SEL-5705 Synchrowave® Reports

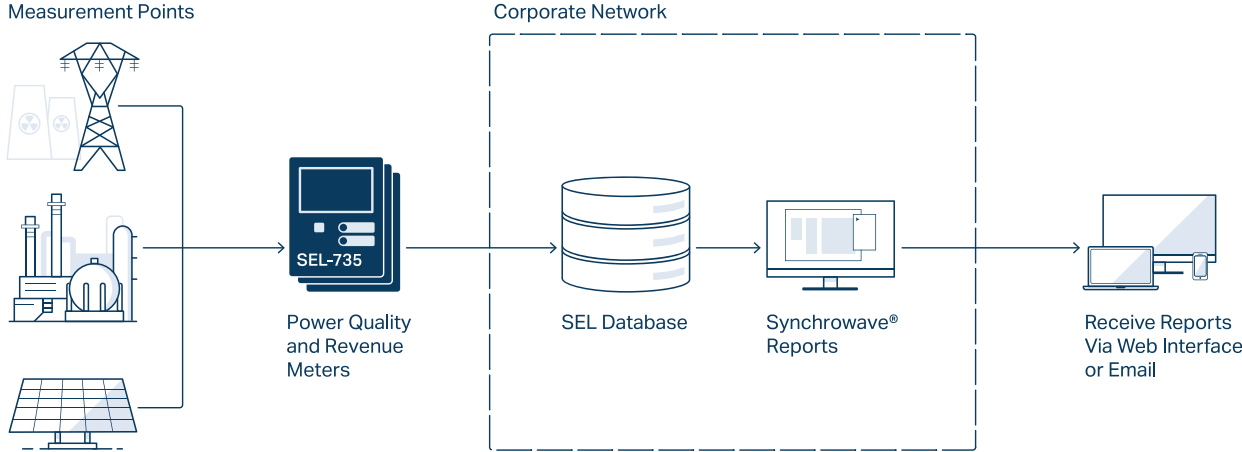## Take action with automated meter data and power quality reports

- Use interactive charts to monitor and report resource consumption across your system.

- Schedule automatic delivery of PDF or CSV reports to your email inbox.

- Reduce operational costs by analyzing historical data to predict system trends and drive planning.

- Improve system awareness by identifying long-term harmonic distortions or consumption patterns with IEEE 519 reports.
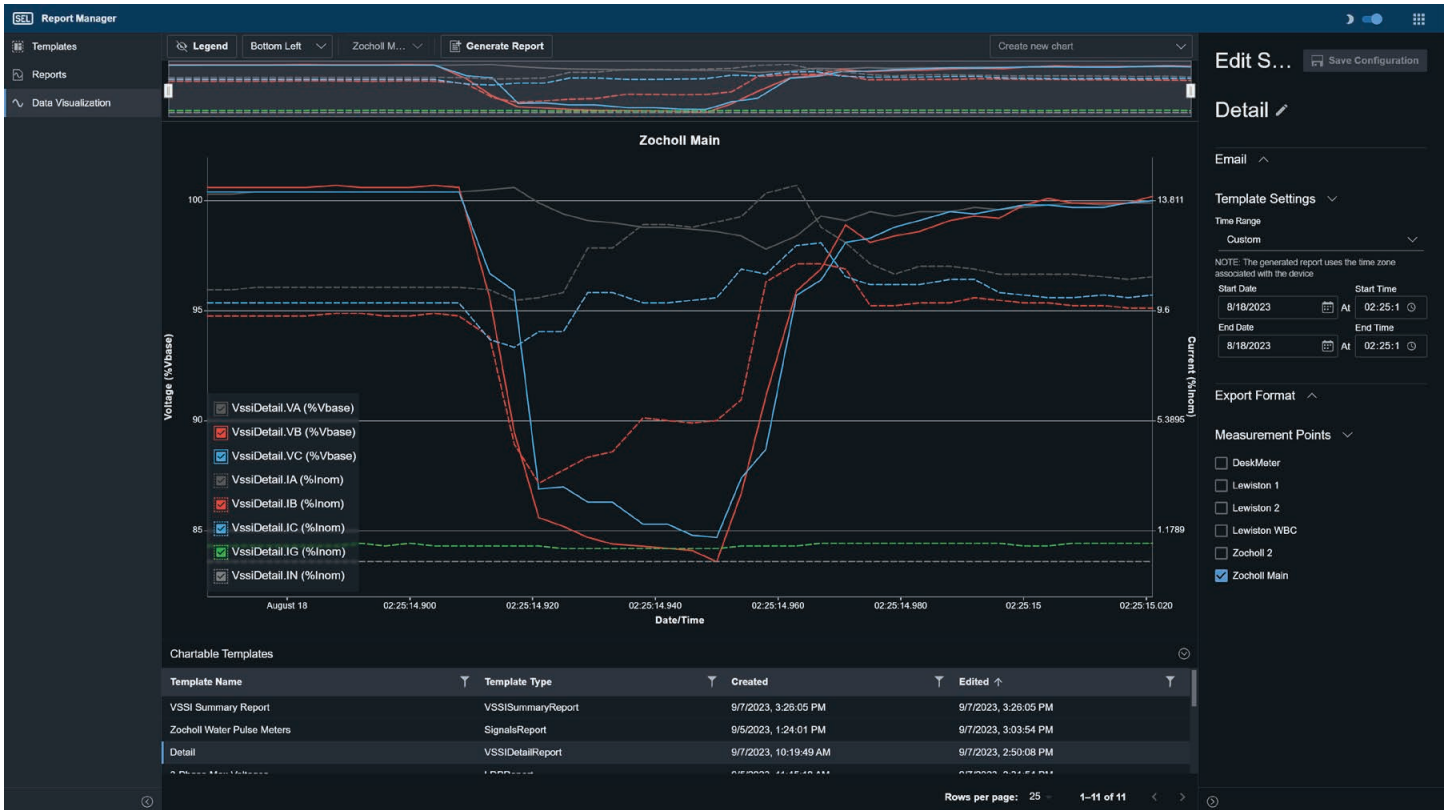
SEL

