IES Series
Industrial Ethernet Switch
User Guide

Models: IES-MCG-SFP, IES-2205, IES-2206, IES-2208, IES-2210, IES-2212, IES-2216 & IES-2220

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Only qualified personnel should perform installation procedures.

NOTICE

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FCC NOTICE

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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 uses, generates, and can radiate radio frequency energy and if not installed in accordance with the operator's manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference in which case the user will be required to correct the interference at their own expense.

WARNING: Changes or modifications made to this device which are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

SAFETY PROVISIONS

Please read this user manual thoroughly before installing the IES switch

- Do not place equipment in or around water
- Keep power line connections clear
- Do not let power lines touch or contact each other
- Verify power requirements of all attached devices prior to installation
- Keep optical fiber ports clear of debris
- Do not attempt to open and service this product yourself

Some fiber switches use laser powered optical transceivers that can cause permanent eye damage if directly viewed with the naked eye or with optical instruments. **DO NOT** view the optical fiber ports when the product is in use.

Contents

Chapter 1 Introduction

1.1 10/100TX, 10/100/1000TX, 100FX & 1000FX Ethernet Switches

The IES series Industrial Ethernet switches provide 10/100TX, 10/100/1000TX, 100FX and/or 1000FX (model depending) Full Duplex Ethernet connectivity to Ethernet enabled devices in harsh environments. All switches in this series are DIN rail mountable using standard 35mm DIN rail and require 24V DC power for operation. The IES series is perfect for designing and building new industrial IP networks or adding to existing Industrial LAN infrastructure. These unmanaged switches utilize standards based Ethernet and are compatible with all other IEEE 803.3/802.3u/803.3ab compliant devices such as PLC's and media converters as well as IP enabled, meters, valves, and drives.

1.2 Features (port options vary by model)

- 10Base-T/100Base-TX adaptive port（Full/Half duplex) – RJ45
- 10Base-T/100Base-TX/1000Base-TX adaptive port (Full/Half duplex) – RJ45
- Auto connection with MDI/MDI-X
- 100Base-FX Full duplex Single mode or Multimode fiber – SC
- 1000Base-FX Full duplex SFP port
- Broadcast Storm Protection
- Redundant 24V DC power inputs (except IES-MCG-SFP & IES-2205)
- Reliable protection from EMC and against over-current / over-voltage
- IP40 protection with aluminum alloy shell
- Ribbed heat-removal case design satisfies harsh environment and industrial requirements
- Wide temperature range of -40°C to +85°C with 5% to 95% ambient humidity
- Fan-less design extends mean time between failures (MTBF)
- DIN-Rail mounting with standard 35mm DIN rail
- LED indicator lights
- Plug & play design
- Supports power-down status relay alarm

1.3 Product packing list

IES series switches includes the following items:

- IES series Ethernet Switch
- User Manual

1.4 System Parameters

Configurations	**IES-MCG-SFP** 2x 10/100/1000TX (RJ45), 1x 1000FX (SFP) **IES-2205** 5x 10/100TX (RJ45) **IES-2206-M2** 4x 10/100TX (RJ45), 2x duplex 100FX Multimode 2km (SC) **IES-2206-S20** 4x 10/100TX (RJ45), 2x duplex 100FX Single mode 20km (SC) **IES-2206-S40** 4x 10/100TX (RJ45), 2x duplex 100FX Single mode 40km (SC) **IES-2206-S60** 4x 10/100TX (RJ45), 2x duplex 100FX Single mode 60km (SC) **IES-2206G-SFP** 4x 10/100/1000TX (RJ45), 2x 1000FX (SFP) **IES-2208** 8x 10/100TX (RJ45) **IES-2208G** 8x 10/100/1000TX (RJ45) **IES-2210-M2** 8x 10/100TX (RJ45), 2x duplex 100FX Multimode 2km (SC) **IES-2210-S20** 8x 10/100TX (RJ45), 2x duplex 100FX Single mode 20km (SC) **IES-2210-S40** 8x 10/100TX (RJ45), 2x duplex 100FX Single mode 40km (SC) **IES-2210-S60** 8x 10/100TX (RJ45), 2x duplex 100FX Single mode 60km (SC) **IES-2210-S80** 8x 10/100TX (RJ45), 2x duplex 100FX Single mode 80km (SC) **IES-2210-SFP** 8x 10/100TX (RJ45), 2x 1000FX (SFP) **IES-2210-M2-SFP** 4x 10/100TX (RJ45), 4x duplex 100FX Multimode 2km (SC), 2x 1000FX (SFP) **IES-2210-S20-SFP** 4x 10/100TX (RJ45), 4x duplex 100FX Single mode 20km (SC), 2x 1000FX (SFP) **IES-2210G** 8x 10/100TX (RJ45), 2x 10/100/1000TX (RJ45) **IES-2210G-SFP** 8x 10/100/1000TX (RJ45), 2x 1000FX (SFP) **IES-2212G-SFP** 8x 10/100/1000TX (RJ45), 4x 1000FX (SFP) **IES-2216** 16x 10/100TX (RJ45) **IES-2220-M2** 16x 10/100TX (RJ45), 4x duplex 100FX Multimode 2km (SC) **IES-2220-S20** 16x 10/100TX (RJ45), 4x duplex 100FX Single mode 20km (SC) **IES-2220-S40** 16x 10/100TX (RJ45), 4x duplex 100FX Single mode 40km (SC) **IES-2220-S60** 16x 10/100TX (RJ45), 4x duplex 100FX Single mode 60km (SC) **IES-2220-S80** 16x 10/100TX (RJ45), 4x duplex 100FX Single mode 80km (SC)
Switch parameters	Standards：IEEE 802.3 (Ethernet), IEEE 802.3u (100Base-TX & 100Base-FX), IEEE 802.3x (Flow Control), IEEE 802.3z (1000Base-LX), IEEE 802.3ab (1000Base-T) Store-and-Forward mode rate：148,880pps MAC address table size：1K to 8K Bridging method：Store-and-forward mode Switch Delay: <5μs
RJ45 port parameters	Physical：RJ45 Jack (shielded) Speed: 10Base-T/100Base-TX or Gigabit/Triple-Speed 10Base-T/100Base-TX/1000Base-Tx: auto-negotiation Standards: IEEE 802.3/802.3u/802.3ab Communication distance：<100m over Category 5e/6/6a/7 twisted pair cable
100Base-FX Optical port parameters	Optical port type： Duplex SC Transport rate： 125Mbps Link Budget： >-12dBm(Single mode fiber) >-17dBm(Multimode fiber) RX Sensitivity： <-38dBm(Single mode fiber) <-35dBm(Multimode fiber) Wavelength： 1310nm(Single mode fiber) 1550nm(Single mode fiber 60km and 80km) 1310 nm(Multimode fiber) Typical Distance： 20～80Km(Single mode fiber) <5Km(Multi mode fiber)
Gigabit FX port parameters	Optical port type: SFP port for duplex LC interface, single mode or multimode (SFP module sold separately) Baud rate: 1000Base-FX (Gigabit)
Power parameters	Input Voltage：24V DC Input expend: IES-2205 series, IES-2206 series, IES-2208 series <5W IES-2210 series, IES-2212 series, IES-2216 series, IES-2220 series <15W Voltage passing：Inside

Dimensions	IES-MCG-SFP, IES-2205 series 1.3”W x 3.2”D x 4.5”H IES-2208, IES-2206 series 1.3” W x 3.9” D x 5.7”H IES-2210 series 2.1”W x 4.4”D x 5.7”H IES-2212 series 2.8”W x 4.7” D x 6.1” H IES-2216, IES-2220 series 2.8”W x 4.3”D x 5.7”H
Weight	IES-MCG-SFP, IES-2205 series: 0.75 lbs IES-2206 & IES-2208 series: 0.95 lbs IES-2210 series: 1.40 lbs IES-2212 series: 1.89 lbs IES-2216 & IES-2220 series: 2.00 lbs
Temperature	Operating Temp：-40℃～+85℃ Storage Temp：-45℃～+85℃ Ambient Relative Humidity：5～95%(non-condensing)
Industry Standards EMC	EN61000-4-2（ESD）, Level 4 EN61000-4-3（RS）, Level 4 EN61000-4-4（EFT）, Level 4 EN61000-4-5（Surge）, Level 4 EN61000-4-6（CS）, Level 4 EN61000-4-8,Level 5
Industry Standards Other	Impact: IEC60068–2-27 Falling: IEC60068-2-32 Shock: IEC60068-2-6 Certifications: CE/FCC/RoHS

Chapter 2 Hardware functionality

2.1 Main functions

2.1.1 Power Input Interface and Installation

Power Terminal Block

The IES-MCG-SFP & IES-2205 features a single 24V DC power input with one V+ power anode and one V- power cathode.
See Figure 2-2.

