SEL-2725 Unmanaged Ethernet Switch

Features and Benefits

The SEL-2725 is an unmanaged five-port Ethernet switch and copper-to-fiber media converter. Single- or multimode fiber optics are available to accommodate a wide range of utility and industrial applications. The environmental specifications exceed the requirements of IEEE 1613 and IEC 61850-3, making it suitable for operation in harsh environments, such as electric utility substations or industrial plants.

- **Easy Installation.** The SEL-2725 has no settings. Copper ports autoconfigure for crossover cables, autospeed detects for 10 or 100 Mbps links, and automatically detects half- or full-duplex operation.
- **Reliable Power Supply.** 12/24/48 Vdc and 125/250 Vdc power supplies exceed all harsh environmental standards along with a 3,000 year MTBF.
- **Robust Performance.** Operates above the required temperature range (–40° to +85°C). Exceeds the requirements of IEEE 1613 and IEC 61850-3.

Use as a multiport media converter to connect Ethernet 10/100BASE-T devices to one location or equipment rack. Use the 100BASE-FX multimode or 100BASE-LX10 single-mode fiber-optic port options to interconnect devices with the central or managed Ethernet switch. Keeping the electrical connections short and localized greatly reduces the possibility of induced noise.

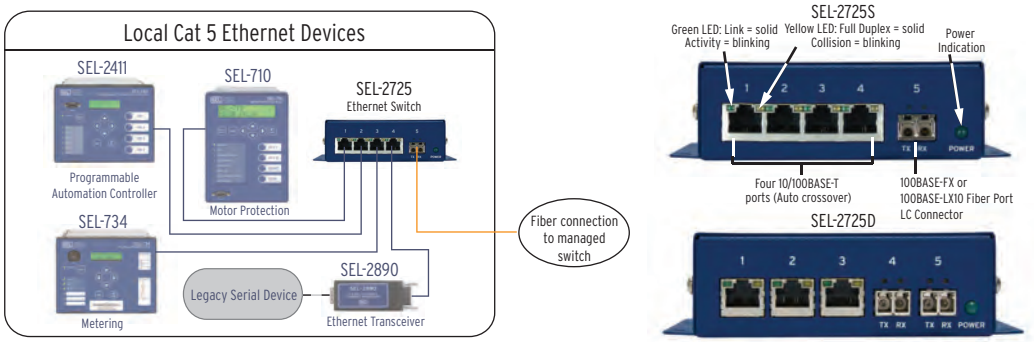

Figure 1 Ethernet Connections and Indicators

Installation and Maintenance

Power Supply

⚠DANGER

Contact with instrument terminals may cause electrical shock which can result in injury or death.

You can order the SEL-2725 with different supply voltages listed in *Specifications*. The serial number label on the device lists the power supply voltage. The SEL-2725 power supply ceases operation when the input voltage is too low to maintain reliable operation. Applying the rated input voltage returns the SEL-2725 to proper operation.

Use 1.5 mm^2 (16 AWG) wire (or heavier) to connect to the **POWER** terminals. When you use a dc power source, you must connect the source with the proper polarity, as indicated by the **+** and **–** symbols on the power terminals. After connecting the input wiring and introducing the external source of power, you will see the **POWER** LED illuminate. For compliance to UL/CSA/IEC 60950-1, the SEL-2725D must be installed so that the input power is not accessible during normal operation.

Disconnect Device

Disconnect device must be located in reasonable proximity and be readily accessible. This disconnect must also comply with IEC 60947-1 and IEC 60947-3 or an equivalent approved disconnect device appropriate for the country of installation and be identified as the disconnect device for this equipment.

The maximum current rating for the power disconnect circuit breaker or overcurrent device must be 15 A. Operational power is internally fused. This fuse is not user replaceable. Should failure occur, return the unit to the factory for repair.

