

# SDS-3008 Series Quick Installation Guide

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**Moxa's Industrial Smart Ethernet Switch**

**Edition 2.0, March 2017**

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**P/N: 1802300800011**



## Overview

The SDS-3008 industrial smart Ethernet switch is the ideal device for IA engineers and automation machine builders to make their networks compatible with the vision of Industry 4.0. By breathing life into machines and control cabinets, the smart switch simplifies daily tasks with its easy configuration and easy installation. In addition, it is monitorable and easy to maintain throughout the entire product life cycle.

The most frequently used automation protocols—including EtherNet/IP, PROFINET, and Modbus/TCP—are embedded in the SDS-3008 to provide enhanced operational performance and flexibility by making it controllable and visible from automation HMIs. It also supports a range of useful management functions, including IEEE 802.1Q VLAN, port mirroring, SNMP, and warning by relay.

## Package Checklist

The SDS-3008 is shipped with the following items. If any of these items are missing or damaged, please contact your customer service representative for assistance.

- 1 SDS-3008 industrial smart Ethernet switch
- Protective caps for unused ports
- Quick installation guide (printed)
- Warranty card

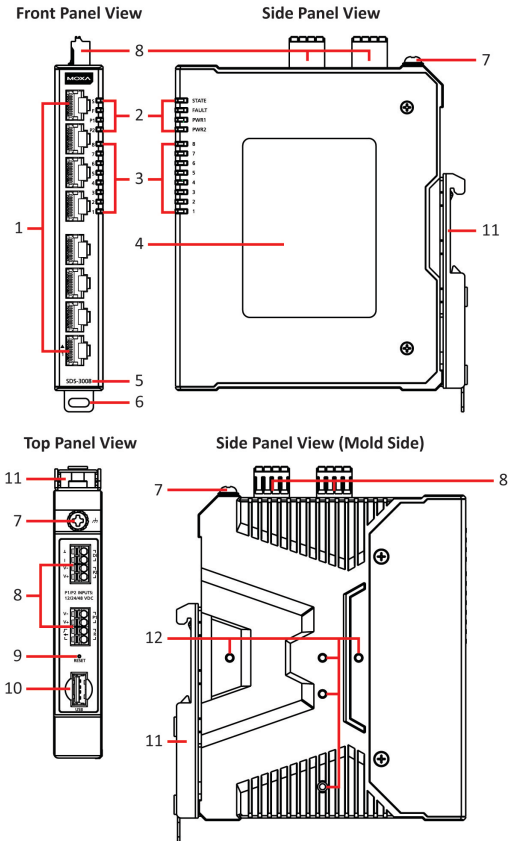
## Features

- 8 10/100BaseT(X) Fast Ethernet ports
- Web-based graphical user interface for quick configuration and management
- Supports EtherNet/IP, PROFINET, and Modbus/TCP industrial protocol profiles for easy device integration and monitoring in HMI/SCADA systems
- Supports IEEE 802.1D-2004 and IEEE 802.1w STP/RSTP for rapid network redundancy
- IEEE 802.1Q VLAN to ease network planning
- Unused port lock, SNMPv3 and HTTPS to enhance network security
- Role-based account management for self-defined administration and/or user accounts
- ABC-02 automatic backup configurator for quick event log and configuration backup. Can also enable quick device change over and firmware upgrade
- Automatic warning by exception through relay output
- Local log and the ability to export inventory files simplify inventory management

