



SEL-2245-43 12 Channel Analog Input Module

The SEL-2245-43 module provides 12 ac analog inputs for the SEL-2240 Axion®, the SEL-2245-431 8LEA/4PT Analog Input Module provides eight LEA voltage inputs and four standard ac voltage inputs, and the SEL-2245-432 12 LEA Analog Input Module provides 12 LEA voltage inputs.

Front Panel



Figure 1 SEL-2245-43 12 Channel Analog Input Module

Mechanical Installation

Each SEL-2242 Chassis/Backplane has four or ten slots, labeled A-J. Slots B-J support the SEL-2245-43 modules.

To install an SEL-2245-43 module, tip the top of the module away from the chassis, align the notch on the bottom of the module with the slot you want on the chassis, and place the module on the bottom lip of the chassis, as *Figure 2* illustrates. The module is aligned properly when it rests entirely on the lip of the chassis.



Figure 2 Proper Module Placement

Next, carefully rotate the module into the chassis, making sure that the alignment tab fits into the corresponding slot at the top of the chassis (refer to *Figure 3*). Finally, press the module firmly into the chassis and tighten the chassis retaining screw.



Figure 3 Final Module Alignment

Input Connections

The SEL-2245-43 LEA inputs include a + next to the terminal number to indicate the positive connection. The SEL-2245-431 PT analog inputs include a dot next to the terminal number to indicate the positive connection. Refer to *Specifications* on page 2 for ac analog input ratings for terminal assignments. Use LEA inputs for external current transducers (CTs), such as split core CTs, that produce 0.033–10 V and use PT inputs that produce 6–300 V. See *Section 6: Axion EtherCAT I/O* in the *SEL-5033 Software Instruction Manual* for channel mapping, configuration, and field calibration details.

LED Indicators

The LEDs labeled **ENABLED** and **ALARM** are related to EtherCAT network operation. The green **ENABLED** LED illuminates when the module is operating normally on the network. The **ALARM** LED illuminates during network initialization or when there is a problem with the network.

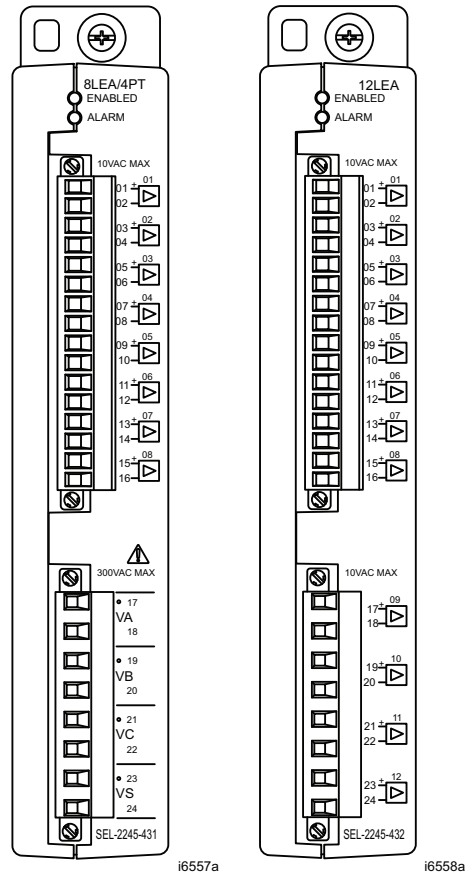


Figure 4 SEL-2245-43 Connection Diagrams

Specifications

General

Fuse Rating (Chassis Power)

Non-Serviceable: 2.5 A, 125 V, time-lag T

Standard Voltage Analog Input Channels (SEL-2245-431)

Frequency

Rated: 50/60 Hz
 Range: 40–90 Hz
 Typical Accuracy: ±0.005 Hz above 20 V
 Worst Case Accuracy: ±0.01 Hz above 20 V (±0.1 Hz for <2.5 cycles during transients)

Phase Rotation: ABC, ACB

Input Configuration: 3-Wire Delta, 4-Wire Wye

Update Intervals

Fundamental Metering: 250 Hz
 RMS: 250 Hz, 1 cycle window

THD (15th Harmonic Limited): 250 Hz, 1 cycle window

Harmonics and THD (63rd Harmonic Limited): 10/12 cycle for 50/60 Hz system frequency

AC Voltage Channels (SEL-2245-431)

