This information comes from the **Device** tab information in Device Manager and includes post-connection and collection information gathered during normal processing. Some fields may appear blank depending on what data have been populated for the device.

The screenshot shows the 'Devices' tab selected in the left sidebar. The main area displays a tree view of devices under 'Main' and 'RTAC Listening'. Under 'RTAC Listening', there are entries for SEL-3530, SEL-300G, SEL-387L, and SEL-387L. The 'SEL-387L' entry is expanded, showing sub-items for Lewiston (LEW_735), Pullman (2270N, 2270S, 2270S_734), and 2350 (2350_C_734, 2350_N_734). To the right, a table titled '/localhost/RTAC Listening' lists device details for SEL-300G and SEL-3530. Below the table is a detailed view of SEL-387L, including fields like Database (localhost), Location (localhost/RTAC Listening/), and various configuration parameters.

Figure 238 TEAM Dashboard Device Details Tab

NOTE: SEL IEDs do not provide time zone information with event reports, therefore to have the most accurate time displayed in the TEAM Web Server, apply a metering point with the correct time zone for the device.

The **SOE**, **Event**, **VSSI**, or **Profile** tabs display TEAM Event and TEAM Profile collected data.

The **TEAM Jobs** tab displays the configured jobs and their properties, as shown in *Figure 239*. This allows you to quickly see when the job(s) last executed, whether they are enabled, and what their frequency is to ensure that your TEAM system is operating as expected.

The screenshot shows the 'TEAM Jobs' tab selected in the top navigation bar. The main area displays a table of configured jobs for the 2270N SEL-734P device. The columns include Device, Job Name, DDC Host, Listening Job, Enabled, Frequency, Last Executed, Inherited Job, and Inherited From. The table lists four jobs: VSSI Collection, SER Collection, Profile Collection, and SEL Default Event Collection Job, all running on TEAMUPGRW2K12R2 with a frequency of 10 Minutes. The 'Last Executed' column shows the date and time of the most recent execution, and the 'Enabled' column indicates whether the job is active.

Figure 239 TEAM Jobs Tab

TEAM Status

The **TEAM Status** page provides information about your TEAM installation, including access to TEAM service logs. This page is particularly useful should you require more in-depth troubleshooting assistance for your TEAM install. *Figure 240* shows the layout of the **TEAM Status** page.

The screenshot shows the TEAM Status page with the following sections:

- TEAM Service Status:** Shows all services are running.
- TEAM Logs:** Displays the last 10 KB of logs for each service. The logs show various DCP tasks and database credential retrieval attempts.
- TEAM Application Versions:** Lists application versions for AcSELerator Database, Database Minimum Compatibility, AcSELerator QuickSet, AcSELerator TEAM DDC, AcSELerator TEAM EDT, AcSELerator TEAM Sync, and AcSELerator TEAM TMS.
- License Information:** Shows license host ID, machine host ID, type, and expiration.
- Licensed Features:** Lists features: TEAM Events (50), TEAM Profile (50), TEAM Security (50), TEAM Transmission Fault Location (50), TEAM SOE (100), and TEAM VSSI (100).

Figure 240 TEAM Status Page

The **TEAM Service Status** pane shows the state of each service. **Running** is the normal operating mode. If the status is **Stopped**, TEAM is unable to either collect or translate data, depending on which service is stopped. *Figure 241* shows an example of the **TEAM Service Status** pane.



Figure 241 TEAM Service Status

The **TEAM Logs** pane displays the last 10 KB of each service log. These logs are updated in the dashboard every 30 seconds. See *Figure 242* for an example of the **TEAM Logs** pane.

TEAM Logs

DDC EDT Sync TMS

```
[09:28:12.758641] Sending 'ID' to [228] "DCP Jobs.Campus Meters.2440-E, 208V SEL-734P"
[09:28:12.758641] Sending 'ID' to [228] "DCP Jobs.Campus Meters.2350 North SEL-734P"
[09:28:13.774276] Communicating with 2440-E, 208V SEL-734P device [231] "DCP Jobs.Campus Meters.2440-E, 208V SEL-734P"
[09:28:13.774276] Sending '!!!' to [231] "DCP Jobs.Campus Meters.2440-E, 208V SEL-734P"
[09:28:13.774276] Communicating with 2350 North SEL-734P device [228] "DCP Jobs.Campus Meters.2350 North SEL-734P"
[09:28:13.774276] *** Starting DCP Task ***
DCP Command
"C:\PROGRA~2\SEL\ACSELE~1\TEAM\DDC\bin\DCP_Common\LDP\Collector\dcp_LDP_Collector.exe" -c 2732 -p 5500
*** Starting DCP Task **

[09:28:13.993039] Attempting to locate database credentials for host: 'localhost'.
[09:28:13.993039] Successful retrieval of database credentials.
[09:28:14.352412] Sending 'ID' to [228] "DCP Jobs.Campus Meters.2350 North SEL-734P"
[09:28:14.414920] Sending 'STA' to [228] "DCP Jobs.Campus Meters.2350 North SEL-734P"
[09:28:14.493049] Received 1.46 KB from [228] "DCP Jobs.Campus Meters.2350 North SEL-734P"
[09:28:14.493049] Sending 'SHO G' to [228] "DCP Jobs.Campus Meters.2350 North SEL-734P"
[09:28:14.555556] Changing device access level for DCP task.
[09:28:15.555567] Sending ymodem file transfer for DCP task.
[09:28:15.555567] Sending 'FILE READ ldp_data.bin 12/22/2017 00:00:00' to [228] "DCP Jobs.Campus Meters.2350 North SEL-734P"
[09:28:16.993097] Sending 'ACC' to [231] "DCP Jobs.Campus Meters.2440-E, 208V SEL-734P"
[09:28:17.555609] Sending ascii character: '43'
[09:28:17.571231] Sending '-c' to [228] "DCP Jobs.Campus Meters.2350 North SEL-734P"
[09:28:17.633738] Sending ascii character: '6'
[09:28:17.696240] Received 4.06 KB from [228] "DCP Jobs.Campus Meters.2350 North SEL-734P"
[09:28:17.696240] Sending ascii character: '6'
[09:28:17.758739] Sending ascii character: '6'
[09:28:17.821239] Sending ascii character: '6'
[09:28:17.883736] Sending ascii character: '6'
[09:28:17.946011] Sending ascii character: '6'
```