## Default Settings

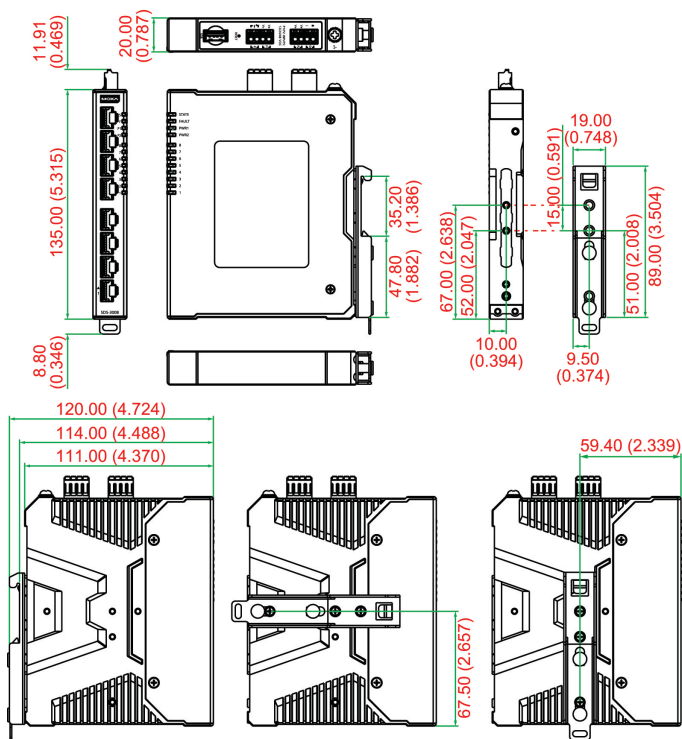
- Default IP address: 192.168.127.253
- Default Subnet Mask: 255.255.255.0
- Default Usernames: admin, user
- Default Password: moxa

# SDS-3008 Panel Layout



1. 1 to 8 10/100BaseT(X) ports (bottom to top)
2. System status LEDs (top to bottom)  
STATE LED indicator (Green), FAULT LED indicator (Red), PWR1 LED indicator (Amber), PWR2 LED indicator (Amber)
3. 1 to 8 port status LEDs (bottom to top)
  - LED lights in Green: 100 Mbps
  - LED lights in Amber: 10 Mbps
4. Model side label (Multiple production information included)
  - Default IP: 192.168.127.253
5. Model name
6. Latch of the DIN-rail mounting kit
7. Grounding screw (chassis ground)
8. 4-pin terminals for power inputs (P1/P2), relay output (R) and digital input (DI)  
*NOTE: starting from the front side called first terminal*
9. Reset button
10. USB storage port (type A connector)
11. DIN-rail mounting kit
12. Screw hole (reserved for other DIN-rail mounting methods; for more information please see the *DIN-Rail Mounting* section)

## Mounting Dimensions; unit = mm (inches)



## DIN-Rail Mounting

There are 2 options for DIN-rail mounting that can be adopted on a SDS-3008. Option 1 is the default type when shipped.

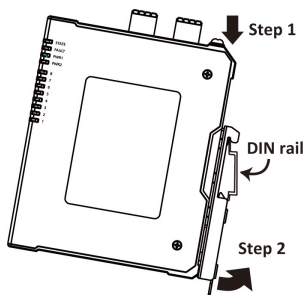
### Option 1 (Default):

When shipped, the metal DIN-rail mounting kit is fixed to the back panel of the SDS-3008. Mount the SDS-3008 on the corrosion-free mounting rail that adheres to the EN 60715 standard.

### Suggested Installation Method

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

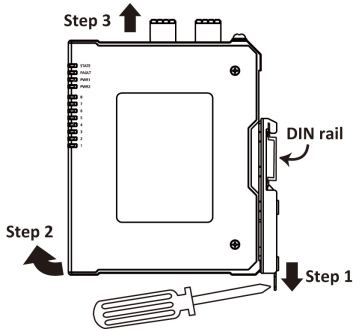
**STEP 2**—Press the SDS-3008 towards the mounting rail until it snaps into place.



### **Suggested Removal Method**

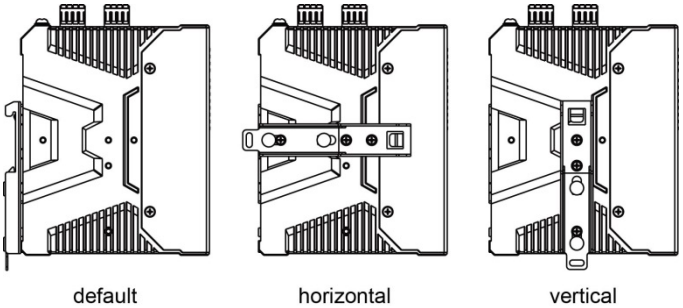
**STEP 1**—Pull down the latch on the DIN-rail kit with a screwdriver.

