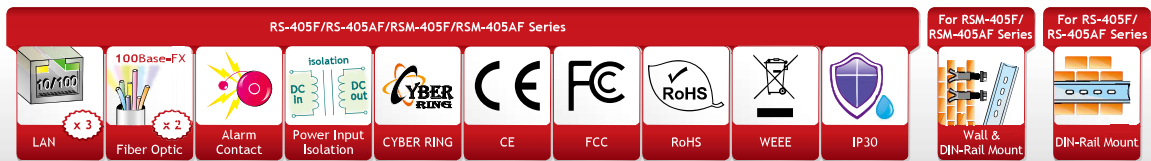# RS-405F/RS-405AF/RSM-405F/RSM-405AF Series

5-port Real-time Redundant Ring Switch with 2-Fiber Port

RS-405FT/RS-405AFT Series

RS-405FC/RS-405AFC/ RS-405FCS/RS-405AFCS Series

RSM-405FC/RSM-405AFC/ RSM-405FCS/RSM-405AFCS Series

RSM-405FT/RSM-405AFT Series

RS-405F/RS-405AF/RSM-405F/RSM-405AF Series

| LAN x 3 | 100Base-FX Fiber Optic x 2 | Alarm Contact | Power Input Isolation | CYBER RING | CE | FCC | RoHS | WEEE | IP30 | For RSM-405F/ RSM-405AF Series Wall & DIN-Rail Mount | For RS-405F/ RS-405AF Series DIN-Rail Mount |

Features ▶▶▶▶

- Automatic MDI/MDI-X crossover for plug-and-play
- 3.2 Gbps high performance memory bandwidth
- Each port supports both 10/100 Mbps speed auto negotiation
- Full duplex IEEE 802.3x and half duplex backpressure flow control
- Supports operating temperatures from -30 °C ~ +75 °C (For RS-405AF/RSM-405AF series)
- Redundant Power Inputs +12 V_{DC} ~ +48 V_{DC} (For RS-405AF/RSM-405AF series)

- Power failure alarm by relay output
- Modbus remote monitoring
- Supports Modbus OPC Server
- Store-and-forward architecture
- Built-in Cyber-Ring redundant technique
- Frame buffer memory: 512 Kbit
- 1024 MAC addresses
- DIN-Rail Mounting

Introduction

The RS-405F/RS-405AF/RSM-405F/RSM-405AF series is a 5-port Industrial Ethernet Real-time Redundant Ring Switch with 2-Fiber Port that secures data transmission by using fiber optic transmission to provide immunity from EMI/RFI interference.

Built-in ICP DAS Cyber-Ring technique enables multiple switches to be placed into a redundant ring. Typically the switch detects and recovers from a fiber or copper link failure within approximately 20 ms – for the majority of application, it is seamless. After unpacking the shipping case, it just takes one or two dip or rotary switch to make it work.
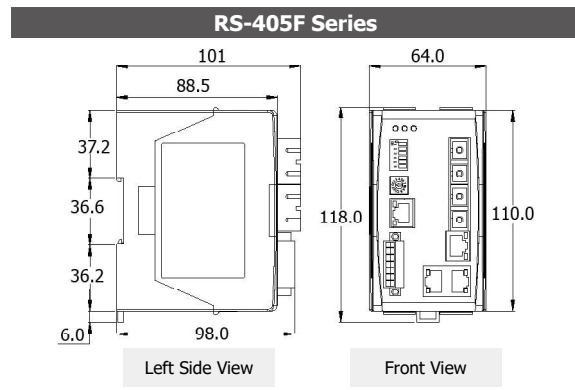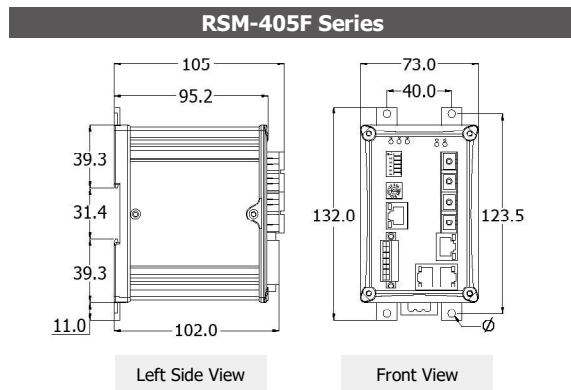
RS-405F/RS-405AF/RSM-405F/RSM-405AF provides two power inputs that can be connected simultaneously to live DC power sources. If one of the power inputs fails, the other live source will act as a backup to automatically support the it's power needs. And the relay output facility can deliver warning signal while power or network link failure.