Figure 242 TEAM Logs

The **TEAM Application Versions, License Information, and License Features** panes display the versions of all required and installed components, the state of your license file, and the features that are enabled by the license file, respectively. The **Collect Support Data**, shown in *Figure 243*, captures and packages the information displayed on the **TEAM Status** page, as well as the remainder of the TEAM service logs and some ACCELERATOR Database logs that are helpful when troubleshooting. An SEL support engineer may request these data when assisting in troubleshooting a TEAM system; alternatively, you may choose to provide this capture when contacting SEL for assistance.

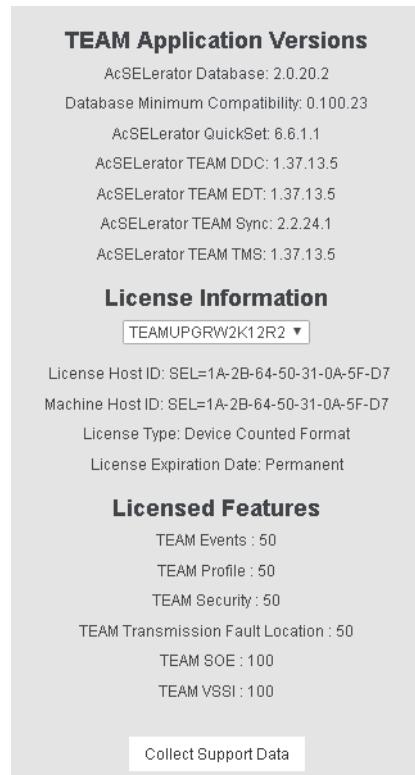


Figure 243 Application Versions, License Information, License Features, and Collect Support Data

When viewing data for multiple databases, the **TEAM Status** page also shows information for TEAM installations in which their connection keys have been shared with the machine where the web server service has been installed.

Settings

The **Settings** page provides the ability to change the time zone that will be applied to the data in the dashboard view. This is useful if your TEAM server is collecting and storing data on a machine in a different time zone than where it is being viewed.

From the **Settings** page, you can also select which **Active Databases** to show on the Devices page, as shown in *Figure 244*.

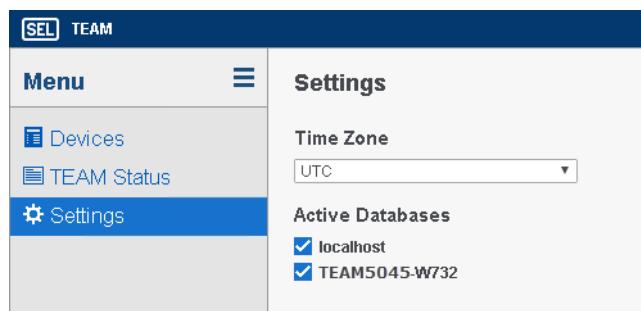


Figure 244 Example With Multiple Databases

The dashboard only shows TEAM-collected data from databases for which it has connection keys and which are selected under **Active Databases**. Import connection keys from other TEAM installation locations to enable them as **Active Database** options.

Troubleshooting

All services log events into Windows Event Viewer. Always check logs first when troubleshooting any issue.

TEAM DDC Is Unable to Start, or Errors Are Generated by the Service

This section helps you troubleshoot when the TEAM DDC service is not running correctly.

1. Check the ACCELERATOR Database server status. Start the server if the server does not respond.
2. Restart the TEAM DDC server only after the ACCELERATOR Database server has been verified.
3. Verify that license files have been placed in correct locations.
4. Enable logging for any TEAM DDC having an issue in the DDC configuration section.
5. Check the TEAM DDC log for information regarding the services operation. The log can be found at **C:\Users\sel_service\AppData\Roaming\SEL\AcSELErator\TEAM\DDC**.

Note that the ACCELERATOR Database must be started.

TEAM EDT Is Unable to Start, or Errors Are Generated by the Service

This section helps you troubleshoot when the TEAM EDT service is not running correctly.

1. Check the ACCELERATOR Database server status. Start the server if the server does not respond.
2. Restart the TEAM EDT server only after the ACCELERATOR Database server has been verified.
3. Check the TEAM DDC log for information regarding the services operation. The log can be found at **C:\Users\sel_service\AppData\Roaming\SEL\AcSELErator\TEAM\EDT**.

Note that the ACCELERATOR Database must be started.

TEAM Glossary

ACSELERATOR Database

The SQL database TEAM uses to store device connection information and normalized event data. This database is a central component of the TEAM system. The TEAM device data collection (DDC) and TEAM Event data translator (EDT) services use this database for event report collection and translation.

Auto-Configure Workflow

A workflow, for non-listening jobs, that automatically creates and associates the necessary communications channels and metering points necessary for TEAM.

Classic Workflow

A workflow for configuring all TEAM jobs, specifically listening jobs, that requires configuration of a communications channel prior to the addition of a job to an in-service device.

Communications Channel

The path from a TEAM DDC to a device. It defines how the DDC will communicate with the device.

Communications Method

One of three methods a TEAM DDC uses to communicate with an SEL communications processor or intelligent electronic device (IED): serial, modem, or Ethernet.