Rated Range: 67–240 V_{L-N}
Note: Rated Range refers to the IEEE C37.118 rating system.
 Operational Range: 0–300 V_{L-N}
 Accuracy Range: 6.7–300 V_{L-N}
 Rated Insulation Voltage: 300 V_{L-N} continuous
 600 V_{L-N} for ten seconds

Galvanic Isolated Channels

Channel-to-Ground and Channel-to-Channel: 2.5 kV_{RMS} for one minute

Fundamental Measurement Accuracy

Magnitude: ±1%, typical, plus ±0.05 V
 ±3%, worst case, plus ±0.05 V
 Phase: ±0.5° @ f_{NOM}, typical
 ±1° @ f_{NOM}, over full rated temperature range
 ±2° @ f_{NOM}, worst case

RMS Measurement Accuracy

Magnitude: ±1%, typical, plus ±0.05 V
 ±3%, worst case, plus ±0.05 V

Burden: <0.01 VA @ 67 V
 Impedance > 500 kΩ

THD Accuracy (15th Harmonic Limited): $\pm 5\%$ of measurement plus $\pm 0.25\%$
 Data Acquisition Resolution: 24 bit

LEA Input Channels

Nominal Input: 333 mV
 Measurement Range: 0.033–10 V_{RMS}
 Fundamental Measurement Accuracy
 Magnitude: $\pm 0.25\%$, typical (>33 mV), plus ± 1.3 mV
 Phase: $\pm 0.1^\circ$ @ f_{NOM} , typical
 $\pm 1^\circ$ @ f_{NOM} , over full rated temperature range
 RMS Measurement Accuracy
 Magnitude: $\pm 0.25\%$, typical (>33 mV), plus ± 1.3 mV
 Burden: <0.1 VA
 Impedance: >150 k Ω
 <10 nF
 Data Acquisition Resolution: 24 bit

Sequence Components

SEL-2245-431 Values: I0X, I1X, I2X, I0Y, I1Y, I2Y, V0, V1, V2
 SEL-2245-432 Values: I0X, I1X, I2X, I0Y, I1Y, I2Y, I0Z, I1Z, I2Z
Note: Sequence components are of the fundamental frequency.
 Accuracy
 Magnitude: $\pm 2\%$, typical
 Angle: $\pm 2^\circ$, typical

Synchrophasors

Conformance: IEEE C37.118.1-2011 as amended by
 IEEE C37.118.1a-2014
 IEEE C37.118.2-2011
 IEC/IEEE 60255-118-1-2018
 Accuracy: Level 1 as specified by IEEE C37.118
 Measurements: Software selectable (P or M class)
 SEL-2245-431 Values: IAX, IBX, ICX, INX, IAY, IBY, ICY, INY,
 VA, VB, VC, VS, and Sequence
 Component Values
 SEL-2245-432 Values: IAX, IBX, ICX, INX, IAY, IBY, ICY, INY,
 IAZ, IBZ, ICZ, INZ, and Sequence
 Component Values
 Periodic: Frequency and df/dt
 Processing Rate: 120 Hz
 Message Rates
 (60 Hz nominal): 1, 2, 4, 5, 10, 12, 15, 20, 30, 60, and 120*
 (messages/second)
 Message Rates
 (50 Hz nominal): 1, 2, 5, 10, 25, 50, and 100*
 (messages/second)

* Message rates are supported on the SEL-2241-2, SEL-3350, SEL-3555, and SEL-3560.

Triggered Waveform Recording

Sampling Rates: 1, 2, 4, 8, 24 kHz software selectable
 Transient Fault Record Length
 Individual Records as Long as: 24 seconds for 24 kHz
 72 seconds for 8 kHz
 144 seconds for 4 kHz
 288 seconds for 2 kHz
 576 seconds for 1 kHz
 Pre-Fault Time: 0.05 s to (max. event length – 0.05 s)
 Data Format: IEEE C37.111-2013 COMTRADE
 File Naming: IEEE C37.232 COMNAME

Technical Support

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

Schweitzer Engineering Laboratories, Inc.
2350 NE Hopkins Court
Pullman, WA 99163-5603 U.S.A.
Tel: +1.509.338.3838
Fax: +1.509.332.7990
Internet: selinc.com/support
Email: info@selinc.com

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SCHWEITZER ENGINEERING LABORATORIES, INC.

2350 NE Hopkins Court • Pullman, WA 99163-5603 U.S.A.

Tel: +1.509.332.1890 • Fax: +1.509.332.7990

selinc.com • info@selinc.com



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