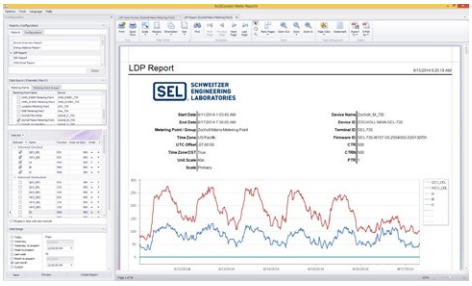
Metering Overview

SEL-735 Power Quality and Revenue Meter

Achieve high-accuracy revenue and power quality metering for any application. The SEL-735 offers 1 GB of recording memory for up to 20 years of storage and is now available with a color touchscreen display. Multiple enclosure and mounting options are available.

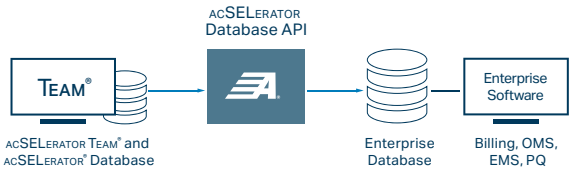
Meter Installation Options and Accessories

Mount SEL meters and accessory devices into a variety of locations using a complete line of mounting kits. You can choose from rack-mount, wall-mount, indoor, or outdoor configurations. If you have an existing panel cutout, you can retrofit your meter using our retrofit bezels. For more information, visit selinc.com/products/73x/meter-options.



ACSELERATOR® Meter Reports

Transform metering data into action with ACSELERATOR Meter Reports SEL-5630 Software. The software offers interactive charts, fast database interrogation, and the ability to customize metering reports for utilities, industrial operations, and site-wide campus monitoring.



ACSELERATOR Database API

Allow third-party systems to access ACSELERATOR TEAM® SEL-5045 Software data with the SEL-5230 ACSELERATOR Database API. This allows different enterprise-level systems, such as an energy management system or a billing system, to integrate data reporting.

SEL-735 Power Quality Options

General	Basic	Intermediate	Advanced
Display	Customizable three-line or single-line display	Customizable three-line or single-line display	Customizable three-line or single-line display; 5-inch, 800 × 480 color touchscreen display*
Type-C USB Front Port	No	No	Yes*
Memory	128 MB	256 MB	1 GB
Maximum Harmonic Order	15th	63rd	63rd
Interharmonic Quantities	No	No	Yes
Harmonic Angles	No	No	Yes
Power Harmonics	No	No	Yes
Portable Case	No	No	Yes*
Waveform Capture			
Samples Per Cycle	16	16, 128	16, 128, 512
Duration (Cycles)	15	15–600	15–600
Number of Events	256	33–6,200	101–10,000
COMTRADE Reports	Yes	Yes	Yes
Wave View Oscillography	No	No	Yes
Load Profile Data			
Recorders × Channels	1 × 16	12 × 16	32 × 16
Acquisition Rates	1–120 min	3–59 s, 1–120 min	3–59 s, 1–120 min
Storage Duration for 10-Minute Interval Data			
16 Channels	10 years	20 years	20 years
192 Channels	N/A	1.5 years	9.5 years
512 Channels	N/A	N/A	3.5 years
Voltage Sag, Swell, and Interruption (VSSI) Recorder			
Typical Number of Summary Events	260	260	600
Number of Detailed Rows	60,000	60,000	130,000
Minimum Disturbance Duration	1/4 cycle	1/4 cycle	1/4 cycle
Sampling Rate	4 samples/cycle–1 sample/day, adaptive	4 samples/cycle–1 sample/day, adaptive	4 samples/cycle–1 sample/day, adaptive
Sequential Events Recorder (SER)			
Number of Events	>80,000	>80,000	>80,000
Number of Channels Monitored	≤72	≤72	≤72
IEC 61000-4-30 Power Quality Compliance			
150/180-Cycle, 10-Minute, 2-Hour Aggregation	–	Class A	Class A
Flicker	–	Class A (10 min, 2 hr updates)	Class A (1 min, 10 min, 2 hr updates)
Voltage Harmonics	Class A	Class A	Class A
Harmonic Currents	Class A	Class A	Class A

