

ACCELERATOR Meter Reports

SEL-5630 Software

Instruction Manual

20230201

SEL SCHWEITZER ENGINEERING LABORATORIES

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Overview

ACSELERATOR Meter Reports SEL-5630 Software

ACSELERATOR® Meter Reports SEL-5630 Software allows users of ACSELERATOR TEAM® SEL-5045 Software to compile metering data and generate reports. Use preconfigured templates or customize reports and charts for analysis. Export reports as a PDF, email attachment, or a spreadsheet to facilitate information sharing.

ACSELERATOR Overview

ACSELERATOR is a suite of programs, plug-ins, and services that work together to manage SEL devices and automate data retrieval. *Figure 1* shows a high-level diagram of the system components.

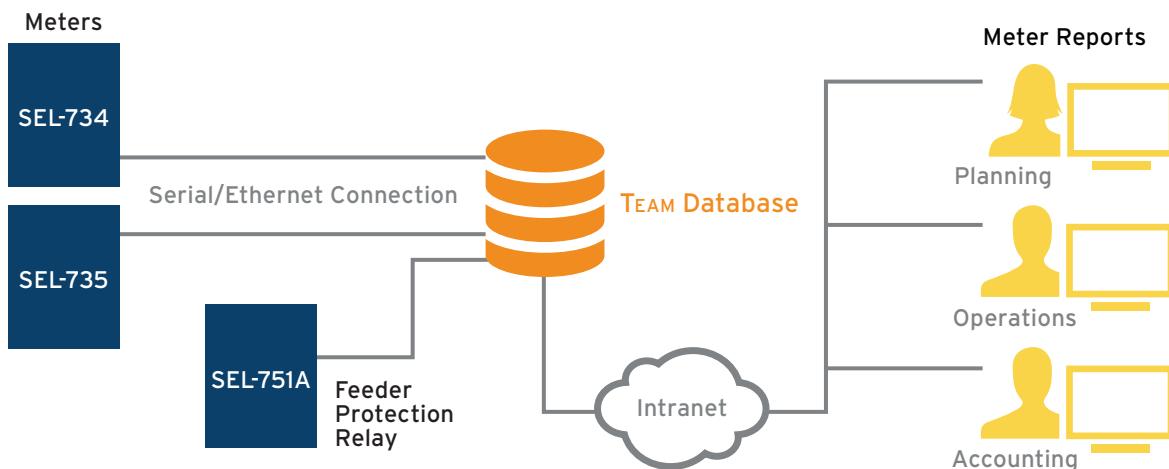


Figure 1 High-Level Diagram of ACSELERATOR System Components

See the following sections for an overview of the ACSELERATOR subsystems used by Meter Reports.

ACSELERATOR QuickSet SEL-5030 Software

Use ACSELERATOR QuickSet® SEL-5030 Software to read, edit, and send settings on most SEL devices.

Device Manager Plug-in

Device Manager is a plug-in to QuickSet for managing devices in the system. It organizes devices in a tree structure and stores settings related to data collection for each device. Meter Reports software uses the Device Manager user management system for user authentication.

TEAM Plug-in

The TEAM plug-in is the configuration interface for TEAM. Use this plug-in together with the Device Manager to poll data from devices in the system.

TEAM

TEAM is a set of services that reads the polling configuration you created through use of the Device Manager and TEAM plug-ins, collects data from the devices, and stores the data in the ACSELERATOR Database. For more details on TEAM, see the SEL-5045 instruction manual.

ACCELERATOR Database

The ACCELERATOR Database is an open database connectivity (ODBC) compliant structured query language (SQL) database that stores all data polled by TEAM. The database is the central component in the TEAM system.

System Requirements

Hardware Requirements

Following are the minimum hardware requirements to run Meter Reports:

- Dual-core 1.5 GHz or faster processor
- 2 GB of RAM
- 200 MB of free hard drive space
- 1024 x 768 or higher resolution display

Software Requirements

To run Meter Reports, the computer must meet the following requirements:

- Windows XP, Windows 7, Windows Server 2008–2019, Windows 8/8.1, or Windows 10.
- Microsoft .NET 4.0 Framework
- Administrative privileges for installation

The server or computer running the ACCELERATOR Database containing the data TEAM collects must be accessible on the network from the computer running Meter Reports.

Meter Reports requires ACCELERATOR Database 3.1.0.2 or higher. Verify that your ACCELERATOR Database is up to date using SEL Compass® or contact SEL for assistance: pc_software_support@selinc.com.

Technical Support

We appreciate your interest in SEL products and services. If you have questions or comments, please contact us at:

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Getting Started

Installation

To install Meter Reports, double-click the **InstallSEL5630.exe** file and follow the installation wizard.

Licensing

Meter Reports software does not require a license for use during the first 60 days following installation. After 60 days, a license from SEL is necessary to continue using the software.

Obtain Meter Reports licensing to view data from devices polled by TEAM. If the number of devices you have configured in the TEAM system exceeds the number of devices for which Meter Reports is licensed, the list of available metering points to report on will be truncated to the licensed quantity.

To purchase a license, contact your local SEL sales representative. Once you have purchased a license, use the following steps to license the software:

- Step 1. Open Meter Reports and navigate to **Help > Licensing**.
- Step 2. Select and copy the Host ID. Be sure to include the entire hexadecimal string following “SEL=” in the format **XX-XX-XX-XX-XX-XX-XX-XX**.
- Step 3. Open your browser and navigate to <https://licensing.selinc.com>.
- Step 4. At the landing page, enter your license authorization code (LAC) and select **Login**. The LAC is either printed on the CD from SEL or was sent to you by an SEL customer service representative (CSR).
- Step 5. Select **Generate Licenses**.
- Step 6. Paste the Host ID you obtained in *Step 2* into the **Node-locked Hostid** text box.
- Step 7. Select **Generate** and then save the file to your computer.
- Step 8. Open Meter Reports and navigate to **Help > Licensing**.
- Step 9. Select **Load License**, navigate to the file you saved in *Step 7*, and open the license.
- Step 10. Check that the software successfully loaded the license in the **License Status** field of the licensing dialog, and select **OK**.

You need to complete licensing only once and from a single client. The licensing information is stored in the ACCELERATOR Database, so any client that connects to the database will validate the license automatically.

User Authentication

You can configure Meter Reports with or without user authentication. If unauthorized people have access to the ACCELERATOR Database on the network, SEL recommends that you enable authentication. If your network configuration prevents unauthorized access, you may choose to disable authentication.

To enable user authentication, perform the following steps:

Step 1. Open QuickSet on a computer that has network access to the AcSELerator Database.

Step 2. Open Device Manager. Select the **Device Manager** option on the Getting Started screen.

The **Log on to AcSELerator Database** dialog box displays, as shown in *Figure 2*.

Step 3. Select the server to connect to from the drop-down list. Enter credentials with administrative permissions in the **User Name** and **Password** fields and select the **Log on** button.

QuickSet starts the Device Manager plug-in.

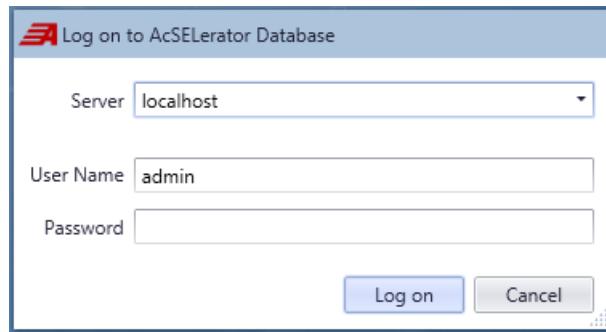


Figure 2 Device Manager Login

Step 4. Select **Tools > Device Manager > Users** to cause Device Manager to launch the User Management interface.

Step 5. Expand the **Local Groups** folder in the left pane listing.

If the group **AcSELerator Meter Reports** does not display in the list, right-click **Local Groups** and select **Add** from the **Add Group** dialog. Name the new group **AcSELerator Meter Reports**.

If there are already users configured in the system for whom you want to grant permissions for generating reports, you can add those users to the group on the **Members** tab on the left side of the dialog.

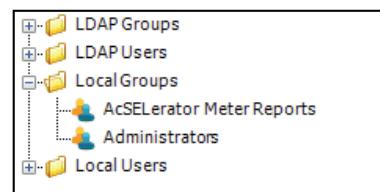


Figure 3 Left Pane Listing

Step 6. After naming the group, add at least one user and select **OK** to create the group.

Step 7. To create new user accounts, right-click **Local Users** in the left pane listing and select **Add**. Fill in the form with the new account information and select **OK**.

Creation of the **AcSELerator Meter Reports** group will now cause the Meter Reports software to prompt for login credentials.

Using Meter Reports

When the Meter Reports software opens, it prompts for a username and password if user authentication has been enabled as described previously in *User Authentication on page 3*.

