EDS-4014 Series Quick Installation Guide

Moxa EtherDevice[™] Switch

Version 1.1, November 2022

Technical Support Contact Information www.moxa.com/support



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P/N: 1802040140011

Package Checklist

The EDS-4014 Series industrial DIN-rail EtherDevice Switch (EDS) is shipped with the following items. If any of these items are missing or damaged, please contact your customer service representative for assistance.

- 1 EDS-4014 Ethernet switch
- Quick installation guide (printed)
- Warranty card
- Substance disclosure table
- Product certificate of quality inspection (Simplified Chinese)
- Product notices (Simplified Chinese)

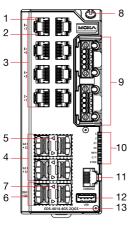
NOTE You can find information and software downloads on the relevant product pages located on Moxa's website: www.moxa.com

Default Settings

- IP address: 192.168.127.253
- Subnet Mask: 255.255.255.0
- Username: admin
- Password: moxa

Panel Views of EDS-4014 Series

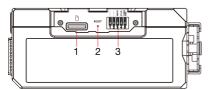
EDS-4014-4GS-2QGS



Front Panel View

- 1. 100/1000BaseT(X) LED indicator
- 2. 10BaseT(X) LED indicator
- 10/100BaseT(X) ports, ports 1 to 8
- 4. 100/1000BaseSFP ports, ports G1 to G4
- 5. 1000BaseT(X) LED indicator
- 1000/2500BaseSFP ports, ports QG1 and QG2
- 7. 1000/2500BaseSFP LED indicator
- 8. Grounding connector screw
- Terminal blocks for power input, digital input, and relay
- LED indicators: STATE (S), FAULT (F), PWR1 (P1), PWR2 (P2), MSTR/HEAD (M/H), CPLR/TAIL (C/T), SYNC
- 11. Console port (RJ45, RS-232)
- USB storage port (type A, currently disabled)
- 13. Model name

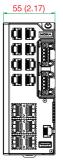
Bottom Panel View

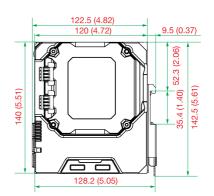


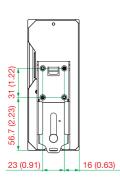
- microSD card slot (currently disabled)
- 2. Reset button
- DIP switches for Turbo Ring, Ring Master, and Ring Coupler

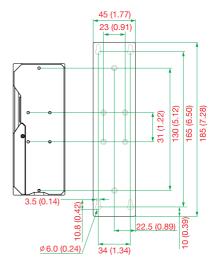
Mounting Dimensions

Unit: mm (inch)









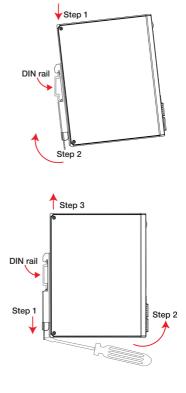
DIN-rail Mounting

The DIN-rail mounting kit is fixed to the back panel of the EDS device when you take it out of the box. Mount the EDS device on corrosion-free mounting rails that meet the EN 60715 standard.

Installation

STEP 1—Insert the upper lip of the DIN rail into the DIN-rail mounting kit.

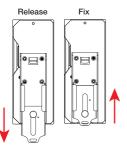
STEP 2—Press the EDS device towards the DIN rail until it snaps into place.



Removal

STEP 1—Pull down the latch on the mounting kit with a screwdriver.

STEP 2 & 3—Slightly pull the EDS device forward and lift up to remove it from the DIN rail.



NOTE Our DIN rail kit now utilizes a quick release mechanism to make it easier for users to remove the DIN rail from the EDS device.

Wall Mounting (Optional)

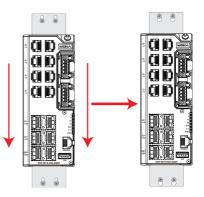
For some applications, you will find it convenient to mount the Moxa EDS device on a wall, as shown in the following illustrations:

STEP 1—Remove the DIN-rail attachment plate from the rear panel of the EDS device, and then attach the wall mount plates with M3 screws.

STEP 2—Mounting the EDS device on a wall requires four screws. Use the EDS device, with wall mount plates attached. The heads of the screws should be less than 6.0 mm in diameter, and the shafts should be less than 3.5 mm in diameter, as shown in the figure on at right.

