

User Manual for SC09FPCR 1/2S 1/2F: Profibus DP to Fiber Repeater / Redundant Converter

Summary

This series is designed for industrial grade Profibus-DP Optical Fiber Repeater. It supports Profibus-DP protocol, support DIP switch for setting communication rate, 1 or 2 Profibus-DP bus, Redundancy optical fiber ring network. When fiber optic has error somewhere, the system will rebuild the network link within 20ms and guarantee the normal system communication. The system will recover automatically after the troubleshooting. The product is Industrial grad with IP40 protection, DIN rail mounting, DC (9 to 36v) power input, support optical fiber link failure and bus error alarm output, dual redundant power input and isolation protection. Operating Temperature of -40 to 75°C.

Characteristic

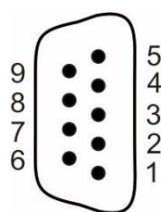
- Support 1 to 2 Profibus-DP ports.
- Support 1 to 2 Fiber Optic Ports, ST connector (SC, FC Optional)
- Support optical fiber link failure and Profibus bus error alarm output and LED indication
- Support DIP switch for setting communication rate
- Support Redundancy optical fiber ring network, recovery time < 20ms
- DC 9 to 36V dual redundant power input, With DC1500V voltage isolation and reverse polarity protection
- IP40 protection, , 35mm DIN-Rail Installation
- Operating Temperature : -40 to 75°C

Terminal Resistor

The Terminal resistors of the two ends of line should be on the state of “ON”, the ones of intermediate node should be on the state of “ OFF”.

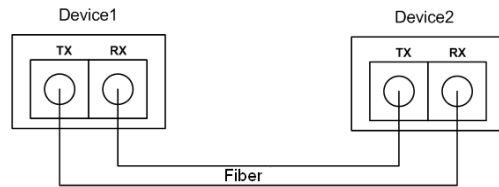
Connection

1. DP port wiring methods: 9-pin Sub-D socket connector.

Profile	Pin	Signal type	Definition
	1	Shield	Shield
	2	-	-
	3	RxD / TxD-P	Data line B
	4	-	-
	5	Ground	Data reference potential(ground)
	6	+5V Output	Supply voltage (+5V)
	7	-	-
	8	RxD /TxD -N	Data line A
	9	-	-

2. Fiber connection methods:

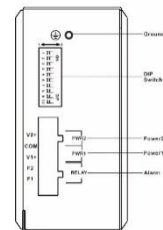
The RX connect to other side TX, and TX to RX accordingly. SC09FPCR 1S 1F is one fiber port device, suitable for point-to-point connection, SC09FPCR 1S 2F is dual fiber port device, suitable for bus network topology, one optical port (OPT1) to connect with front-end equipment, the other optical port (OPT2) with back-end equipment, optical fiber must be with cross connection.



3. Power connection as shown in the figure below, this device supports dual redundant input, V1+, V2+. COM is -ve terminal with double power input sharing.

4. Relay alarm output connection: F1, F2 in normal open.

5. When alarm, make F1, F2 both contacted in series with external alarm circuit (e.g., buzzer, etc.).



LED Indicators

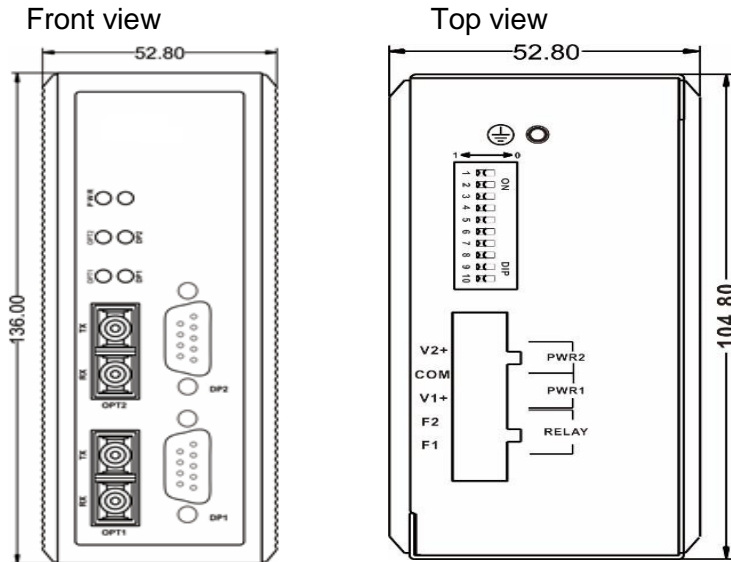
LED	state	Description	Alarm
PWR	Off	Non-connect or error	No
	Green	Power is ok	No
	Red	Power Error	No
OPT1-2	Off	Non-connect or error	No
	Red	1. No optical signal. 2. Optical port fault.	Yes
	Red blink	Optical failure, but data is being sent	Yes
	Green	Fiber link is normal	No
	Green Blink	Fiber link is normal, have data	No
DP1-2	Off	No Profibus Signal	No
	Red	1. No data received within 2 seconds. 2. Wrong setting.	Yes
	Red Blink	DP port fault but data being sent	Yes
	Green	DP port is normal	No
	Green Blink	DP port is normal, Receiving data	No