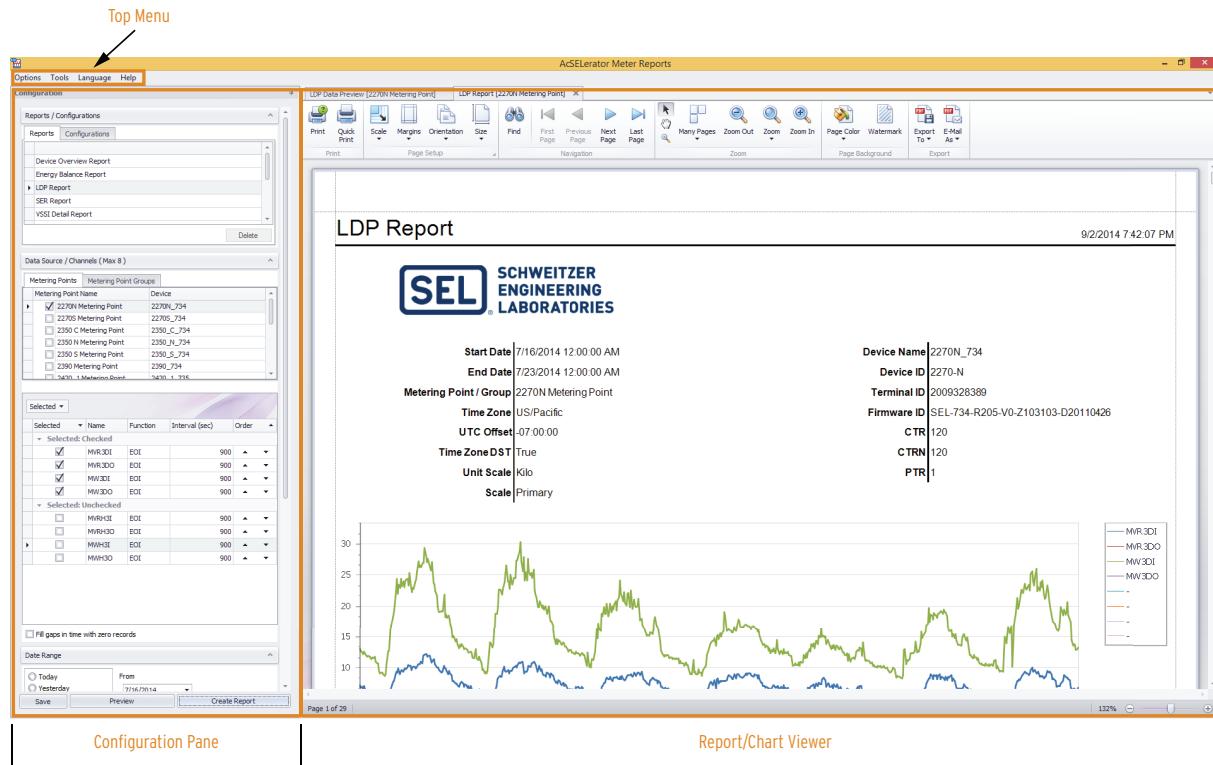


Figure 4 Meter Reports Application Layout

Charts

Charts display data in an interactive interface that allows customization of how data are displayed, the addition of annotations, and more.

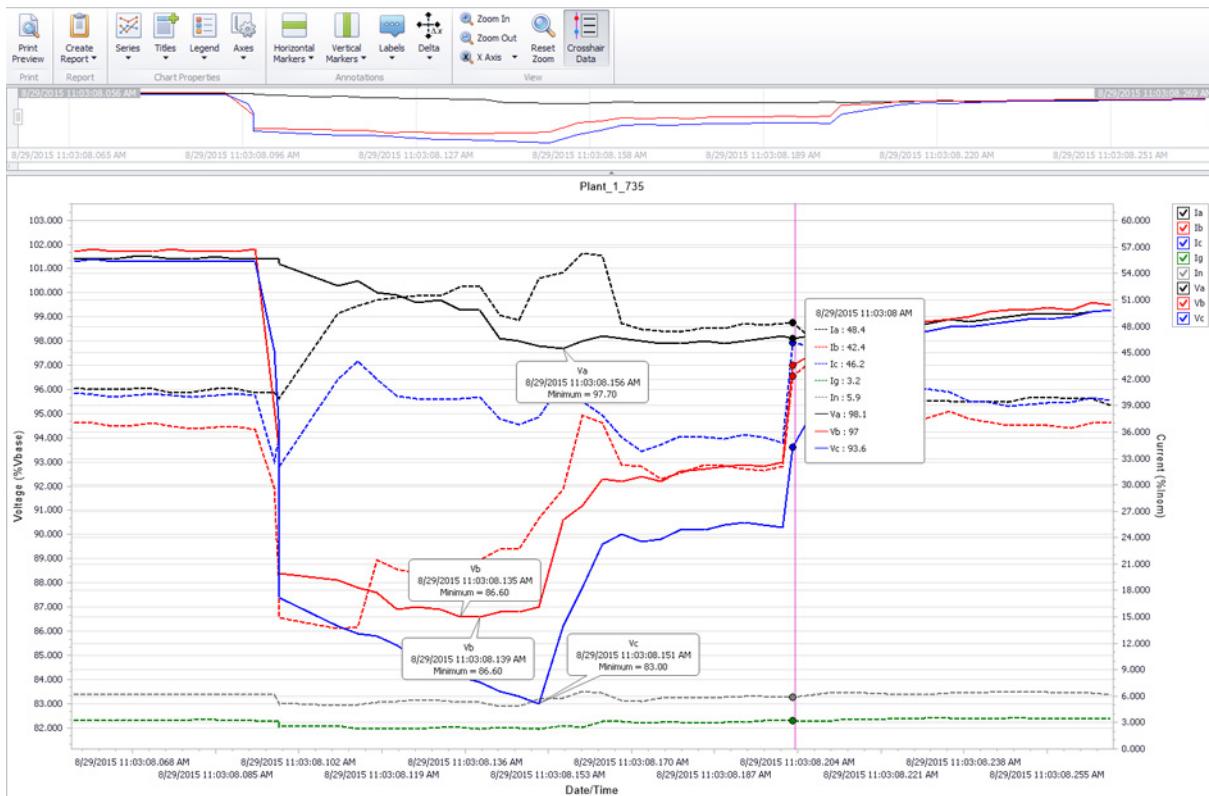


Figure 5 Chart Display

Reports

Reports display data in a format defined by the report template. Once a report has been created, you cannot interact with the data or change formatting.

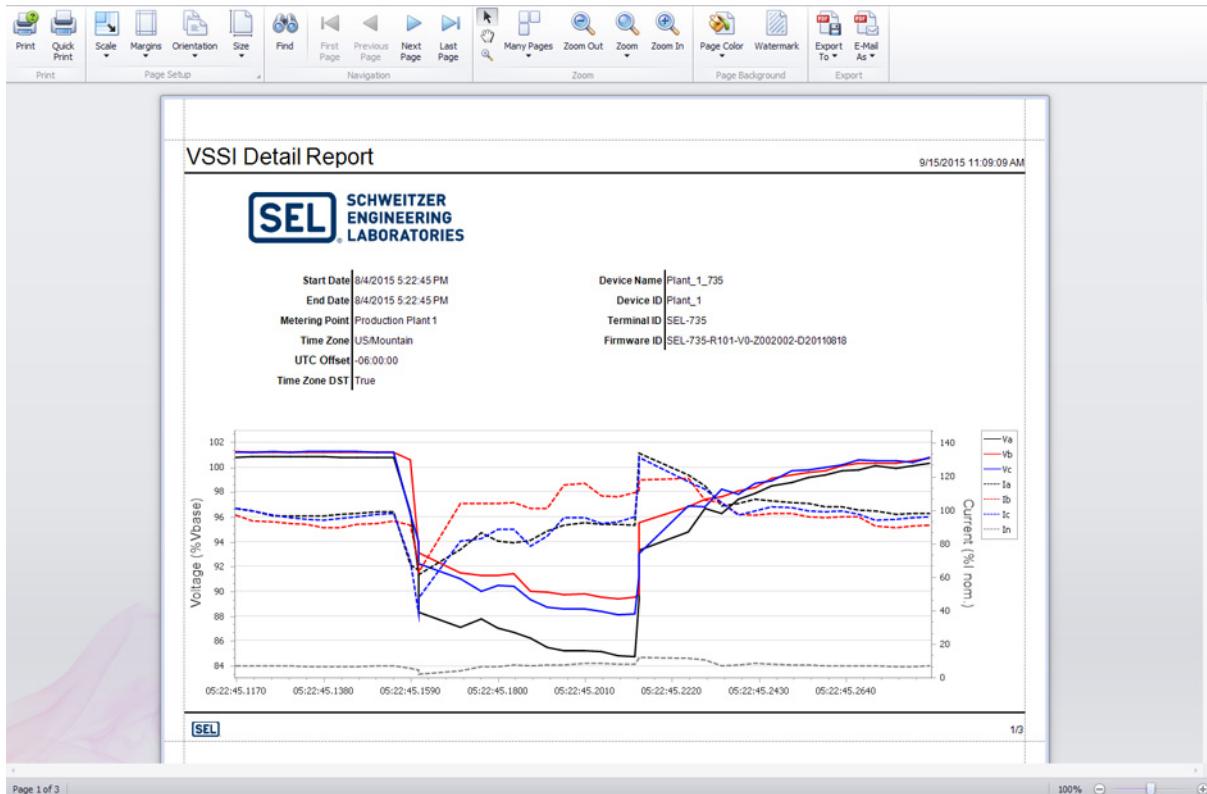


Figure 6 VSSI Detail Report

Top Menu

The top menu of the application is organized as follows:

- Options
 - Grouping
 - Data Source
 - Refresh
- Tools
 - Import Report
 - Export Report
 - Report Designer
- Language
 - English
 - Español
- Help
 - Instruction Manual
 - Licensing
 - About

Options > Grouping

The **Grouping** option allows you to combine metering points to be used in reports. Each group must contain at least one metering point.

Metering points within the groups are assigned an aggregation function. The aggregation options are Add or Subtract.

Aggregation is useful in determining the total consumption of multiple meters, or in excluding submeter quantities from a main meter.

For example, if you group two metering points, MP_1 and MP_2, and set MP_1 to **Add** and MP_2 to **Subtract**, any report generated with that group will use the result of MP_1 data minus MP_2 data.