- **NOTE** Before tightening the screws into the wall, make sure the screw head and shank size are suitable by inserting the screw through one of the keyhole-shaped apertures of the Wall Mounting Plates.
- **NOTE** Do not screw the screws in all the way—leave about 2 mm to allow room for sliding the wall mount panel between the wall and the screws.

STEP 3—Once the screws are fixed to the wall, insert the four screw heads through the wide parts of the keyholeshaped apertures, and then slide the EDS device downwards, as indicated in the figure at the right. Tighten the four screws for more stability.



n.

< 6 mm

< 3.5 mm

Wiring Requirements



External metal parts are hot. Take the necessary precautions if you are required to handle the device.



ATTENTION

In order to ensure reliable operations, please make sure the operating temperature of the environment does not exceed the specifications. When mounting an EDS device with other operating units in a cabinet without forced ventilation, a minimum of 4 cm space on both the left and right of the switch is recommended.



ATTENTION

Safety First!

Be sure to disconnect the power cord before installing and/or wiring your EDS device. Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size. If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

Be sure to read and follow these important points below:

 Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.

NOTE Do not run signal or communications wiring and power wiring through the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.

- You can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.
- You should separate input wiring from output wiring.
- We advise that you label the wiring to all devices in your system.

Grounding the Moxa EDS Series

Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw (M4) to the grounding surface prior to connecting devices.

NOTE The grounding wire should have a minimum diameter of 1.5 mm^2 .



ATTENTION

This product is intended to be mounted to a well-grounded mounting surface such as a metal panel.

Suggested Wire Type for Wiring Relay Contact

(RELAY), Digital Input (DI), and Power Inputs

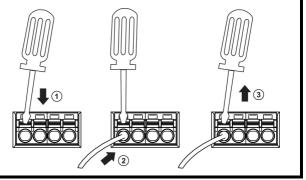
(P1/P2)

The EDS device includes two 4-pins 3.5 mm pin-pitch terminal blocks. When wiring the relay contact (RELAY), digital input (DI), and power inputs (P1/P2), we suggest using the cable type AWG 18-24 and the corresponding pin type cable terminals.

NOTE The wire must be able to withstand at least 105° C and the torque value should be 4.5 lb-in (0.51 N-m).

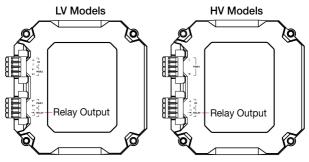
NOTE We suggest the length of the pin type cable terminal is 8 mm.

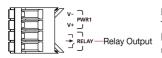
In order to tighten the wire properly, ① use a small flathead screwdriver to press the push-in button beside each terminal of the terminal block connector before and during ② inserting the wire. ③ Release the screwdriver after the wire has been fully inserted. Please refer to the diagram below.



Wiring the Relay Contact

The EDS device has one set of relay output. This relay contact uses two contacts of the terminal block on the EDS's power module. Refer to the section for detailed instructions on how to connect the wires to the terminal block connector, and how to attach the terminal block connector to the terminal block receptor.



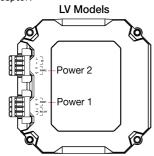


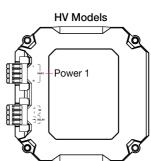
Relay:

The two contacts of the 4-pin terminal block connector are used to detect user-configured events. The two wires attached to the fault contacts form an open circuit when a user-configured event is triggered or there is no power supply to the switch. If a userconfigured event does not occur, the fault circuit remains closed.

Wiring the Redundant Power Inputs

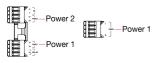
The EDS device includes both high-voltage and low-voltage products. For the low-voltage (LV models) products, there are two power inputs for redundancy; for the high-voltage (HV models) products, there is only one power input. Refer to the instructions and diagram below on how to connect the wires to the terminal block connector on the receptor.





LV Models

HV Models

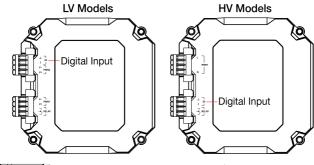


STEP 1: Insert the Positive/Negative DC or Line/Neutral AC wires into the V+/V- or L/N terminals, respectively. **STEP 2:** To keep the DC or AC wires from pulling loose, use a small flatblade screwdriver to tighten the wireclamp screws on the front of the terminal block connector.

STEP 3: Insert the plastic terminal block connector prongs into the terminal block receptor, which is located on the EDS devices' right side.