**STEPS 2 & 3**—Slightly pull the SDS-3008 forward and lift up to remove it from the mounting rail.



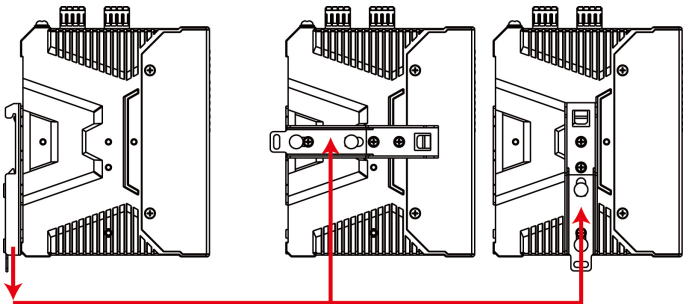
### **Option 2 (when side cabling is needed):**

The metal DIN-rail mounting kit can be fixed to the side panel (mold side) of the SDS-3008 (horizontal or vertical). Mount the SDS-3008 on the corrosion-free mounting rail that adheres to the EN 60715 standard.



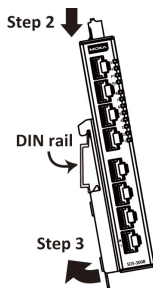
### **Suggested Installation Method**

**STEP 1**—Detach the metal DIN-rail mounting kit from the back panel and attach it to the side panel (mold side) in either the horizontal or vertical direction as indicated in the figure below.



**STEP 2**—Insert the upper lip of the DIN-rail kit into the mounting rail.

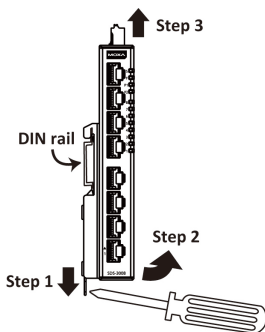
**STEP 3**—Press the SDS-3008 towards the mounting rail until it snaps into place.



### **Suggested Removal Method**

**STEP 1**—Pull down the latch on the DIN-rail kit with a screwdriver.

**STEPS 2 & 3**—Slightly pull the SDS-3008 forward and lift up to remove it from the mounting rail.



**NOTE** Screws that are used to fix the DIN-rail kit on the SDS-3008 should be securely fastened before mounting on the mounting rail. Please make sure that if you remove the DIN-rail, it must be securely fastened when it is reattached.



### **ATTENTION**

In order to ensure reliable operations, please make sure the operating temp. of the environment does not exceed the spec. When mounting a SDS-3008 with other operating units in a cabinet without forced ventilation, minimum spacing of 3cm on both sides and above/below the switch is recommended.

## **Wiring Requirements**



### **ATTENTION** **Safety First!**

Be sure to disconnect the power cord before installing and/or wiring your Moxa Industrial Smart 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 Industrial Smart 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.



### **ATTENTION**

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

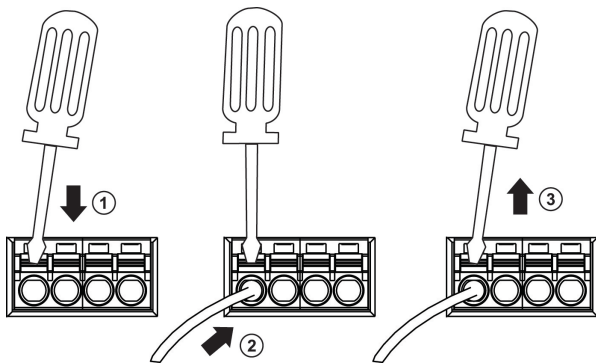
## Suggested Wire Type for Wiring Relay Contact (R), Digital Input (DI) and Power Inputs (P1/P2)

The switch includes two 4-pins 3.5mm pin-pitch terminal blocks. When wiring the relay contact (R), digital input (DI) and power inputs (P1/P2) for the SDS-3008, we suggest using the cable type - AWG (American Wire Gauge) 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

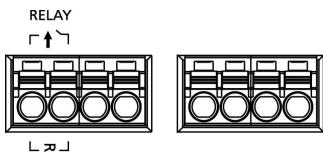
The SDS-3008 has one relay output for identifying when a specific event has occurred (i.e., fault; see below). This relay output uses the first two contacts out of the first 4-pin terminal on the SDS-3008's top panel.