*Optional feature

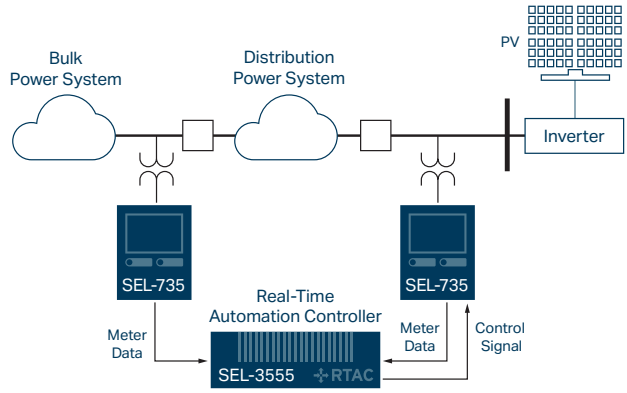
Metering Applications

Improve grid operation

Improve reliability and enhance the integration of variable resources into the bulk power system. Meters installed at renewable energy generation points provide fast streams of accurate synchrophasor data to the system operator.

The SEL-735 Power Quality and Revenue Meter includes the latest version of the synchrophasor standard, IEEE C37.118.1a-2014 Class P, making it ideal for applications requiring fast response times under dynamic conditions.

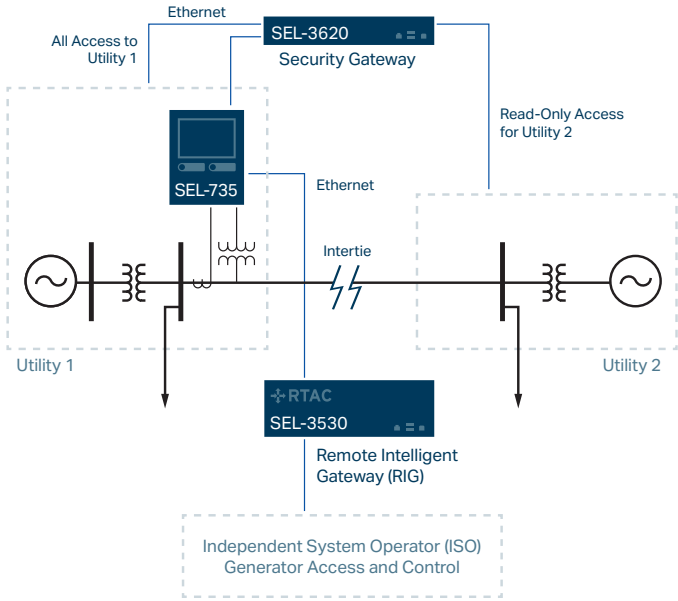
As part of a NERC PRC-002 disturbance monitoring system, you can connect the SEL-735 to SEL-5073 SYNCHROWAVE® Phasor Data Concentrator (PDC) Software. This lets you distinguish between utility outages and transient disturbances to quickly choose when to island the system.



Communicate intertie and generation data securely

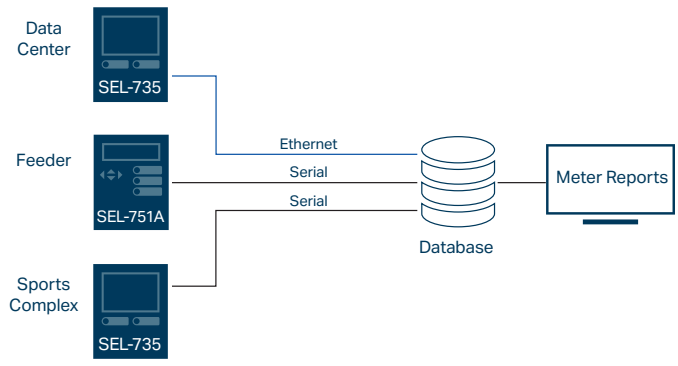
Share intertie data and limit privileges to read-only access using the SEL-3620 Ethernet Security Gateway. Alternatively, you can choose the SEL Remote Intelligent Gateway (RIG) solution for read and control access. The SEL-3530 Real-Time Automation Controller (RTAC) allows the independent system operator (ISO) access to plant information for generation control.

