SEL-2245-221 Low-Voltage (LEA) Monitoring Module

The SEL-2245-221 provides low-voltage (LEA) monitoring inputs for the SEL 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](image2)

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.

Configure inputs by adding a Fieldbus I/O connection for each module in ACSELERATOR RTAC® SEL-5033 Software. See the EtherCAT® portion in Section 2: Communications in the SEL-5033 Software Instruction Manual for 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.

**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
\( V_{\text{NOM}} \): 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% @ \( f_{\text{NOM}} \) and > 50 mV RMS
±0.1% @ \( f_{\text{NOM}} \) and > 50 mV Fundamental
Worst-Case Accuracy: ±3% ±1 mV @ \( f_{\text{NOM}} \) Fundamental/RMS
Angle
Range: ±180°
Typical Accuracy: ±0.1° @ \( f_{\text{NOM}} \) and > 50 mV
Worst-Case Accuracy: ±2° @ \( f_{\text{NOM}} \)
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
IP3X 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
IEEE 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
IEEE 61000-4-6:2008
Severity Level: 10 V/m
IEEE 61000-4-5:2005
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>Immunity</th>
<th>Standard(s)</th>
<th>Severity Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast Transient, Burst Immunity</td>
<td>IEC 60255-22-4:2008</td>
<td>Class A: 4 kV, 5 kHz; 2 kV, 5 kHz on communications ports (cable length ≤ 2 m)</td>
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<tr>
<td></td>
<td>IEC 61000-4-4:2011</td>
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<tr>
<td>Magnetic Field Immunity</td>
<td>IEC 61000-4-8:2009</td>
<td>1000 A/m for 3 seconds, 100 A/m for 1 minute</td>
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<tr>
<td></td>
<td>IEC 61000-4-9:2001</td>
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<tr>
<td>Surge Withstand Capability Immunity</td>
<td>IEC 60255-22-1-2007</td>
<td>2.5 kV common-mode; 1.0 kV differential-mode</td>
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<td></td>
<td>IEC 61000-4-10:2001</td>
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<tr>
<td>Oscillatory Waves Immunity</td>
<td>IEC 61000-4-12:2006</td>
<td>Ring Wave: 2 kV common; Oscillatory: 2.5 kV common, 1.0 kV differential (cable length ≤ 2 m)</td>
</tr>
<tr>
<td>Common Mode Disturbance Immunity</td>
<td>IEC 61000-4-16:2002</td>
<td>Frequency: 0 Hz to 150 Hz; Level 4, Segment 4: 30 Vrms open-circuit, 15 kHz–150 kHz (cable length ≤ 2 m)</td>
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<tr>
<td>Emissions</td>
<td>IEC 60255-25-2000</td>
<td>Class A</td>
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<tr>
<td>Radiated and Conducted Emissions</td>
<td>IEC 60255-22-4:2008</td>
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