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 two wires into the relay position (see the diagram below showing the top view) on the terminal to form an open circuit.

**STEP 2**—To keep the relay wires from coming loose, use a small flathead screwdriver to press the button beside each terminal of the plastic terminal block connector in order to insert the wire tightly. Release the screwdriver after the wire has been inserted properly.

**STEP 3**—Insert the plastic terminal block connector prongs into the terminal block receptor, which is located on the SDS-3008's top panel.

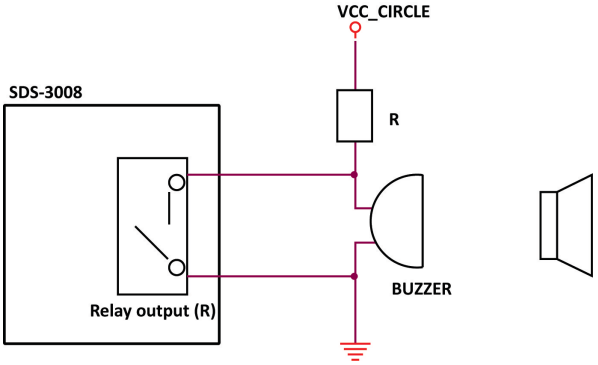


### **FAULT:**

The two relay contacts of the 4-pin terminal block connector can be used to indicate that a user-configured event has occurred. The two wires attached to the relay contacts will form an open circuit when a user-configured event is triggered. 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. For more details about user-configured events, please refer to the SDS-3008 user manual.



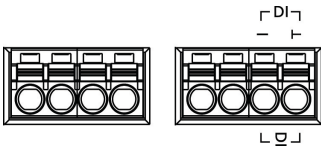
**NOTE** The relay output of the SDS-3008 reflects a potential-free, normally opened solid-state relay. Therefore, not only when user-configured events are triggered but also when there is no power supply to the switch it will open. To indicate a fault has occurred one can integrate the relay contact 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 SDS-3008 has one set of digital inputs (DI). The DI consist of two contacts of the second 4-pin terminal block on the SDS-3008's top panel, and the other 2 contacts are used for the power 2 (P2) DC inputs.

Refer to the instructions and diagram (top view) 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.



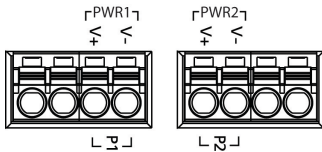
**STEP 1:** Insert the negative (ground)/positive DI wires into the respective  $\pm$ /I terminals.

**STEP 2:** To prevent the DI wires from coming loose, use a small flathead screwdriver to press the button beside each terminal of the plastic terminal block connector in order to insert the wire tightly. Release the screwdriver after the wire has been properly inserted.

**STEP 3:** Insert the plastic terminal block connector prongs into the terminal block receptor, which is located on the top panel of the SDS-3008.

## Wiring the Redundant Power Inputs (12/24/48 VDC)

The SDS-3008 has two sets of power inputs—power input 1 (PWR 1/P1) and power input 2 (PWR 2/P2). The top view of the terminal block connector and the positions of the power inputs are shown below.



Take the following steps to wire the redundant power inputs:

**STEP 1:** Insert the Positive/Negative DC wires into the V1+/V1- terminal for PWR 1 and/or V2+/V2- terminal for PWR 2.

**STEP 2:** To prevent the DC wires from coming loose, use a small flathead screwdriver to press the button beside each terminal of the plastic terminal block connector in order to insert the wire tightly. Release the screwdriver after the wire has been properly inserted.