Wiring the Digital Inputs

The EDS device has one set of digital input (DI). The DI consists of two contacts of the 4-pin terminal block connector on the EDS's right-side panel. Refer to the instructions and diagram below on how to connect the wires to the terminal block connector on the receptor.



STEP

STEP 1: Insert the negative (ground)/positive DI wires into the \perp /I terminals, respectively.

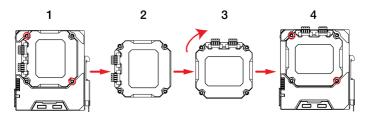
STEP 2: To keep the DI wires from pulling loose, use a small flat-blade screwdriver to tighten the wire-clamp button on the front of the terminal block connector.

STEP 3: Insert the plastic terminal block connector prongs into the terminal block receptor, which is located on the EDS devices' right side.

Rotating the Power Module

The power module for the EDS device can be rotated to make it easier to fit your field site application.

- **Step 1:** Remove the two screws that fasten the power module to the EDS device and remove the module.
- **Step 2:** Turn the power module clockwise so that the power, digital input, and relay output connectors can be moved upwards.
- Step 3: Replace the module back on to the EDS device.
- Step 4: Fasten two screws on to the module.



Communication Connections

Each EDS-4014 Series switch has various types of communication ports:

- RJ45 console port (RS-232 interface)
- USB storage port (type A connector, currently disabled)
- 10/100BaseT(X) Ethernet ports
- 100/1000BaseSFP ports
- 1000/2500BaseSFP slots
- microSD card slot (currently disabled)

Console Port Connection

The EDS device has one RJ45 console port (RS-232), located on the front panel. Use either an RJ45-to-DB9 (see the cable following wiring diagrams) to connect the EDS's console port to your PC's COM port. You may then use a console terminal program, such as Moxa PComm Terminal Emulator, to access the EDS that has a baud rate of 115200.

Pin	Description
1	DSR
2	RTS
3	-
4	TxD
5	RxD
6	GND
7	CTS
8	DTR





USB Connection

NOTE The USB function is currently reserved and may be required in the future. It should be noted that this port cannot be used for charging any devices.

10/100BaseT(X) Ethernet Port Connection

The 10/100BaseT(X) ports located on the front panel of the switch are used to connect to Ethernet-enabled devices. Most users will choose to configure these ports for Auto MDI/MDI-X mode, in which case the port's pinouts are adjusted automatically depending on the type of Ethernet cable used (straight-through or cross-over), and the type of device (NIC-type or HUB/Switch-type) connected to the port.

In the following, we give pinouts for both MDI (NIC-type) ports and MDI-X (HUB/Switch-type) ports. We also give cable wiring diagrams for straight-through and cross-over Ethernet cables.

10/100Base T(x) RJ45 Pinouts

MDI Port Pinouts

Pin	Signal
1	Tx+
2	Tx-
3	Rx+
6	Rx-

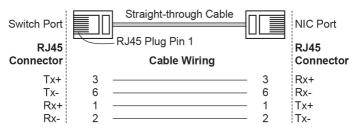
	•••••
Pin	Signal
1	Rx+
2	Rx-
3	Tx+
6	Tx-

MDT-X Port Pinouts

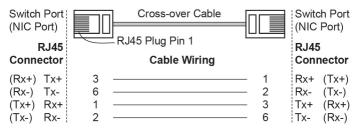
8-pin RJ45



RJ45 (8-pin) to RJ45 (8-pin) Straight-through Cable Wiring



RJ45 (8-pin) to RJ45 (8-pin) Cross-over Cable Wiring



100/1000BaseSFP and 1000/2500BaseSFP (mini-GBIC)

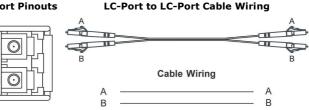
Fiber Port

The Gigabit Ethernet fiber ports on the switch are 100/1000BaseSFP and 1000/2500BaseSFP fiber ports, which must use 100M,1G, 2.5G mini-GBIC fiber transceivers to work properly.

The concept behind the LC port and cable is guite straightforward. Suppose that you are connecting devices I and II; contrary to electrical signals, optical signals do not require a circuit in order to transmit data. Consequently, one of the optical lines is used to transmit data from device I to device II, and the other optical line is used transmit data from device II to device I, for full-duplex transmission.