Mechanical Diagrams

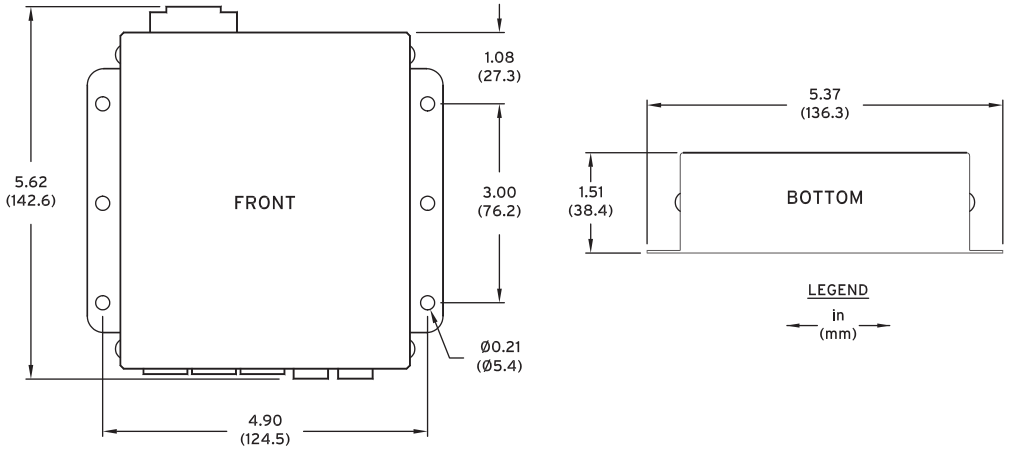

Figure 2 SEL-2725D Dimension Drawing

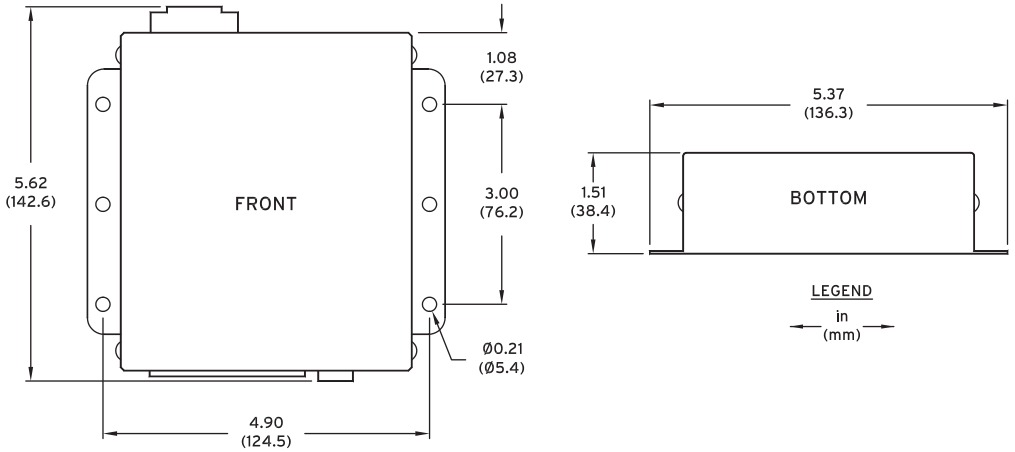

Figure 3 SEL-2725S Dimension Drawing

Specifications

Compliance

All SEL-2725 Models

ISO 9001:2008 Certified

FCC CFR 47 Part 15, 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 operated 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.

SEL-2725D Only

UL Recognized:	UL 60950-1 (except 12 Vdc option)
CSA:	CAN/CSA C22.2 No. 60950-1

General

Switching Technology

Non-blocking, store and forward

Latency

Less than 10 µs

LED Indicators

Power (green)

Link/Activity (green per port)

Full duplex/collision (yellow per port)

Network

IEEE 802.3u:	100BASE-T and 100BASE-FX or 100BASE-LX10
IEEE 802.3:	10BASE-T
IEEE802.x:	Flow control
Address Table:	1000 MAC addresses

RJ45 Ports

Recommended Cable:	Category 5(e) Shielded Twisted Pair Cable (STP) (SEL-C627)
Autonegotiation:	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
Multimode (100BASE-FX) Option:	62.5 µm fiber
Lowest TX Level:	–20 dBm
Lowest RX Sensitivity:	–31 dBm
Optical Budget:	11 dBm
Max Distance:	2 Km
Wavelength:	1300 nm
Single-Mode (100BASE-LX10) Option:	9 µm fiber
Lowest TX Level:	–15 dBm
Lowest RX Sensitivity:	–25 dBm
Optical Budget:	10 dBm
Max Distance:	15 Km
Wavelength:	1310 nm

Environmental

Operating Temperature

–40° to +85°C (–40° to +185°F)
SEL-2725D UL/CSA Rating: –40° to +80°C (–40° to +176°F)

Relative Humidity

0 to 95% non-condensing

Altitude

2000 m

Power Supply

12 Vdc

Voltage Range:	9–30 Vdc
Power Consumption:	<5 W

24/48 Vdc

Voltage Range:	18–60 Vdc
Power Consumption:	<5 W

125/250 Vdc or 110/240 Vac

Voltage Range:	85–275 Vdc or 85–264 Vac (50/60 Hz)
Power Consumption:	<5 W

Type Tests

Electromagnetic Compatibility (EMC)