Communications Processor Polling Job

A polling job for which assignment to a communications processor has the effect of adding the job to all devices below it. Devices you add after assignment of the polling job will be unaffected. Deleting the polling job from the communications processor will delete that polling job from the devices below the communications processor at the time of the job assignment.

Connection Explorer

The window pane on the left of the QuickSet Welcome screen from which you can define devices, device connections, and device configurations.

Device Data

SEL device information containing system or device information, e.g., event reports and the results of user commands.

Device Node

A node in the Connection Explorer tree view that represents a device (IEDs, communications processors). You select a device node to define device attributes, provide connection information, and select TEAM options, specifically polling jobs.

Device Recorder

A physical recorder in an SEL IED that is capable of acquiring device data. Load Profile (LDP) data recorders also have associated LDP channels.

Device Scripting Language

An SEL proprietary scripting language that a TEAM DDC uses to establish communications with devices and to run user commands.

Device Type

A specific type of SEL IED.

Event Collection Command

The actual command that a TEAM DDC sends to an IED to collect an event report, e.g., **CEV #**.

Event Collection Command Wizard

A wizard from which you can define an event collection command for a particular device based on the available options for that device, e.g., **CEV # S16R**.

Event Collection Task

A task defined to collect 1/4-cycle, long, and COMTRADE event reports. The first release of SEL TEAM supports event collection tasks only, although you can use user commands to read other types of data.

Event Data Translator (EDT)

A Windows service that reads event report files, translates the contents into specific units, and stores the normalized results in the ACCELERATOR Database. The TEAM EDT is installed during device installation. You can install more than one EDT, but you must install each instance on a separate PC for all instances of the service to work together processing event data.

Event Report

Data that have been retrieved from an IED through the use of the **EVE**, **CEV**, or **File Read** commands (COMTRADE). These data include header, summary, event data, and settings information that the device recorded when the event was triggered.

Event Report File

An ASCII file (or a set of COMTRADE files: .hdr, .cfg, .dat) retrieved from an SEL device containing event data in ASCII, Compressed ASCII, or COMTRADE format. The file consists of a header that describes the device and the event, summary data that provide sample data, and settings.

Event Summary

A subset of an event report that consists of a few key fields that serve to uniquely identify a specific event report.

Fault Register

A logical bitmask found on a communications processor used to determine what devices below the communications processor have reported event histories. During listening operations, the TEAM DDC determines which serial ports below the communications processor have connected devices that have reported event histories.

Fault Register Polling

A special polling job that can be assigned to a communications processor that has no user-assigned tasks. When the TEAM DDC polls a communications processor, it retrieves the fault register, navigates to all devices below the communications processor, and executes the appropriate listening job for each device that has asserted its bit in the fault register.

File Name Template

Templates used to dynamically name event report files and the files containing user commands results. When a TEAM DDC saves files, the names given to these files can be generated dynamically through the use of a default or user-defined file name template. Global Options define the file name templates.

Folder Node

A folder node in the Connection Explorer tree view that lets you organize your devices by geographic locations and other categories.

Global Options Wizard

A wizard you can use in the TEAM Global Options to define the date and time formats for use in the file name templates.

Incident Report

A formatted, printed report of a system incident that describes the event and lists its associated device events.

LDP Binary File

The file the SEL-734 and SEL-735 create in response to a command to retrieve load profile archives. The device does not store these files; TEAM creates these files dynamically during data transmission.

Listening Communications Channel

A communications channel that has been configured for listening. TEAM monitors listening communications channels periodically for communications processor new event messages.

Listening Job

A TEAM DDC operation relating to event report retrieval when that retrieval is the direct result of a communications processor's new event notification. Each specific device in the Device Manager can only have one listening job.

Metering Data

Electrical system measurements a metering device collects at a metering point. Metering data are associated with a metering device and metering point. Examples of metering data include profile data, voltage sag/swell/interruption (VSSI) data, and Sequential Events Recorder (SER) data.

Metering Data Collection Job

Any of three predefined TEAM metering data collection jobs: profile collection, VSSI collection, and SER collection. Each job contains just one predefined task and is noneditable. Double-click the TEAM > **Jobs** node in the Connection Explorer to view these jobs.

Metering Device

An IED connected to a region of common measurement (RCM) that collects metering data. An SEL-734 is one type of metering device. Multiple metering devices can collect data from the same metering point. Some metering devices can collect data from multiple metering points.

Metering Point

A device- and location-independent entity that represents a set of measurements of a particular type that TEAM collects from an RCM. A metering point represents the point in the electrical system at which a metering device is connected to measure power system quantities, namely voltage and current.

Metering Point Wizard

A wizard that enables you to create and manage metering points.

New Event

A text message a communications processor sends via a communications channel to a TEAM DDC service to notify the DDC that one or more connected devices has reported a new event.

Polling Frequency

The frequency at which a device executes a polling job to determine whether a new event report exists.

Polling Job

A scheduled task that executes a predefined set of commands and saves the command results according to a polling frequency. A polling job services only one device as the result of the polling frequency. Individual devices can have multiple polling jobs.

Polling Job Assignment Wizard

A wizard that lets you assign jobs to a TEAM DDC service. You can access this wizard from the **TEAM** tab within the tab for a device you select in the Connection Explorer.

Profile Collection Polling Job

A TEAM polling job that you can schedule to retrieve profile data from SEL devices that TEAM supports. A typical profile collection polling job will collect load profile data from SEL-734/735 metering devices.

Profile Data

Refers primarily to load profile (LDP) data that several SEL devices generate, particularly the SEL-734/735 device families. These devices generate load profile binary files that TEAM retrieves, translates, and stores in the ACSELERATOR Database.

