SEL-5073

SYNCHROWAVE® Phasor Data Concentrator (PDC) Software

High-performance, versatile PDC software designed and tested for reliable operation.

- Intuitive user interface allows for quick setup and easy commissioning.
- Real-time monitoring provides a dynamic view of system behavior.
- Versatile account management enables secure local and centralized authentication.
- Disturbance data archiving provides synchronized, high-quality data for analysis.

SEL

Features and Benefits

High Performance

Install SEL-5073 SYNCHROWAVE PDC Software on your PC, and connect more than 500 phasor measurement unit (PMU) inputs with message rates up to 240 per second. Combine data from multiple input message rates into a single output stream. Control downstream data access with six individually configurable output streams. The SYNCHROWAVE PDC supports redundant inputs and outputs for higher availability of data.

Powerful Database Archiving

Use the SYNCHROWAVE PDC to archive synchrophasor data as part of a NERC PRC-002-2 disturbance recording system. Select from several data-capturing options: continuous or triggered archiving with pre- and postdisturbance data capture. Retrieve data in binary or ASCII COMTRADE, comma-separated value (CSV), and compressed CSV formats. Directly access the archived database using the included PDC Assistant Software. Configure archives for scheduled data publishing to local or remote network drives.

Reliable Operation

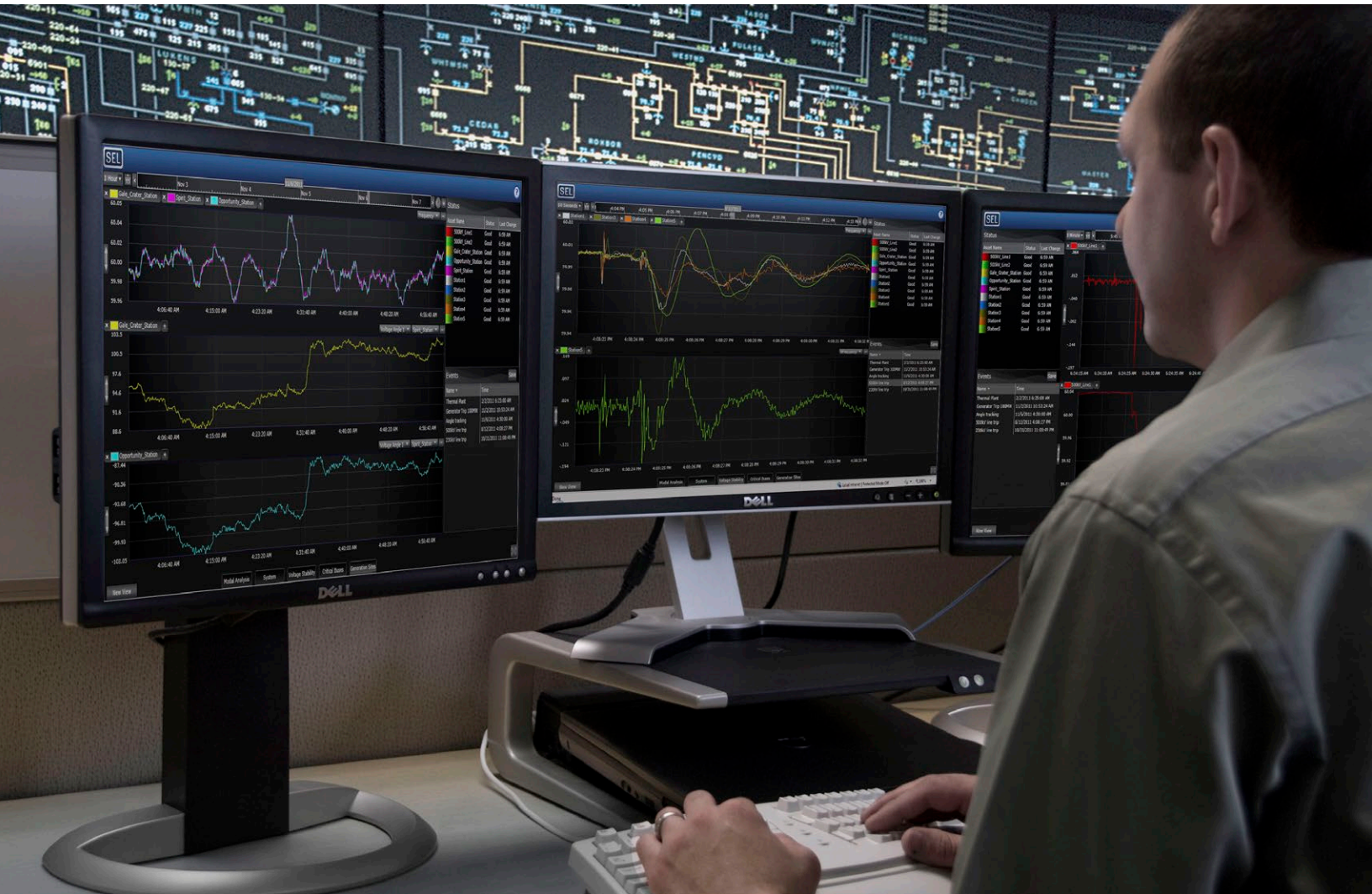
Run SYNCHROWAVE PDC Software on your Microsoft Windows-based computer. The software is designed and rigorously tested for continuous and reliable operation, including autorestart after a computer reboot.

