TWS-3010-SPE Series Quick Installation Guide

Moxa Industrial Two-wire Ethernet Switch

Version 1.0, January 2026

Package Checklist

The TWS-3010-SPE Series is shipped with the following items. If any of these items are missing or damaged, please contact your customer service representative for assistance.
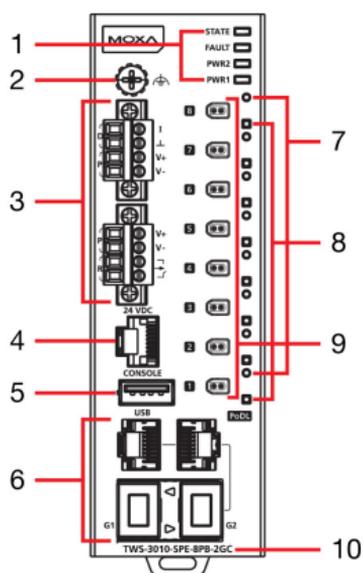
- 1 TWS-3010-SPE industrial two-wire Ethernet switch
- Quick installation guide (printed)
- Warranty card

Default Settings

- IP address: 192.168.127.253
- Subnet Mask: 255.255.255.0
- Usernames: admin, user
- Password: moxa

TWS-3010-SPE Series Panel Layout

TWS-3010-SPE-8PB-2GC-T Front Panel

1. System LEDs: STATE, FAULT, PWR1, PWR2
2. Ground connector screw
3. Terminal blocks for power input, digital input, and relay output
4. Console port (RJ45, RS-232)
5. USB storage port (type A connector)
6. 10/100/1000BaseT(X) or 100/1000BaseSFP combo ports
7. 10Base-T1L SPE Port LED indicators
8. PoDL LED indicators
9. 10Base-T1L SPE ports (IEC63171-2, IP20 connector)
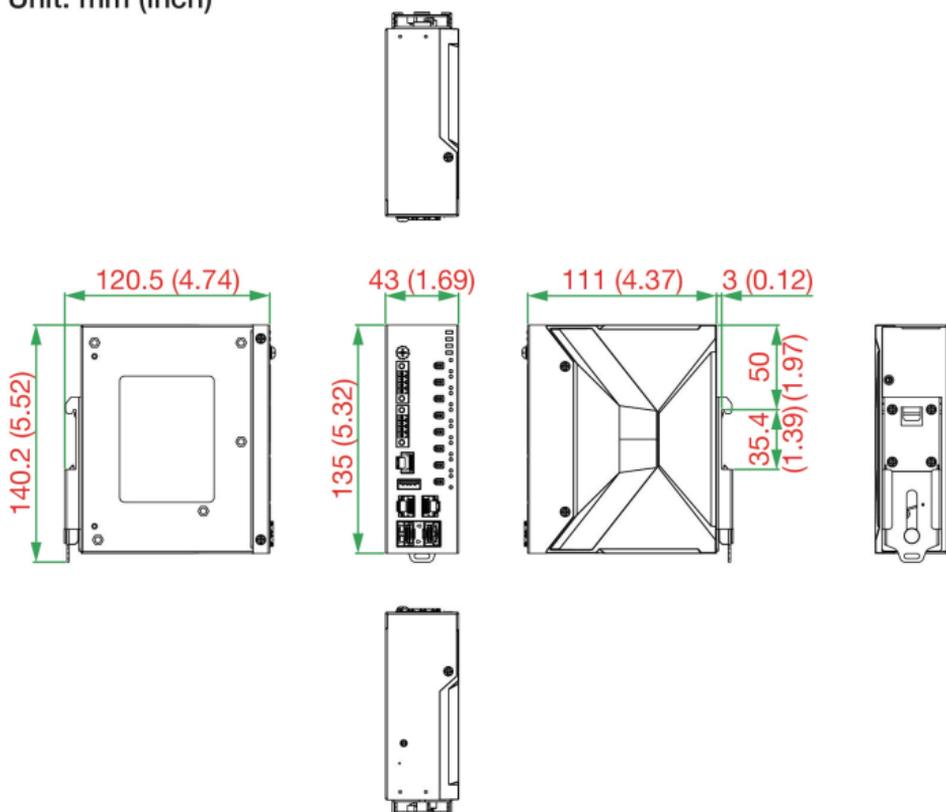10. Model name