Region of Common Measurement (RCM)

A physical region within an electrical power infrastructure from which any two measurements of the same quantity taken at the same time instant will always yield the same value (allowing for some margin of error).

Script Manager

A component within the TEAM Device Manager that manages the user's connection scripts for such things as connecting to and disconnecting from devices.

SEL-5040 Event Summary Database

The Microsoft® Access® database resulting from ACSELERATOR Report Server® SEL-5040 installation. It contains summary information describing power system event reports the SEL-5040 has retrieved. It also contains corresponding pathnames to event report files.

SER Collection Polling Job

A TEAM polling job that you can schedule to retrieve SER data from SEL devices that TEAM supports. A typical SER collection polling job will collect SER data from SEL-734/735 metering devices.

SER Data

The Sequential Events Recorder (SER) reports that most SEL devices generate. TEAM retrieves, translates, and stores SER reports in the ACSELERATOR Database.

Service

A software application that can begin as soon as the computer starts. It runs as long as the computer has power, and it needs no direct user input. A Microsoft Windows operating system would have Windows services, while a Linux® operating system would have Daemon services.

System Incident

A powerful feature of TEAM that lets you define a system incident (a tornado, for example) and select event reports to associate with that incident. A system incident will typically cause one or more device events.

Task

One specific action a job performs to retrieve one collection of device data or execute one user command. An example of a task would be retrieving a single event report or executing a single user command. Whereas jobs are containers for all operations the TEAM DDC performs during a listening or polling operation, tasks are the individual operations a job contains.

TEAM Device Scripting Language

An SEL proprietary scripting language the TEAM DDC uses to establish communication with devices and to run user commands.

TEAM Job

An operation the TEAM DDC performs and which results from a polling or listening operation that causes execution of one or more tasks. A TEAM job consists of a list of device tasks that run to carry out polling or listening operations on IEDs. There are two types of device tasks: 1) data collection and 2) user command.

Each job consists of one or many tasks that can collect event reports and run user-based commands. You can set up event collection jobs to poll devices at specific date and time intervals or to listen for incoming calls from communications processors or Ethernet connections.

A job consists of two lists. The first list enumerates the event report collection tasks the job is to execute. The second list enumerates the user command tasks the job is to execute. For every job, there will be at least one task definition. For event report collection jobs, there will be at least one event report collection task definition.

Template Palette

The GUI that allows the user to drag and drop devices the Template Palette defines. You can use the Template Palette to customize individual devices, as well as entire substations.

Transparent Connection

A transparent connection that provides a data tunnel between two or more Ethernet or serial communications ports.

User Command

An ASCII or File Read command that a TEAM DDC sends to a device with the purpose of retrieving device-related data and saving those data to a local file, or of executing a command (e.g., getting device status).

User Command Results

The result of executing a user command. This is either an ASCII capture saved to a file or files that were transferred from the device.

User Command Script Editor

An editor that lets you easily create a script of user commands and verify syntax. Access the Script Editor by selecting **User Command Scripts** under the **TEAM > Jobs** node in the Connection Explorer.

User Command Task

A task that specifies the actual script that executes when a job-specified user command type is to be executed. An operation to issue a user command to a device. Types of user commands include **STA**, **SET**, **PASSWORD**, **SER**, **TRI**, and **BRE**. Use the TEAM Device Scripting Language to define user commands in user command scripts.

User Command Type

A classification of user commands based on function (e.g., device status, breaker, SER). Categorization of every user command occurs through the use of a single user command type. Every user command will be associated with one, and only one, user command type. SEL can specify user command types at product release. Users can also define new user command types.

UTC

Coordinated Universal Time. TEAM converts all metering data time stamps to UTC before recording data in the ACCELERATOR Database.

VSSI Collection Polling Job

A TEAM polling job that you can schedule to retrieve VSSI data from SEL devices that TEAM supports. A typical VSSI collection polling job will collect VSSI data from SEL-734/735 metering devices.

VSSI Data

Information contained within VSSI reports such as SEL devices (the SEL-735, for example) generate. TEAM retrieves, translates, and stores VSSI reports in the ACCELERATOR Database. TEAM stores both summary and detailed VSSI data.

VSSI Detailed Report

The detailed VSSI report that includes a point-by-point record of each VSSI value. This report can be useful for post-disturbance graphing of data.

Appendix A: Software and Manual Versions

Software

To find the software version of ACSELERATOR TEAM SEL-5045 Software, navigate to the following location:

32-bit operating system:

C:\Program Files\SEL\AcSELerator\TEAM\DDC\bin

64-bit operating system:

C:\Program Files (x86)\SEL\AcSELerator\TEAM\DDC\bin

Right-click **Team_DDC.exe** and select **Properties**. Select the **Details** tab and view the File version entry, as shown in *Figure 245*.

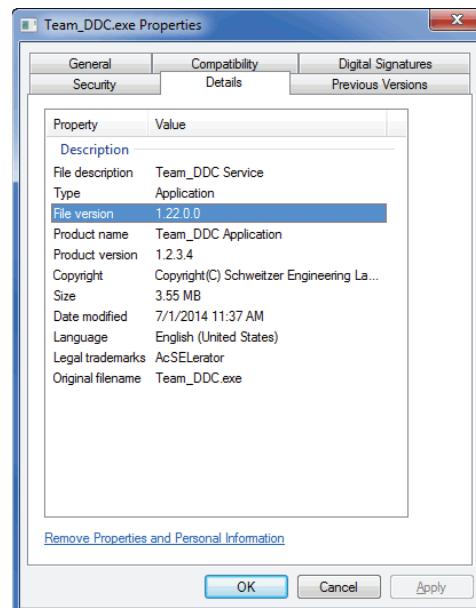


Figure 245 Select the Details Tab to View the TEAM Version

Table 9 lists the software versions, a description of modifications, and the date code corresponding to the software version. The table lists the most recent software version first. This instruction manual does not cover software versions released prior to 1.1.0.0. *Table 9* is frequently updated, but go to selinc.com/products/5045/ and select **Latest Software Version** for the most recent software version.

