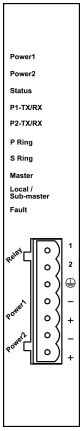
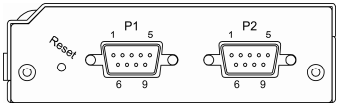
1. Quick Start Guide

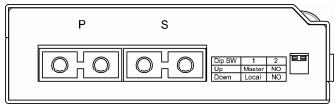
This quick start guide describes how to install and use the Industrial Serial Self-Healing Ring Fiber Modem. Capable of operating at temperature extremes of -10℃ to +60℃.

1.1. Physical Description

1.1.1. The Port Status LEDs and Power Inputs





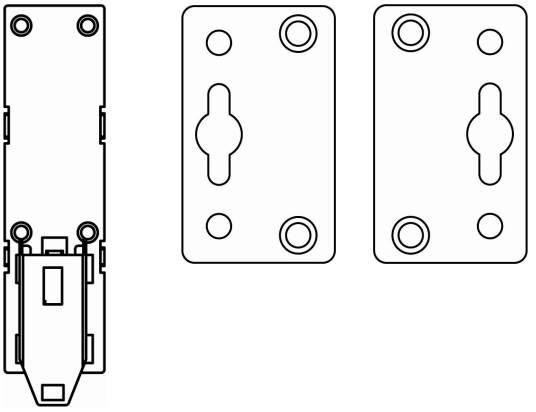


Power Input Assignment			
Power1	＋	12-32VDC	Terminal Block
	－	Power Ground	
Power2	＋	12-32VDC	
	－	Power Ground	
⏚		Earth Ground	
Relay Alarm Assignment			
Relay	*Warning signal disable for following: The relay contact closes if Power1 and/or Power2 are failed.		

LED	State	Indication
System		
Power 1 Power 2 (Green)	Steady	Power on
	Off	Power off
Status (Green)	Steady	Functioned
	Flashing	Reset
Fault (Orange)	Steady	Power or port link fails
	Off	Well Functioned
Machine mode		
Master (Green)	Steady	Master Mode
	Off	Off status
Sub-master/Local (Green)	Steady	Local Mode
	Flashing	Sub-master mode
	Off	Off status
Serial port		
Port 1 (TX/RX) Port 2 (TX/RX)	Flashing	Data transmitting
Ethernet port: 100Base-FX		
P Ring (Primary Ring) (Green)	Steady	A valid connection through Primary path
	Flashing	Ethernet port data transmitting
	Off	No valid connection established
S Ring (Secondary Ring) (Green)	Steady	A valid connection through Secondary path
	Flashing	Ethernet port data transmitting
	Off	No valid connection established

There are Terminal Block power inputs can be used to power up this device. Redundant power supplies function is supported.

1.1.2. DIN-Rail Kits and optional Panel Mounting Kits



1.1.3. DIP Switch Settings

DIP switch for Master and Sub-master/Local mode settings.

DIP switch	1	2
Up	Master	Function reserved
Down	Sub-master/Local (Default)	Function reserved

There should be only one master in a ring, and only master supports console configuration.

1.1.4. Pin Assignments of Serial Port

- DB-9

Pin	1	2	3	4	5	6	7	8	9
RS-232	DCD	RxD	TxD	DTR	Signal GND	DSR	RTS	CTS	RI
RS-422 4-wire RS-485	TxD+	RxD-	RxD+		Signal GND		TxD-		
2-wire RS-485		D-	D+		Signal GND				