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Pune 411045, India

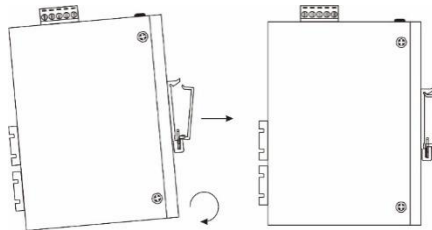


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Overall Dimension



DIN Rail Installation



SC09FPCR 1/2S 1/2F has 35mm DIN-Rail installation, the installation steps as shown in the pic.

Ring Network

SC09FPCR Networking topology can achieve 1. Point to Point communication, 2. Chain network, 3. Star network, 4. Redundant dual networks and fiber optic ring network with self-healing protection

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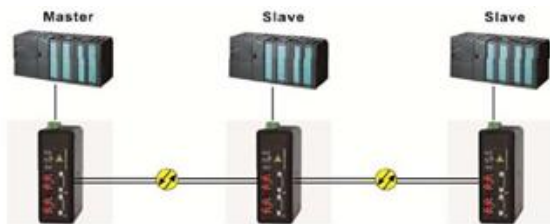
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Typical Application

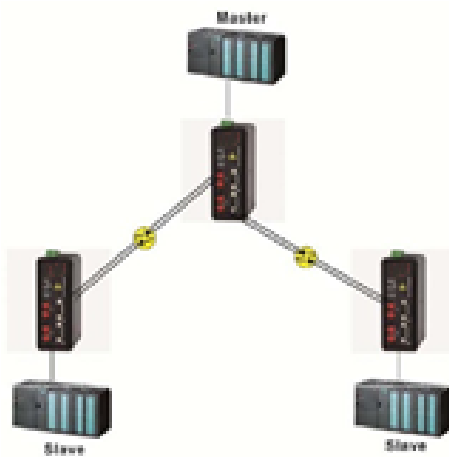
Point to Point



Daisy Chain



Star Topology

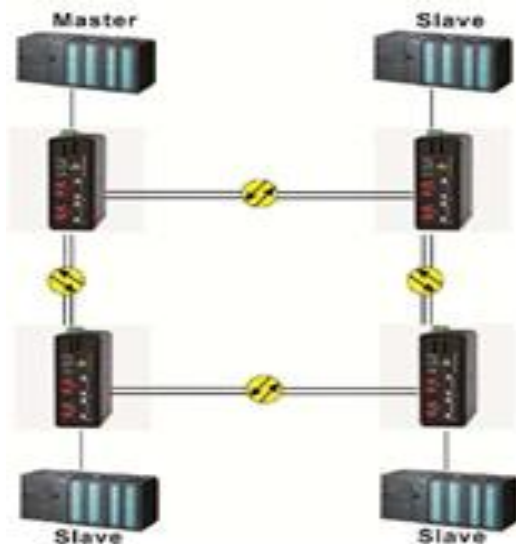


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Redundancy optical fiber ring network topology