Table 9 Software Version History (Sheet 1 of 4)

Software Version Number	Summary of Revisions	Date Code
1.43.5.0	► Resolved issue where RTAC SOE collection via the Encrypted Database method would fail.	20200423
1.43.3.0	► Added additional description fields to the email summary contents. ► Improved event report translation error handling. ► Resolved email processing issue that caused TEAM to stop sending emails. ► Improved Metering Point association with data collected by the RTAC. ► Discontinued Excel Templates.	20200317
1.43.1.0	► Resolved handling of zip compression when reading events out of the database. ► Enhanced email subject line for RTAC Encrypted Database collected events.	20190627

Table 9 Software Version History (Sheet 2 of 4)

Software Version Number	Summary of Revisions	Date Code
1.43.0.0	<ul style="list-style-type: none"> ► Added a time zone label to the time stamp in the TEAM Web Server. ► Added SOE support for SEL-311C-3, SEL-487B-1, SEL-849, SEL-2411P, SEL-401, and SEL-421-7. ► Added support for SEL-3560. ► Removed SEL-321-X TEAM TFL support. 	20181113
1.40.0.0	<ul style="list-style-type: none"> ► Added the ability to configure 32 recorders for load data profile collection. ► Enhanced the database deletion process. ► Enhanced the TMS process for more efficient translation of SOE and LDP data. 	20180703
1.38.1.0	<ul style="list-style-type: none"> ► Added support for read-only TEAM web-based viewer. 	20180103
1.37.13.5	<ul style="list-style-type: none"> ► Added SOE support for SEL-710-5. ► Added support for emailing Shot and Fault location when available from device. ► Resolved issue where event files would not launch with SYNCHROWAVE Event. 	20171222
1.37.12.2	<ul style="list-style-type: none"> ► Resolved SOE Viewer display of UTC time stamp. ► Increased the time-out of the SEL-3620 Log Collector Job ► Profile data translation maintenance. 	20171013
1.37.11.4	<ul style="list-style-type: none"> ► Upgraded the PostgreSQL Database version to 9.6.2 from version 9.2. ► Resolved large event file collection issue from SEL DDFR. 	20170614
1.37.10.0	<ul style="list-style-type: none"> ► Resolved an issue with the Automated Data Deletion job's access to the database. 	20170113
1.37.8.0	<ul style="list-style-type: none"> ► Performed general maintenance and enhancements for TEAM TMS. ► Performed general maintenance and performance enhancements to the Event Timeline. 	20161222
1.37.7.0	<ul style="list-style-type: none"> ► Enabled SSL connections to the ACCELERATOR Database for TEAM DDC, TEAM EDT, and TEAM TMS. ► Added support for RTAC Listening Emails. ► Added support for SEL-T400L. ► Added Profile support for RTAC Recorder. 	20161011
1.37.3.0	<ul style="list-style-type: none"> ► Added support for SEL-651RA. 	20160127
1.37.1.0	<ul style="list-style-type: none"> ► Added support for RTAC event collection via an ACCELERATOR Database to RTAC Database connection. ► Added new TEAM license file requirement. ► Performed general maintenance to TEAM services (DDC, EDT, TMS, and Sync). ► Performed general maintenance and performance enhancements to the Event Viewer. ► Performed general maintenance and performance enhancements to the Event Timeline. 	20150715
1.27.7.0	<ul style="list-style-type: none"> ► Performed general maintenance for ACCELERATOR TEAM DDC. ► Improved data load times in Event Viewer and SOE Viewer. ► TEAM logs to the Windows Event Viewer upon failed email attempt. 	20150515
1.27.2.0	<ul style="list-style-type: none"> ► Enhanced TEAM configuration work flow to reduce configuration steps. 	20150319
1.27.2.0	<ul style="list-style-type: none"> ► Performed general maintenance for TEAM Sync and ACCELERATOR TEAM EDT. ► Reduced the data retrieval time for the TEAM Excel Templates. 	20150106
1.27.0.0	<ul style="list-style-type: none"> ► Added support for collection of events from selected Alstom devices. 	20141210
1.25.2.0	<ul style="list-style-type: none"> ► Performed general maintenance for the TEAM Event Viewer 	20141021
1.25.0.0	<ul style="list-style-type: none"> ► Added support for collection of SOE records from selected GE devices. ► Added the Licensing tab to TEAM to display a report of entitled features based on the presently installed license file. 	20140930

Table 9 Software Version History (Sheet 3 of 4)