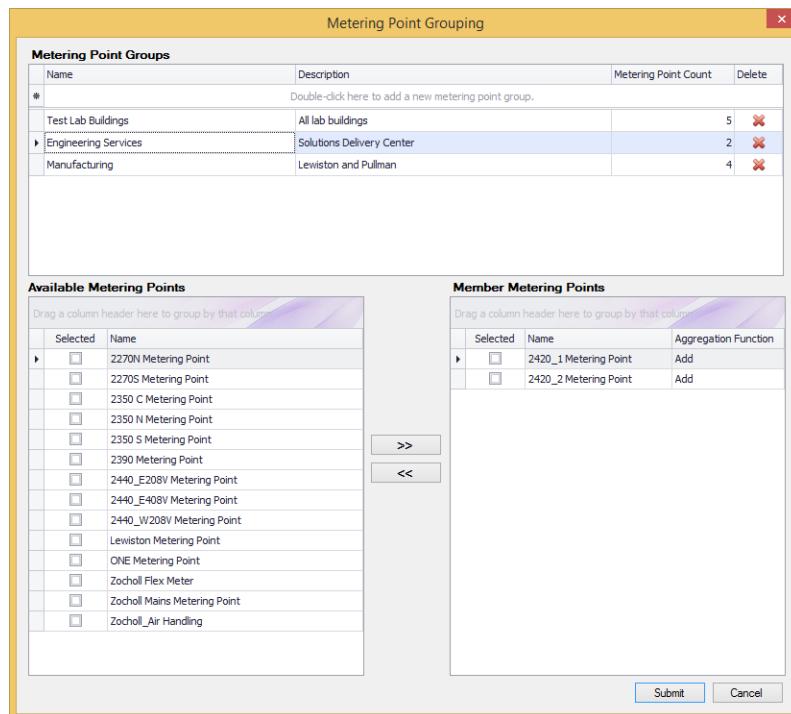


Figure 7 Grouping Screen

Options > Data Source

The Data Source option allows you to set the source from which Meter Reports software retrieves data. When prompted, select one of the three data source options:

- Connect to a TEAM Database—select a server from the list or select the **Import** button to import a new connection key. The connection keys used by Meter Reports are created in QuickSet on the computer that is sharing the database, and then imported into Meter Reports to access the shared database. See the Database Management section of the ACCELERATOR QuickSet SEL-5030 Software Instruction Manual for more information.
- Load an archive—browse to the data archive file to read
- Try features in Demo Mode—select this option to use the built-in demo data with two months of sample data. The software will adjust the data to be timestamped in the two months prior

to the current day. This adjustment will happen when you initially select Demo Mode and when the software is started while Demo Mode was previously selected.

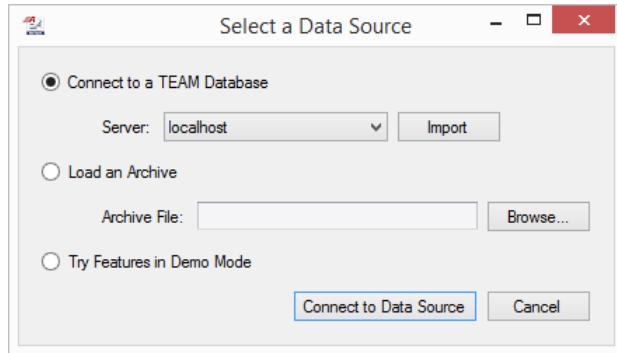


Figure 8 Data Source Selection Dialog

After you apply new settings, Meter Reports will reinitialize the configuration panes with data from the new data source. If the new data source you select has user authentication enabled, the software will prompt you for login credentials.

Options > Refresh

The **Refresh** option deletes cached data and reinitializes from the database. Select the **Refresh** option after making changes to the TEAM configuration to ensure that the metering point list is updated.

Tools > Report Designer

This option launches the **Report Designer**, which allows you to customize the appearance and function of reports. Refer to *Report Designer on page 26* for information on report customization.

Tools > Import Report

This option allows you to import a report file into the local report library. Reports modified through use of the **Report Designer** can be saved or emailed to users. Those report files must then be imported into the report library on the local machine to be used by the software.

When you select **Import Report**, the software displays a dialog that allows you to locate the report file. Selecting a file and then selecting **OK** imports the selected file.

Once you have imported a report, it becomes accessible in the Reports list in the **Reports / Configurations** section of the Configuration pane.

Tools > Export Report

This option allows you to export a report from the local report library to a file that you may save or send via email. You can then import the file as described previously.

Language

This menu allows you to select from a list of supported languages. If you change the language, the software notifies you that you must restart the application to apply the change.

Help > Instruction Manual

This option opens the Meter Reports instruction manual in the default PDF viewer of the local computer.

Help > Licensing

This option allows you to apply the license as described in *Getting Started on page 3*.

Help > About

This option displays information about the software, including the present version.

Configuration Pane

This section describes the interface and parameters required to generate a particular type of report or chart. Depending on the type of data that the report or chart uses, parameters may be a subset or variation of the following options.

Reports / Configurations

Before Meter Reports generates a report, you must select which report template to create and provide valid input parameters.

If you regularly want to see the same report template, you can save the report template, channels, and relative date range selection as a configuration. The next time you want to generate that report with the saved parameters, you only need to select the saved configuration.

NOTE: Only generate a report containing a script if it is from a trusted source.

The **Reports / Configurations** interface allows you to select a report template or a saved configuration. After your selection, the software displays the parameters necessary for the report. Reports that come standard with Meter Reports are at the top of the list with custom reports below, as shown in *Figure 9*. If a custom report contains scripts, a caution icon appears for that report. If you select a saved configuration, the parameters will be set to the saved values. You can modify the values and create the report(s) with or without saving the configuration.

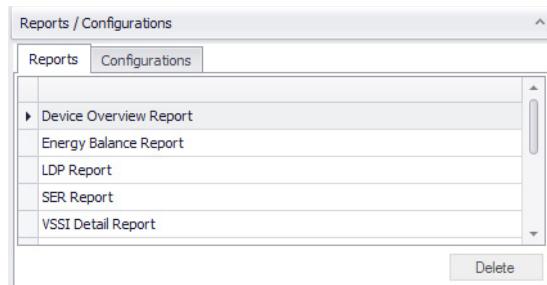


Figure 9 Reports / Configurations Interface

For example, if you want to generate a load data profile (LDP) report of the previous day from several metering points, you could select the metering points, the channels of interest, select **Yesterday** for the date/time range, and select your preferred scaling. You can then save that configuration with a custom name. Now, select the saved configuration from the list and select **Create Report**. Meter Reports generates one report for each metering point you selected in the configuration.

To load a saved configuration, perform the following steps:

- Step 1. Select the **Configurations** tab at the top of the Configuration pane.
- Step 2. Select the configuration you saved previously. The saved parameters will be loaded in the Configuration pane, where you can view or edit and resave the configuration.
- Step 3. Select **Create Report**.

Data Source

The data source of a report or chart can be a metering point, a device, or a metering point group (the result of aggregating the metering points in the group). Select the metering points and/or devices from the **Metering Points / Devices** tab. Select metering point groups from the **Metering Point Groups** tab.

Meter Reports generates a report or chart for each selected source in a new tab in the Report/Chart Viewer interface.

The screenshot shows a software interface titled "Data Source". Below it is a table titled "Metering Points". The table has two columns: "Metering Point Name" and "Device". There are seven entries in the table, each with a small icon to its left and a plus sign to its right, indicating expandable details. The entries are: 2270N Metering Point, 2270S Metering Point, 2350 C Metering Point, 2350 N Metering Point, 2350 S Metering Point, and 2390 Metering Point.

Metering Points	
Metering Point Name	Device
2270N Metering Point	2270N_734
2270S Metering Point	2270S_734
2350 C Metering Point	2350_C_734
2350 N Metering Point	2350_N_734
2350 S Metering Point	2350_S_734
2390 Metering Point	2390_734

Figure 10 Data Source

Channels

The **Channels** interface lists the LDP channels that are common among the selected metering points, devices, and metering point groups. Available channels are an attribute of the selected data source, so the software groups the Channels interface with the Data Source interface. The interface shows the name, function, and recording interval for each channel.

Multiple channels may or may not be selectable, depending on the report or chart. If multiple channels can be selected, the report layout or chart viewer defines the maximum number of channels. This maximum number displays in the title bar of the **Data Source / Channels** section.

If you select the **Insert zero records for missing intervals** option, the software inserts records in LDP data when there are missing records, such as when the device is turned off. The inserted records have data values of zero and are flagged as inserted records.

After you select a channel, the software moves it to the top of the list, where it can then be reordered. Only Profile reports and WAGES reports require channel selection and support the channel selector tool.

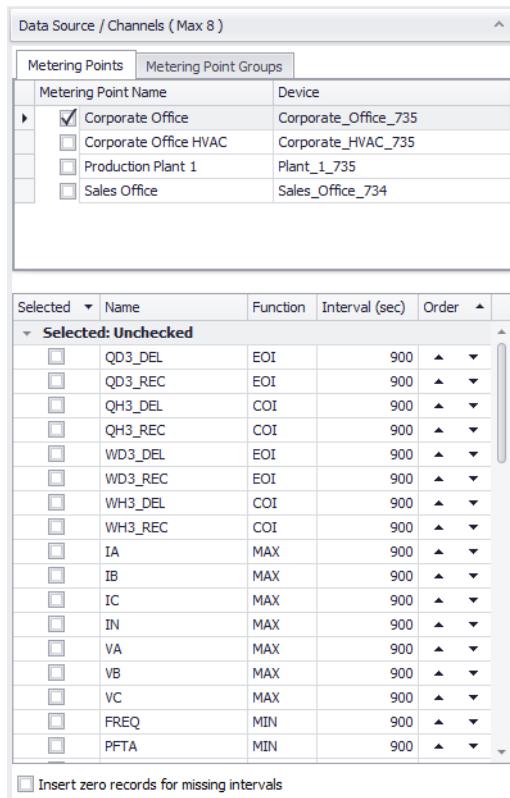


Figure 11 Data Source / Channels Selection

Date Range

The **Date Range** interface allows you to specify the starting and ending date and time for the data in the report or chart. Presets relative to the present time are available, or you can select **Custom** and select a custom range.