The SEL-735 Power Quality and Revenue Meter provides uninterrupted information access with up to ten simultaneous communications sessions. Advanced communications deliver critical and historical information in real time to virtually any communications system. Cryptographically signed firmware ensures that the meter integrity is not compromised.



Automate data collection

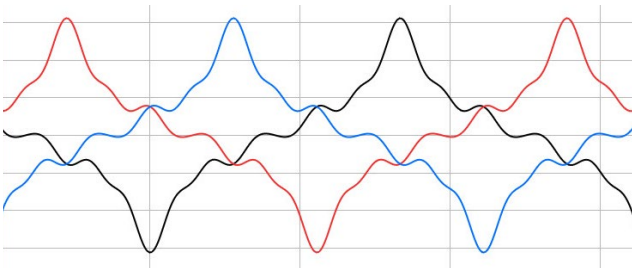
Automate data collection and improve efficiency by eliminating the need to collect data from field devices manually. To streamline the process, ACSELERATOR TEAM® SEL-5045 Software identifies new reports, downloads them, and stores the information. TEAM collects event reports; Sequential Events Recorder (SER) data; voltage sag, swell, and interruption (VSSI) data; and load profile data for historical analysis. After TEAM gathers and stores the data from the metering devices, ACSELERATOR® Meter Reports SEL-5630 Software displays the information to help you make planning, operating, and accounting decisions that will increase efficiency and reduce costs. With the ACSELERATOR Database API, third-party software tools can access metering data and use the data in different enterprise-level systems, such as an energy management system or a billing system.



Achieve accurate revenue metering

Achieve high-accuracy revenue metering under real-world power quality conditions. The SEL-735 Power Quality and Revenue Meter exceeds the ANSI C12.20-2015 0.1 accuracy class and the IEC 62053-22:2003 0.1 S accuracy class over a wide current range.

The SEL-735 accurately reports energy even in the presence of harmonics and distorted waveforms. When tested with peaked waveform distortion, the SEL-735 reports with an error of just 0.006%. The table shows SEL-735 performance with peaked waveform distortion.

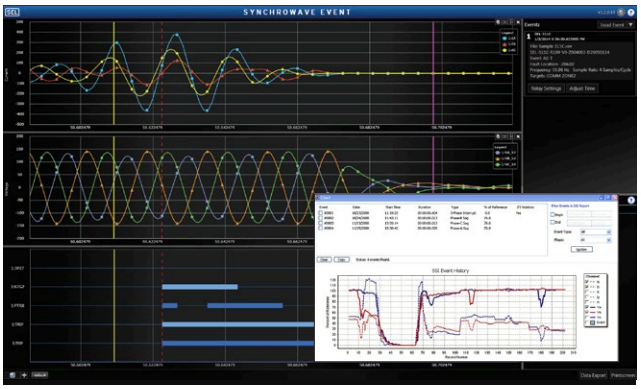


ANSI Test #41: Peaked Current Waveform

Voltage Waveform	Current Waveform	0.1 Class Allowable Error %	Measured SEL-735 Error %
Sinusoidal	Sinusoidal	±0.05	0.003
Sinusoidal	Peaked	±0.2	0.006
Peaked	Peaked	±0.3	0.006

Reduce system downtime

Access critical information directly at the control center with SCADA-ready SEL meters. Reports with voltage sag, swell, and interruption (VSSI) data and events plotted on the ITI (CBEMA) chart can help both plant operators and power producers resolve issues before they affect consumers. The ITI curve classifies voltage events to indicate disturbance severities that cause malfunctions, such as insulation failure, overvoltage trip, or load dropout. The Sequential Events Recorder (SER) in SEL devices monitors and records device events, such as power loss, settings changes, voltage disturbances, or any change in the state of digital status bits. Wave View, a real-time oscillography tool in the SEL-735 Power Quality and Revenue Meter, gives system operators a snapshot of their system for actionable intelligence.



