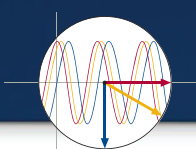



SEL-487E

STATION PHASOR MEASUREMENT UNIT (PMU)



SEL Synchrophasors®



A COMPLETE SYNCHROPHASOR SYSTEM

FEATURES AND BENEFITS

Multichannel Synchrophasors

Transmit IEEE C37.118 synchrophasor messages for all 24 analog channels: five 3-phase current inputs, three single-phase (REF) current inputs, and two 3-phase voltage inputs. Use synchrophasors over serial or Ethernet communications to easily detect reactive loop flows, turn state estimation into state measurement, and provide early warning of potential system instability.

IEEE-Compliant Integration

Integrate with synchrophasor system by applying IEEE C37.118-2005 compliance Level 1 standards.

High-Speed Data Communications

Send and receive up to 60 synchrophasor messages per second for disturbance recording, state measurement through SCADA, and control.

Comprehensive Data Archiving

Easily compare data over a wide geographic area using built-in time correlation for time stamps accurate to 1 μ s. Build system-wide synchrophasor measurement coverage with existing SEL relays and/or by adding PMUs.

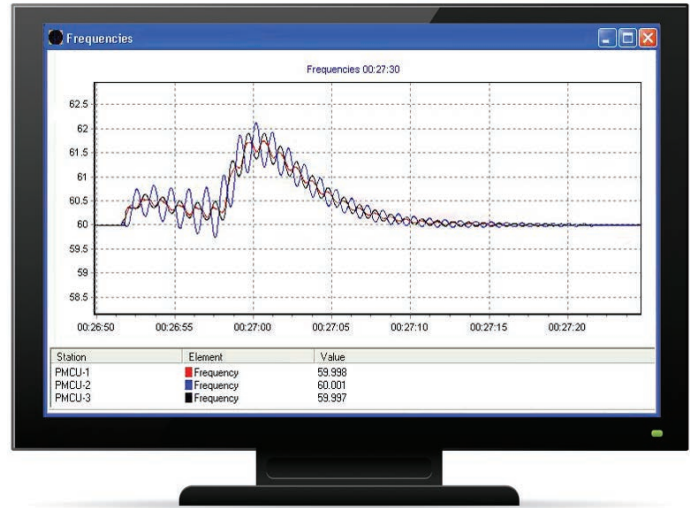
Real-Time Control

Receive up to two IEEE C37.118 synchrophasor data streams from two remote PMUs via serial communications. The relay automatically time aligns the incoming synchrophasor information so that it can be directly applied to relay measurements and control actions.

SYNCHROPHASOR APPLICATIONS

SYNCHROPHASORS MEASURE ALL CT AND PT CHANNELS

- Improve power system quality and save money with SEL synchrophasors simultaneously available from all 24 analog channels (6 voltage and 18 current sources).
- With synchrophasors over serial or Ethernet communications, easily detect reactive loop flows, turn state estimation into state measurement, and provide early warning of potential system instability.
- Simplify system architecture and improve system operations with UDP multicast synchrophasor data. Configurable data streams allow the user to select analog and binary information for up to five independent IEEE C37.118 data streams over Ethernet.

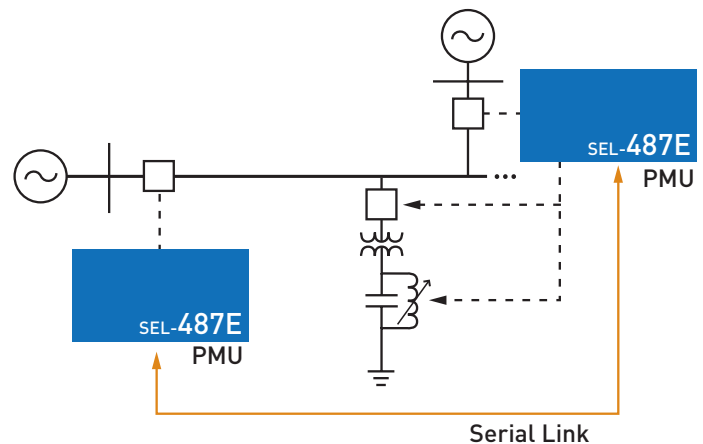


The SEL-487E exceeds the IEEE C37.118 standard with up to 50 messages per second at 50 Hz or up to 60 messages per second at 60 Hz.

REAL-TIME CONTROL

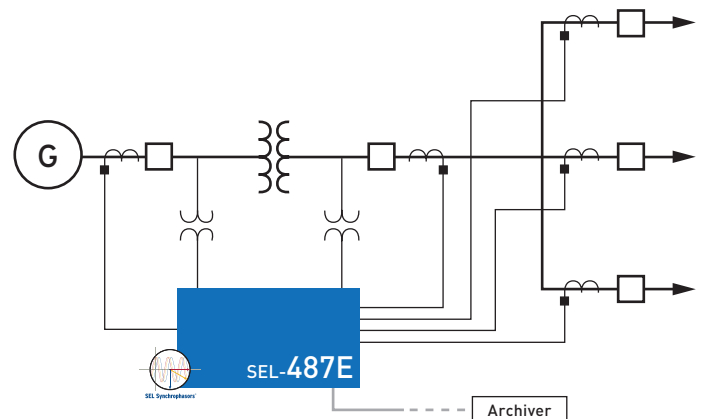
Improve system stability, and reduce remote control requirements. Apply remote measurements to local control by using direct relay-to-relay communications of synchrophasor values. Employ real-time values from remote transmission ends to control circuit breakers, static VAR compensators (SVCs), and power system stabilizers. Control devices based on voltage or current magnitude and phase angle, real or reactive power, or the rate of change of the input quantities.

Share synchrophasor data between two or three SEL-487E Relays for special protection schemes or custom logic. Remote measurements are available in SELlogic® control equations for protection or automation.



STATION-WIDE SYNCHROPHASOR APPLICATION

The SEL-487E is also a station-wide synchrophasor measurement and recording system. With 120 seconds of IEEE C37.118 binary synchrophasor data recording for all 24 analog channels, it serves as a central PMU in any substation or power generation facility. Measure voltage magnitudes and current phase-angle relationships at generators and transformers, which are key source nodes for stability studies and load angle measurements.



The SEL-487E PMU provides comprehensive data archiving.

ADDITIONAL SYNCHROPHASOR PRODUCTS

Integrate the SEL-487E with other products, such as the SEL-3378 Synchrophasor Vector Processor, SEL-5078-2 SYNCHROWAVE® Central Software, and other SEL synchrophasor relays, for a complete SEL solution.



**MAKING ELECTRIC POWER SAFER,
MORE RELIABLE, AND MORE ECONOMICAL**

**SCHWEITZER ENGINEERING
LABORATORIES, INC.**

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