Software Version Number	Summary of Revisions	Date Code
1.22.1.0	<ul style="list-style-type: none"> ► Resolved an issue with TEAM Sync and event report replication. ► Performed general maintenance enhancements to event report collection. 	20140725
1.22.0.0	<ul style="list-style-type: none"> ► Added support for individual application versions within ACSELERATOR Database. ► Changed TEAM to ensure that only one SSH connection to a device is created at a time. 	20140708
1.20.0.0	<ul style="list-style-type: none"> ► Added Automated Data Deletion functionality. 	20140611
1.16.5.0	<ul style="list-style-type: none"> ► Resolved an issue with GE Event Report collection when more than 100 analog channels are configured. ► Resolved a TEAM Sync out of memory issue 	20140515
1.16.4.0	<ul style="list-style-type: none"> ► Added support for COMTRADE and HIF event data collection from an SEL-651R-2. 	20140306
1.15.0.2	<ul style="list-style-type: none"> ► Added SSH terminal support. ► Added support for collecting EVE format event reports from an SEL-501 and SEL-551. <p>Note: EVE format event reports cannot be manually imported.</p>	20140123
1.14.3.0	<ul style="list-style-type: none"> ► Resolved RTAC SOE Collector bug fixes with custom priorities. ► Implemented RTAC listening job fixes. 	20130906
1.14.2.0	<ul style="list-style-type: none"> ► Enhanced load profile collection by reducing database size and translation times. ► Implemented general DDC performance enhancements. 	20131101
1.13.1.0	<ul style="list-style-type: none"> ► Performed general maintenance. 	20131002
1.13.0.0	<ul style="list-style-type: none"> ► Added on-demand translation of event report data. 	20130829
1.11.0.1	<ul style="list-style-type: none"> ► Added support for SEL-751A load profile collection. ► Performed general maintenance. 	20130719
1.10.0.0	<ul style="list-style-type: none"> ► Modified services for integration with multiple support changes to ACSELERATOR Database. ► Added support for COMTRADE collection from SEL-734 and SEL-735 devices. ► Performed general maintenance. 	20130619
1.6.0.0	<ul style="list-style-type: none"> ► Modified Team Services to now require ACSELERATOR TEAM Plugin Version 5.12.2.1 or newer. ► Improved handling of clock changes in profile data collection and translation. ► Improved handling of SSI and SER collection with large system installations. 	20130416
1.5.2.0	<ul style="list-style-type: none"> ► Performed general maintenance. ► Added support for collecting COMTRADE files from GE devices over Modbus. ► Added support for collecting Security Logs from SEL-3620 and SEL-3025 devices. ► Modified TEAM Sync to fix problem with SOE duplicates. 	20130227
1.4.6.0	<ul style="list-style-type: none"> ► Performed general maintenance. ► Modified ACSELERATOR TEAM Service installers to now allow users to set a password for the account that the services use. ► Resolved an issue where the Windows Event Log entry only displays the word ‘Parsing.’ 	20121022
1.4.5.0	<ul style="list-style-type: none"> ► Modified TEAM Sync to now support SOE/SER Data synchronization. ► Modified TEAM DDC to now support SOE/SER Collection from the SEL-RTAC. 	20120905
1.4.2.0	<ul style="list-style-type: none"> ► Performed general maintenance. ► Modified DDC so it can now listen and poll on the same serial port. ► Added support for Traveling Wave events. 	20120725

Table 9 Software Version History (Sheet 4 of 4)

Software Version Number	Summary of Revisions	Date Code
1.4.1.0	<ul style="list-style-type: none"> ► Added ACCELERATOR TEAM Transmission Fault Location. ► Added the ability to accurately determine a fault location on a transmission line based on event information collected at the two end terminals of the line. Refer to the ACCELERATOR TEAM Software instruction manual for usage. ► Allowed assignment of Profile, SER, and VSSI jobs to folder nodes and to communications processor nodes. ► Updated ACCELERATOR TEAM Excel templates for use with various regional settings. 	20120503
1.3.0.0	<ul style="list-style-type: none"> ► Included ACCELERATOR TEAM Excel templates. ► Generated Profile, VSSI, and SER reports from metering data in the ACCELERATOR Database by using Excel templates. Refer to the ACCELERATOR TEAM Software instruction manual for usage. ► Assigned profile, VSSI, and SER data collection jobs to folder nodes and communications processor nodes. ► Resolved a defect where the DDC would end the YMODEM transfer incorrectly when collecting load profile data from an SEL-735. The device would report “Invalid Command.” ► Resolved a defect where the DDC would sometimes fail to send device event retrieval commands in the order specified by the user. 	20120405
1.2.1.0	<ul style="list-style-type: none"> ► Performed general maintenance. ► Added DDC support for SEL-5041. ► Improved DDC handling of passwords. ► Improved DDC handling of modem offhook detection. ► Resolved a DDC crash issue that occurred during RTAC listening. ► Improved DDC handling of transparent connections. 	20120119
1.2.0.0	<ul style="list-style-type: none"> ► Added ACCELERATOR TEAM Profile. ► Added support for collection of profile, VSSI, and SER data collected from SEL-734 and SEL-735 meters. Refer to the ACCELERATOR TEAM Software instruction manual for details on usage. 	20111031
1.1.1.0	<ul style="list-style-type: none"> ► Performed general maintenance. ► Resolved an Event Data Viewer (EDV) defect that caused crash when deleting records. ► Resolved an EDT defect that occurred when parsing time stamps. ► Resolved a Team Configuration defect where email information was not saved to database. ► Updated QuickSet login to allow connection to older databases. ► Modified EDV to show all records regardless of parse state. ► Resolved a defect in EDV related to hiding acknowledged events not working. 	20110930
1.1.0.0	<ul style="list-style-type: none"> ► Added ACCELERATOR TEAM Device Data Synchronization. ► Synchronized device data collected at multiple TEAM stations into one ACCELERATOR Database. Refer to the ACCELERATOR TEAM Software instruction manual for details on usage. 	20110810

Instruction Manual

The date code at the bottom of each page of this manual reflects the creation or revision date.

Table 10 lists the instruction manual release dates and a description of modifications. The most recent instruction manual revisions are listed at the top.