Remember to connect the Tx (transmit) port of device I to the Rx (receive) port of device II, and the Rx (receive) port of device I to the Tx (transmit) port of device II. If you make your own cable, we suggest labeling the two sides of the same line with the same letter (A-to-A and B-to-B, as shown below, or A1-to-A2 and B1-to-B2).

LC-Port Pinouts





ATTENTION

This is a Class 1 Laser/LED product. To avoid causing serious damage to your eyes, do not stare directly into the Laser Beam.

Reset Button

There are two functions available on the Reset Button. One is to reset the Ethernet switch to factory default settings by pressing and holding the Reset button for 5 seconds. Use a pointed object, such as a straightened paper clip or toothpick, to depress the Reset button. This will cause the STATE LED to blink once a second. After depressing the button for 5 continuous seconds, the STATE LED will start to blink rapidly. This indicates that factory default settings have been loaded and you can release the reset button. The other function is to reboot the device by depressing the reset button for less than five seconds.

Turbo Ring DIP Switch Settings

The EDS devices are plug-and-play managed redundant Ethernet switches. The proprietary Turbo Ring protocol was developed by Moxa to provide better network reliability and faster recovery time. Moxa Turbo Ring's recovery time is less than 50 ms (**Turbo Ring V2**) — compared to a 3- to 5-minute recovery time for commercial switches— decreasing the possible loss caused by network failures in an industrial setting.

There are five Hardware DIP Switches for Turbo Ring on the bottom panel of the EDS device that can help setup the Turbo Ring easily within seconds. If you do not want to use a hardware DIP switch to setup the Turbo Ring, you can use a web browser, telnet, or console to disable this function.

NOTE Please refer to the *Turbo Ring* section in User's Manual for more detail information about the setting and usage of *Turbo Ring V2*.

Turbo Ring DIP Switch Settings

OFF ON	
	MSTR
	CPLR
	TURBO RING

The default setting for each DIP Switch is OFF. The following table explains the effect of setting the DIP Switch to the ON position.

Remove the rubber cover on the bottom panel of the device to expose the DIP switches.

DIP Switch Settings

DIP 1	DIP 2	DIP 3	DIP 4	DIP 5
	ON: Enables the	ON: Enables	<u>ON</u> :	ON : Activates
	default "Ring	this EDS as	Enables the	DIP switch 2,
	Coupling	the Ring	default	3, and 4 to
	(backup)" port	Master.	"Ring	configure
Reserved	when DIP switch 4		Coupling"	Turbo Ring V2
for future	is already enabled.		port.	settings.
	OFF: Enables the	OFF: This	OFF: This	OFF: DIP
use	default Ring	EDS will not	EDS will not	switch 2, 3,
	Coupling	be the Ring	be the Ring	and 4 will be
	(primary) port	Master.	Coupler.	disabled.
	when DIP switch 4			
	is already enabled.			

- **NOTE** You must enable the **Turbo Ring** (DIP switch 5) first before using the DIP switch to activate the Master and Coupler functions.
- **NOTE** If you do not enable any of the EDS switches to be the Ring Master, the Turbo Ring protocol will automatically choose the EDS switch with the smallest MAC address range to be the Ring Master. If you accidentally enable more than one switch to be the Ring Master, these switches will auto-negotiate to determine which one will be the Ring Master.

LED Indicators

The front panel of the Moxa EDS-4014 Series contains several LED indicators. The function of each LED is described in the following table:

Device LED Indicators

LED	Color	State	Description
		On	When system has passed power- on self-test (POST) and is ready to run.
Green	Blinking (1 time/sec)	Press the reset button for five seconds to reset to factory default settings	
	Blinking (4 times/sec)	When pressing the reset button depress for 5 seconds to reset to factory default.	
		Off	N/A
	Red	On	The system has initially failed the boot-up process • System Info. Read Fail or EEPROM information error