Easy Configuration and Commissioning

Quickly set up or add PMUs with the intuitive user interface. Select all PMU data or just a subset for concentration and archiving, and set event triggers and security options, all with the advanced and easy-to-use PDC Assistant Software.

Safety and Security

Support NERC CIP compliance efforts by using the Lightweight Directory Access Protocol (LDAP) for centralized device and user management, individual user- and role-based account authentication, strong passwords, and access logs. Build a secure interutility synchrophasor data exchange network for wide-area situational awareness.



See the Bigger Picture

Disturbance Data Recording and Archiving

After major power system events, analyzing synchronized, high-quality data dramatically reduces the time needed to understand the events. Additionally, observing trends and patterns in archived data helps in developing future power system design and control.

SYNCHROWAVE PDC Software:

- Complies with NERC PRC-002-2 disturbance recording requirements when combined with SEL relays and ACSELERATOR TEAM® SEL-5045 Software.
- Archives data locally in a substation, main office, and/or control center.
- Provides read-only, secure access to the archived database via the included PDC Assistant Software or the ODBC interface.
- Allows you to share data with a neighboring utility or send data to a regional control center. You decide which data to send.
- Offers programmable phasor angle scaling for downstream PT/CT phase error correction and phase rotation adjustment.

Real-Time, Wide-Area Monitoring and Control

See up-to-the-second status of the entire power system. When combined with SEL-5078-2 SYNCHROWAVE Central Software, observe the system's dynamic behavior in a graphical display. This real-time information helps operator decision-making.

Apply the capabilities of the SYNCHROWAVE PDC to:

- Provide data to SYNCHROWAVE Central for archived data analysis and real-time visualization.
- Archive disturbance data.
- Calculate time-stamped power quantities.
- Stream phasor data to the independent system operator (ISO).
- Meet ISO PMU naming conventions with aliasing support for tags, PMU names, and IDs.
- Monitor network performance with packet delay and network latency calculations.

PDC Selection Chart

The SEL product line includes several PDC solutions. The following table summarizes product offerings to assist you in selecting the right one for your application.

