SEL-2730U 24-Port Unmanaged Ethernet Switch

Reliable Ethernet Communication for Substation and Plant Networks

The SEL-2730U Unmanaged Ethernet Switch is designed for the harsh environments commonly found in the energy and utility industries. The SEL-2730U supports communications infrastructures built for engineering access, supervisory control and data acquisition (SCADA), and offers the same reliability found in SEL protective relays.

- **Reliable.** Increase availability with the SEL-2730U, which is designed, built, and tested to function in harsh environments such as substations. Optional hot-swappable, dual power supplies provide for primary and backup power sources.
- **Flexible.** Maximize flexibility by using SEL-2730U ordering options to meet different network configurations. Order the SEL-2730U with Ethernet ports in combinations of copper, single-mode fiber, and multimode fiber. Add even more flexibility by using the four small form-factor pluggable (SFP) modules to change port configurations when network designs change.
- **Easy to Use.** Simply plug Ethernet devices into the SEL-2730U to start communications. There are no settings or configurations.

Functional Overview

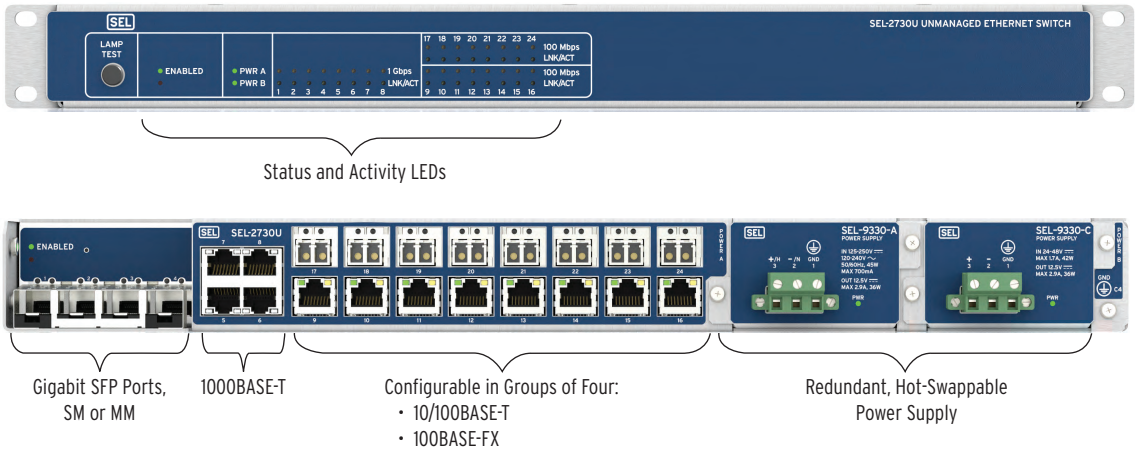

Figure 1 Functional Diagram

The base-model SEL-2730U has 4 Gigabit Ethernet copper ports and 16 10/100 Mbps copper Ethernet ports, built as 4-port modules. You can order each of the 10/100 Mbps copper port modules as single- or multimode fiber-optic ports to meet the unique requirements of your network. You can also add as many as four fiber-optic Gigabit Ethernet ports via SFP modules, for a total of 24 ports.

- **Four SFP ports.** Ports 1–4 are compatible with the single- or multimode fiber SFP modules orderable from SEL.
- **Four Gigabit Ethernet ports.** Ports 5–8 support 10/100/1000 Mbps copper Gigabit Ethernet.
- **Sixteen 10/100 Mbps ports.** Ports 9–24 can be ordered in combinations of 4-port groups of either copper or fiber. When fiber is ordered for the 10/100 Mbps ports, far end fault indication (FEFI) is supported on those ports.
- **Redundant, hot-swappable power supplies.** Optional redundant power supplies provide failover protection. Connect a separate power source to each power supply. If one source fails, the other continues to keep the switch operational. The power supply has an estimated MTBF of 3000 years.
- **Reversible mounting.** The SEL-2730U comes with reversible mounting ears to support both front and rear-panel installations.

SEL manufactures the SEL-2730U using the same high standards as those for SEL protective relays and backs it with the same 10-year worldwide warranty.

The SEL-2730U supports far end fault indication (FEFI) on the 10/100 fiber ports. This is enabled by default. If you do not want FEFI, you can turn it off by removing the top panel, locating jumper J16, and asserting position 3 when you are facing the front of the product and counting from left to right.