Bottom Panel
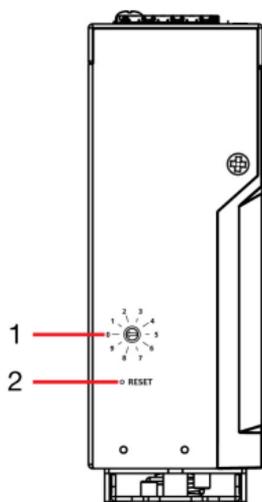
1. Rotary DIP switch for EtherNet/IP, PROFINET, Modbus/TCP, and DHCP Client configurations
2. Reset button

TWS-3010-SPE-8PB-2GC-T Mounting Dimensions

Unit: mm (inch)

DIN-rail Mounting

The DIN-rail mounting kit is fixed to the back panel of the Moxa industrial two-wire Ethernet switch when you take it out of the box. Mount the Moxa industrial two-wire Ethernet switch on corrosion free mounting rails that meet the EN 60715 standard.

⚠️ **ATTENTION**

In order to ensure reliable operations, please make sure the operating temperature of the environment does not exceed the specification. When mounting the Moxa industrial two-wire Ethernet switch with other operating units in a cabinet without forced ventilation, a minimum spacing of 5 cm on both sides and above/below the switch is recommended.

Installation

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

STEP 2—Press the Moxa industrial two-wire Ethernet switch towards the DIN rail until it snaps into place.
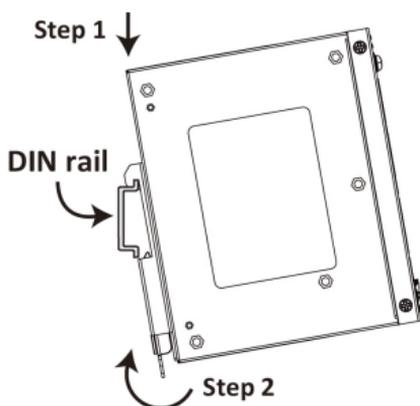
Removal

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

STEP 2 & 3—Pull the Moxa industrial two-wire Ethernet switch slightly forward and lift up to remove it from the DIN rail.
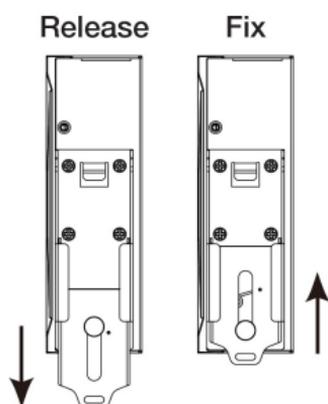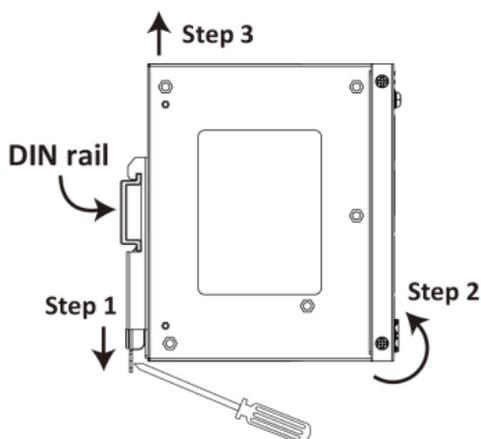

NOTE This is an open type module, and should be installed in a safety enclosure with mechanical rigidity and an appropriate IP rating.