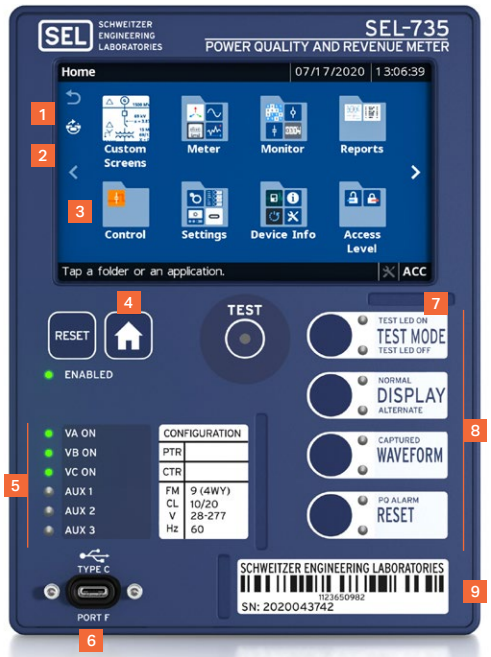
SEL-735

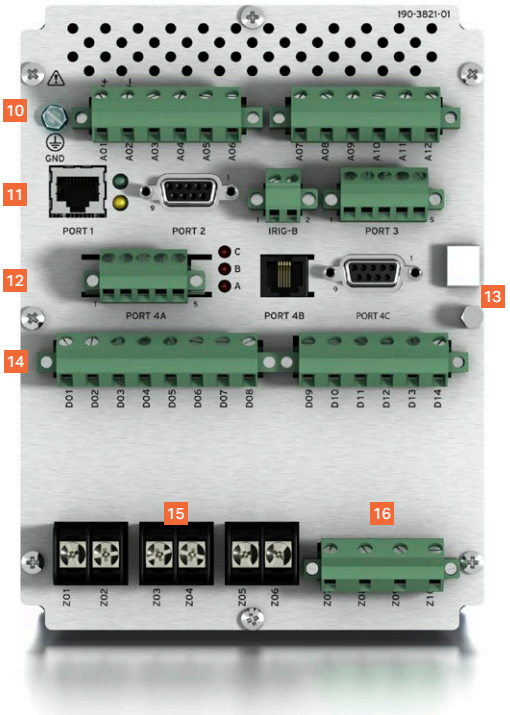
Power Quality and Revenue Meter

Starting price
$1,560 USD

selinc.com/products/735 | Select models typically ship in 2 days

The SEL-735 is fully Class A-compliant to the IEC 61000-4-30 power quality (PQ) standard. With reliable Class A measurement, operators can identify power system anomalies and isolate their source with confidence. The 5-inch, 800 × 480 color touchscreen display option allows you to view metered quantities, phasor diagrams, voltage and current waveforms, and more. For high-accuracy revenue metering applications, the SEL-735 exceeds ANSI C12.20-2015 0.1 and IEC 62053-22:2003 0.1 S accuracy class requirements over a wide current range. This makes the SEL-735 the premiere choice for generation, interchange, transmission, distribution, or industrial applications. You can enhance the capabilities of SEL meters with ACSELERATOR® Meter Reports SEL-5630 Software. Meter Reports allows you to optimize your system by analyzing data, identifying usage trends, and diagnosing system problems.





1. Capacitive 5-inch, 800 × 480 color touchscreen
2. Full onscreen keyboard
3. Folders and applications to access information
4. Pushbutton to return to default home screen
5. Six programmable LEDs
6. USB Type-C port
7. Simple Test Mode access
8. Customizable local controls
9. Custom nameplate and barcode
10. Power supply board: 2 inputs, 3 outputs
11. Main board: RJ45 copper or fiber-optic Ethernet, EIA-232, IRIG-B, EIA-232/-485
12. Communications board (Expansion Slot #1): EIA-485, telephone modem, EIA-232
13. Sealing provision
14. I/O board (Expansion Slot #2): 4 inputs, 4 outputs (solid-state or electromechanical); or 4 analog outputs, 4 solid-state outputs
15. CT board: Ia, Ib, Ic
16. PT board: Va, Vb, Vc, Vn

Accurate revenue metering

Exceed ANSI C12.20 0.1 and IEC 62053-22 0.1 S accuracy class requirements with bidirectional, full four-quadrant energy metering. Transformer and line-loss compensation adds to meter accuracy when the meter location and billing points differ. Instrument transformer compensation removes the magnitude and phase error introduced by CTs and PTs.

