

# SDS-3016 Series

## Industrial 14+2G-port Gigabit smart Ethernet switches



### Features and Benefits

- Compact and flexible housing design to fit into confined spaces
- Web-based GUI for easy device configuration and management
- Port diagnostics with statistics to detect and prevent issues
- Multi-language web GUI: English, Traditional Chinese, Simplified Chinese, Japanese, German, and French
- Supports RSTP/STP for network redundancy
- Supports MRP redundancy based on IEC 62439-2 to ensure high network availability
- EtherNet/IP, PROFINET, and Modbus TCP industrial protocols supported for easy integration and monitoring in automation HMI/SCADA systems
- IP port binding to ensure critical devices can be replaced quickly without reassigning the IP Address
- Rotary DIP switch can perform profile-based settings without using a web browser
- Security features based on IEC 62443

### Certifications



### Introduction

The SDS-3016 smart Ethernet switch is the ideal product 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 is 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-3016 switch 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, warning by relay, and a multi-language Web GUI.

### Additional Features and Benefits

- Supports IEEE 802.1D-2004 and IEEE 802.1w STP/RSTP for rapid network redundancy
- IEEE 802.1Q VLAN to ease network planning
- Supports the ABC-02-USB automatic backup configurator for quick event log and configuration backup. Can also enable quick device switch over and firmware upgrade
- Automatic warning by exception through relay output
- Unused port lock, SNMPv3, and HTTPS to enhance network security
- Role-based account management for self-defined administration and/or user accounts
- Local log and the ability to export inventory files ease inventory management

### Specifications

|                        |                                                                                 |
|------------------------|---------------------------------------------------------------------------------|
| Input/Output Interface |                                                                                 |
| Alarm Contact Channels | 1<br>Relay output with current carrying capacity of 1 A @ 24 VDC                |
| Buttons                | Reset button                                                                    |
| Digital Input Channels | 1                                                                               |
| Digital Inputs         | +13 to +30 V for state 1<br>-30 to +3 V for state 0<br>Max. input current: 8 mA |

## Ethernet Interface

|                                            |                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10/100BaseT(X) Ports (RJ45 connector)      | 14<br>Auto negotiation speed<br>Full/Half duplex mode<br>Auto MDI/MDI-X connection                                                                                                                                                                                                                                     |
| 10/100/1000BaseT(X) Ports (RJ45 connector) | 2 (SDS-3016-2GTX Series)<br>Auto negotiation speed<br>Full/Half duplex mode<br>Auto MDI/MDI-X connection                                                                                                                                                                                                               |
| 100/1000BaseSFP Ports                      | 2 (SDS-3016-2GSFP Series)                                                                                                                                                                                                                                                                                              |
| Standards                                  | IEEE 802.3 for 10BaseT<br>IEEE 802.3u for 100BaseT(X)<br>IEEE 802.3ab for 1000BaseT(X)<br>IEEE 802.3z for 1000BaseX<br>IEEE 802.3x for flow control<br>IEEE 802.1D-2004 for Spanning Tree Protocol<br>IEEE 802.1w for Rapid Spanning Tree Protocol<br>IEEE 802.1Q for VLAN Tagging<br>IEEE 802.1p for Class of Service |

## Ethernet Software Features

|                      |                                                                                                                                         |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Industrial Protocols | EtherNet/IP<br>Modbus TCP<br>PROFINET IO Device                                                                                         |
| Management           | Back Pressure Flow Control<br>DHCP Client<br>Flow control<br>IPv4/IPv6<br>LLDP<br>Port Mirror<br>SNMP Inform<br>SNMPv1/v2c/v3<br>Syslog |
| MIB                  | RFC1213<br>Ethernet-like MIB<br>IF MIB<br>LLDP MIB<br>Bridge MIB<br>Q-BRIDGE MIB                                                        |
| Redundancy Protocols | RSTP<br>STP<br>MRP                                                                                                                      |
| Security             | Broadcast storm protection<br>HTTPS/SSL<br>SNMPv3<br>Port Lock                                                                          |
| Time Management      | NTP Server/Client<br>SNTP                                                                                                               |
| Filter               | 802.1Q VLAN                                                                                                                             |