The SEL-2730U meets or exceeds the IEEE 1613 Class 1, IEC 61850-3, and IEC 60255 industry standards for communications devices in electrical substations for vibration, electrical surges, fast transients, extreme temperatures, and electrostatic discharge.

Front- and Rear-Panel Diagrams

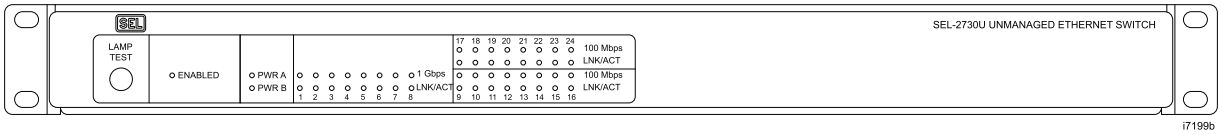

Figure 2 SEL-2730U Front-Panel Diagram

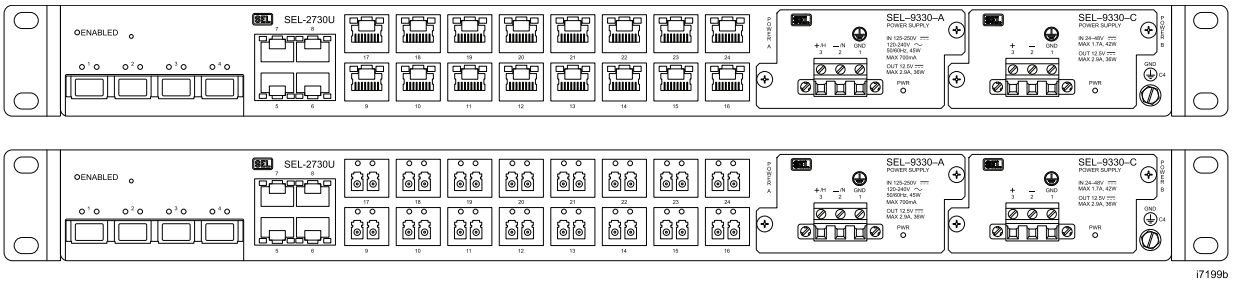

Figure 3 SEL-2730U Rear-Panel Diagrams

Dimensions

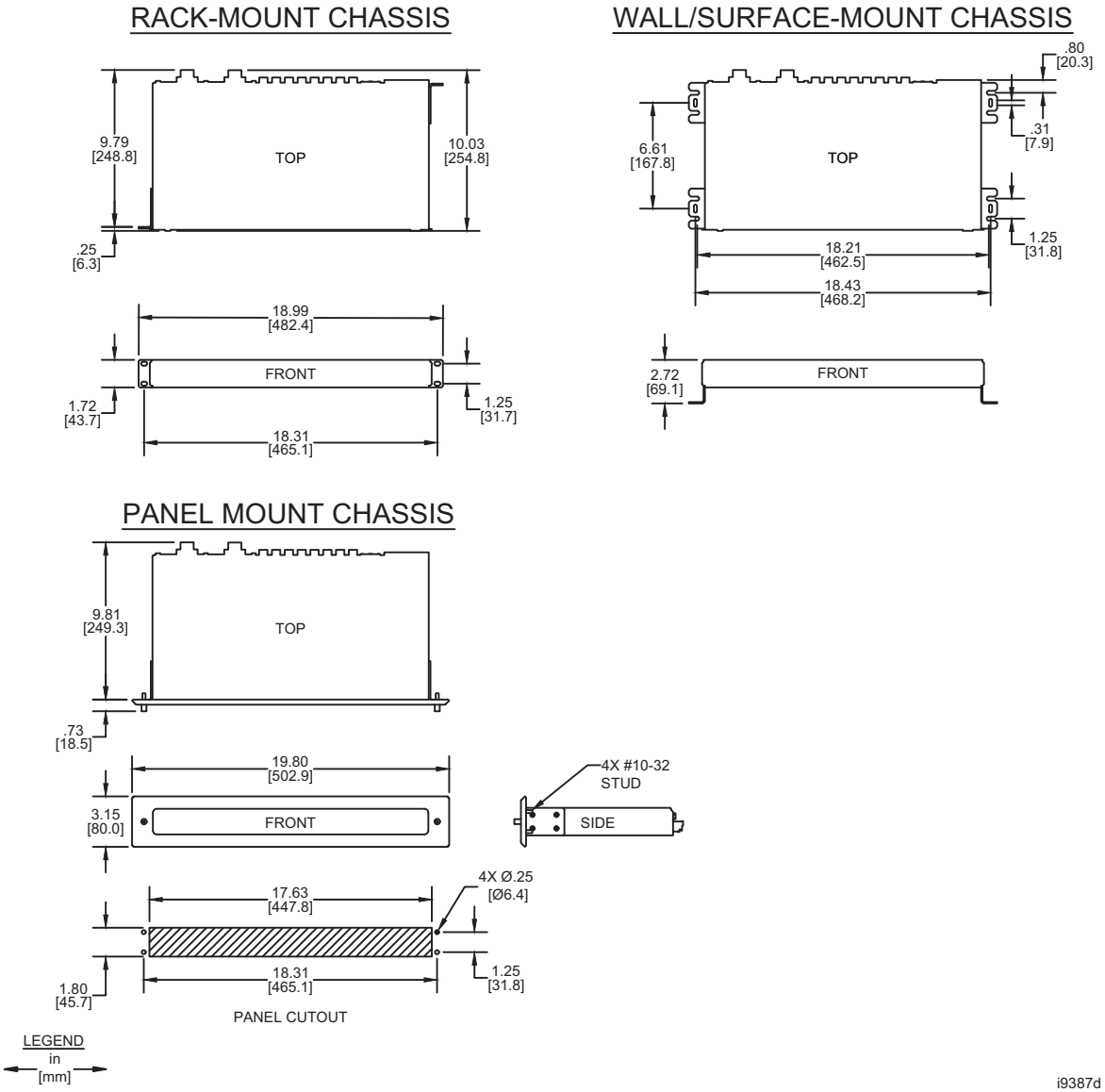

Figure 4 SEL-2730U Dimensions

Specifications

Compliance

Designed and manufactured under an ISO 9001 certified quality management system

47 CFR 15B, Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operating in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may be likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Any changes or modifications not expressly approved by the manufacturer can void the user's authority to operate the equipment.

UL Listed to U.S. and Canadian safety standards (File E220228; NRAQ/NRAQ7) (rack-mount configuration only)

UKCA Mark

CE Mark

General

Operating Environment

Pollution Degree:	2
Overvoltage Category:	II

Dimensions

1U Rack Mount