LED Col	or	State	Description
			1. The relay contact has been
			triggered
		On	2. The ingress rate limit has
			been exceeded and the port
FAULT Re			has entered shut down mode
FAULI RE	a		3. Invalid Ring port connection
			When the system boots up and
		Off	runs correctly or a user-
			configured event is not
			triggered.
		On	Power is being supplied to power
P1 Aml	per	•	input PWR.
		Off	Power is not being supplied to
		•	power input PWR.
		On	Power is being supplied to power
P2 Aml	per 📃		input PWR.
		Off	Power is not being supplied to
			power input PWR.
			When the switch is
		On	Master/Head/Root of Turbo
			Ring/Turbo Chain/Fast RSTP.
			1. The switch has become the
			Master of Turbo Ring after
			Turbo Ring has gone down 2. The switch is set as Head of
			Turbo Chain and Turbo Chain
			has gone down
MSTR/	в	inking	3. The switch is set as the
HEAD Gre	en	mes/sec)	
(M/H)	()	,	the corresponding Ring port
			is down
			4. The switch is set as the
			Turbo Chain's Member/ Tail
			and the corresponding Head-
			end Chain port is down.
			When the switch is not the
		Off	Master/Head/Root of this Turbo
			Ring/ Turbo Chain/Fast RSTP.
			1. The switch's ring coupling or
			dual homing function is
		On	enabled.
			2. The switch is set as the Tail
			of Turbo Chain.
			1. The switch is set as the Tail
CPLR/ Gre	en		of Turbo Chain and the Chain has gone down.
TAIL	BI	inking	2 The switch is set as the
	(4 tii	mes/sec)	Turbo Chain's Member/ Head
			and the corresponding Tail-
			end Chain port is down.
			When the switch disables the
		Off	When the switch disables the coupling or tail role of Turbo

LED	Color	State	Description
System LED (Except PWR)	Green + Amber + Red	Blinking (2 times/sec)	The switch is being discovered/located by the locator function.
System LED (Except PWR)	Green + Amber + Red	Rotate On -> Off Sequentially	The switch is importing/exporting a file via ABC-02-USB or SD card (currently disabled).

Ports LED Indicators

LED	Color	State	Description
10M/ 100M/		On	When the port is active and
		01	links at 1000Mbps.
100M/	Green	Blinking	When the port's data is being
Copper	Green	(4 times/sec)	transmitted at 1000Mbps.
top LED		Off	When the port is inactive or link
		011	down.
10M/		On	When the port is active and
100M/			links at 10/100Mbps.
1000M	Amber	Blinking	When the port's data is being
Copper	Amber	(4 times/sec)	transmitted at 10/100Mbps.
bottom		Off	When the port is inactive or link
LED		•	down.
		On	When the port is active and
		•	links at 1,000Mbps.
	Green	Blinking	When the port's data is being
	e.ee.i	(4 times/sec)	transmitted at 1,000Mbps.
100M/		Off	When the port is inactive or link
1000M		•	down.
(SFP port)		On	When the port is active and
(* * · · /			links at 100Mbps.
	Amber	Blinking	When the port's data is being
		(4 times/sec)	transmitted at 100Mbps.
		Off	When the port is inactive or link
			down.
	Green	On	When the port is active and
		DUaldara	links at 2500Mbps.
		Blinking	When the port's data is being
		(4 times/sec)	transmitted at 2500Mbps.
1000M/		Off	When the port is inactive or link
2500M			down.
(SFP port)		On	When the port is active and
	Amber	Blinking	links at 1000Mbps.
			When the port's data is being transmitted at 1000Mbps.
		(4 times/sec) Off	When the port is inactive or link
			down.
			uown.

Specifications

Interface		
RJ45 Ports	10/100/1000BaseT(X)	
Fiber Ports	100/1000BaseSFP	
	1000/2500BaseSFP	
Console Port	RS-232 (RJ45)	
Button	Reset button	
LED Indicators	STATE (S), FAULT (F), PWR1 (P1), PWR2 (P2),	
	MSTR/HEAD (M/H), CPLR/TAIL (C/T), SYNC	
Alarm Contact	1 normally open electromagnetic relay output with	
	current carrying capacity of 1 A @ 24 VDC	
Digital Input	1 isolated digital input:	
	+13 to +30V for state "1" -30 to +3V for state "0"	
	Max. input current: 8 mA	
Power		
	-LV/-LV-T models: PWR-100-LV	
Module	-LV/-LV-T models: PWR-100-LV -HV/-HV-T models: PWR-105-HV-I	
Note	The EDS-4014 Series supports modular power	
Note	supplies. The model names and power parameters	
	are determined by the installed power module.	
	, ,	
	For example:	
	EDS-4014-T + PWR-100-LV = EDS-4014-LV-T	
	EDS-4014-T + PWR-105-HV-I = EDS-4014-HV-T	
	If you install a different power module, refer to the	
	specifications of the corresponding model. For	
	example, if you replace the power module of the	
	EDS-4014-LV-T with the PWR-105-HV-I, refer to	
	the specifications of the EDS-4014-HV-T.	
Rated Voltage	-LV/-LV-T models: 12/24/48 VDC, redundant dual	
	inputs	
	-HV/-HV-T models: 110/220 VDC/VAC, single input	
Operating Voltage	-LV/-LV-T models: 9.6 to 60 VDC	
	-HV/-HV-T models: 88 to 300 VDC, 85 to 264 VAC	
Rated Current	-LV/-LV-T models: 12-48 VDC, 1.50-0.40 A or 24	
	VDC, 0.70 A -HV/-HV-T models: 110-220 VAC, 50-60 Hz, 0.30-	
	0.20 A or 110-220 VDC, 0.30-0.20 A	
Power	EDS-4014-4GS-2QGS-LV(-T) models: 12.15 W	
Consumption	EDS-4014-4GS-2QGS-EV(-T) models: 12.13 W	
Inrush Current	Max. 0.58 A @ 48 VDC $(0.1 - 1 \text{ ms})$ (Applied to -	
	LV models)	
Overload Current	Present	
Protection at Input		
Reverse Polarity	Present	
Protection		
Connection	2 removable 4-contact terminal blocks	
Physical Characte		
Housing	Metal, IP40 protection	
Dimension	55 x 140 x 122.5 mm (2.17 x 5.51 x 4.82 in)	
Weight	846 g (1.87 lb)	
	/	