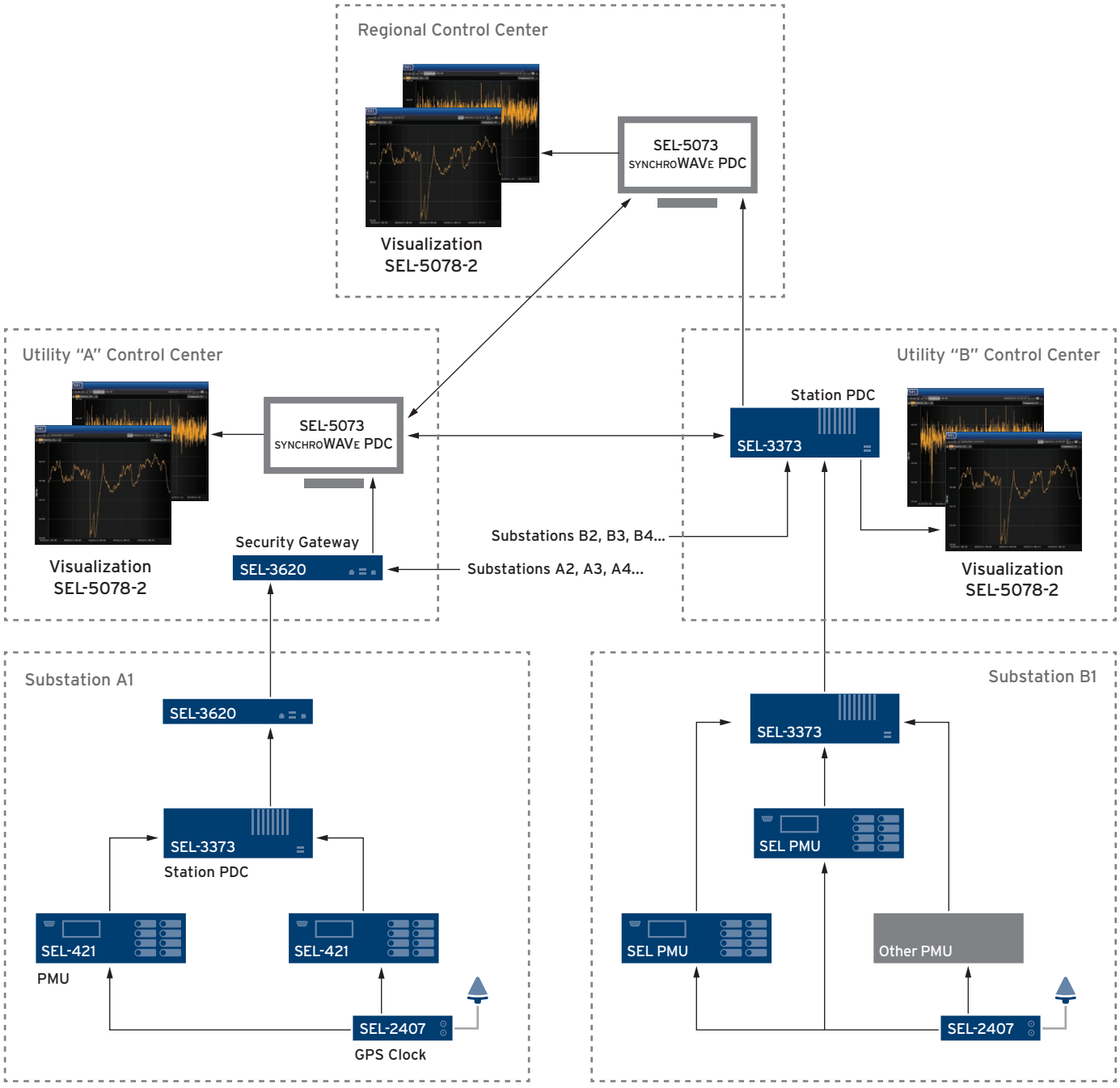
	SEL-3373 Phasor Data Concentrator (PDC)	**SEL-5073** SYNCHROWAVE PDC Software	**SEL-3378** Synchrophasor Vector Processor (SVP)	**SEL-3555** Real-Time Automation Controller (RTAC)
Number of Inputs	40	>500	20	100
Number of Outputs	6	6	7	100
Archiving	Yes	Yes	No	Yes (with DDR extension)
Data Rates	Up to 240 messages per second	Up to 240 messages per second	Up to 60 messages per second	Up to 240 messages per second
Control	No	No	Yes	Yes
Input Format	IEEE C37.118	IEEE C37.118	IEEE C37.118	IEEE C37.118 DNP3 Modbus SEL Fast Message
Output Format	IEEE C37.118	IEEE C37.118	IEEE C37.118 SEL Fast Operate	IEEE C37.118 DNP3 Modbus SEL MIRRORED BITS® SEL Fast Message
Platform	Hardware	Software	Hardware	Hardware
Selectable Outputs	Yes	Yes	Yes	Yes
Multiple Input Rates	Yes	Yes	No	No