Product Overview

The SEL-5705 Synchrowave Reports software collects and combines data from multiple measurement points and provides dynamic charts and tabular reports of load profile data (LDP), voltage disturbances, energy consumption, and power quality compliance. LDP data trends include voltage, current, frequency, power factor, energy, demand, flicker, unbalance, and harmonics—providing key insights into power system operation, disturbances, and improvement opportunities. This software generates reports from multiple measurement points, using data collected by SEL-5045 acSELerator Team® software. The Team software also interfaces with the SEL Real-Time Automation Controller (RTAC) to trend data from SEL as well as third-party devices.

Synchrowave Reports allows you to organize, visualize, analyze, and automatically share collected data using a variety of report templates. Available meter data reports include LDP, Sequential Events Recorder (SER), voltage sag, swell, and interruption (VSSI), and Device Overview. For power quality, SEL-5705 provides compliance reports per IEEE 519.

Measurement Points

Corporate Network

SEL-735

Power Quality and Revenue Meters

SEL Database

Synchrowave® Reports

Receive Reports Via Web Interface or Email

Key Benefits

Visually Analyze Metering Data

Use interactive charts in the Synchrowave Reports web interface to analyze metering data trends, refining selections by time to get a complete picture of system events.

Retrieve Reports by Email or On Demand

Receive emailed reports or generate reports on demand to streamline compliance monitoring and power system analysis. Add graphical charts to PDF reports or use CSV formatted reports for further analysis.

Trend Data to Understand Power System Performance

Combine metering and power quality data to compare and understand power system performance at specific times or over longer intervals.

Optimize Resources and Drive Planning

Increase efficiency and reduce costs using data captured by SEL meters to drive planning, operating, and accounting decisions.

Use interactive charts to identify increased power usage or power quality fluctuations and harmonics during specific time ranges, then export those data to tabular reports for further analysis or recordkeeping.

Web-Based User Interface

As a server-based software application, Synchrowave Reports simplifies licensing and maintenance. Conveniently access the software application using the web-based user interface and take advantage of security features like lightweight directory access protocol (LDAP) authentication and transport layer security (TLS) encryption. Generate reports on demand from available metering points, schedule automated report delivery to an email address, and determine which report type should be generated. View graphical charts and tabular reports in your browser or generate a new report from a configured template.

Synchrowave Reports Software Options

Select from Meter Data or Power Quality reports. Each offers a default set of report options to meet an application's needs.

	Meter Data Bundle	Power Quality Bundle
acSELerator Team License[1]		
Team Event	✓	✓
Team Profile	✓	✓
Reports		
Device Overview	✓	✓
Sequential Events Recorder (SER)	✓	✓
Load Data Profile (LDP)	✓	✓
Voltage Sag, Swell, and Interruption (VSSI)	✓	✓
Signals or WAGES	✓	✓
IEEE 519 Compliance		✓

[1]Both Meter Data and Power Quality options are available without an acSELerator Team license if an application already has Team software available.