## Rotary Switch Configuration

| Industrial Profile | Indicator | Mode                                            |
|--------------------|-----------|-------------------------------------------------|
|                    | 0         | Modbus TCP profile (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     |
|                    | Others    | Reserved (has the same behavior as Indicator 0) |

### Switch Properties

|                    |               |
|--------------------|---------------|
| MAC Table Size     | 8 K           |
| Max. No. of VLANs  | 8             |
| VLAN ID Range      | VID 1 to 4094 |
| Packet Buffer Size | 3 Mbits       |

### USB Interface

|              |            |
|--------------|------------|
| Storage Port | USB Type A |
|--------------|------------|

### LED Interface

|                |                                                    |
|----------------|----------------------------------------------------|
| LED Indicators | PWR1, PWR2, STATE, FAULT, 10/100M, 1000M (TP Port) |
|----------------|----------------------------------------------------|

### Power Parameters

|                             |                                                                                                    |
|-----------------------------|----------------------------------------------------------------------------------------------------|
| Connection                  | 2 removable 4-contact terminal block(s)                                                            |
| Input Voltage               | 12/24/48/-48 VDC<br>Redundant dual inputs                                                          |
| Operating Voltage           | 9.6 to 60 VDC                                                                                      |
| Input Current               | SDS-3016-2GTX series: 12-48 VDC, 0.858 A (max.)<br>SDS-3016-2GSFP series: 12-48 VDC, 0.99 A (max.) |
| Overload Current Protection | Supported                                                                                          |
| Reverse Polarity Protection | Supported                                                                                          |

### Physical Characteristics

|              |                                           |
|--------------|-------------------------------------------|
| Housing      | Metal                                     |
| IP Rating    | IP40                                      |
| Dimensions   | 36 x 135 x 111 mm (1.42 x 5.32 x 4.37 in) |
| Weight       | 590 g (1.3 lb)                            |
| Installation | DIN-rail mounting                         |

### Environmental Limits

|                                        |                                                                                             |
|----------------------------------------|---------------------------------------------------------------------------------------------|
| Operating Temperature                  | Standard Models: -10 to 60°C (14 to 140°F)<br>Wide Temp. Models: -40 to 75°C (-40 to 167°F) |
| Storage Temperature (package included) | -40 to 85°C (-40 to 185°F)                                                                  |
| Ambient Relative Humidity              | 5 to 95% (non-condensing)                                                                   |

## Standards and Certifications

|           |                                                                                                                                                                                                                                                    |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EMC       | EN 55032/35<br>EN 61000-6-2/-6-4                                                                                                                                                                                                                   |
| EMI       | CISPR 32, FCC Part 15B Class A                                                                                                                                                                                                                     |
| EMS       | IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV<br>IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m<br>IEC 61000-4-4 EFT: Power: 1 kV; Signal: 1 kV<br>IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV<br>IEC 61000-4-6 CS: 10 V<br>IEC 61000-4-8 PFMF: 30 A/m |
| Safety    | EN 62368-1<br>UL 61010-2-201                                                                                                                                                                                                                       |
| Shock     | IEC 60068-2-27                                                                                                                                                                                                                                     |
| Freefall  | IEC 60068-2-32                                                                                                                                                                                                                                     |
| Vibration | IEC 60068-2-6                                                                                                                                                                                                                                      |

## MTBF

|           |                          |
|-----------|--------------------------|
| Time      | 1,109,179 hrs            |
| Standards | Telcordia (Bellcore), GB |