Typical Synchrophasor Measurement System Architecture

SYNCHROWAVE PDC Software plays a key role in wide-area synchrophasor measurement, control, or distributed disturbance recording systems. The diagram below represents a typical architecture using station and system PDCs, which provide local archiving and phasor data concentration. SYNCHROWAVE PDC Software and the SEL-3373 Station PDC share a common user interface, allowing you to seamlessly implement both into your system. You decide how many PMU inputs you want to concentrate. The SEL-3373 provides up to 40 inputs and the SYNCHROWAVE PDC more than 500 inputs, making these solutions ideal for typical applications, such as individual substations, utility control centers, and regional control centers. Configure the PDC to provide only the data you want to send to other utilities or the regional control center.

Satellite-synchronized clocks at each substation provide time synchronization for synchrophasor data and for disturbance event recording. Additionally, security gateways or encrypted serial communications devices from SEL secure communications.

The PDCs can time-align, process, concentrate, and archive data from any IEEE C37.118-2005 or C37.118-2011 compliant PMU.



Simple interface accelerates commissioning, providing offline and online settings modification.

Configure both continuous and triggered archives.

Employ the internal relational database for efficient data storage, or use external archiving for streamlined network storage.

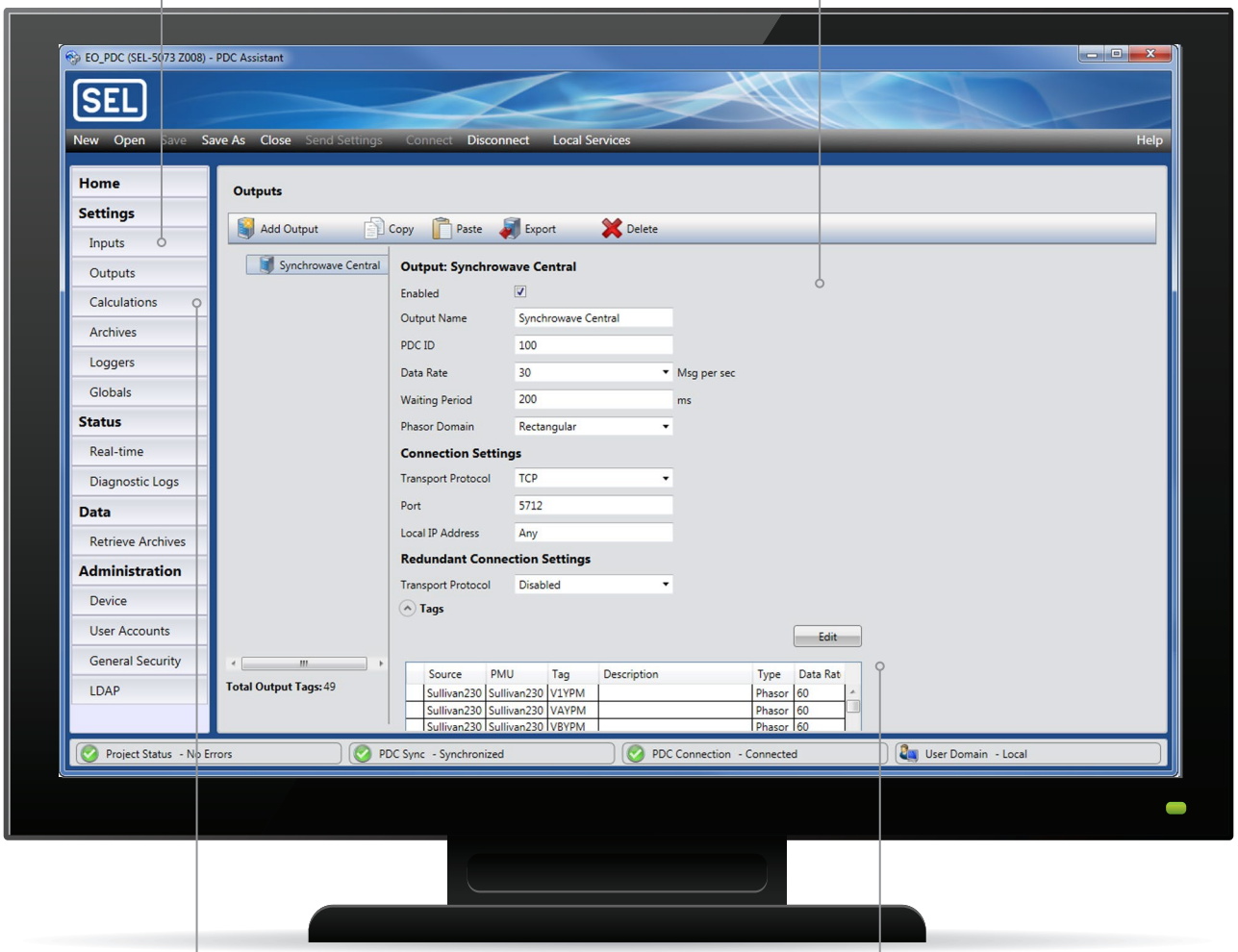
Calculates real-time network latency for commissioning and system debugging.

