The SEL-2245-411 provides standard current and low-voltage (LEA) monitoring inputs for the SEL Axion®. Within an Axion node, install as many as 16 SEL-2245-411 Modules per system in any combination.

**Front Panel**

![Figure 1 SEL-2245-411 4 CT/4 LEA Module](image)

**Mechanical Installation**

Each SEL-2242 chassis/backplane has four or ten slots, labeled A–J. Slots B–J support the SEL-2245-411 Modules.

![Figure 2 Notch for Module Alignment](image)

To install an SEL-2245-411 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-2245-411 4 CT/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 and current transformer (CT) inputs for 0–22 A.

Configure inputs by adding a Fieldbus I/O connection for each module in ACCELERATOR 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 ambiant. 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

Current Inputs Phase and Neutral

INOM: 1 A or 5 A (no settings required)

Measurement Range: 0.050–22 A Continuous

22–100 A Symmetrical for 25 s

Thermal Withstand Limit: 500 A for 1 s

Typical Accuracy: ±0.1% Fundamental @ f_NOM and > 0.6 A

±0.1% RMS @ f_NOM and > 0.6 A

Worst-Case Accuracy: ±2% ± 0.005 A Fundamental

±1% ± 0.005 A RMS

Angle

Range: ±180°

Typical Accuracy: ±0.1° @ f_NOM and > 50 mV

Worst-Case Accuracy: ±2° @ f_NOM

Burden: < 0.1 VA

Power and Power Factor (Per Phase and Three-Phase)

PA, PB, PC, 3P

Typical Accuracy: 0.1% @ PF ≥ 0.5

Worst-Case Accuracy: 2%

QA, QB, QC, 3Q

Typical Accuracy: 0.1% @ PF ≤ 0.98

Worst-Case Accuracy: 2%

SA, SB, SC, 3S

Typical Accuracy: 0.1%

Worst-Case Accuracy: 2%

PFA, PFB, PFC, 3PF

Typical Accuracy: 0.1% @ Unity PF

Worst-Case Accuracy: 2%

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
IEC 601004-2:2008
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

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

Conducted RF Immunity: IEC 60255-22-6:2001
IEC 61000-4-6:2008
Severity Level: 10 Vrms

IEC 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)

IEC 61000-4-4:2011
Severity Level: Class A: 4 kV, 5 kHz;
2 kV, 5 kHz on communications ports
(cable length ≤2 m)

Magnetic Field Immunity: IEC 61000-4-8:2009
Severity Level: 1000 A/m for 3 seconds,
100 A/m for 1 minute
IEC 61000-4-9:2001
Severity Level: 1000 A/m
IEC 61000-4-10:2001
Severity Level: 100 A/m

Severity Level: 2.5 kV common-mode
1.0 kV differential-mode
IEEE C37.90.1-2002
Severity Level: 2.5 kV Oscillatory
4.0 kV Fast Transient (cable length ≤2 m)

Oscillatory Waves Immunity: IEC 61000-4-12:2006
Severity Level: Ring Wave: 2 kV
common, 1.0 kV differential
Oscillatory: 2.5 kV common,
1.0 kV differential (cable length ≤2 m)

Common Mode Disturbance Immunity: IEC 61000-4-16:2002
Frequency: 0 Hz to 150 Hz
Severity Level: Level 4, Segment 4:
30 Vrms open-circuit, 15 kHz–150 kHz
(cable length ≤2 m)

Emissions

Severity Level: Class A