Height:	43.7 mm (1.72 in)
Depth:	232.1 mm (9.14 in)
Width:	482.5 mm (19 in)

1U Panel Mount

Height:	80 mm (3.15 in)
Depth:	261.9 mm (10.31 in)
Width:	502.9 mm (19.80 in)

Weight

1.96 kg (4.3 lb)

Switching Properties

Switching Method:	Store and Forward
Switching Latency:	<7 µs
Switch Fabric Throughput:	19.2 Gbps
MAC Address Table Size:	8192 Addresses

Warranty

10 Years

Network

IEEE 802.3u:	100BASE-T and 100BASE-FX
IEEE 802.3:	10BASE-T
IEEE 802.x:	Flow control

RJ45 Ports

Recommended Cable:	Category 5(e) Shielded Twisted Pair Cable (STP) (SEL-C627)
Auto Negotiation:	10 or 100 MBps, full- or half-duplex and MDI/MDI-X crossover

Fiber Optics

Class 1 LASER/LED Product:	IEC 60825-1:1993 + A1:1997 + A2:2001
Data Rate:	100 Mbps
Connector Type:	LC
Wavelength:	1300 nm
Multimode Option:	62.5 µm fiber
Lowest TX Level:	–20 dBm
Lowest RX Sensitivity:	–31 dBm
Optical Budget:	11 dBm
Max Distance:	2 km
Single-Mode Option:	9 µm fiber
Lowest TX Level:	–15 dBm
Lowest RX Sensitivity:	–25 dBm
Optical Budget:	10 dBm
Max Distance:	15 km

Communications Ports

Ethernet Ports

Ports:	24 rear
Data Rate:	10, 100, or 1000 Mbps
Rear Connectors:	RJ45 Female or LC Fiber (single-mode or multimode)
Standard:	IEEE 802.3