Configure and Commission With PDC Assistant Software

- Configure PDC settings in “online” or “offline” mode.
- Create input connections for PMUs or other PDCs.
- Archive continuous synchrophasor data and/or triggered events.
- Monitor the status of your synchrophasor system in real time.
- Manage user accounts.
- Configure the various PDC calculations.

Redundant input/output support enables high data availability.

Flexible user interface allows remote PDC configuration and monitoring over a TCP/IP connection.



Implement angle and phase rotation adjustment with included scaling calculations.

Offers aliasing for station names, IDs, and tags.

SEL-5073 SYNCHROWAVE PDC Software Specifications

General	
Operating Systems Supported	Windows XP Professional (32- and 64-bit) Windows Embedded Standard Windows 2003 Server (32- and 64-bit) Windows 2008 Server (32- and 64-bit) Windows 2008 Server R2 (64-bit) Windows 7 (32- and 64-bit) Windows Vista (32- and 64-bit) Windows 8/8.1 (32- and 64-bit) Windows 2012 Server R2 (64-bit) Windows 10 (32- and 64-bit)
System Hardware Requirements	Recommended Disc Space for Archiving: 60 GB or larger
Security Features	Account Management: LDAP for centralized management of user access Role-based accounts Strong passwords
Supported Communications Protocols	Inputs: EIA-232, TCP, UDP, UDP_U, UDP_T, UDP_S (unicast and multicast) Outputs: TCP, UDP_U, UDP_T, UDP_S (unicast and multicast) Compatible with C37.118-2005 and C37.118-2011 clients/servers
Archiving (optional)	Conforms to IEEE C37.232 naming practice for time-sequence file names Secure ODBC API for use with database management systems Supports ASCII COMTRADE and CSV formats Local and remote archive file management Continuous and Triggered archiving
Calculations	Supports power; sequence; analog and phasor scaling; derivative; and latency calculations
Diagnostics and Status	Up to 10 syslog outputs (RFC 3164) Remote log retrieval Secure status connection
PMU Inputs	Up to 20 inputs (standard) >500 inputs (optional)
Configurable Outputs	6 fully configurable outputs

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