Standard:	EN 50263:1999 [BS EN 50263:2000] IEEE 1613, Class 2
Radiated, Radio-Frequency (EMI):	EN 50204:1995 IEC 61000-4-3:2006 [BS EN 61000-4-3:2006] 10 v/m
Conducted Disturbances:	IEC 60255-26:2005 [BS EN 60255-26:2005] IEC 61000-4-6:2006 [BS EN 61000-4-6:1996 + A1:1997] 10 Vrms
Voltage Dips, Short Interruptions and Voltage Variations on DC Input Power Port:	IEC 61000-4-29:2000 [BS EN 61000-4-29:2001] Severity: Dip: 70% V_{NOM} for 10 ms, 40% V_{NOM} for 100 ms Interruption: 0% V_{NOM} for 2, 5, 10, 20, 50, 100, 200 ms Variations: 80% IEC 61000-4-11:2004 [BS EN 61000-4-11:2004] Severity: Dip: 70% V_{NOM} for 10 ms, 40% V_{NOM} for 100 ms
Electrostatic Discharge:	IEC 61000-4-2:2001 [BS EN 61000-4-2:1995 + A1:1999 + A2:2001] Severity Level: 2, 4, 6, 8 kV contact; 2, 4, 8, 15 kV air

Electrical Fast Transient/Burst:	IEC 61000-4-4:2004 + CRGD:2006 [BS EN 61000-4-4:2005] Severity Level: 4 kV
Surge Immunity:	IEC 61000-4-5:2005 [BS EN 61000-4-5:1995 + A1:1996] Severity: 1 kV Line to Line, 2 kV Line to Earth
Power Frequency Magnetic Field:	IEC 61000-4-8:2001 [BS EN 61000-4-8:1994 + A1:2001] Severity: 1000 A/m for 3 seconds, 100 A/m for 1 minute

Emissions

FCC Emissions:	CFR 47 Part 15, Class A
Electromagnetic Emission:	IEC 60255-25:2000 [BS EN 60255-25:2000]
Radio Disturbance Characteristics:	EN 55011: 1998 + A1:1999 + A2:2002, Class A
Conducted Radio Frequency:	IEC 60255-22-6:2001 [BS EN 60255-22-6:2001], 10 Vrms

Environmental Tests

Cold:	IEC 60068-2-1:1990 + A1:1993 + A2:1994 [BS EN 60068-2-1:1993 Test Ad: 16 hr at –40°C
Damp Heat, Cyclic:	IEC 60068-2-30:2005 Test Db: 25° to 55°C, 6 cycles, 95% humidity
Dry Heat:	IEC 60068-2-2:1974 + A1:1993 + A2:1994 [BS EN 60068-2-2:1993] Test Bd: 16 hr at +85°C

Dielectric Strength and Impulse Tests

Dielectric:	IEC 60255-5:2000 [BS EN 60255-5:2001] 1.5 kV signal ports IEEE C37.90-2005 2830 Vdc on power port. Type tested for 1 minute
Impulse:	IEC 60255-5:2000 [BS EN 60255-5:2001]

Electrostatic Discharge Test

ESD:	IEC 60255-22-2:1996 [BS EN 60255-22-2:1997] Severity Level: 2, 4, 6, 8 kV contact; 2, 4, 8, 15 kV air IEEE C37.90.3-2001 Severity Level: 2, 4, 8 kV contact; 4, 8, 15 kV air

RFI and Interference Tests

1 MHz Burst Disturbance:	IEC 60255-22-1:2005 [BS EN 60255-22-1:2006] 2.5 kV peak common mode; 1.0 kV peak differential mode
Fast Transient Disturbance:	IEC 60255-22-4:2002 [BS EN 6025502204:2002] 4 kV on signal ports
Radiated EMI:	IEC 60255-22-3:2000 [BS EN 60255-22-3:2001] IEEE C37.90.2-2004, 35 V/m
Surge Test:	IEC 60255-22-5:2002 [BS EN 60255-22-5:2002] Severity: 1 kV Line to Line, 2 kV Line to Earth
Surge Withstand:	IEEE C37.90.1-2002 2.5 kV oscillatory; 4.0 kV fast transient

Vibration and Shock Tests

Shock and Bump:	IEC 60255-21-2:1988 [BS EN 60255-21-2:1996 + A1:1996] Class 1: Shock withstand, bump Class 2: Shock
Seismic (Quake Response):	IEC 60255-21-3:1993 [BS EN 60255-21-3:1995 + A1:1995]
Sinusoidal Vibration:	IEC 60255-21-1:1988 [BS EN 60255-21-1:1996 + A1:1996] Class 1: Endurance; Class 2: Response

Safety Requirements

Laser (LED) Safety:	IEC 60825-1:1993 +A1:1997 + A2:2001 [BS EN 60825-1:1994 + A1:1996 + A2:1997 + A3:2002] Complies with 21 CFR Chapter 1, Subchapter J, Part 1040.10.

Safety:	IEC 60950-1:2001 [EN 60950-1:2001]

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