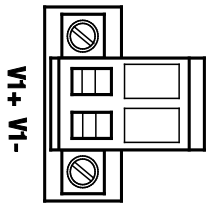

Fig. 2-2

The IES-2206, IES-2208, IES-2210, IES-2212, IES-2216, and IES-2220 all feature redundant power connectors with dual V+ power anodes and V- power cathodes. See Figure 2-3.

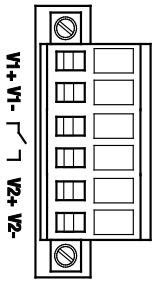

Fig. 2-3

When using only one power supply make sure to connect the supply to the V1+ and V1- terminals.

Power conductor diameter should be less than 1.5mm to fit the screw terminals.

2.1.2 Relay option

Additionally, a dry contact relay connection is available. In the event of a power supply failure, you can attach an audible or visual alarm such as a Klaxon to the relay to alert plant personnel a power supply has failed. This feature works with a single or dual power supply configuration. See Figure 2-4.

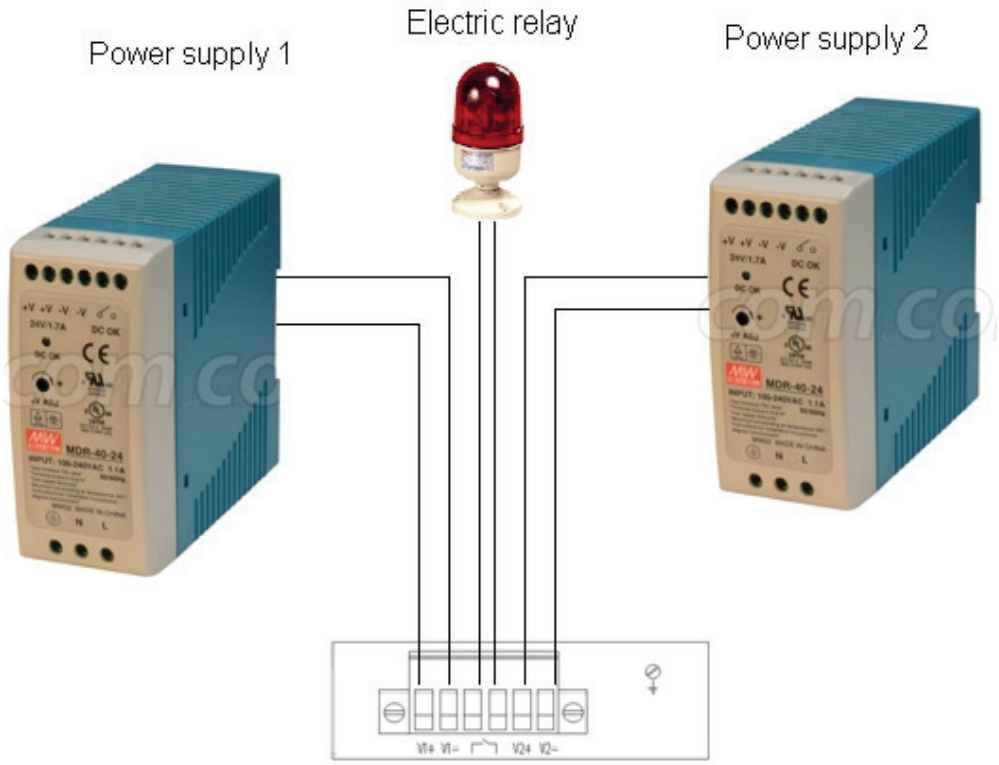

Fig. 2-4

To connect power to the switch first make sure the AC/DC power supply is NOT connected to an AC power outlet. Connect the + and – conductors from the AC/DC power supply to the V1+ and V1- terminals respectively. If a redundant DC power configuration is to be used connect the second set of conductors to V2+ and V2- respectively.

Grounding

Be sure to properly ground the IES switch. Failure to properly ground the switch may result in damage or destruction of the switch or attached devices.

2.1.3 LED indication lights

The front panels of the IES series Industrial Ethernet Switches feature LED indicators which aid in troubleshooting and viewing the system status at a glance. See Figure 2-5.