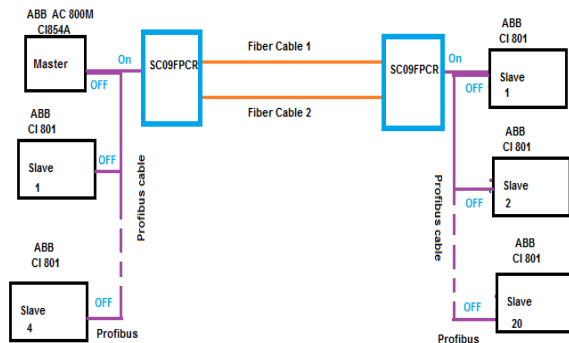


Baud rate switch settings

SW	Function
S1	=1(default) enable OPT1 Fiber port alarm output =0 disable OPT1 Fiber port error alarm output
S2	=1(default) enable OPT2 Fiber port alarm output =0 disable OPT2 Fiber port error alarm output
S3...S6	=0000 set DP1 bus rate as 9.6Kbps =0001 set DP1 bus rate as 19.2Kbps =0010 set DP1 bus rate as 45.45 Kbps =0011 set DP1 bus rate as 93.75Kbps =0100 set DP1 bus rate as 187.5Kbps =0101 set DP1 bus rate as 500Kbps =0110 set DP1 bus rate as 1.5Mbps =0111 set DP1 bus rate as 3Mbps =1000 set DP1 bus rate as 6M bps =1001 set DP1 bus rate as 12M bps =1111 set DP1 bus rate in Auto
S7...S10	=0000 set DP2 bus rate as 9.6Kbps =0001 set DP2 bus rate as 19.2Kbps =0010 set DP2 bus rate as 45.45Kbps =0011 set DP2 bus rate as 93.75Kbps =0100 set DP2 bus rate as 187.5Kbps =0101 set DP2 bus rate as 500Kbps =0110 set DP2 bus rate as 1.5Mbps =0111 set DP2 bus rate as 3Mbps =1000 set DP2 bus rate as 6M bps =1001 set DP2 bus rate as 12M bps =1111 set DP2 bus rate in Auto

Termination Resistors of the Profibus Cables : 2 Examples (For Understanding)

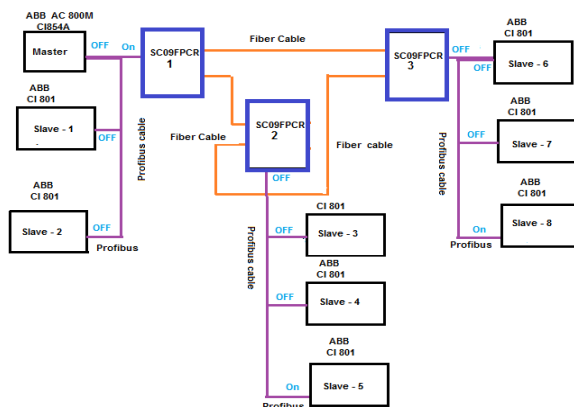
Setup 1: Point to Point communication



T/R DIP Switch selection details on Profibus “Y” cable

1. Termination Resistor Switches of both sides of the Profibus Cable connected to SC09FPCR should be ON.
2. All other Termination Resistor DIP Switches on the Profibus cables should OFF.

Setup 2: Ring Network Communication



T/R DIP Switch selection details on Profibus “Y” cable for Ring Network

1. Master SC09FPCR : ON at the Converter end.
2. All other Slave SC09FPCR's: ON only on the last multidropped Slaves device.
3. Other all Profibus cables Termination Resistors Switches are OFF.

Earthing

Each SC09FPCR needs to be earthed. The connector is near the DIP Switch
Last 2 ends of DP cable shields to be grounded. Ground not in our Converter but on a separate ground

Conditions Tested for :

- IEC61000-4-2(ESD): Power ± 2 KV Contact, ± 15 KV Air, Relay ± 2 KV Contact, ± 15 KV Air, Data Cable ± 15 KV Air
- IEC61000-4-4(EFT):Power ± 4 KV, Data Cable ± 4 KV
- IEC61000-4-5(Surge):Power ± 2 KV CM/ ± 1 KV DM, Relay ± 2 KV CM/ ± 1 KV DM
- IEC60068-2-27(Shock)
- IEC60068-2-32(Free Fall)
- IEC61000-6-2(General Industrial Standard)
- EN50121-4 (rail transit)