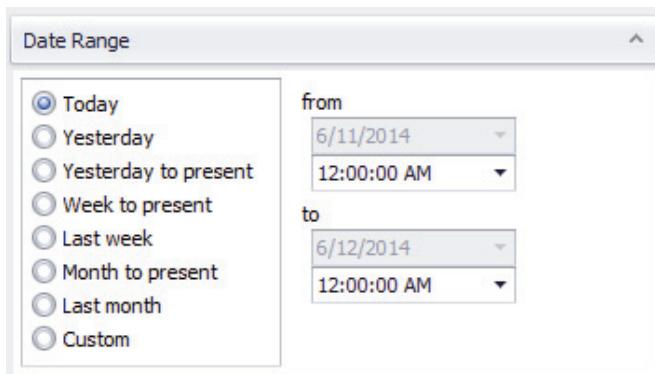


Figure 12 Date Range

The date range is relative to the report or chart creation time with the exception of the **Custom** range, which is absolute. For example, if you save a configuration on January 1st with a date range set to Yesterday, when you generate a report or chart from the saved configuration on January 20th, the report will contain data from January 19th.

Scale

If the selected report or chart data type supports scaling, this interface allows you to select primary or secondary scaling. Quantities selected in primary units represent actual power system conditions and are scaled by the appropriate current and/or potential transformer ratios as defined in the device. Quantities that are not related to voltage or current magnitudes, such as phase angles or power factor, are not affected by this parameter.

NOTE: Configurable register quantities from SEL-735 meters are not scaled, but are presented as configured in the device.

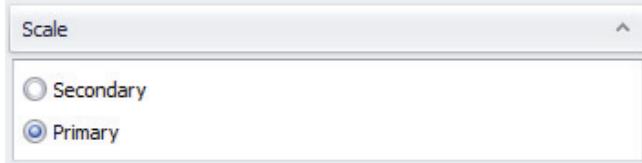


Figure 13 Scale

Unit Scale

Some reports and charts can present data in different unit scaling. The options available are as follows:

- Unity, such as watts, watt-hours, etc.
- Kilo, such as kilowatts, kilowatt-hours, etc.
- Mega, such as megawatts, megawatt-hours, etc.

Quantities such as percentages, power factor, and phase angles (in degrees) are not affected by this parameter.

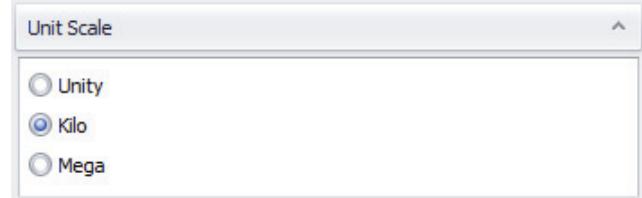


Figure 14 Unit Scale

Notes

Use the **Notes** section to record notes or other information. The notes are saved with the configuration and are available for future use.

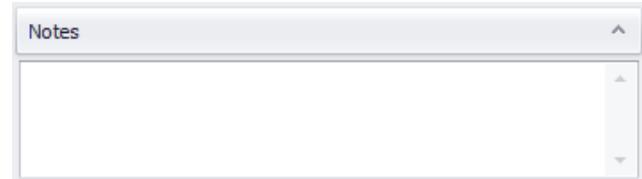


Figure 15 Notes

Save Button

The **Save** button allows you to save the presently selected parameters for later use. Saved configurations are available in the **Configurations** list in the **Report / Configurations** section of the Configuration Pane.

Create Report Button

Pressing the **Create Report** button creates the report based on the selected parameters and displays it in a new tab in the report viewer.

Create Chart Button

Pressing the **Create Chart** button creates an interactive chart based on the selected configuration parameters. The software uses the same data type as the selected report and creates a chart on a new tab.

LDP Chart

The LDP chart displays a trend of selected LDP channels over a period of time. If you select this data type, the software will allow you to view channels from among those collected by TEAM. Charts created using LDP data are a series of data points, with each line representing one quantity channel.

WAGES Chart

The WAGES chart is similar to the LDP chart with the addition of scale factors for each channel. Scale factors represent the factor to convert pulse counts to engineering units. For example, a channel could have a scale factor of 0.1 to represent 0.1 cubic feet of water for each pulse count.

VSSI Summary Chart

The VSSI Summary chart is based on the ITI chart. This chart categorizes events based on event depth and event duration. Hover the cursor over an event point to see an overview of data from the event. Select an event to load the VSSI Detail chart.

VSSI Detail Chart

The VSSI Detail chart shows voltage and current waveforms recorded when sags, swells, or voltage interruptions occur.

- On the Y-axis, view voltages as a percentage of V_{base} and currents as a percentage of I_{NOM} .
- On the X-axis, view event time stamps.

The Device Overview, SER, and Energy Balance data are not associated with a chart type. They can only be generated as static reports.

Chart Viewer Ribbon

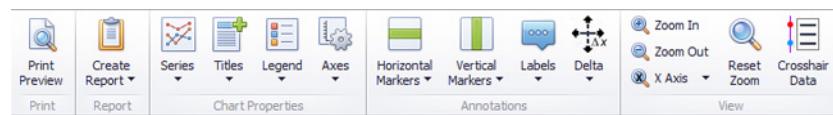


Figure 16 Chart Viewer Ribbon

Print

The **Print Preview** option opens a new tab in the software and displays a preview of the chart for printing. The print preview interface is the same as the report viewer described in *Report Viewer Ribbon on page 16*.

Report

The **Create Report** option will prompt you to pick a report template from which to create a report. Choose from report templates in your library that are compatible with the type of data in the chart. The report will use the same data source (metering point, group, or device) as the chart, the start and end date/times of the visible area in the chart, and the channel selections from the legend.

Chart Properties

The **Series** option allows you to change properties of each series on the chart.

The **Save Changes as Default** button in the bottom of the series property drop-down will save modified series properties, which will be applied to subsequent charts.

1. Series name—The series name is the name of the series as defined by the device. Series based on load profile data will also have the recorder function and acquisition rate as part of the name.
2. Series alias—By default, series have names as per settings in the device. Rename the series in the chart viewer by typing an alias in the **Series Alias** text box.
3. Line color—Select a custom color from the palette to override the automatically assigned unique color.
4. Line type—Select from solid, dotted, dashed, or dot-dash combinations to differentiate channel lines.
5. Line thickness—Set custom line thickness from one pixel thick to ten pixels thick. The default thickness is two pixels.
6. Unit Scale—Scale a series to unity, kilo, or mega units independently of other series by changing the unit scale setting.
7. Trend line—Optionally add a trend line to the chart for each series by checking the box.
8. Max/Min Annotations—Select this option for a series to add an annotation containing the values and pointing to the maximum and minimum points for the series.
9. Y-Axis assignment—Assign one or more series to a secondary Y-axis to better visualize series in different ranges. The secondary Y-axis is on the right of the graph.

The **Titles** option allows you to add titles to the chart. You can add a custom title and subtitle to the top of the chart or add axis labels on the X, Y, and secondary Y axes.

The **Legend** option allows you to select the horizontal and vertical position of the legend on the chart. In the position options, **Inside** will place the legend inside the chart area and **Outside** will place the legend outside the chart area.

The **Axes** options allow you to set the resolution on the axes by defining the major and minor ticks. In the X-axis, major ticks are units of time, year, month, day, hour, minute, second, or millisecond. Y-axis major ticks are any number from 0.001 to 1,000,000,000. Minor ticks further divide the axis between each major tick. The Y-axis supports 0–9 minor ticks, dividing the axis into as many as 10 segments. Similarly, the X-axis supports 0–59 ticks, allowing as many as 60 segments along the axis.

Annotations

The **Horizontal Markers** option will add a horizontal line with a label to the chart. This is useful for indicating a threshold or boundary value.

The **Vertical Markers** option will add a vertical line with a label to the chart. This is useful to mark a point in time, such as when a peak occurred.

To add a horizontal or vertical marker to the chart, select a marker button on the ribbon, then select **Add**. The software will add a marker to the middle of the chart. You can change the properties of the marker, including the label, color, line type, and line thickness from the ribbon option drop-down menu. You can also set the value (horizontal) or time (vertical) of the marker. The horizontal axis value is defined by the primary Y-axis. You can also select and drag the marker to a location with the mouse.

The **Labels** option allows you to add text to the chart. You could choose to extend a pointer from the label to mark specific data points. Select and drag the label box or the arrow pointer to reposition them. Use the ribbon option drop-down menu to define the time instant on the X-axis and the value of the data point on the Y-axis for the label pointer location.

The **Delta** option allows you to choose a start and end point on the chart to calculate the difference in values and time between the two points. After enabling **Delta**, the first click on the chart sets the starting point, the second click sets the end. If you select the chart again after setting the end point, the previous delta will be removed and a new starting point will be defined where you clicked. To remove the delta data from the chart, clear the **Show Delta Annotation** check box on the ribbon. To reset the data, disable the deltas.

View

To zoom in or zoom out, first select the axis of view and then select the **Zoom In** or **Zoom Out** button options. The **X Axis** option will scale the horizontal axis, and the **Y Axis** option will scale the vertical axis.

The **Reset Zoom** button will return the chart back to the original scaling.

The **Crosshair Data** option controls whether a box with data values appears when hovering the cursor over the chart area.

Report Viewer Ribbon

The report viewer refers to the portion of the application where reports are displayed and from which they can be manipulated, printed, or exported.