Wall Mounting (Optional)

For some applications, you will find it convenient to mount the Moxa industrial two-wire Ethernet switch on a wall, as shown in the following illustrations:

STEP 1—Remove the DIN-rail attachment plate from the rear panel of the Moxa industrial two-wire Ethernet switch, and then attach the wall mount plates with M3 screws.
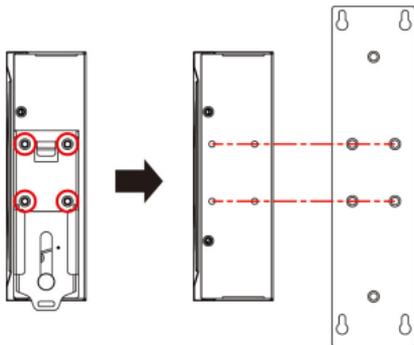
STEP 2—Mounting the Moxa industrial two-wire Ethernet switch on a wall requires four screws. Use the Moxa industrial two-wire Ethernet switch, with wall mount plates attached. The heads of the screws should be 5 to 6 mm in diameter, and the shafts should be 3 to 3.5 mm in diameter, as shown in the figure on at right. Screws should be at least 6 mm long.
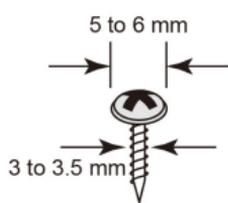
STEP 3—Once the screws are fixed to the wall, insert the four screw heads through the wide parts of the keyhole shaped apertures, and then slide the Moxa industrial two-wire Ethernet switch downwards, as indicated in the figure at the right. Tighten the four screws for more stability.
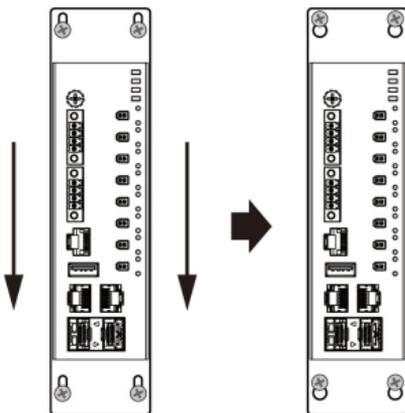
NOTE Mounting the Moxa industrial two-wire Ethernet switch onto a wall requires an optional accessory that must be purchased separately.

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.

Wiring Requirements

> ⚠️ **ATTENTION**   **Safety First!**
>
> Be sure to disconnect the power cord before installing and/or wiring your Moxa industrial two-wire Ethernet switch. 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 guidelines:

• 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 the system.

Grounding the Two-wire Ethernet Switch

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

Functional Earth

> ⚠️ **ATTENTION**
>
> This product is intended to be mounted onto a well-grounded mounting surface, such as a metal panel.

Suggested Wire Type for Wiring Relay Contact (RELAY), Digital Input (DI), and Power Inputs (PWR1/PWR2)

The TWS-3010-SPE includes two 4-pin 3.5 mm pin-pitch terminal blocks. When wiring the relay contact (RELAY), digital input (DI) and power inputs (PWR1/PWR2), use of copper cable with 30 to 14 AWG is recommended.

> ⚠️ **ATTENTION**
>
> The wire must be able to withstand at least 105°C and the torque value should be 2.5lb-in (0.28 N-m).

NOTE For cables with wire ferrules, 24 to 16 AWG with a length of 8 to 10mm is recommended.

Wiring the Relay Contact

The TWS-3010-SPE has one set of relay outputs for identifying when a specific event has occurred (i.e. FAULT events, see below). This relay output uses the two contacts out of the 4-pin terminal on the TWS-3010-SPE's front panel.