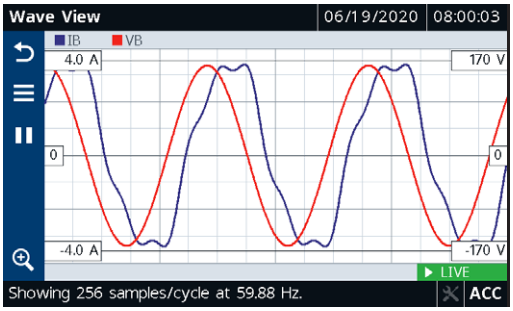
Reliable PQ indicators

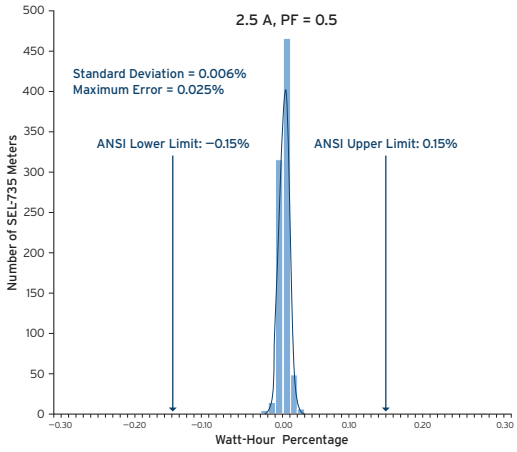
Ensure precise and reliable measurements with IEC 61000-4-30 Class A PQ compliance. You can size feeders appropriately, safeguard equipment, and plan upgrades using PQ indicators for predictive maintenance. The SEL-735 measures harmonics, interharmonics, flicker, power factor, voltage disturbances, K-factor, and other key PQ indicators.

Other popular applications include troubleshooting voltage disturbances, monitoring photovoltaic (PV) inverter interconnections, and monitoring sine wave purity for critical industrial facilities. The SEL-735 allows you to quickly identify PQ problems before equipment damage or misoperation occurs.

Wave View

SEL-735 meters with the Advanced PQ and Recording option include the Wave View monitoring tool in the ACSELERATOR QuickSet® SEL-5030 HMI. The tool is also available via the optional touchscreen display. Wave View allows you to view voltage and current waveforms in real time using an oscilloscope-like functionality. Waveforms in Wave View can be viewed immediately without having to retrieve and import files. The HMI provides the time-domain display as well as the frequency spectrum of any waveform captured.





Accuracy-test results of approximately 1,000 SEL-735 meters report a maximum error of 0.025 percent, outperforming ANSI 0.1 and IEC 0.1 S accuracy class requirements.

Advanced integration

The SEL-735 integrates seamlessly with Itron MV-90 billing software and IEC 61850, DNP3, IEEE C37.118, Modbus, or SEL communications protocols. Multiple communications ports and protocols enable the SEL-735 to simultaneously communicate with up to ten devices.

The SEL-735 offers three security levels to provide access to only authorized users. In addition, you can independently disable or set each port to provide read-only or read/write access.

For system-level security, adding the SEL-3620 Ethernet Security Gateway offers user account management, substation firewall protection, and NERC CIP compliance support. The SEL Real-Time Automation Controller (RTAC) provides secure, encrypted communications and works as a remote intelligence gateway. Cryptographically signed firmware ensures that the meter integrity is not compromised.