Table 10 Instruction Manual Revision History (Sheet 1 of 2)

Revision Date	Summary of Revisions
20200423	<ul style="list-style-type: none"> ► Updated <i>Table 5: QuickSet and Team Compatibility</i>. ► Updated <i>Table 9: Software Version History</i>.
20200317	<ul style="list-style-type: none"> ► Updated <i>System Requirements</i>. ► Updated <i>Table 5: QuickSet and Team Compatibility</i>. ► Updated <i>RTAC SOE Data</i>. ► Updated <i>Create a Metering Point</i>. ► Updated <i>TEAM Metering Data Access</i>. ► Removed <i>TEAM Excel Template</i>.
20190627	<ul style="list-style-type: none"> ► Updated <i>Table 5: QuickSet and TEAM Compatibility</i>. ► Updated <i>Table 9: Software Version History</i>.
20181113	<ul style="list-style-type: none"> ► Updated <i>Table 4: SEL Devices Supported by TEAM</i>. ► Updated <i>Table 5: QuickSet and TEAM Compatibility</i>. ► Updated <i>TEAM Web Server</i>. ► Updated <i>Table 9: Software Version History</i>. ► Updated <i>Appendix B: Cybersecurity Features</i>.
20180703	<ul style="list-style-type: none"> ► Updated <i>System Requirements</i>.
20180103	<ul style="list-style-type: none"> ► Updated the licensing information in <i>Installation</i>. ► Added <i>TEAM Web Server</i> in <i>Automated Data Management</i>.
20170614	<ul style="list-style-type: none"> ► Updated <i>System Requirements</i> by adding support for Windows Server 2012 and correcting RAM values.
20170428	<ul style="list-style-type: none"> ► Added <i>Example 5: Configure TEAM for Event Collection From the SEL-T400L</i>. ► Updated <i>Example 10: Listening Via RTAC Encrypted Database Connection</i>. ► Added <i>Appendix B: Cybersecurity Features</i>.
20161222	<ul style="list-style-type: none"> ► Added <i>Example 13: Profile Recorder Solution</i>. ► Updated <i>Table 2: SEL Devices Supported by TEAM</i>.
20161011	<ul style="list-style-type: none"> ► Updated <i>Table 2: SEL Devices Supported by TEAM</i>. ► Updated <i>Table 3: ACSELERATOR QuickSet and ACSELERATOR TEAM Compatibility</i>. ► Added <i>Example 9: Listening Via RTAC Encrypted Database Connection</i>. ► Added <i>Example 10: Listening Via RTAC Legacy Server Connection</i>. ► Updated <i>ACSELERATOR TEAM Device Data Synchronization</i>. ► Updated <i>Troubleshooting</i>.
20150715	<ul style="list-style-type: none"> ► Added <i>Example 9: Listen for Events and SOE Data</i>.
20150515	<ul style="list-style-type: none"> ► Added email system requirements and logging information. ► Added description of the Configuration button to <i>Event Summary</i>.
20150319	<ul style="list-style-type: none"> ► Added auto-configure workflow and classic workflow examples throughout.
20141208	<ul style="list-style-type: none"> ► Added <i>Example 3: Configure TEAM for Event Collection From an Alstom P544</i>. ► Updated the supported devices to include Alstom P544. ► Updated <i>System Requirements</i> with the removal of support for Windows XP and Windows Server 2003 and added support for Windows Server 2008. ► Updated the <i>Compatibility Matrix</i>.
20140930	<ul style="list-style-type: none"> ► Added reference to the ACSELERATOR QuickSet SEL-5030 Software Instruction Manual for additional information regarding use of Device Manager, Script Manager, or Password Manager. ► Added <i>Example 1</i> through <i>Example 8</i> throughout the manual.

Table 10 Instruction Manual Revision History (Sheet 2 of 2)

Revision Date	Summary of Revisions
	<ul style="list-style-type: none">► Added <i>Job Done Example: Overview</i>.► Added <i>ACCELERATOR TEAM Security</i>.► Added <i>Appendix A: Software and Manual Versions</i>.
20140611	<ul style="list-style-type: none">► Added <i>Automated Data Management</i>.► Added <i>Recommended Meter Settings</i> and <i>Recommended TEAM Metering Settings</i>.

Appendix B: Cybersecurity Features

ACCELERATOR TEAM SEL-5045 Software has a number of security features to assist users with meeting their cybersecurity design requirements for data collection and storage systems.

Ports and Services

TEAM uses various ports for correct operation of the collection and translation services. All ports, with the exception of Port 5434, are disabled by default until you enable TEAM communications with the device in the device configuration. *Table 11* provides a summary of network ports and a description of their use.

Table 11 Port Numbers

IP Port Default	Network Protocol	Default Port State	Purpose
5434	PostgreSQL	Enabled	ACCELERATOR Database port. Used by the TEAM services during normal operation. Encrypted Postgres connection.

Access Controls

TEAM runs as a set of services independent of a user being logged in to the machine. For the services to operate without a user logged in, a Microsoft® Windows® service account is created at the time of installation. This service account can be tied into your corporate Lightweight Directory Access Protocol (LDAP) or a local Windows account.

Local Account

TEAM creates and uses a Windows account named sel_service for operation of the TEAM DDC, EDT, TMS, and Sync services. The service account is created at the time of installation. You need this sel_service account password when installing TEAM services and subsequent upgrades. During normal operation, the sel_service account is used only by TEAM.

Revocation and authorization changes are made using Windows Computer Management.

Centrally Managed Account (Optional)

TEAM supports the use of LDAP for the sel_service account. This provides a means to centrally administer the account password.

Revocation and authorization changes are managed by your organization's directory service (e.g., Active Directory).

Database Accounts

The following table describes the accounts used by the TEAM services to interact with the ACCELERATOR Database. The passwords are generated randomly upon database installation. During normal operation, these accounts are only used by TEAM.

Table 12 Database Accounts

Account	Service	Purpose
dm_engineer	DDC, EDT, TMS	Normal operation of the collection, translation, and storage processes
sel_pgsql	DDC	Used only when the Automated Data Deletion job is enabled
team_sync	TEAM Sync	Used only by TEAM Sync for migrating Event and Sequence of Events data between ACSELERATOR Databases

Passwords

TEAM has no default passwords. Passwords must be initialized upon installation.