Refer to the instructions and diagram below on how to connect the wires to the terminal block connector, and how to attach the terminal block connector to the terminal block receptor.
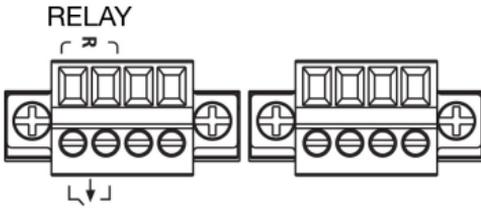
FAULT Events
The two contacts of the 4-pin terminal block connector are used to detect user-configured events. The two wires attached to the relay contacts will form an open circuit when a user-configured event is triggered, or when there is no power supply to the switch. If a user-configured event does not occur, the circuit remains closed as the relay itself is closed. Examples of user-configured events include port link-down and power input ON/OFF.

NOTE To indicate a fault has occurred one can integrate the relay contact on the smart switch with an external alarming system circuit so that the status of user-configured events or no power supply can be monitored. An example is given in the diagram below where the buzzer will sound when user-configured events happen.

Wiring the Digital Input

The TWS-3010-SPE has one set of digital inputs (DI). The DI consists of two contacts of the 4-pin terminal block on the TWS-3010-SPE's front panel.
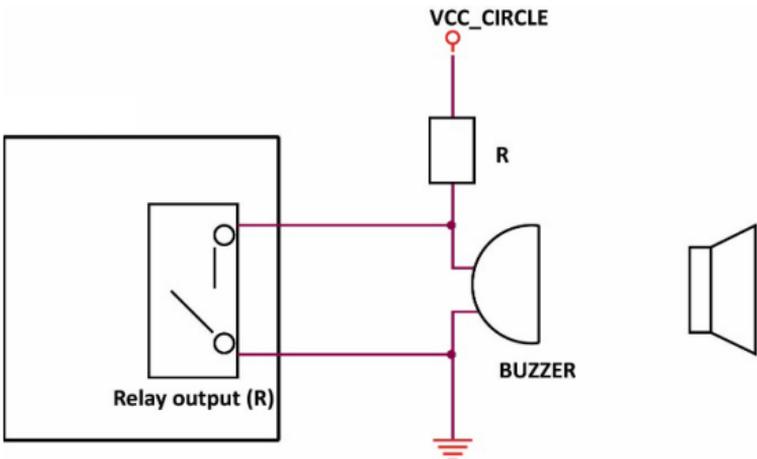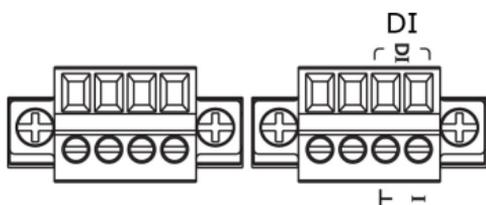
Refer to the instructions and diagram below on how to connect the wires to the terminal block connector, and how to attach the terminal block connector to the terminal block receptor.

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 screws on the terminal block connector.

STEP 3: Insert the plastic terminal block connector prongs into the terminal block receptor, which is located on the TWS-3010-SPE's front panel.

Wiring the Redundant Power Inputs

The TWS-3010-SPE has two sets of power inputs–power input 1 (PWR 1) and power input 2 (PWR 2). Refer to the instructions and diagram below on how to connect the wires to the terminal block connector on the receptor.
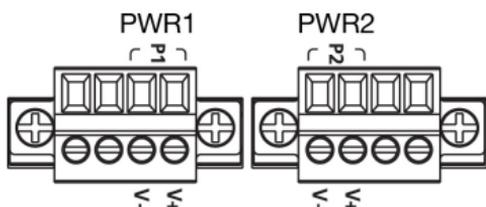
STEP 1: Insert the negative/positive DC wires into the V-/V+ terminals, respectively.

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

STEP 3: Insert the plastic terminal block connector prongs into the terminal block receptor, which is located on the TWS-3010-SPE's front panel.

> ⚠️ **ATTENTION**
>
> Before connecting the Moxa industrial two-wire Ethernet switch to the DC power inputs, ensure the DC power supply voltage is stable and of a correct level and polarity.