Installation	DIN-rail mounting, wall mounting (with optional
	kit)
Environmental Lin	nits
Operating	-10 to 60°C (14 to 140°F) for standard models
Temperature	-40 to 75°C (-40 to 167°F) for -T models
Storage	-40 to 85°C (-40 to 185°F)
Temperature	
Ambient Relative	5 to 95% (non-condensing)
Humidity	
Altitude	Up to 2000 m
	Note: Please contact Moxa if you require products
	guaranteed to function properly at higher altitude.
Regulatory Approv	vals
Industrial	IEC 62443-4-1, IEC 62443-4-2
Cybersecurity	
Safety	UL 61010-2-201, EN 62368-1(LVD)
EMC	EN 55032/35, EN 61000-6-2/6-4
EMI	FCC Part 15 Subpart B Class A
EMS	EN 61000-4-2 (ESD) Level 4
	EN 61000-4-3 (RS) Level 3
	EN 61000-4-4 (EFT) Level 4
	EN 61000-4-5 (Surge) Level 4
	EN 61000-4-6 (CS) Level 3
	EN 61000-4-8 Level 4
Shock	IEC 60068-2-27
Free Fall	IEC 60068-2-32
Vibration	IEC 60068-2-6
Hazardous Location	Class I Division 2, ATEX, IECEx
Rail Traffic	EN 50121-4
(Wayside)	
Traffic Control	NEMA TS2
Warranty	
Warranty	5 years



ATTENTION

This device complies with Part 15 of the FCC rules.

Operation is subject to the following conditions:

- 1. This device may not cause harmful interference.
- 2. This device must accept any interference received

including interference that may cause undesired operation.

Hazardous Location Information (except for PoE

and HV models)

ATEX information	EX II 3G Ex ec nC IIC T4 Gc
	UL 22 ATEX 2741X Ambient Range: $-40^{\circ}C \le Tamb \le +75^{\circ}C$ for $-T$ models Ambient Range: $-10^{\circ}C \le Tamb \le +60^{\circ}C$ for models without "-T" Rated Cable Temp. $\ge 90.4^{\circ}C$ WARNING-DO NOT SEPARATE WHEN ENERGIZED
IECEx	IECEx UL 22.0031X
Certificate no.	
Address of	No. 1111, Heping Rd., Bade Dist., Taoyuan City 334004,
manufacturer	Taiwan



WARNING - EXPLOSION HAZARD

Do not disconnect this equipment unless the power source has been removed or turned off, or the installation location is known to be non-hazardous.

Standards and Certifications

Hazardous Location	IEC 60079-0, Edition 7
	IEC 60079-7, Edition 5.1
	IEC 60079-15, Edition 5
	EN IEC 60079-0:2018
	EN IEC 60079-7:2015+A1:2018
	EN IEC 60079-15:2019

Specific Condition of Use

- The equipment shall only be used in an area of at least pollution degree 2, as defined in IEC/EN 60664-1.
- The equipment shall be installed in an enclosure that provides a minimum ingress protection of IP 54 in accordance with IEC/EN 60079-0 and accessible only by use of a tool.