TEAM supports strong passwords for the sel_service account. You must define the password in accordance with your organization's IT policy.

For instructions on changing the sel_service account password, see *Service Accounts on page 13*.

The sel_service account will lock out after your organization's defined number of incorrect password attempts.

See *Alerts and Logging on page 180* for details on logging of authentication-related events.

DNS Considerations

TEAM Sync uses the machine name to resolve connection information. Either DNS needs to be enabled on the server computer, or the network host table needs to be modified to accept connections from specific client connections.

Alerts and Logging

Debug Logging Service Process Logs

The TEAM services process logs capture and store the processing information between the services and the TEAM-enabled devices during job execution. Logs for each service are found in their respective folders located in C:\Users\sel_service\AppData\Roaming\SEL\AcSELerator\TEAM. TEAM continues to add information to a log file until it has reached 5 MB, at which point it begins logging to a new file. There can be a maximum of five log files, each with 5 MB. When the limit is reached, the oldest data are overwritten to accommodate new data. You can view these log files with any text editor program and are often very helpful when troubleshooting data collection issues.

Debug Logs

When enabled, the debug logs capture the traffic between TEAM and the TEAM-enabled devices for troubleshooting purposes. The location of each log is user-defined in the TEAM node for each DDC instance on the Archive Directories subtab. A log with a cap size that is user-defined is generated for each device upon TEAM's initial connection to that device. Note that device passwords are obscured with the “*” symbol in place of the actual characters in the log files. You can view these log files with any text editing program.

Shell Logs

When enabled by adding the -d parameter to the DDC service executable, logs are generated in C:\Program Files (x86)\SEL\AcSELERator\TEAM\DDC\bin\shell-logs. These logs will contain operational information for the ETP and DCP processes. Logging is limited to 100 files (with no size restraint), and a log file is created each time a debug DDC instance is initiated. You can view these log files with any text editing program.

Viewing Events With Windows Event Viewer

TEAM logs any distinct errors it encounters to the Windows Event Viewer, including device connections, database incompatibility, service failure, licensing, etc. These log files are often very helpful when troubleshooting data collection and licensing issues.

Backup and Restore

Backing Up the TEAM Configuration

The TEAM configuration and collected data are stored in the ACSELERATOR Database. Device connection passwords are included in the exported database and are encrypted. Store and secure the backups according to your organization policy. When backing up a TEAM system, follow these steps:

- Step 1. Stop the TEAM services in services.msc to cease normal operation.
- Step 2. In ACSELERATOR QuickSet® SEL-5030 Software, select **File > Database Manager**.
- Step 3. Select the **AcSELERator Database** tab.
- Step 4. Under the **Backup** section, select a location for saving the backup file, and select **Backup Database**.
- Step 5. Make a backup of the license file (DDC.lic) located in C:\Program Files (x86)\SEL\AcSELERator\TEAM\DDC\bin.
- Step 6. (Optional) Make a copy of the stored files (including collected event files and security logs) on the hard disk drive. These files are located on the hard disk drive according to the structure that was defined at the time of configuration.
- Step 7. (Optional) Make a backup of the pg_hba.conf file located in C:\ProgramData\SEL\AcSELERator\MasterDatabase\Database Server\Database\data. Note that this is only necessary if the configuration file was customized.
- Step 8. (Optional) Make a backup of the TEAM installer files for the version installed.
- Step 9. Restart the TEAM services in services.msc to resume normal operation.

Restoring the TEAM Configuration

Follow these steps to restore a previously backed up TEAM system database. Note that following these steps overwrites all the data in the ACCELERATOR Database on the current machine. When restoring from a backup, the versions of QuickSet, ACCELERATOR Database, and TEAM services must match the versions that were in use at the time of the backup.

- Step 1. Stop the TEAM services in services.msc to cease normal operation.
- Step 2. In QuickSet, select **File > Database Manager**.
- Step 3. Select the **AcSELERator Database** tab.
- Step 4. Under the **Restore** section, select the previously created backup file, and select **Restore Database**.
- Step 5. (Optional) Place the copy of the event files on the hard drive.
- Step 6. (Optional) Place the previously backed up pg_hba.conf file located in C:\ProgramData\SEL\AcSELERator\MasterDatabase\DatabaseServer\Database\data.
- Step 7. (Optional) Place the previously backed up TEAM license file (DDC.lic) located in C:\Program Files (x86)\SEL\AcSELERator\TEAM\DDC\bin.
- Step 8. Restart the TEAM services in services.msc to resume normal operation.

Moving the TEAM Configuration to a New Machine

Follow these steps when you need to move the TEAM configuration and collected data to a new machine.

- Step 1. Follow the steps under *Backing Up the TEAM Configuration on page 181*.
- Step 2. Match the computer name of the new machine to the computer name of the old machine. This ensures that the DDC does not need to be reconfigured for a new computer name.
- Step 3. Follow the steps under *Restoring the TEAM Configuration on page 182*.
- Step 4. Contact licensing@selinc.com with the old license, LAC, and the Host ID to obtain the license for the new machine.

Revision Management

Appendix A: Software and Manual Versions on page 173 contains a description of each software update.

See *The SEL Process for Disclosing Security Vulnerabilities* at selinc.com/security_vulnerabilities/ for details on vulnerability disclosure.

Product Version Information

You can find TEAM's software version number by selecting **Control Panel > Programs > Programs and Features**.

Update Verification

TEAM software installers are signed by SEL. For instructions on how to verify the signature, see selinc.com/company/verifying-software-downloads/.

Contact SEL

For further questions or concerns about product security, contact SEL at security@selinc.com or +1.509.332.1890.

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