Report Types

Device Overview Report

Visualize meter status, and manage metering point names, locations, time zones, time offsets, and more, from one central tabular report.

LDP Report

Refine LDP data selection with an interactive chart that displays metering data for a specified time period. The LDP report aggregates data from one or more measurement points, up to 16 distinct channels, including timed interval quantities like current, voltage, frequency, and power collected by supported SEL devices. Analyze trends and inspect records with tabular views of LDP information from a metering point, device, or group that you select.

VSSI Summary and Detail Reports

View event summaries, including ITI categorization, with the VSSI Summary Report. Use the VSSI Detail Report to perform event analysis with detailed VSSI data (using variable sampling rate records) in tabular format. Identify points of interest with 4 ms resolution. Interactive charts help determine the time, duration, severity, and location of power quality disturbances.

SER Report

Quickly identify the exact time of power loss events, settings changes, voltage disturbances, digital state changes, and meter access in a precision time-stamped tabular report of device and system events.
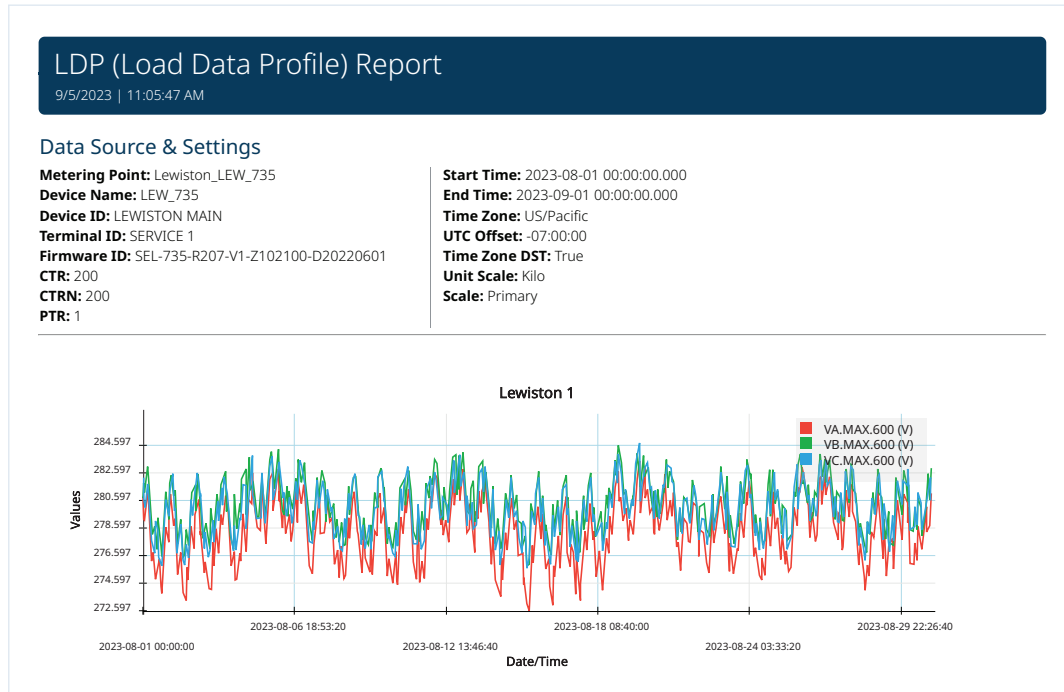
Signals Report

Combine water, air, gas, electricity, and steam (WAGES) consumption from third-party pulse-output meters and convert pulses to engineering units using the scaling features of the Signals Report. Interactive charts and tabular reports support thorough analysis of system-wide resource consumption.

IEEE 519 Compliance Report

Identify distortion at the point of common coupling that produces undesirable harmonics on the power system with IEEE 519 Compliance Reports in the Synchrowave Reports—Power Quality software bundle. Detailed reports combine summary report information, including pass/ fail status, with individual voltage and current harmonic values for each metering point, up to the 50th harmonic.

Use interactive charting to quickly analyze data and isolate events or time periods of interest. Examine those data in the web interface or export them for further analysis.

LDP (Load Data Profile) Report
9/5/2023 | 11:05:47 AM

Data Source & Settings

Metering Point: Lewiston_LEW_735
Device Name: LEW_735
Device ID: LEWISTON MAIN
Terminal ID: SERVICE 1
Firmware ID: SEL-735-R207-V1-Z102100-D20220601
CTR: 200
CTRN: 200
PTR: 1

Start Time: 2023-08-01 00:00:00.000
End Time: 2023-09-01 00:00:00.000
Time Zone: US/Pacific
UTC Offset: -07:00:00
Time Zone DST: True
Unit Scale: Kilo
Scale: Primary

PDF reports include all metering report data in easy-to-read templates. Use LDP reports to quickly analyze trends throughout the reporting period.