LED	Lights	Status
Interface LED Status		
PWR	On	Power is being supplied to the switch
	Off	Power is not being supplied to the switch
RUN	On	The switch is operational and functioning properly
	Off	The switch has a malfunction(after power is applied)
Optical Port LED Status		
LINK	On	FX port's link is active
	Blinking	Data is being transmitted
	Off	Port's link is inactive
RJ45 Port LED Status		
10M/ 100M （Yellow）	On	100Mbps Operation (100Base-TX）
	Off	10Mbps Operation (10Base-T）
LNK/ACT （Green）	On	RJ45 port's link is active
	Blinking	Data is being transmitted
	Off	RJ45 port's link is inactive
10M/ 100M/ 1000M （Yellow）	On	1000Mbps Operation (1000Base-TX）
	Off	10Mbps Operation (10Base-T）
LNK/ACT （Green）	On	RJ45 port's link is active
	Blinking	Data is being transmitted
	Off	RJ45 port's link is inactive

..... Fig. 2-5

Chapter 3 Hardware installation

3.1 DIN-Rail installation

Most industrial areas choose 35mm DIN-Rail installation. The DIN-Rail attachment plate is fixed to the rear panel of the IES Switch when you take it out of the box. If you need remove it and re-attach the plate to the switch, make sure the DIN-Rail bracket is situated towards the top as shown in figure 3-1.

• Insert DIN-Rail into the DIN-Rail slot of the IES Switch and rotate
Downward, compressing the internal spring, as shown in Figure 1 below.

• The IES Switch should be locked firmly into place onto the DIN-Rail as shown in Figure 2 below.

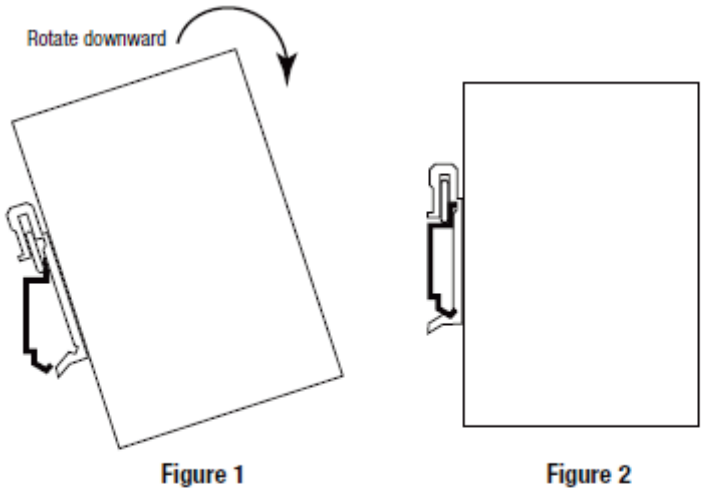

Fig. 3-1

Chapter 4 Support and Warranty

4.1 Support

Should you require support for your IES switch please contact the L-com Product Support team via one of the following methods.

Phone

1-978-682-6936 Toll Free 1-800-341-5266

E-mail support@l-com.com

4.2 Warranty

We warrant these IES Industrial Ethernet Switches for a period of three years from time of purchase. These products are warranted against defects in workmanship or materials under normal use. We cannot warranty our products in case of misuse, acts of God, or consequential damage. Alteration of product cancels all warranties. Under no circumstances will we be responsible for any damage beyond the replacement cost of the defective merchandise. We reserve the right to repair or replace any products that are returned under warranty. Products distributed by us carry the warranty of the respective manufacturer only. This warranty applies to the original purchaser only and is not transferable. This limited warranty covers normal use. The limited warranty does not cover damage incurred during shipment, caused by impact with other objects, dropping, immersion in liquid; service by anyone other than us, use not in accordance with instructions, accident, abuse, misuse, natural disasters such as flood, fire, earthquake or lightning, power surges and problems caused by use of power supplies not supplied by us. Warranty coverage will not apply in the event the serial number or brand-name has been removed, altered or defaced. **EXCEPT AND TO THE EXTENT EXPRESSLY SET FORTH ABOVE, THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND WE EXPRESSLY DISCLAIM ALL WARRANTIES NOT STATED HEREIN.** Some states do not allow the exclusion of implied warranties or limitations on how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.