Communication Connections

Each TWS-3010-SPE switch has several types of communication ports:

- USB storage port (type A connector)
- 10Base-T1L SPE ports (IEC63171-2, IP20 connector)
- 10/100/1000BaseT(X) or 100/1000BaseSFP combo ports
- RJ45 console port (RS-232 interface)

USB Storage Connection

NOTE The USB port is reserved for use with the Moxa ABC-02-USB tool. This port cannot be used for charging any devices.

The TWS-3010-SPE has one USB storage port (type A connector; see the diagram below for pinout assignments) on the top panel. Use Moxa's ABC-02-USB automatic backup configurator to connect to the TWS-3010-SPE's USB storage port for configuration backup, firmware upgrades, or system log file backup.

USB Storage Port (Type A Connector) Pinouts
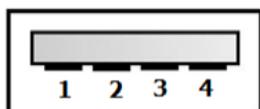
Pin	Description
1	VCC (+5V)
2	D− (Data−)
3	D+ (Data+)
4	GND (Ground)

10Base-T1L SPE Port Connections

The 10Base-T1L SPE ports use IEC63171-2, IP20 SPE connectors located on the front panel of the switch are used to connect to 802.3cg 10Base-T1L SPE devices. Refer to the pinouts below.

IEC63171-2 SPE connector **10Base-T1L SPE port pinouts**
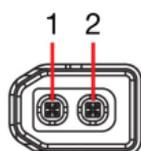
Pin	Function
1	BI_DA +
2	BI_DA −

10/100/1000BaseT(X) Ethernet Port Connections

1000BaseT(X) data is transmitted on differential TRD+/- signal pairs over copper wires.

MDI Port Pinouts   **8-pin RJ45**

Pin	Signal
1	TRD(0)+
2	TRD(0)−
3	TRD(1)+
4	TRD(2)+
5	TRD(2)−
6	TRD(1)−
7	TRD(3)+
8	TRD(3)−
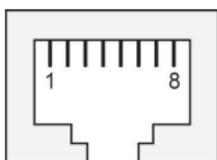
RJ45 (8-pin) to RJ45 (8-pin) Straight-through Cable Wiring

Switch Port — Straight-Through Cable — NIC Port
RJ45 Plug Pin 1

RJ45 Connector   **Cable Wiring**   **RJ45 Connector**

Tx+	3	——	3	Rx+
Tx-	6	——	6	Rx-
Rx+	1	——	1	Tx+
Rx-	2	——	2	Tx-
DD+	4	——	4	DC+
DD-	5	——	5	DC-
DC+	7	——	7	DD+
DC-	8	——	8	DD-
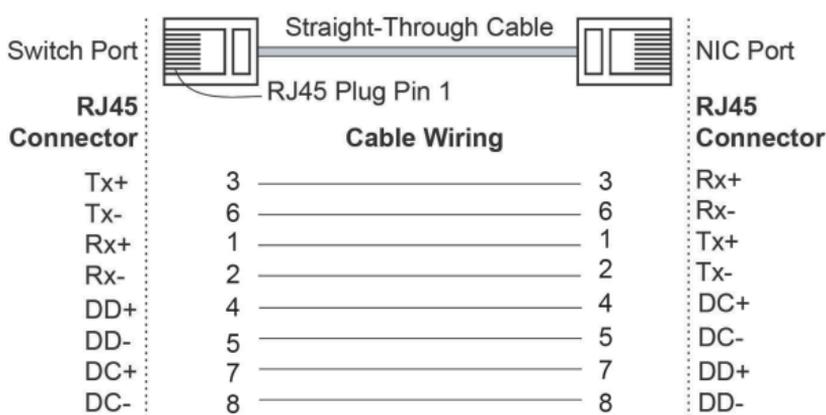
RJ45 (8-pin) to RJ45 (8-pin) Cross-over Cable Wiring

Switch Port (NIC Port) — Cross-Over Cable — Switch Port (NIC Port)
RJ45 Plug Pin 1