Meter Reports software presents each report initially as a tab in the Report Viewer portion of the application. To move the report tabs, select and drag them. You can reorder the tabs, undock a tab to a floating window, or dock tabs next to each other horizontally or vertically.

To dock tabs, perform the following steps:

Step 1. Select and hold the tab and drag it away from the tab bar.

When the tab undocks from the tab bar, the software displays a graphic in the center of the report viewer area that depicts regions of the pane.

Step 2. Move the mouse cursor over the region of the pane to which you want to dock the report.

Step 3. Release the mouse button over the region, and the tab docks in that location.

You can add tabs to tab groups by dragging the tab from one group to another. If you release the tab when you are not hovering over a tab group or the docking graphic, the report will “float.”

Each tab has a collection of tools in a ribbon at the top. The following text describes the elements of the ribbon.

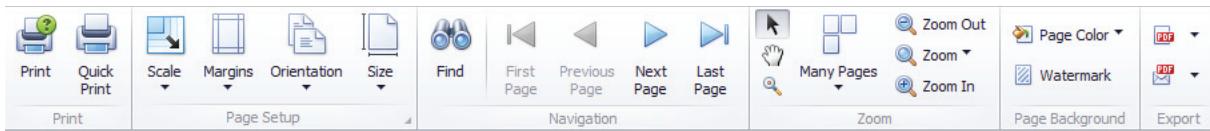


Figure 17 Report Viewer Ribbon

Print

The **Print** option opens the standard Windows print dialog, from which you can choose a printer and print options.

The **Quick Print** option prints the report to the system default printer, using the default options saved for that printer.

Page Setup

By default, reports are formatted for letter-size paper. You can use the options on the ribbon to change the paper size, orientation, and margins. The default margins for the standard reports are 0.5 inches on the top and bottom and 0.25 inches on the sides.

If the report does not fit within the margins after you have changed any of the page setup options, you can use the **Scale** option and select the **Fit to 1 page wide** option to scale the content to fit. Through the use of the **Scale** option, you can also zoom in or out on the report content.

Navigation

Use the **Find** option to search the text data of the report.

The navigation arrows jump to the first page, previous page, next page, or last page of the report.

Zoom

The zoom options allow you to zoom in on the preview of the report. You can view multiple pages at once or zoom in to various levels.

Select the **Mouse Pointer** tool to select and highlight elements of the report.

Select the **Hand** tool to grab and drag the whole report within the viewable region. This is useful if you have zoomed in on a report and want to scroll by dragging the page.

Select the **Magnifier** tool to zoom in and out of the report in relation to where you click.

Page Background

Use the page color option to set the background color of the report.

The watermark option adds a text watermark to the report. This is useful for indicating attributes of the report, such as indicating that it contains confidential information.

Export

Meter Reports software allows you to export a report to a file or create a new email message in your system default mail client with the exported report file attached.

Meter Reports software can export reports to the following formats:

- PDF—Portable document format
- HTML—Webpage
- MHT—MIME HTML (webpage archive format)
- RTF—Rich text format, for use in Microsoft Word or WordPad
- XLS—Microsoft Excel workbook prior to Office 2007
- XLSX—Microsoft Excel workbook for Office 2007 and later
- CSV—Comma-separated values
- Text—Formatted plain text
- Image
 - BMP—Bitmap image
 - GIF—Graphics interchange format
 - JPEG/JPG—Compressed digital image
 - PNG—Portable network graphic
 - TIFF—Raster graphic image
 - EMF/WMF—Windows metafile format

Reports

This section describes the reports that come standard with Meter Reports. Reports that use VSSI, SER, or Load Profile data support selecting a metering point as the data source. If a metering point has multiple devices assigned, the report shows the union of the data for VSSI and SER data, and a sum per matching intervals for load profile data. The report will not identify the source device for the individual records in this case.

Device Overview Report

The **Device Overview Report** shows all the devices that are configured in the system and displays device attributes, such as the following:

- The name of the metering point
- Indication of whether the metering point is enabled in TEAM
- Device names associated with the metering point
- Indication of whether the device is marked as “In Service” in Device Manager
- The location (folder) of the device as defined in Device Manager
- The time zone in which the metering point is located
- The UTC offset of the time zone as of the time the report is generated
- A flag indicating if the time zone is affected by daylight saving time (DST)

Device Overview Report

9/2/2014 11:25:46 AM



Metering Point	Enabled	Device Name	In Service	Location	Time Zone	UTC Offset	DST
2270N Metering Point	True	2270N_734	True	2270N	US/Pacific	-07:00:00	True
2270S Metering Point	True	2270S_734	True	2270S	US/Pacific	-07:00:00	True
2350 C Metering Point	True	2350_C_734	True	2350	US/Pacific	-07:00:00	True
2350 N Metering Point	True	2350_N_734	True	2350	US/Pacific	-07:00:00	True
2350 S Metering Point	True	2350_S_734	True	2350	US/Pacific	-07:00:00	True

Figure 18 Device Overview Report

VSSI Reports

There are two VSSI reports available: the summary report and the detail report.

VSSI Summary Report

The **VSSI Summary Report** displays the VSSI summary data as generated by the meter. Each event is summarized in a row of the data table. Each event contains the following attributes:

- The type of event
- The date the event occurred
- The time the event occurred
- The duration of the event
- The depth of the event
- A-phase V_{base} voltage
- B-phase V_{base} voltage
- C-phase V_{base} voltage
- A-phase minimum voltage
- A-phase maximum voltage
- B-phase minimum voltage
- B-phase maximum voltage

- C-phase minimum voltage
- C-phase maximum voltage
- ITI curve region

For each event, there is a link to the graph of the VSSI detail data for the event that will expand in-line in the summary report.

The Information Technology Industry Council (ITI) defines regions based on the VSSI event duration and depth that indicate the impact on standard information technology (IT) equipment. The **VSSI Summary Report** shows the ITI curve region for each event and plots all events in the report in a graph at the top of the report. The following table defines the ITI curve regions.

ITI Curve Region Definition

SR	Safe Region
ND	No Damage Region
PR	Prohibited Region

VSSI Summary Report

9/2/2014 11:32:15 AM

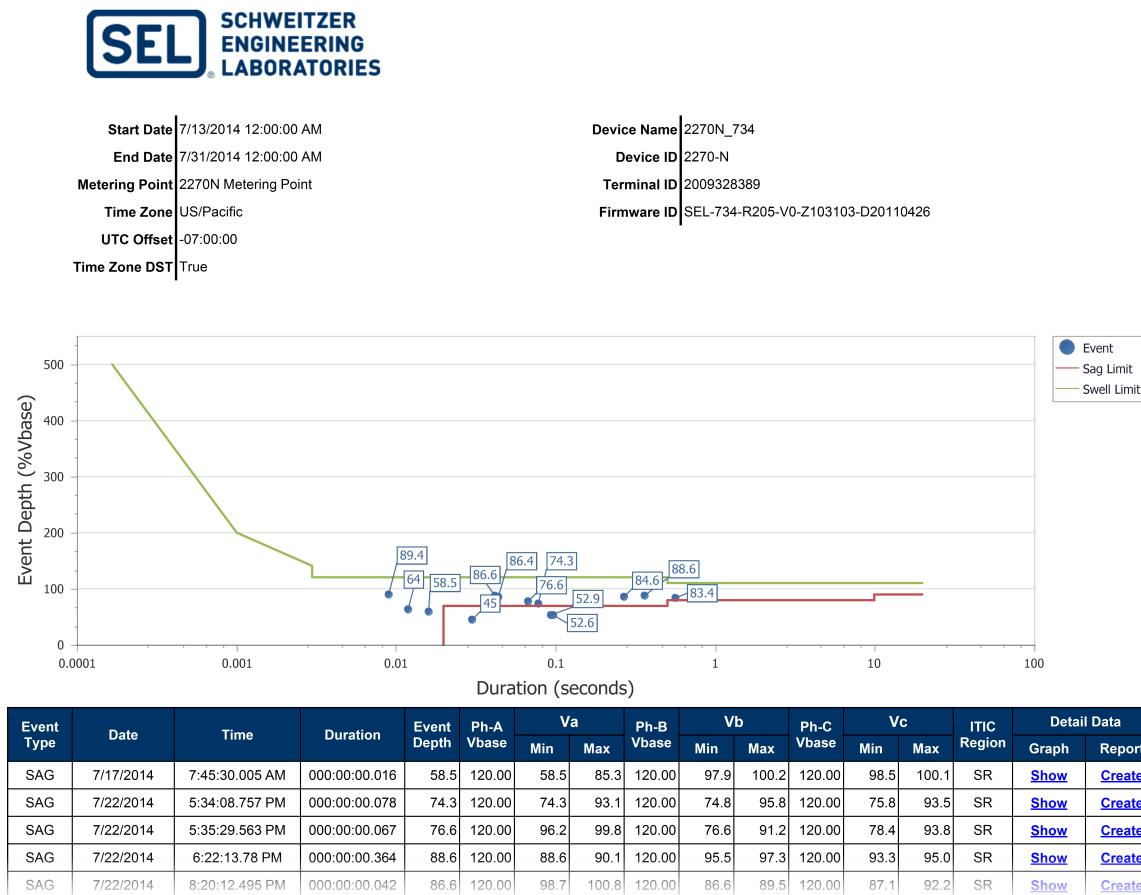


Figure 19 VSSI Summary Report

VSSI Detail Report

The **VSSI Detail Report** displays the VSSI data polled from the selected device. The **VSSI Detail Report** contains the following data for each sample:

- Date the sample was recorded
- Time of day that the sample occurred to the millisecond
- A-phase current percent of nominal
- B-phase current percent of nominal
- C-phase current percent of nominal
- Ground current percent of nominal
- Neutral current percent of nominal
- A-phase V_{base} voltage
- A-phase voltage percent of V_{base} A
- B-phase V_{base} voltage
- B-phase voltage percent of V_{base} B
- C-phase V_{base} voltage
- C-phase voltage percent of V_{base} C
- A-phase state
- B-phase state
- C-phase state
- Record status value indicating the recording rate when the record was recorded
- Indication of whether daylight saving time was in effect at the time the record was recorded

VSSI detail records are captured at a variable rate that depends on the event length and when the voltage crosses the VSSI thresholds. The Status column indicates the recording rate for each record. The report includes status codes below the data table. These codes are defined as follows:

Status Code	Meaning
R	Ready (any channel is armed)
P	Predisturbance (4 samples per cycle)
F	Fast recording mode (4 samples per cycle)
E	End (post-disturbance at 4 samples per cycle)
M	Medium recording mode (one sample per cycle)
S	Slow recording mode (one sample per 64 cycles)
D	Daily recording mode (one sample per day, triggered at midnight)

VSSI Detail Report

9/2/2014 11:39:04 AM



Start Date	7/22/2014 5:35:29 PM	Device Name	2270N_734
End Date	7/22/2014 5:35:29 PM	Device ID	2270-N
Metering Point	2270N Metering Point	Terminal ID	2009328389
Time Zone	US/Pacific	Firmware ID	SEL-734-R205-V0-Z103103-D20110426
UTC Offset	-07:00:00		
Time Zone DST	True		

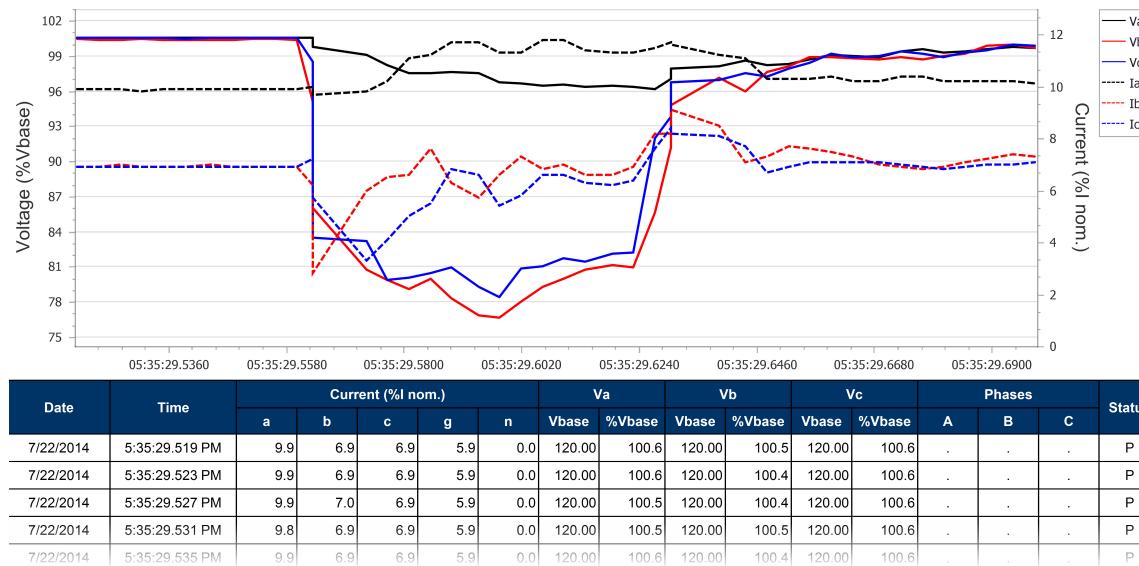


Figure 20 VSSI Detail Report

SER Report

The Sequential Events Recorder (SER) in SEL devices monitors and records device events. For example, if the settings are changed in a device, the device records an SER entry that the settings changed. The device time-stamps each SER entry.

The SER will also record binary state changes of Word bits mapped to the SER recorder. For example, if you map the SAGA word bit to the SER recorder, the device records the state change and time when the word bit changes.

The SER report retrieves the SER data from the ACCELERATOR Database for a user-specified metering point and date range and puts the data into a formatted report. See *Figure 21* for an example of the report.

SER Report

9/2/2014 11:45:16 AM



Start Date	7/15/2014 12:00:00 AM	Device Name	2270N_734
End Date	7/23/2014 12:00:00 AM	Device ID	2270-N
Metering Point	2270N Metering Point	Terminal ID	2009328389
Time Zone	US/Pacific	Firmware ID	SEL-734-R205-V0-Z103103-D20110426
UTC Offset	-07:00:00		
Time Zone DST	True		

Date	Time	Element	State
7/17/2014	7:45:30.265 AM	ITIC_SR	Asserted
7/17/2014	7:45:30.29 AM	ITIC_SR	Deasserted
7/22/2014	8:33:39.792 AM	ITIC_SR	Asserted
7/22/2014	8:33:40.792 AM	ITIC_SR	Deasserted

Figure 21 SER Report

LDP Report

The load data profile (LDP) recorder in the device records configured quantities in the meter to record at a set interval. For example, the device may be configured to record the phase voltages every five minutes.

LDP recorders in SEL meters can also be configured to perform functions on the data at every recording interval. The following is a list of supported functions:

- EOI (End Of Interval)—Records the value of the quantity at the end of each interval
- COI (Change Over Interval)—Records the difference in values for a quantity between the beginning and end of the interval
- MIN (Minimum)—Records the minimum value for a quantity observed during the interval
- MAX (Maximum)—Records the maximum value for a quantity observed during the interval
- AVG (Average)—Records the average value of a quantity during the interval

SEL meters with advanced or intermediate power quality options support multiple LDP recorders. Each recorder can contain as many as 16 quantities (channels) and can have a different function and acquisition rate than for other recorders. The same quantity can exist in multiple recorders with different functions and/or acquisition rates, so channels are uniquely identified using the quantity name, the function performed on the data, and the acquisition rate at which data are recorded.

The LDP report displays selected channels in a tabular format and shows a trend graph of the data.

LDP Report

9/2/2014 12:20:30 PM

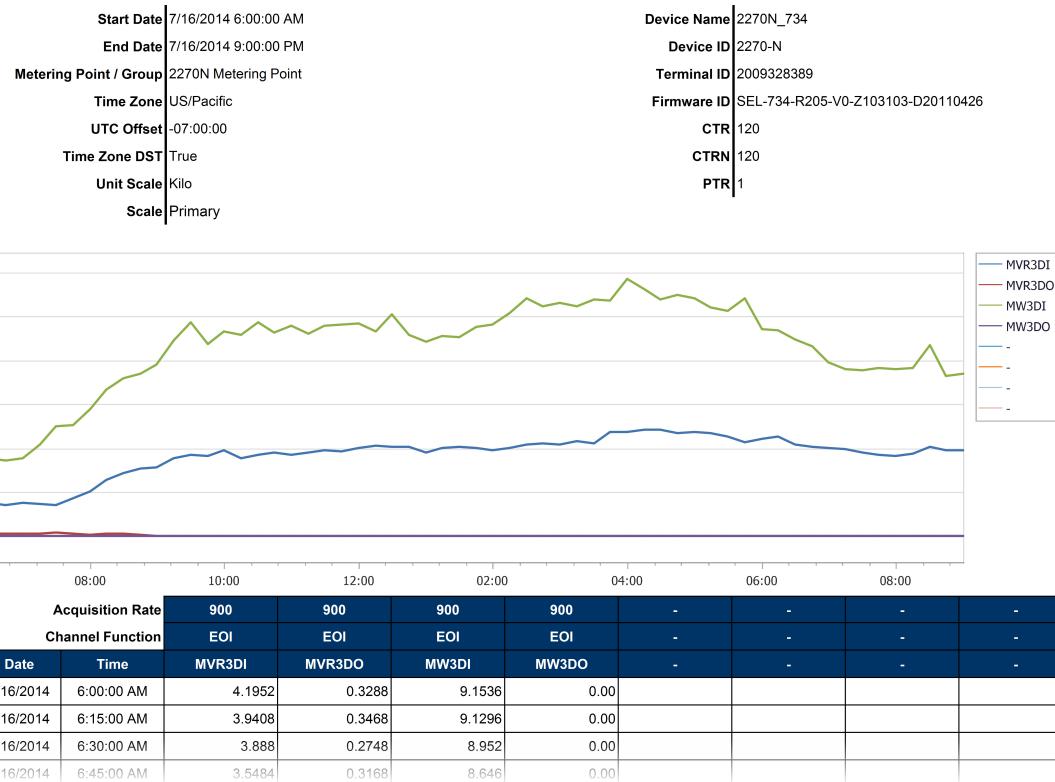


Figure 22 LDP Report

WAGES Report

WAGES stands for water, air, gas, electricity, and steam. SEL meters can use digital inputs to monitor and record pulses generated by other meters (water, air, gas, other electricity, and steam meters and transducers). SEL meters count and record the pulses in the load profile recorders. TEAM can then collect and archive the pulse data, which should be converted from pulses to engineering units for analysis. Through the use of the **WAGES Report**, you can perform this data conversion.