SEL-5630

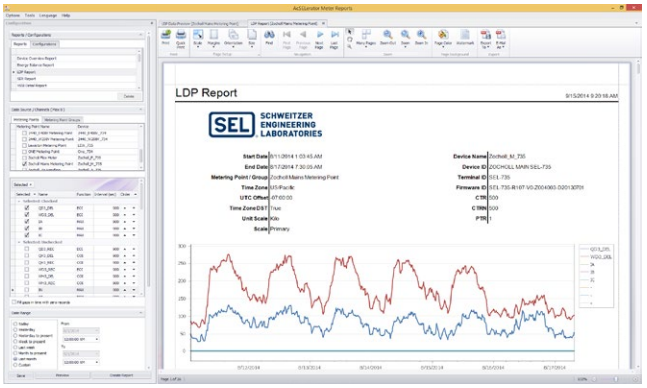
ACSELERATOR® Meter Reports Software

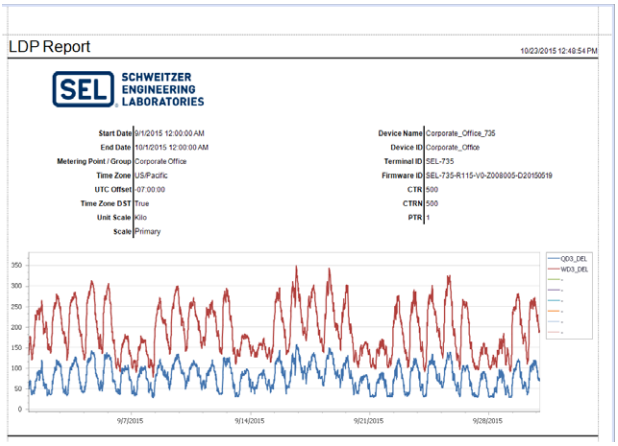
Starting price
$2,590 USD

selinc.com/products/5630

Requires ACSELERATOR TEAM® SEL-5045 Software for meter data collection.

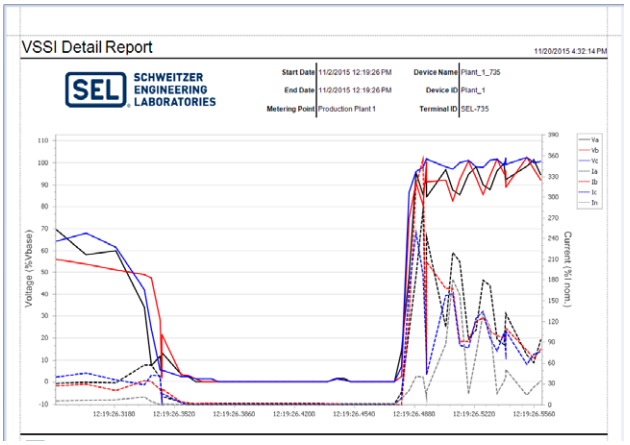
Meter Reports enhances the visualization and analysis of data captured by SEL meters in your system. You can combine SEL meters with pulse-type or DNP3-enabled devices to monitor consumption of resources, such as water, air, gas, and steam. ACSELERATOR TEAM SEL-5045 Software automatically retrieves and stores metering data on these resources in a centralized database. Meter Reports then displays the information so you can drive planning, operating, and accounting decisions that will increase efficiency and reduce costs.





LDP Report

Avoid peak demands by analyzing the electrical usage for processes in your facility. An interactive view of the information lets you refine the load data profile (LDP) data selection for a specified time period. You can create a report or hover your mouse over data points to view channel values at that point in time. Graphical and tabular views of LDP information from a metering point, device, or group make it easy to analyze trends and inspect records.



VSSI Detail Report

Investigate power quality events with voltage sag, swell, and interruption (VSSI) data at your fingertips. You can perform VSSI event analysis with detailed VSSI data (using variable sampling rate records) in graphical and tabular format. The 4 ms resolution makes it easy to identify points of interest and determine the time, duration, severity, and location of power quality disturbances.