## Warranty

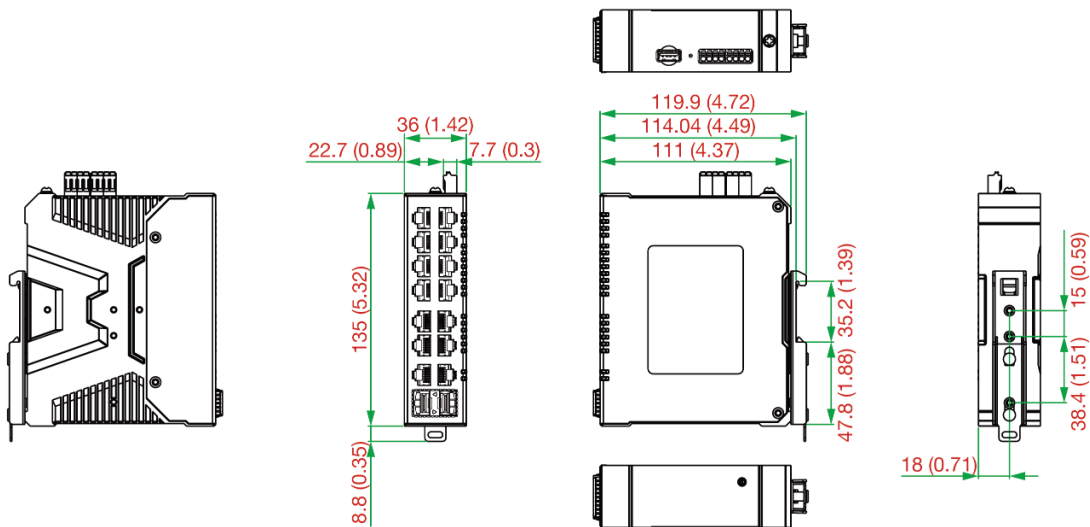
|                 |                                                                      |
|-----------------|----------------------------------------------------------------------|
| Warranty Period | 5 years                                                              |
| Details         | See <a href="http://www.moxa.com/warranty">www.moxa.com/warranty</a> |

## Package Contents

|                  |                                                                                                                                                                   |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Device           | 1 x SDS-3016 Series switch                                                                                                                                        |
| Installation Kit | 4 x cap, plastic, for RJ45 port                                                                                                                                   |
| Documentation    | 1 x product certificates of quality inspection, Simplified Chinese<br>1 x product notice, Simplified Chinese<br>1 x quick installation guide<br>1 x warranty card |

## Dimensions

Unit: mm (inch)



## Ordering Information

| Model Name       | Layer | Total No. of Ports | 10/100BaseT(X)<br>Ports, RJ45<br>Connector | 10/100/<br>1000BaseT(X)<br>Ports, RJ45<br>Connector | 100/1000BaseSFP<br>Ports | Operating Temp. |
|------------------|-------|--------------------|--------------------------------------------|-----------------------------------------------------|--------------------------|-----------------|
| SDS-3016-2GTX    | 2     | 16                 | 14                                         | 2                                                   | –                        | -10 to 60°C     |
| SDS-3016-2GTX-T  | 2     | 16                 | 14                                         | 2                                                   | –                        | -40 to 75°C     |
| SDS-3016-2GSFP   | 2     | 16                 | 14                                         | –                                                   | 2                        | -10 to 60°C     |
| SDS-3016-2GSFP-T | 2     | 16                 | 14                                         | –                                                   | 2                        | -40 to 75°C     |