**STEP 3:** Insert the plastic terminal block connector prongs into the terminal block receptor, which is located on the top panel of the SDS-3008.



### ATTENTION

Before connecting the SDS-3008 to the DC power inputs, ensure the DC power supply voltage is stable and of a correct level and polarity.

## Communication Connections

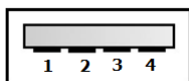
Each SDS-3008 smart Ethernet switch has 2 types of communication ports:

- 1 USB storage port (type A connector)
- 8 10/100BaseT(X) Fast Ethernet ports

### USB Storage Connection

The SDS-3008 has one USB storage port (type A connector; see the diagram below for pinout assignments) on the front panel. Use Moxa's ABC-02-USB automatic backup configurator to connect to the SDS-3008's USB storage port in order to perform configuration backup, firmware upgrade, or system log file backup.

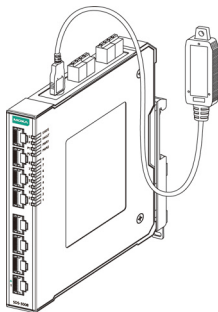
#### USB Storage Port (Type A Connector) Pinouts



Pin	Description
1	VCC (+5V)
2	D- (Data -)
3	D+ (Data+)
4	GND (Ground)

## NOTE ABC-02-USB Installation

Plug the ABC-02-USB into the USB storage port of the SDS-3008. We suggest securing the ABC-02-USB on the wall with an M4 screw.



## 10/100BaseT(X) Ethernet Port Connection

The 10/100BaseT(X) ports located on the front panel of the SDS-3008 are used to connect to Ethernet-enabled devices. Most users 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 wiring (straight-through or cross-over), and the type of device (NIC-type or HUB/Switch-type) connected to the port.

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

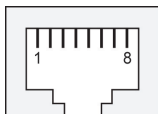
### MDI Port Pinouts

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

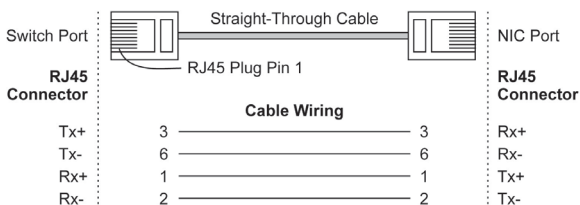
### MDI-X Port Pinouts

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

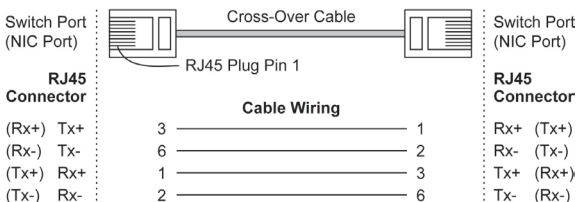
### 8-pin RJ45



## RJ45 (8-pin) to RJ45 (8-pin) Straight-Through Cable Wiring



## RJ45 (8-pin) to RJ45 (8-pin) Cross-Over Cable Wiring



## Reset Button

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

### 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 smart Ethernet switch when the default settings are loading.

### Configuration and Log Files Back Up

When the ABC-02-USB is connected to the industrial smart Ethernet switch, the reset button allows for a quick back up of configuration and event logs to the ABC-02-USB. Press the reset button on top of the SDS-3008 in order for the industrial smart 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 can't reset to factory default by pressing the reset button.

## LED Indicators

LED	Color	Status	Description
<b>Per Device LED</b>			
PWR 1	Amber	Solid light	Power is being supplied to the main system's power input PWR1
		Light off	Power is not being supplied to the main system's power input PWR1
PWR 2	Amber	Solid light	Power is being supplied to the main system's power input PWR2
		Light off	Power is not being supplied to the main system's power input PWR2
STATE	Green	Solid light	System has passed self-diagnosis test on boot-up and is ready to run
		Blinking	1. System is undergoing the self-diagnosis test 2. System detects that the ABC-02-USB is plugged in and has been detected by the USB port 3. Blinks continuously when the reset button is pressed for 5 seconds to reset to factory default settings
	Red	Solid light	System failed self-diagnosis on boot-up.