RJ45 Connector   **Cable Wiring**   **RJ45 Connector**

(Rx+)	Tx+	3 —— 1	Rx+	(Tx+)
(Rx-)	Tx-	6 —— 2	Rx-	(Tx-)
(Tx+)	Rx+	1 —— 3	Tx+	(Rx+)
(Tx-)	Rx-	2 —— 6	Tx-	(Rx-)
(DD+)	DC+	4 —— 7	DD+	(DC+)
(DD-)	DC-	5 —— 8	DD-	(DC-)
(DC+)	DD+	7 —— 4	DC+	(DD+)
(DC-)	DD-	8 —— 5	DC-	(DD-)
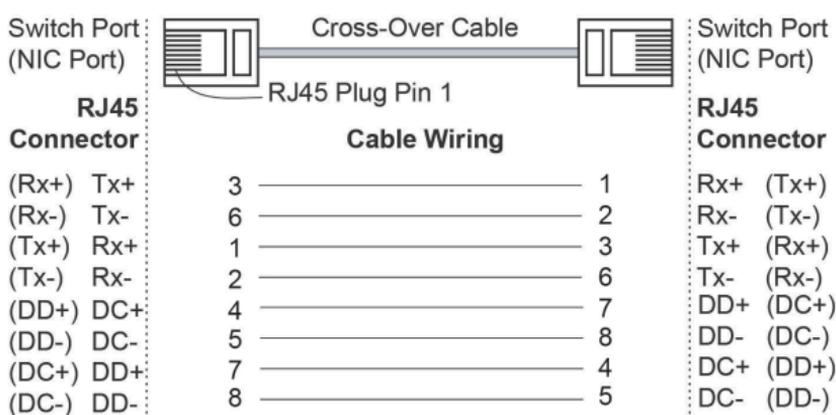
100/1000BaseSFP Port Connections

The fiber ports on the switch are 100/1000BaseSFP fiber ports, which require using 100M or 1G mini-GBIC fiber transceivers to work properly. Moxa provides a complete selection of transceiver models for different distance requirements.

The concept behind the LC port and cable is straightforward. Suppose you are connecting devices A and B; 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 A to device B, and the other optical line is used transmit data from device B to device A, for full-duplex transmission.

Remember to connect the Tx (transmit) port of device A to the Rx (receive) port of device B, and the Rx (receive) port of device A to the Tx (transmit) port of device B. 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).
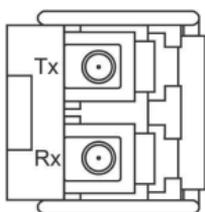
LC Port Pinouts   **LC port-to-LC port Cable Wiring**

Cable Wiring

A ———————————————— A
B ———————————————— B

> ⚠️ **ATTENTION**
>
> Use SFP modules that comply with IEC 60825-1, 21 CFR 1040 Section 1040.10 and 1040.11, and are classified as Class 1 Laser products. To avoid causing serious damage to your eyes, do not stare directly into the laser beam.

Rotary DIP Switch

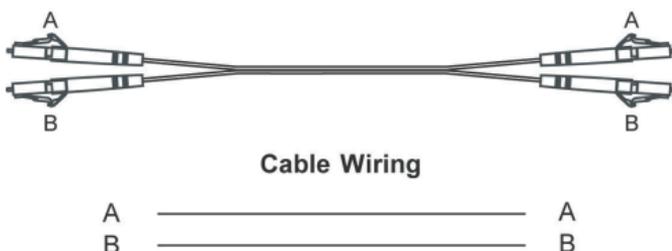The rotary DIP switch located on the bottom panel of the Moxa industrial two-wire Ethernet switch allows users to enable industrial protocols and DHCP client functionality in a matter of seconds without having to use the web interface.