Power Supply

125–250 Volt Power Supply

Rated Supply Voltage:	125–250 Vdc; 120–240 Vac, 50/60 Hz
Input Voltage Range:	88–300 Vdc or 85–264 Vac
Power Consumption:	AC: <60 VA DC: <45 W
Input Voltage Interruptions:	50 ms @ 125 Vac/Vdc 100 ms @ 250 Vac/Vdc

24–48 Volt Power Supply

Rated Supply Voltage:	24–48 Vdc (polarized)
Input Voltage Range:	19.2 Vdc to 57.6 Vdc
Power Consumption:	<45 W
Input Voltage Interruptions:	50 ms @ 48 Vdc

Environmental

Operating Temperature

–40° to +85°C (–40° to +185°F)

Relative Humidity

0% to 95% non-condensing

Altitude

2000 m

Green Product

Compliant with the European Union's RoHS directive

Type Tests

Communication Product Testing

IEC 61850-3:2002
IEEE 1613, Class 1

Electromagnetic Compatibility Emissions

IEC 60255-25:2000

Generic Emissions: CFR 47 Part 15
Severity Level: Class A
Canada ICES-001(A) / NMB-001(A)

Electromagnetic Compatibility Immunity

Conducted RF Immunity: IEC 60255-22-6:2001
Severity Level: 10 Vrms
IEC 6100-4-6:2008
Severity Level: 10 Vrms

Electrostatic Discharge Immunity: IEC 60255-22-2:2008
Severity Level: 2, 4, 6, 8 kV contact; 2, 4, 8, 15 kV air
IEC 61000-4-2:2008
Severity Level: 2, 4, 6, 8 kV contact; 2, 4, 8, 15 kV air
IEEE C37.90.3:2001
Severity Level: 2, 4, and 8 kV contact; 4, 8, and 15 kV air

Fast Transient/Burst Immunity: IEC 60255-22-4:2008
Severity Level: Class A - 4 kV, 5 kHz; 2 kV, 5 kHz on communications ports
IEC 61000-4-4:2011
Severity Level: 4 kV, 5 kHz

Magnetic Field Immunity: IEC 61000-4-10:2001
Severity Level: 100 A/m
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

Power Supply Immunity: IEC 60255-11:2008
IEC 61000-4-11:2004
IEC 6100-4-29:2000

Radiated Radio Frequency Immunity: IEC 60255-22-3:2007
Severity Level: 10 V/m
IEC 61000-4-3:2010
Severity Level: 10 V/m
IEEE C37.90.2:2004
Severity Level: 35 V/m

Surge Immunity: IEC 60255-22-5:2008
Severity Level: 1 kV line-to-line, 2 kV line-to-earth
IEC 61000-4-5:2005
Severity Level: 1 kV line-to-line, 2 kV line-to-earth

Surge Withstand Capability Immunity: IEC 60255-22-1:2007
Severity Level: 2.5 kV peak common mode, 1.0 kV peak differential mode
IEEE C37.90.1:2002
Severity Level: 2.5 kV oscillatory, 4 kV fast transient waveform

Environmental

Cold: IEC 60068-2-1:2007
Severity Level: 16 hours at –40°C

Damp Heat, Cyclic: IEC 60068-2-30:2005
Severity Level: 25°C
Relative Humidity: 93%
Duration: 4 days

Dry Heat: IEC 60068-2-2:2007
Severity Level: 16 hours at +85°C

Vibration (Front-Panel Mount Only): IEC 60255-21-1:1988
Severity Level: Class 1 endurance, Class 2 response
IEC 60255-21-2:1988
Severity Level: Class 1 - Shock withstand, bump, and Class 2 - Shock response
IEC 60255-21-3:1993
Severity Level: Class 2 (quake response)

Safety

Dielectric Strength: IEC 60255-5:2000
3100 Vdc on power supply.
Type tested for 1 minute.
IEEE C37.90:2005
3100 Vdc on power supply.
Type tested for 1 minute.

Impulse: IEC 60255-5:2000
Severity Level: 0.5 Joule, 5 kV
IEEE C37.90:2005
Severity Level: 0.5 Joule, 5 kV

Safety: IEC 61010-1:2010
[IEC 61010-2:201:2010]

Technical Support

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

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Notes

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