Channel Settings

Channel Function Descriptions

AVG (Average): Records the average value during the LDAR period
MAX (Maximum): Records the maximum value during the LDAR period
MIN (Minimum): Records the minimum value during the LDAR period

EOI (End of Interval): Records the value at the end of the interval
COI (Change-Over-Interval): Records the difference in values between the beginning and end of the LDAR period

Channel Settings	VA	VB	VC
Acquisition Rate(s)	600	600	600
Channel Function	MAX	MAX	MAX

Channel Load Data

Status Descriptions

DST: Daylight Savings Time is in effect during or at start of interval
PF: Power fail within interval (missing data)
CRF: Clock reset forward during interval
CRB: Clock reset backwards during interval

SI: Skipped interval
TST: TEST mode data
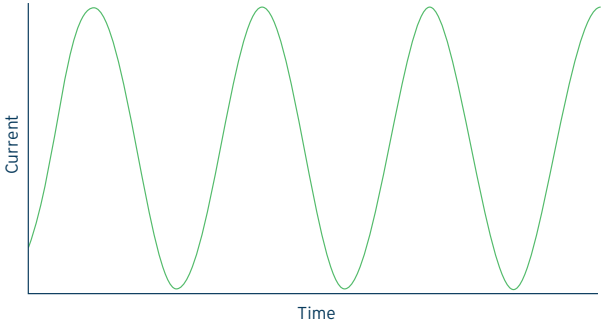DO: Data overwrite
MI: Missing interval, zero record inserted

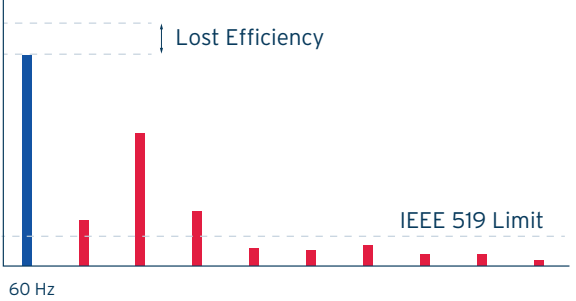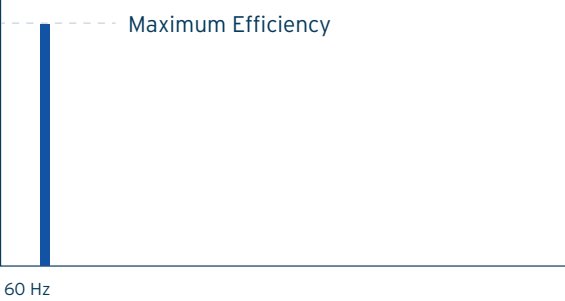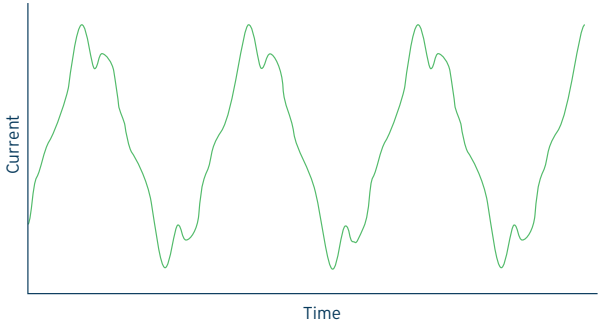| Time	VA	VB	VC	Status
2023-08-01 00:00:00.000	0.2802	0.2807	0.2816	
2023-08-01 00:10:00.000	0.2804	0.2811	0.2817	
2023-08-01 00:20:00.000	0.2809	0.2813	0.2822	
2023-08-01 00:30:00.000	0.2792	0.2816	0.2822	
2023-08-01 00:40:00.000	0.2799	0.2818	0.2810	
2023-08-01 00:50:00.000	0.2798	0.2819	0.2807	

Power Quality Monitoring

Within ac power systems, the most efficient transfer of energy is with a pure sinusoidal waveform, as it only contains the fundamental frequency. Innovations in ac/dc and dc/ac power conversion have led to the growing adoption of technologies that produce nonlinear distortions in power systems, such as energy-efficient LED lighting, variable-frequency drives (VFDs), and power inverters. The switching nature of these devices has increased harmonic distortion on distribution and transmission lines, which negatively affects neighboring loads and generation sources. Power quality distortions result in excess heat, efficiency loss, system capacity reduction, mechanical oscillations of motors and generators, light flickering, and other issues.