The rotary DIP switch has ten options that can be selected by adjusting the switch. The default setting 0 represents no DIP switch function is enabled and follows the configuration in the web interface. Options 1 to 6 are used for the PROFINET, EtherNet/IP profile, Modbus, and DHCP client functions. Options 7 to 9 are reserved for future use.
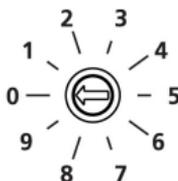
Reboot the device after changing the rotary DIP switch setting for the change for the selected function to take effect. When any of these functions is enabled through the rotary DIP switch, that function cannot be changed through the web interface. Please make sure that the arrow is pointing at 0, 7, 8, or 9 before using the web interface to change relevant configurations.

NOTE Use a 2.0 mm flathead screwdriver to rotate the DIP switch.

Rotary DIP Switch Settings for IA Profiles

Indicator	Mode
0	No function enabled via DIP switch (default)
1	PROFINET profile enabled
2	PROFINET profile and DHCP Client enabled
3	EtherNet/IP profile enabled
4	EtherNet/IP profile and DHCP Client enabled
5	Modbus TCP profile enabled
6	Modbus TCP profile and DHCP client enabled
7-9	Reserved (currently performs the same behavior as indicator 0)

Reset Button

The reset button can perform two functions. One is to reset the Moxa industrial two-wire Ethernet switch back to factory default settings and the other is to perform a quick backup of configuration and log files to the ABC-02-USB automatic backup configurator.

NOTE The reset button only functions during the first 10 minutes after powering on. Operating periods longer than 10 minutes require restarting before using the reset button.

Reset to Factory Default Settings

Use a pointed object, such as a straightened paper clip, to depress and hold the reset button for 5 seconds. This will cause the state LED to blink once a second. After depressing the button for 5 seconds, the state LED will start to blink rapidly. This indicates that factory default settings have been loaded and executed, and that you can release the reset button.

NOTE Do NOT power off your Moxa industrial two-wire Ethernet switch when the default settings are loading.

Configuration and Log File Backup

The reset button is used to perform quick configuration and event log backups to the Moxa ABC-02-USB. With the ABC-02-USB device connected to the switch, press the reset button on bottom of the Moxa industrial two-wire Ethernet switch to start backing up the current system configuration files and event logs to the ABC-02-USB.

NOTE When the ABC-02 is plugged in, you cannot reset the device to factory default settings by pressing the reset button.

LED Indicators

LED	Color	State	Description
System LEDs			
PWR1	Amber	On	Power is being supplied to power input PWR1
		Off	Power is not being supplied to power input PWR1.

LED	Color	State	Description
PWR2	Amber	On	Power is being supplied to power input PWR2.
		Off	Power is not being supplied to power input PWR2.
STATE	Green	On	The system passed the self-diagnosis test on boot-up and is ready to run.
		Blinking (1 Hz)	1. When pressing the reset button and continue 5 seconds to reset factory default. 2. System service initialization.
		Blinking (2 Hz)	Detect ABC-02-USB connect to the switch.
		Blinking (4 Hz)	After pressing reset button for 5 seconds and system is ready to do factory reset.
		Off	N/A
	Red	On	The system failed self-diagnosis on boot-up.
FAULT	Red	On	1. Network loop detected when loop protection is enabled. 2. The relay contact is triggered. 3. ABC-02-USB Loading/Saving Fail. 4. The port is being disabled because exceeding the ingress rate limit of shut down mode.
		Off	When system boot up and run well or user-configured event is not trigger.
STATE + FAULT	STATE: Green FAULT: Red	Rotate Blinking Sequentially	ABC-02-USB is importing/exporting files.
		Blinking (2 Hz)	Switch is being discovered/located by the Switch Locator at the Web GUI.
Uplink Ports LEDs			
Copper (10/100/ 1000 Mbps)	Green	On	When the port is active and links on 1,000 Mbps.
		Blinking	When the port's data is being transmitted at 1,000 Mbps.
		Off	When the port is inactive or link down.
	Amber	On	When the port is active and links on 10/100 Mbps.
		Blinking	When the port's data is being transmitted at 10/100 Mbps.
		Off	When the port is inactive or link down.
SFP (100/1000 Mbps)	Green	ON	When the port is active and links on 1,000 Mbps.
		Blinking	When the port's data is being transmitted at 1,000 Mbps.
		OFF	When the port is inactive or link down.
	Amber	On	When the port is active and links on 100 Mbps.