Specifications

Models	RS-405F Series	RSM-405F Series	RS-405AF Series	RSM-405AF Series
Technology				
Standards	IEEE 802.3, 802.3u and 802.3x			
Processing Type	Store & forward, wire speed switching			
MAC Addresses	1024			
Memory Bandwidth	3.2 Gbps			
Frame Buffer Memory	512 Kbit			
Flow Control	IEEE 802.3x flow control, back pressure flow control			

Models	RS-405F Series	RSM-405F Series	RS-405AF Series	RSM-405AF Series
Interface				
RJ-45 Ports	10/100 Base-TX auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection			
Fiber Optics Port	100 Base-FX			
LED Indicators	10/100M, Link/Act, Full duplex/Half duplex (Fiber Port)			
Ethernet Isolation	1500 V$_{rms}$ 1 minute			
Multi-mode Multi-mode Fiber Cables	50/125, 62.5/125 or 100/140 μm			
Distance	2 km, (62.5/125 μm recommended) for full duplex			
Wavelength	1300 or 1310 nm			
Min. TX Output	-20 dBm			
Max. TX Output	-14 dBm			
Max. RX Sensitivity	-32 dBm			
Min. RX Overload	-8 dBm			
Budget	12 dBm			
Single-mode Single-mode Fiber Cables	8.3/125, 8.7/125, 9/125 or 10/125 μm			
Distance	30 km, (9/125 μm recommended) for full duplex			
Wavelength	1300 nm or 1310 nm			
Min. TX Output	-15 dBm			
Max. TX Output	-8 dBm			
Max. RX Sensitivity	-34 dBm			
Min. RX Overload	-5 dBm			
Budget	19 dBm			
Single-mode (60T) Single-mode Fiber Cables	8.3/125, 8.7/125, 9/125 or 10/125 μm			
Distance	60 km, (9/125 μm recommended) for full duplex			
Wavelength	1300 nm or 1310 nm			
Min. TX Output	-5 dBm			
Max. TX Output	0 dBm			
Max. RX Sensitivity	-35 dBm			
Min. RX Overload	-5 dBm			
Budget	30 dBm			
Ethernet ransmission Distance Ethernet	2-pair UTP/STP Cat.3, 4, 5, EIA/TIA-568 100 Ω			
Fast Ethernet	2-pair UTP/STP Cat. 5, EIA/TIA-568 100 Ω			
COM1	RS-232 (TxD, RxD and GND); Non-isolated			
COM2	RS-485 (D2+, D2-; Self-Tuner ASIC inside); Non-isolated			
Power				
Input Voltage Range	+10 V$_{DC}$ ~ +30 V$_{DC}$ Redundant Dual Inputs		+12 V$_{DC}$ ~ +48 V$_{DC}$ Redundant Dual Inputs	
Power Consumption	0.4 A @ 24 V$_{DC}$			
LED Indicator	Yes			
Protection	Power reverse polarity protection			
Mechanical				
Casing	Plastic	Metal	Plastic	Metal
Environmental Rating	IP30	IP30	IP30	IP30
Dimensions (W x L x H)	64 mm x 98 mm x 110 mm	75.2 mm x 102 mm x 110 mm	64 mm x 98 mm x 110 mm	75.2 mm x 102 mm x 110 mm
Installation	DIN-Rail Mounting	DIN-Rail or Wall Mounting	DIN-Rail Mounting	DIN-Rail or Wall Mounting
Environmental				
Operating Temperature	0 °C ~ +70 °C		-30 °C~ +75 °C	
Storage Temperature	-20 °C ~ +85 °C		-40 °C ~ +85 °C	
Ambient Relative Humidity	10% ~ 90% RH, non-condensing			
Accessories				
Option Cable	CA-090510			

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Managed Ethernet Switches

Dimensions (Units: mm)