Synchrowave Reports can streamline compliance monitoring and reporting by analyzing waveform distortion at a single point or throughout a power system and delivering daily or weekly reports.

Clean Power System

Distorted Power System

Summary one-page IEEE 519 Compliance Reports document pass or fail information for voltage and current. For asset management, detailed site information is also recorded, including the location, device type, and system configuration.

IEEE 519 Weekly Summary
February 3, 2022 - February 10, 2022

✔ Pass

Company
Sample Company
1234 County Line Rd.
Example Engineer
(555)555-5555
example_engineer@SampleCompany.com

Site
High Valley Rd.
United States

IEEE 519 Compliance
Voltage: ✔ Pass
Current 99th: ✔ Pass
Current 95th: ✔ Pass

Device Information

Name	Part Number	Firmware	Nominal Frequency
HighValley735	0735LX20944EXXXXXX16101XX	R206V0	60 Hz

System Configuration

Setting Name	Setting Value
Maximum Demand Load Current (A)	128.9
Short Circuit Current (A)	250

❗ Fail

519 Compliance
: ❗ Fail
99th: ❗ Fail

		ware	Nominal Frequency
		7	60 Hz

System Configuration

Setting Name   Setting Value

Detailed IEEE 519 Compliance Reports combine the summary report information with individual voltage and current harmonic values for each metering point, up to the 50th harmonic. This additional granularity helps identify exact frequency ranges that cause harmonic distortion.

Harmonic Voltage Compliance

❗ = Fail   ⚠ = Warn

Harmonic	VA Limit	VA Measured	VB Limit	VB Measured	VC Limit	VC Measured
THD	12%	8.66%	12%	8.49%	12%	8.66%
2	7.5%	4.86%	7.5%	4.69%	7.5%	4.86%
3	7.5%	5.38%	7.5%	5.21%	7.5%	5.38%
4	7.5%	5.9%	7.5%	5.73%	7.5%	5.9%
5	7.5%	6.42%	7.5%	6.24%	7.5%	6.42%
6	7.5%	6.93% ⚠	7.5%	6.76% ⚠	7.5%	6.93% ⚠
7	7.5%	7.45% ⚠	7.5%	7.28% ⚠	7.5%	7.45% ⚠
8	7.5%	7.97% ❗	7.5%	7.8% ❗	7.5%	7.97% ❗
9	7.5%	8.49% ❗	7.5%	8.31% ❗	7.5%	8.49% ❗
10	7.5%	4.69%	7.5%	4.52%	7.5%	4.69%
11	7.5%	5.21%	7.5%	5.04%	7.5%	5.21%

Configurable alerts warn of noncompliance.

Fail indicates frequency and amount above IEEE 519 threshold.

Specifications

General	
System Overview	Synchrowave Reports is a web-based data analysis application. View reports and sort by file name, device name, date/time, or compliance status.
Available Reports	Device Overview, LDP, SER, VSSI (summary and detail), and daily and weekly compliance reports per IEEE 519 (summary and detail)
IEEE 519 Compliance Limits	Apply compliance limits as defined by IEEE 519.
Report Scheduling	Automate report generation from 15-minute to monthly intervals.
Report Generation and Distribution	View, print, and email reports in PDF, with automated or manual email delivery of reports in PDF or CSV format.
Source Data	The Meter Data software report displays data stored in the TEAM Profile database. IEEE 519 reports use three-second aggregated harmonic values up to the 50th order from the SEL-735 Power Quality and Revenue Meter. An LDP setting preset is available in ACSELERATOR QuickSet® SEL-5030 Software. Reports will generate on full or partial source datasets.
Supported Devices	Meter Data reports support the SEL-734, SEL-735, SEL-751A, SEL RTAC TrendRecorder, and other SEL devices that TEAM polls. IEEE 519 reports support SEL-735, firmware Version R201 and above, equipped with 1 GB memory and the advanced power quality and recording option.
File System	Local drive or external network file system
Web Browsers	Google Chrome, Version 84.0 or newer; Microsoft Edge, Version 84.0 or newer
Server	2.1 GHz processor with 16+ cores, 16 GB RAM, and 100 Mb network card See the instruction manual for minimum and high-performance recommendations.
Operating Systems	Microsoft Windows 10 Enterprise, Windows Server 2016, and Windows Server 2019
Network	1 Gbps network recommended; 100 Mbps network minimum