LED	Color	State	Description
		Blinking	When the port's data is being transmitted at 100 Mbps.
		Off	When the port is inactive or link down.
SPE Port & PoDL LEDs			
SPE port (10Base-T1L with IEC 63171-2 IP20 connector)	Green	On	When the port is active and links on 10 Mbps.
		Blinking	When the port's data is being transmitted at 10 Mbps.
		Off	When the port is inactive or link down.
PoDL LED Indicators	Green	On	When the port is connected to PoDL powered device (PD).
		Off	When the power is not being supplied to a powered device (PD).
	Red	Blinking (4 time/sec)	Overcurrent has occurred on the powered device (PD).
		Off	PoDL is normal operation.

Specifications

Interface	
RJ45 Ports	10/100/1000BaseT(X)
Fiber Ports	100/1000BaseSFP
SPE ports	10Base-T1L with SPE connectors according to IEC 63171-2
Storage Port	USB storage (Type A connector for ABC-02-USB)
Console port	RS-232 (RJ45)
Rotary DIP switch	10 modes rotary dip for industrial protocols and DHCP client functionality settings
Alarm Contact (Relay Output)	1 normally open solid-state relay output with current carrying capacity of 1 A @ 24 VDC
Digital Input	1 input with the same ground, but electrically isolated from the electronics. • +13 to +30 V for state "1" • -30 to +3 V for state "0" • Max. input current: 8 mA
Button	Reset button
PoDL	
Total Power Budget	102 W @ 24 VDC power input
PoDL Output Voltage	24 VDC (power bypass)
PoDL Output Power	1.85 W for 802.3cg PoDL class 10, 4.8 W for 802.3cg PoDL class 11, 12.63 W for 802.3cg PoDL class 12
PoDL Output Current	92 mA for 802.3cg PoDL class 10, 240 mA for 802.3cg PoDL class 11, 632 mA for 802.3cg PoDL class 12
Overload Current Protection at Port	Supported
Power Requirements	
Input Voltage	24 VDC, redundant dual inputs
Operating Voltage	20 to 30 VDC

Input Current	24 VDC, 4.8 A (max.)
Overload Protection	Supported
Connection	2 removable 4-contact terminal blocks
Reverse Polarity Protection	Supported
Physical Characteristics	
Housing	Metal
IP Rating	IP30
Dimension (W x H x D)	43 x 135 x 111 mm (1.69 x 5.32 x 4.37 in)
Weight	830 g (1.77 lbs)
Installation	DIN-rail mounting, wall mounting (with optional kit)
Environmental Limits	
Operating Temperature	-40 to 75°C (-40 to 167°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5% to 95% (non-condensing)
Altitude	Up to 2000 m
NOTE: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.	
Standards and Certifications	
Safety	UL 61010-2-201, EN IEC 62368-1
EMC	EN 61000-6-2/6-4
EMI	FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Level 3
	IEC 61000-4-3 RS: Level 3
	IEC 61000-4-4 EFT: Level 3
	IEC 61000-4-5 Surge: Level 3
	IEC 61000-4-6 CS: Level 3
	IEC 61000-4-8 PFMF: Level 3
Shock	IEC 60068-2-27
Freefall	ISTA-1A
Vibration	IEC 60068-2-6, IEC 60068-2-64
Warranty	
Warranty Period	5-years
Details	See www.moxa.com/warranty

⚠ 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.

⚠ WARNING: HOT SURFACE

External metal parts of this equipment are hot!!

Before touching the equipment, you must take special precautions to protect your hands and body from serious injury.

⚠️ WARNING

為避免電磁干擾，本產品不應安裝或使用於住宅環境。