RSM-405F Series

Left Side View   Front View

105
95.2
39.3
31.4
39.3
11.0
102.0
73.0
40.0
132.0   123.5

RS-405F Series

Left Side View   Front View

101
88.5
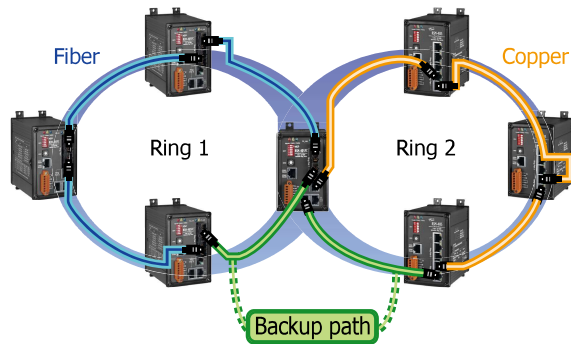37.2
36.6
36.2
6.0
98.0
64.0
118.0   110.0

Applications

Ring Coupling

The Ring Coupling topology can connect separate Cyber-Ring network together. It is ideal for two-ring application scene.

The Ring Coupling topology not only construct individual Cyber-Ring network for each floor but also provide backup path to each other. It is a cost-effective solution to coupling ring topology.

Fiber   Copper

Ring 1   Ring 2

Backup path

DIP/Rotary Switches

SW1: Redundancy mode configuration

	OFF	ON
1	Redundancy Mode	Tradition Mode
2	Normal State	Default Setting
3	Primary Switch	Secondary Switch
4	Ring Protocol	STP Protocol
5	Disable Ring Pair2	Enable Ring Pair2
6	Disable Ring Pair1	Enable Ring Pair1

SW2: Max. Recovery time selection

State	Time	State	Time	State	Time
F	1.5 s	9	900 ms	3	300 ms
E	1.4 s	8	800 ms	2	200 ms
D	1.3 s	7	700 ms	1	100 ms
C	1.2 s	6	600 ms	0	N/A
B	1.1 s	5	500 ms		
A	1.0 s	4	400 ms		

Ordering Information

RS-405FT CR	5-port Real-time Redundant Ring Switch with 2-Fiber Port, Multi-mode, ST Connector (RoHS)
RSM-405FT CR	5-port Real-time Redundant Ring Switch with 2-Fiber Port, Multi-mode, ST Connector, metal case (RoHS)
RS-405FC CR	5-port Real-time Redundant Ring Switch with 2-Fiber Port, Multi-mode, SC Connector (RoHS)
RSM-405FC CR	5-port Real-time Redundant Ring Switch with 2-Fiber Port, Multi-mode, SC Connector, metal case (RoHS)
RS-405FCS CR	5-port Real-time Redundant Ring Switch with 2-Fiber Port, Single-mode, SC Connector (RoHS)
RSM-405FCS CR	5-port Real-time Redundant Ring Switch with 2-Fiber Port, Single -mode, SC Connector, metal case (RoHS)
RS-405AFC-T CR	5-Port Real-time Redundant Ring Switch with 2-Fiber Port, Multi Mode, SC Type (+12 ~ +48 V_{DC}) (RoHS)
RS-405AFCS-T CR	5-Port Real-time Redundant Ring Switch with 2-Fiber Port, Single Mode, SC Type (+12 ~ +48 V_{DC}) (RoHS)
RS-405AFT-T CR	5-Port Real-time Redundant Ring Switch with 2-Fiber Port, Multi Mode, ST Type (+12 ~ +48 V_{DC}) (RoHS)
RSM-405AFC-T CR	5-Port Real-time Redundant Ring Switch with 2-Fiber Port, Multi Mode, SC Type, metal case (+12 ~ +48 V_{DC}) (RoHS)
RSM-405AFCS-T CR	5-Port Real-time Redundant Ring Switch with 2-Fiber Port, Single Mode, SC Type, metal case (+12 ~ +48 V_{DC}) (RoHS)
RSM-405AFT-T CR	5-Port Real-time Redundant Ring Switch with 2-Fiber Port, Multi Mode, ST Type, metal case (+12 ~ +48 V_{DC}) (RoHS)

Accessories

CA-090510	9-Pin Female D-Sub & RJ-45 Cable, 1 M Cable
MDR-20-24	24 V/1 A, 24 W Power Supply with DIN-Rail Mounting
DIN-KA52F	24 V/1.04 A, 25 W Power Supply with DIN-Rail Mounting
DR-120-24	24 V/5 A, 120 W Power Supply with DIN-Rail Mounting