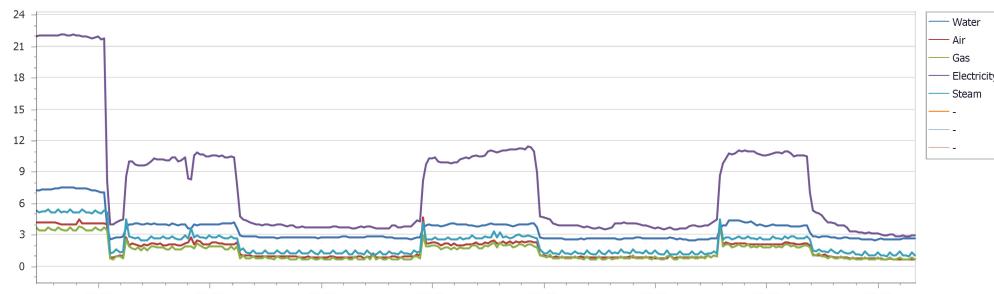
When you select the **WAGES Report**, the program displays a **Channels** parameter interface in which there is a scale factor column. For each selected column, enter the scale factor to convert pulse counters to engineering units. The report scales the channels and reports the scale factors in the report header.

WAGES Report

9/3/2014 3:15:18 PM



Start Date	7/16/2014 12:00:00 AM	Device Name	Zocholl_F_735
End Date	7/19/2014 12:00:00 AM	Device ID	ZOCHOLL FLEX SEL-735
Metering Point / Group	Zocholl Flex Meter	Terminal ID	SEL-735
Time Zone	US/Pacific	Firmware ID	SEL-735-R107-V0-Z004003-D20130701
UTC Offset	-07:00:00	CTR	120
Time Zone DST	True	CTRN	120
Unit Scale	Kilo	PTR	1
Scale	Primary		



Scale Factor	0.89	120	100	0.8	140	-	-	-
Acquisition Rate	900	900	900	900	900	-	-	-
Channel Function	EOI	MAX	MAX	EOI	MAX	-	-	-
Status	Date	Time	Water	Air	Gas	Electricity	Steam	-
	7/16/2014	1:00:00 AM	7.184207	4.151118	3.67943	21.896912	5.350806	
	7/16/2014	1:15:00 AM	7.212711	4.151638	3.443518	21.9817	5.168327	
	7/16/2014	1:30:00 AM	7.318073	4.155999	3.453801	22.074071	5.199934	
	7/16/2014	1:45:00 AM	7.351238	4.167122	3.442705	22.01601	5.196913	
	7/16/2014	2:00:00 AM	7.323563	4.151105	3.680265	22.028732	5.382185	

Figure 23 WAGES Report

Energy Balance Report

The **Energy Balance Report** shows the difference in energy consumed over a specified date/time period from two different devices. This can help you determine losses between meters or the energy used at an unmetered point, among other scenarios.

The **Energy Balance Report** accepts one or two pairs of channels. This report is suitable for use with delivered/received (in/out) energy pairs, because the software calculates the net value of the pair for each metering point. Only channels recorded with the change-over-interval (COI) function are available for this report.

Once the software calculates the energy consumed over the time period for each metering point, it calculates the difference between the two selected metering points. The report contains the resulting values from each metering point and the difference.

Ensure that the energy channels selected are reporting data in the same units. The report always subtracts the values of the second metering point from the values of the first metering point.

Energy Balance Report

9/2/2014 1:09:48 PM



Start Date	7/15/2014 12:00:00 AM	Unit Scale	Kilo
End Date	7/22/2014 12:00:00 AM	Scale	Primary
Metering Point / Group 1	Zocholl Flex Meter	Metering Point / Group 2	Zocholl Mains Metering Point
Device Name 1	Zocholl_F_735	Device Name 2	Zocholl_M_735
Time Zone	US/Pacific	Time Zone	US/Pacific
UTC Offset	-07:00:00	UTC Offset	-07:00:00
Time Zone DST	True	Time Zone DST	True
Device ID	ZOCHOLL FLEX SEL-735	Device ID	ZOCHOLL MAIN SEL-735
Terminal ID	SEL-735	Terminal ID	SEL-735
Firmware ID	SEL-735-R107-V0-Z004003-D20130701	Firmware ID	SEL-735-R107-V0-Z004003-D20130701
CTR	120	CTR	500
CTRN	120	CTRN	500
PTR	1	PTR	1

Zocholl Flex Meter					
QH3_DEL	QH3_REC	Net	WH3_DEL	WH3_REC	Net
493.09316	0.00	493.09316	994.712712	0.00	994.712712
Zocholl Mains Metering Point					
QH3_DEL	QH3_REC	Net	WH3_DEL	WH3_REC	Net
11,499.688026	0.00	11,499.688026	24,493.974796	0.00	24,493.974796
Zocholl Flex Meter - Zocholl Mains Metering Point					
-11,006.5949	0.00	-11,006.594866	-23,499.262085	0.00	-23,499.262085

Figure 24 Energy Balance Report

Report Designer

Customize the standard reports available in Meter Reports through the use of the **Report Designer** tool. When a customized report is saved in the **Report Designer**, the software adds the report to the list available in Meter Reports.

The **Report Designer** tool consists of the following elements:

NOTE: Accept files only from trusted sources. Report files (REPX) and Report Style files (REPSS) can contain scripts that execute when opened or imported.

- Top ribbon
- Toolbox
- Field List
- Property Grid
- Report Editor

Top Ribbon

The following is a description of the options available from the top ribbon in the **Report Designer**.



Figure 25 Report Designer Ribbon

Report

The **New Report** option displays a list of the standard reports available in Meter Reports. Select the report type that you want to customize and it will be loaded into a new tab from which you can make changes.

The **Open** option displays a list of saved reports. Select the report to open into a new tab.

The **Save** option saves the report with the present name (if previously saved). The **Save As** option saves the report under a new name.

The **Save All** option saves all open reports.

Font

Use the controls in the **Font** section to modify font, color, size, properties, and alignment of text within the report.

Alignment

Use the options in the **Alignment** section to align elements in the report, either in relation to each other or in relation to the grid. The software displays a description of each icon when you hover your mouse cursor over it.

Layout

When you arrange elements in the report, use the tools in the **Layout** section to make elements of the report consistent in size and position. The software displays a description of each icon when you hover your mouse cursor over it.

Zoom

The options in the **Zoom** section control the view of the report tab you select.

View

Close the **Toolbox**, **Field List**, and **Property Grid** by selecting the **Close** button in the corner of each section. Once closed, each of these elements can be reopened by selecting the **Windows** button and selecting the element from the list.

Toolbox

The **Toolbox** contains the report elements available for customizing reports.

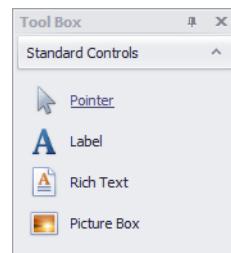


Figure 26 Report Designer Toolbox

Pointer

The **Pointer** tool allows you to select elements of the report and change the positioning and properties of the element. Select the **Pointer** tool and then select the report element you want to change. After selecting the element, you can either drag the element to another location on the report or use the **Property Grid** described later to change the properties of the element.

Label

The **Label** tool adds a text element to the report. The text can be static text or bound to data that are available from the database.

To add a label element to a report, select the label icon in the **Toolbox**, then select the report where you want to add the label. To modify the text, double-click the label element and enter new text.

Control text formatting through the use of the **Font** section in the top ribbon menu, or in the **Appearance** section of the **Property Grid**.

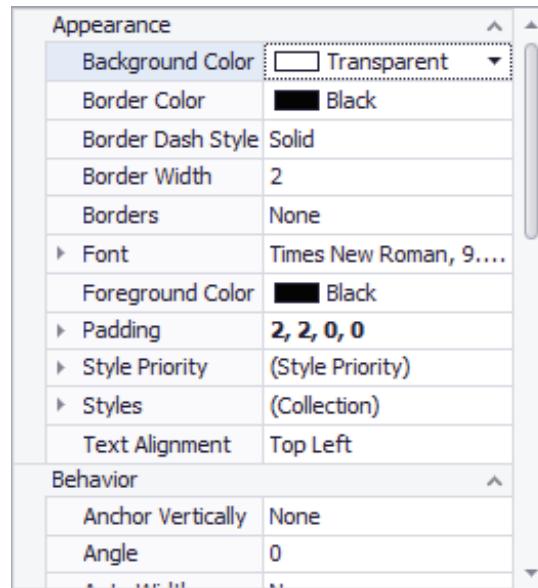


Figure 27 Appearance Section

Rich Text

The **Rich Text** tool allows the report to include large blocks of formatted text. Formatting defined in other documents (including RTF, Microsoft Word, or HTML documents) loaded into the element will be preserved.

To select a document to represent, select the rich text element in the report editor, select the small box with the > near the element, and select **Load File**.

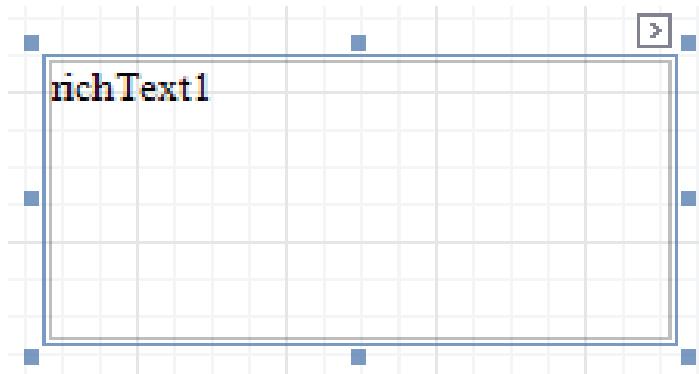


Figure 28 Rich Text Element

Picture Box

The **Picture Box** tool allows you to add an image to the report. Select the **Picture Box** tool and then select the report where you want to add the picture. After placing the picture box, you can set the image file to be displayed by finding the **Image** property in the **Property Grid** and selecting the ellipsis (...).



Figure 29 Data Binding

You can also set the image file by selecting the small box with the > symbol next to the picture box in the **Report Editor**.

Determine the behavior of the image within the box by changing the **Sizing** property, either in the **Property Grid** or in the menu that the software displays when you select the > button.