## Accessories (sold separately)

### SFP Modules

|                 |                                                                                                                                                        |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| SFP-1FEMLC-T    | SFP module with 1 100Base multi-mode, LC connector for 2/4 km transmission, -40 to 85°C operating temperature                                          |
| SFP-1FELLC-T    | SFP module with 1 100Base single-mode with LC connector for 80 km transmission, -40 to 85°C operating temperature                                      |
| SFP-1FESLC-T    | SFP module with 1 100Base single-mode with LC connector for 40 km transmission, -40 to 85°C operating temperature                                      |
| SFP-1G10ALC     | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature   |
| SFP-1G10ALC-T   | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature |
| SFP-1G10BLC     | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature   |
| SFP-1G10BLC-T   | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature |
| SFP-1G20ALC     | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature   |
| SFP-1G20ALC-T   | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature |
| SFP-1G20BLC     | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature   |
| SFP-1G20BLC-T   | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature |
| SFP-1G40ALC     | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature   |
| SFP-1G40ALC-T   | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature |
| SFP-1G40BLC     | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature   |
| SFP-1G40BLC-T   | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature |
| SFP-1GEZXLC     | SFP module with 1 1000BaseEZXC port with LC connector for 110 km transmission, 0 to 60°C operating temperature                                         |
| SFP-1GEZXLC-120 | SFP module with 1 1000BaseEZXC port with LC connector for 120 km transmission, 0 to 60°C operating temperature                                         |
| SFP-1GLHLC      | SFP module with 1 1000BaseLH port with LC connector for 30 km transmission, 0 to 60°C operating temperature                                            |
| SFP-1GLHLC-T    | SFP module with 1 1000BaseLH port with LC connector for 30 km transmission, -40 to 85°C operating temperature                                          |
| SFP-1GLHLC      | SFP module with 1 1000BaseLH port with LC connector for 40 km transmission, 0 to 60°C operating temperature                                            |

|                |                                                                                                                   |
|----------------|-------------------------------------------------------------------------------------------------------------------|
| SFP-1GLHXLC-T  | SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, -40 to 85°C operating temperature    |
| SFP-1GLSXLC    | SFP module with 1 1000BaseLSX port with LC connector for 1km/2km transmission, 0 to 60°C operating temperature    |
| SFP-1GLSXLC-T  | SFP module with 1 1000BaseLSX port with LC connector for 1km/2km transmission, -40 to 85°C operating temperature  |
| SFP-1GLXLC     | SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, 0 to 60°C operating temperature       |
| SFP-1GLXLC-T   | SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, -40 to 85°C operating temperature     |
| SFP-1GSXLC     | SFP module with 1 1000BaseSX port with LC connector for 300m/550m transmission, 0 to 60°C operating temperature   |
| SFP-1GSXLC-T   | SFP module with 1 1000BaseSX port with LC connector for 300m/550m transmission, -40 to 85°C operating temperature |
| SFP-1GZXLC     | SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, 0 to 60°C operating temperature       |
| SFP-1GZXLC-T   | SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, -40 to 85°C operating temperature     |
| SFP-1GTXRJ45-T | SFP module with 1 1000BaseT port with RJ45 connector for 100 m transmission, -40 to 75°C operating temperature    |

#### Storage Kits

|              |                                                                                                                                                                     |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ABC-02-USB   | Configuration backup and restoration tool, firmware upgrade, and log file storage tool for managed Ethernet switches and routers, 0 to 60°C operating temperature   |
| ABC-02-USB-T | Configuration backup and restoration tool, firmware upgrade, and log file storage tool for managed Ethernet switches and routers, -40 to 75°C operating temperature |

#### Power Supplies

|           |                                                                                                                                                                   |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DR-120-24 | 120W/2.5A DIN-rail 24 VDC power supply with universal 88 to 132 VAC or 176 to 264 VAC input by switch, or 248 to 370 VDC input, -10 to 60°C operating temperature |
| DR-4524   | 45W/2A DIN-rail 24 VDC power supply with universal 85 to 264 VAC or 120 to 370 VDC input, -10 to 50°C operating temperature                                       |
| DR-75-24  | 75W/3.2A DIN-rail 24 VDC power supply with universal 85 to 264 VAC or 120 to 370 VDC input, -10 to 60°C operating temperature                                     |
| MDR-40-24 | DIN-rail 24 VDC power supply with 40W/1.7A, 85 to 264 VAC, or 120 to 370 VDC input, -20 to 70°C operating temperature                                             |
| MDR-60-24 | DIN-rail 24 VDC power supply with 60W/2.5A, 85 to 264 VAC, or 120 to 370 VDC input, -20 to 70°C operating temperature                                             |

#### Rack-Mounting Kits

|       |                           |
|-------|---------------------------|
| RK-4U | 19-inch rack-mounting kit |
|-------|---------------------------|

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