The SEL-2245-221 provides low-voltage (LEA) monitoring inputs for the SEL-2240 Axion®. Within an Axion node, install as many as sixteen SEL-2245-221 modules per system in any combination.

### Front Panel

![Figure 1 SEL-2245-221 4 LEA Module](image1)

### Mechanical Installation

Each SEL-2242 chassis/backplane has four or ten slots, labeled A-J. Slots B-J support the SEL-2245-221 modules.

**Figure 2** Notch for Module Alignment

To install the SEL-2245-221 Module, tip the top of the module away from the chassis, align the notch on the bottom of the module (shown in *Figure 2*) with the slot you want on the chassis, and place the module on the bottom lip of the chassis as *Figure 3* illustrates. The module is aligned properly when it rests entirely on the lip of the chassis.
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 4). Finally, press the module firmly into the chassis and tighten the chassis retaining screw.

Input Connections

The SEL-2245-221 4 LEA analog inputs include a dot next to the terminal number to indicate the positive convention. Refer to Specifications for ac analog input ratings and to Figure 5 for terminal assignments. You can configure low-voltage or low-energy analog (LEA) inputs for 0–30 V.

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.

**CAUTION**

Use supply wires suitable for 60°C (140°F) above ambient. See product or manual for ratings.

**ATTENTION**

Utilisez des fils d'alimentation appropriés pour 60°C (140°F) au-dessus ambiante. Voir le produit ou le manuel pour les valeurs nominales.
Specifications

Compliance

Designed and manufactured under an ISO 9001 certified quality management system

UL Listed to U.S. and Canadian safety standards (File E220228; NRAQ, NRAQ7)

CE Mark

General

Operating Temperature Range:

–40° to +85°C (–40° to +185°F)

Operating Environment

Pollution Degree: 2

Overvoltage Category: II

Insulation Class: 1

Relative Humidity: 5%–95%, noncondensing

Maximum Altitude: 2000 m

AC Metering Inputs

Frequency: 50/60 Hz

Range: 45–65 Hz

Typical Accuracy: ±0.005 Hz above 500 mV

Worst-Case Accuracy: ±0.01 Hz above 500 mV

Phase Rotation: ABC, ACB

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

Update Interval

Fundamental Metering: 200 Hz

RMS Metering: 5 Hz

Voltage Inputs

V_{NOM} = 1.5 V

Measurement Range: 30 Vac peak

0.05–22 Vac RMS

Maximum: 300 VL-N for 10 s (surge)

Typical Accuracy:

±0.1% @ f_{NOM} and > 50 mV RMS

±0.1% @ f_{NOM} and > 50 mV Fundamental

Worst-Case Accuracy:

±3% ±1 mV @ f_{NOM} Fundamental/RMS

Angle

Range: ±180°

Typical Accuracy: ±0.1° @ f_{NOM} and > 50 mV

Worst-Case Accuracy: ±2° @ f_{NOM}

Burden: < 0.1 VA

Triggered Waveform Recording

Sampling Rates: 1, 2, 4, 8, 24 kHz software selectable

Record Duration: 0.1-second increments from 0.5 s to specified maximum for each sample rate

Maximum Record Duration: 6 s at 24 kHz

18 s at 8 kHz

36 s at 4 kHz

72 s at 2 kHz

144 s at 1 kHz

Record Pretrigger: 0.05 s minimum to a maximum of (record length—0.05) s


Type Tests

Environmental Tests


V3X excluding the terminal blocks


Vibration Endurance, Severity: Class 2

Vibration Response, Severity: Class 2


Bump Test, Severity: Class 1

Shock Withstand, Severity: Class 1

Shock Response, Severity: Class 2

Seismic: IEC 60255-21-3:1993

Quake Response, Severity: Class 2

Cold: IEC 60068-2-1:2007

–40°C, 16 hours


+85°C, 16 hours

Damp Heat, Cyclic: IEC 60068-2-30:2005

25°C to 55°C, 6 cycles, 95% relative humidity

Dielectric Strength and Impulse Tests

Impulse: IEC 60255-5:2000

IEEE C37.90-2005

Severity Level: 0.5 Joule, 5 kV CT/PT inputs

Dielectric (HiPot): IEC 60255-5:2000

IEEE C37.90-2005

Severity Level: 2500 Vac CT/PT inputs for 1 minute

RFI and Interference Tests

EMC Immunity

Electrostatic Discharge

Immunity: IEEE C37.90.3-2001

IEC 60255-22-2:2008

IEC 61000-4-2:2008

Severity Level: 8 kV contact discharge

15 kV air discharge

Radiated RF Immunity: IEEE C37.90.2-2004

Severity Level: 35 V/m

IEC 61000-4-3:2008

IEC 60255-22-3:2007

Severity Level: 10 V/m

Digital Radio Telephone

RF Immunity: ENV 50204:1995

Severity Level: 10 V/m at 900 MHz and 1.89 GHz

Conducted RF Immunity: IEC 60255-22-6:2001

IEC 60100-4-6:2008

Severity Level: 10 V/m


IEC 60100-4-5:2003

Severity Level: 1 kV Line to Line, 2 kV Line to Earth

(202 ms filter on RMS voltages and frequencies, 33 ms filter on fundamental frequencies, cable length ±2 m)
<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
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<tbody>
<tr>
<td></td>
<td>Severity Level: Class A: 4 kV, 5 kHz; 2 kV, 5 kHz on communications ports</td>
</tr>
<tr>
<td></td>
<td>(cable length ≤ 2 m)</td>
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<tr>
<td>Magnetic Field Immunity</td>
<td>IEC 61000-4-8:2009</td>
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<td></td>
<td>Severity Level: 1000 A/m for 3 seconds, 100 A/m for 1 minute</td>
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<td></td>
<td>IEC 61000-4-9:2001</td>
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<td></td>
<td>Severity Level: 1000 A/m</td>
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<td></td>
<td>IEC 61000-4-10:2001</td>
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<td></td>
<td>Severity Level: 100 A/m</td>
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<td></td>
<td>Severity Level: 2.5 kV common mode</td>
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<tr>
<td></td>
<td>1.0 kV differential-mode</td>
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<td>Oscillatory Waves Immunity</td>
<td>IEC 61000-4-12:2006</td>
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<tr>
<td></td>
<td>Severity Level: Ring Wave: 2 kV common, 1.0 kV differential</td>
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<td></td>
<td>Oscillatory: 2.5 kV common, 1.0 kV differential (cable length ≤ 2 m)</td>
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<tr>
<td>Common Mode Disturbance Immunity</td>
<td>IEC 61000-4-16:2002</td>
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<td></td>
<td>Frequency: 0 Hz to 150 Hz</td>
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<td></td>
<td>Severity Level: Level 4, Segment 4: 30 Vrms open-circuit, 15 kHz–150 kHz</td>
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<td>(cable length ≤ 2 m)</td>
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<td>Emissions</td>
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<tr>
<td></td>
<td>Severity Level: Class A</td>
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