SEL-5230

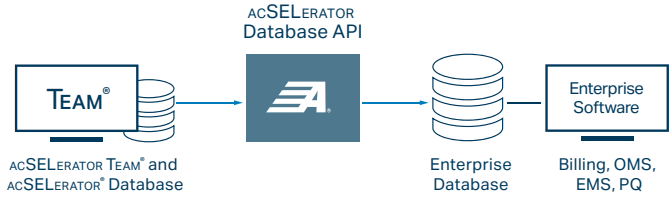
ACSELERATOR® Database API

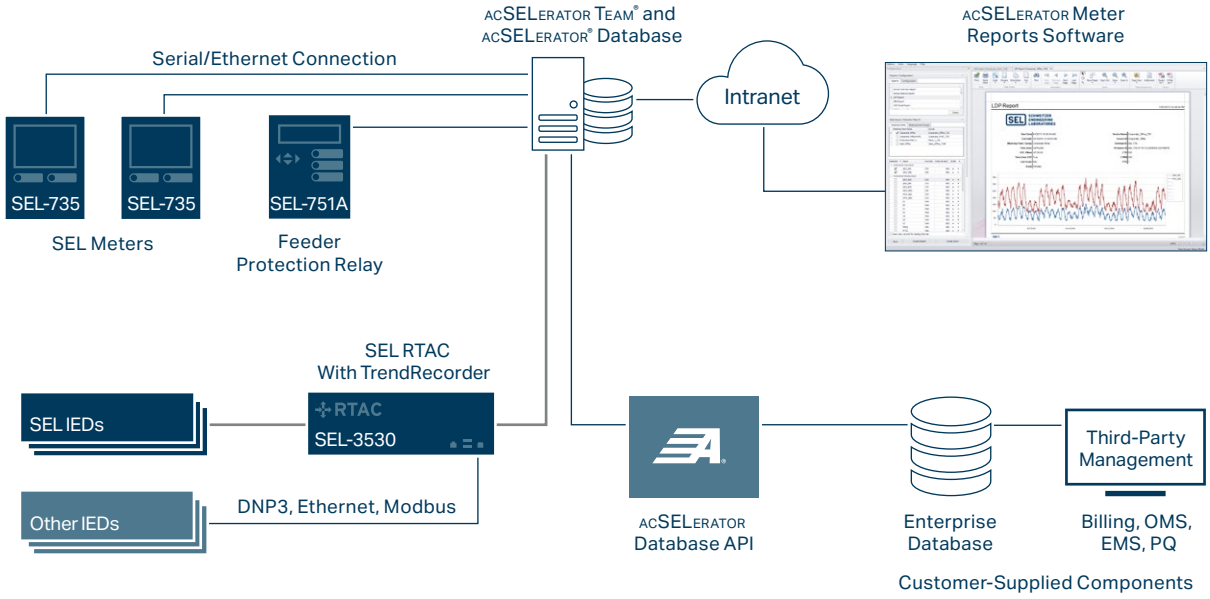
Starting price
$5,180 USD

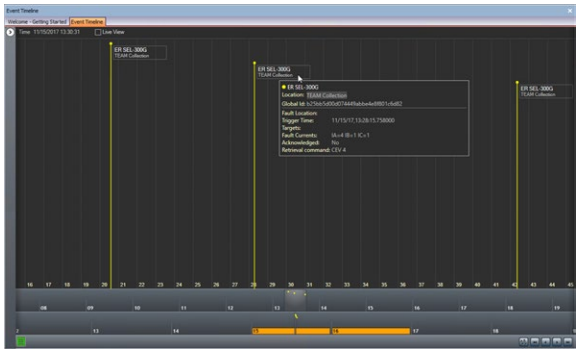
selinc.com/products/5230

Requires ACSELERATOR TEAM® SEL-5045 Software for meter data collection.

ACSELERATOR Database API SEL-5230 Software provides third-party software tools with access to data collected by ACSELERATOR TEAM SEL-5045 Software and archived in the ACSELERATOR Database. This allows different enterprise-level systems, such as an energy management system (EMS) or a billing system, to integrate data reporting. SEL offers two API configuration options, depending on the database integration and client requirements. Contact SEL Engineering Services for custom integrated solutions.







ACSELERATOR TEAM Software

TEAM automates the collection of power system data from multiple devices and stores the data in a central location for easy access. When something happens, whether it's a relay trip, system fault, or security notification, TEAM is ready to help with continuous background monitoring, collection, notification, and storage. This ensures that the data are there when you need them to help discover root cause, maintain records for regulatory compliance, and keep your system running at peak efficiency.