LED	Color	Status	Description
FAULT	Red	Solid light	1. System is in the event of failure, or is under quick inspection 2. Invalid port connection
		Blinking	1. RAM test fail / switch initialization fail 2. Firmware checksum fail / Uncompressed fail
		Light off	The system is operating normally
STATE + FAULT	STATE: Green FAULT: Red	Rotate Blinking Sequentially	ABC-02-USB is importing/exporting files
STATE + FAULT	STATE: Green FAULT: Red	Blinking	Smart switch is being discovered/located by the Switch Locator at the Web GUI or by MXview or MXview ToGo (LEDs blinking twice per second).
<b>Per 10/100 Mbps Port LED</b>			
100M	Green	Solid Light	When there is a secure connection (or link) to a 100Mbps device at any port.
		Blinking	When there is reception or transmission of data occurring at 100Mbps.
		Light off	Link down or no link.
10M	Amber	Solid Light	When there is a secure connection (or link) to a 10Mbps device at any port.
		Blinking	When there is reception or transmission of data occurring at 10Mbps.
		Off	Link down or no link

## Specifications

Technology	
Standards	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) IEEE 802.3x for Flow Control IEEE 802.1D-2004 for Spanning Tree Protocol IEEE 802.1w for Rapid STP IEEE 802.1Q for VLAN Tagging
Software Features	
Management	IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DHCP Client, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter	IEEE 802.1Q VLAN
Redundancy Protocols	STP, RSTP
Security	Broadcast Storm Protection, Port Lock, SNMPv3, HTTPS
Time Management	SNTP/NTP Server/Client
Industrial Protocols	EtherNet/IP, PROFINET IO, and Modbus/TCP
MIB	RFC1213 MIB, Ether-Like MIB, IF MIB, LLDP-MIB, BRIDGE MIB, Q-BRIDGE MIB

<b>Switch Properties</b>	
Max. Number of VLANs	8
VLAN ID Range	VID 1 to 4094
MAC Table Size	8 K
Packet Buffer Size	3 Mbit
<b>Interface</b>	
RJ45 Ports	10/100BaseT(X) auto negotiation speed
Storage Port	USB storage (Type A connector for ABC-02-USB)
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. <ul style="list-style-type: none"> <li>• +13 to +30 V for state "1"</li> <li>• -30 to +3 V for state "0"</li> <li>• Max. input current: 8 mA</li> </ul>
Button	Reset button
<b>Power Requirements</b>	
Input Voltage	12/24/48/-48 VDC, redundant dual inputs
Operating Voltage	9.6 to 60 VDC
Input Current	0.55 A @ 24 V
Overload Current Protection	Supported
Connection	2 removable 4-contact terminal blocks
Reverse Polarity Protection	Supported
<b>Physical Characteristics</b>	
Housing	Metal
IP Rating	IP40
Dimension (W x H x D)	20 x 135 x 111 mm (0.79 x 5.32 x 4.37 in)
Weight	438g (0.97lb)
Installation	DIN rail mounting
<b>Environmental Limits</b>	
Operating Temperature	Standard Models: -10 to 60°C (14 to 140°F) Wide Temp. Models: -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)
IEC/UL 61010	Indoor use and pollution degree. The equipment must be wiped with a dry cloth.

<b>Standards and Certifications</b>	
Safety	UL 61010-2-201, EN 60950-1 (Preliminary)
EMC	EN 61000-6-2/6-4
EMI	CISPR 22, FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: Signal: 10 V IEC 61000-4-8 PFMF: 300A/m, 60 s
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6
<b>Note: Please check Moxa's website for the latest certification status.</b>	
<b>MTBF (mean time between failures)</b>	
Time	1,391,620 hours
Standard	Telcordia (Bellcore), GB
<b>Warranty</b>	
Warranty Period	5-years
Details	See <a href="http://www.moxa.com/warranty">www.moxa.com/warranty</a>



## **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.