Field List

The **Field List** shows the data from the ACCELERATOR Database. The items in the list can be “bound” to an element in the report, and then that element will contain the data from the database when it is generated in Meter Reports.

Some of the elements in the field list represent lists of data. If the report element is in the **Data** band, the software iterates through the list and shows an element for each item in the list. An example of this is the table in the **Data** section of most standard reports. When Meter Reports software generates the report, there is a row in the table for each item in the list.

To bind an item in the field list to an element in the report, select and drag the item from the field list and drop it on the element. Formatting and appearance can be changed through the use of the **Property Grid** or the options on the top ribbon.

Property Grid

Each report element has a set of properties. The set of properties differs for each type of report element. Properties that may be available include colors, font attributes, borders, layout, data binding, and visibility.

When you select a property, the software describes each property in the section below the property list.

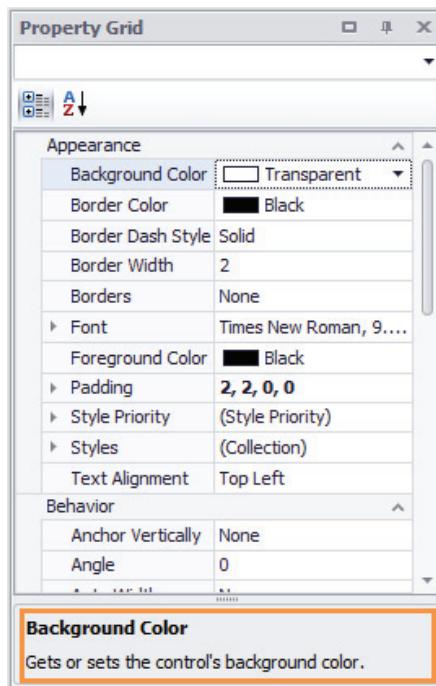


Figure 30 Property Description

Report Editor

The software representation of a report in a tab in editor view differs from the resulting report. A report is built from different bands, each of which has different behavior. The bands available in the reports are as follows:

- Top Margin—Report elements will be present in the top margin of each page
- Report Header—Report elements will be present at the top of the first page of the report
- Page Header—Report elements will be present at the top of every page of the report
- Data—Report elements will be repeated for each row in the data table the database returns
- Page Footer—Report elements will be present at the bottom of every page of the report
- Bottom Margin—Report elements will be present in the bottom margin of each page

How-To Example

This section contains an example and provides all steps necessary for a modification that you can make to the standard reports.

Example: Branding Reports

Users often want reports they use in their organization to be branded with the logo, colors, and contact information for their company. This example guides you through this customization process.

- Step 1. First, open the **Report Designer** by selecting **Tools > Report Designer**.
- Step 2. When the **Report Designer** opens, select **New Report**.
- Step 3. Select the report type you want to customize.

Logo

Step 1. To change the logo, select the SEL logo. The software indicates that you have selected the logo picture box element.

Step 2. With the element selected, find the **Image** property under the **Data** section in the **Property Grid**, as shown in *Figure 31*.

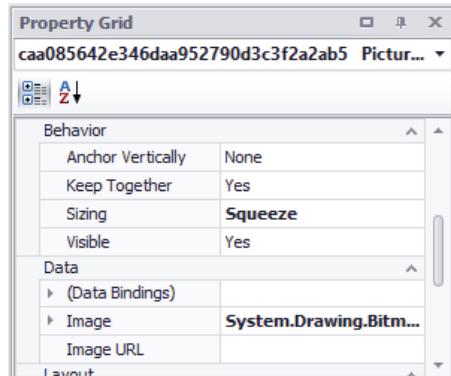


Figure 31 Property Grid

Step 3. Select the ellipsis (...) to the right of the **Image** property value. The software opens a dialog from which you can choose a new image file to display in the box.

Step 4. To adjust how the image displays, change the **Sizing** property in the **Behavior** section in the **Property Grid**, as shown in *Figure 31*.

Other properties are available in the **Property Grid**. When you select an item, the software displays the description of the option at the bottom of the **Property Grid**.

Colors

To change the color of any text element, click once on the element in the **Report Designer**. In the **Property Grid**, in the **Appearance** section, you will find color properties such as background color, border color, foreground color, and appearance properties. Change the appearance by changing the value for the property in the **Property Grid**.

You can change the same property for multiple elements simultaneously by holding the <Ctrl> key while selecting elements to select more than one at a time.

Company Information

In the **Report Designer**, you will see fields for **Company Name**, **Company Address**, **Phone Number**, and **URL** to the right of the logo. Each of these fields has its **Visibility** property set to **No**.

To make an element visible, select the element by clicking on it. Find the **Visible** property in the **Behavior** section in the **Property Grid** and change the value to **Yes**.

To modify the text in the element, double-click the element and the software will allow you to modify the text.

Revision History

Starting with revisions published after March 1, 2022, changes that address security vulnerabilities are marked with “[Cybersecurity]”. Improvements to cybersecurity functionality that should be evaluated for potential cybersecurity importance are marked with “[Cybersecurity Enhancement]”.

Revision	Summary of Revisions
1.0.14.0	<ul style="list-style-type: none"> ➤ [Cybersecurity Enhancement] Added a warning when opening the Report Designer reminding that files can contain scripts and a caution for the user to only accept files from trusted sources. ➤ Addressed an issue where the software could unexpectedly close when installed on a computer with no connection keys previously imported.
1.0.13.0	<ul style="list-style-type: none"> ➤ Added support for ACCELERATOR Database 3.1.0.2 and higher. Verify that your ACCELERATOR Database is up to date using SEL Compass or contact SEL for assistance: pc_software_support@selinc.com.
1.0.12.0	<ul style="list-style-type: none"> ➤ [Cybersecurity] Improved security of stored data by encryption using a unique key generated when the database is installed. ➤ Added support for ACCELERATOR Database 3.0.0.0 and higher. Verify that your ACCELERATOR Database is up to date using SEL Compass or contact SEL for assistance: pc_software_support@selinc.com.
1.0.11.0	<ul style="list-style-type: none"> ➤ Addressed an issue with generating reports in geographical regions where number separators use commas rather than periods to indicate decimals and use periods rather than commas between groups of thousands.
1.0.10.0	<ul style="list-style-type: none"> ➤ Addressed issue importing ACCELERATOR Database connection keys in version 1.0.9.0.
1.0.9.0	<ul style="list-style-type: none"> ➤ Changed the report file processing to improve the handling of malformed files. ➤ Added a warning when a report contains embedded scripts and a caution for the user to only generate reports from trusted sources.
1.0.8.0	<ul style="list-style-type: none"> ➤ Updated internal zip component to address CVE-2018-1002205.
1.0.7.0	<ul style="list-style-type: none"> ➤ Added ACCELERATOR Meter Reports to SEL Compass. ➤ Added support for ACCELERATOR Database 2.0.19.0 and higher. Verify that your ACCELERATOR Database is up to date using SEL Compass or contact SEL for assistance: pc_software_support@selinc.com.
1.0.6.0	<ul style="list-style-type: none"> ➤ Modified to support licenses for sales orders entered on or after May 2, 2016.
1.0.5.0	<ul style="list-style-type: none"> ➤ Added support for connection keys for connection to the ACCELERATOR Database. ACCELERATOR Meter Reports 1.0.5.0 and higher require ACCELERATOR Database 2.0.18.0 or higher. Verify that your ACCELERATOR Database is up to date using SEL Compass or contact SEL for assistance: pc_software_support@selinc.com.
1.0.4.0	<ul style="list-style-type: none"> ➤ Modified to use less memory while generating reports, and to prompt the user with actions to reduce memory usage if unable to display a large report.
1.0.3.0	<ul style="list-style-type: none"> ➤ Added a Demo Mode with built-in sample data for software demonstrations. ➤ Added interactive charts for the VSSI Summary, VSSI Detail, and WAGES reports. ➤ Added Chart viewer tools to format charts and add annotations before creating reports. ➤ Added a message to notify the user when there are no data to report for the set configuration. ➤ Modified the behavior of the Create Report button in the LDP chart viewer (previously the Preview Data function) to account for channel selection in the chart viewer.
1.0.2.0	<ul style="list-style-type: none"> ➤ Increased the speed of query response for profile data. ➤ Modified the behavior of the channel selection tool to account for metering points with common data channels. ➤ Removed description flags from the default view of the ITI chart in the VSSI Summary Report.
1.0.1.0	<ul style="list-style-type: none"> ➤ Initial release.

Glossary

ACSELERATOR Database	The SQL database used by TEAM to store device connection information and normalized event data. This database is a central component of the TEAM system. TEAM DDCs and TEAM EDTs use this database for event report collection and translation.
QuickSet	This is the software that is used to manage settings on SEL devices. QuickSet hosts plug-ins including the Device Manager plug-in and the TEAM plug-in that are used to configure the prerequisites of TEAM Metering Center.
Connection Explorer	The Connection Explorer is located on the left of the QuickSet Welcome screen. Use the Connection Explorer to define devices, device connections, and device configurations. The Explorer screen is divided into three main sections: the Connection Explorer, the Template Palette, and the Status window.
Device Data	Information from SEL devices that contains such system or device information as event reports and the results of User Commands is called Device Data.
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 Type	A specific type of SEL IED, such as an SEL-735.
IED	Intelligent electronic device, such as a relay or a meter.
Location	A location is defined in the Connection Explorer tree view and lets you organize your devices by geographic locations and other categories.
Service	A software application that can start as soon as the computer is booted. It runs as long as the computer is powered, and it requires no direct user input. On the Microsoft Windows operating system, this is a Windows service. On a Linux operating system, this is a Daemon service. The TEAM DDC and TEAM EDT are services.
User Account	User identification that allows a user to authenticate and use Meter Reports.

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