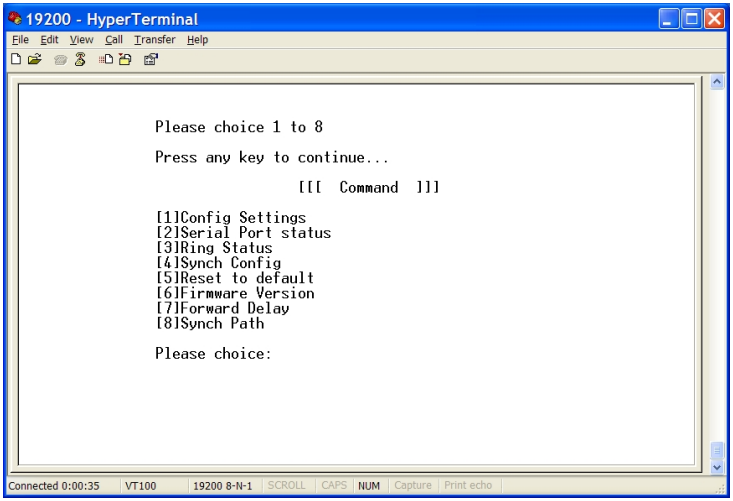
1.2. Functional Description

- Flexible Serial Ports: Supports 2 ports of RS-232/422/485.
- Dual LAN Ports: Supports network connection Self-Healing Ring function.
- Fiber Option: Supports single-mode and multi-mode fiber optics for both LAN ports.
- Redundant Power Input: Two Terminal Block power inputs ensure the continuous electrical stability.
- DNP3.0 transparency: Allows DNP protocol passed through.
- Flexible Installation Method: Aluminum housing with panel and DIN-Rail mounting.
- Warning: Inform user by relay output in case of power failure.
- Simple Configuration: Supports DIP switch for Master/Local settings.

1.3. Console Configuration

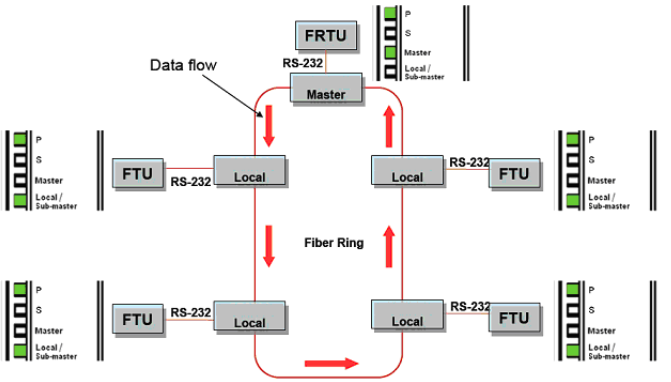
- Connect to the console port: Connect the DB9 straight cable to the RS-232 serial port of the device and the RS-232 serial port of the terminal or computer running the terminal emulation application. Direct access to the administration console is achieved by directly connecting a terminal or a PC equipped with a terminal-emulation program (such as HyperTerminal) to the console port.
- Configuration settings of the terminal-emulation program:

Baud rate	Data bits	Parity	Stop bit	Flow control
19,200bps	8	none	1	none

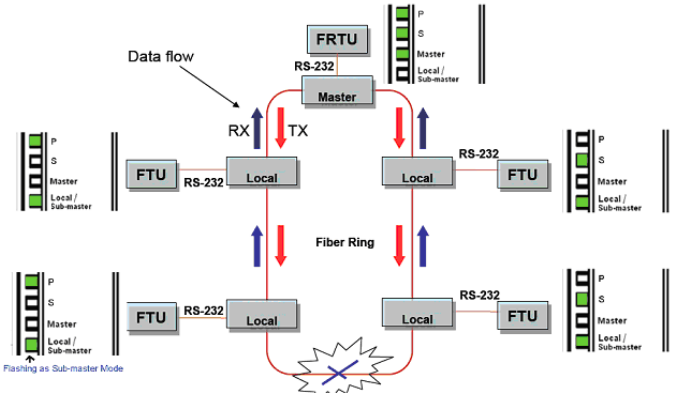


1.4. Self-Healing Ring

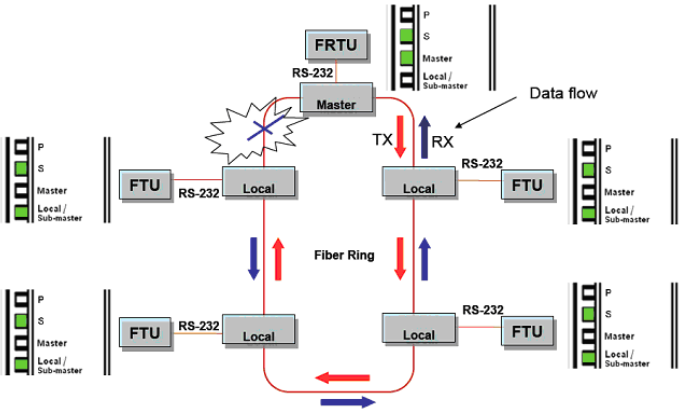
Self-Healing Ring Normal Status – Primary Ring



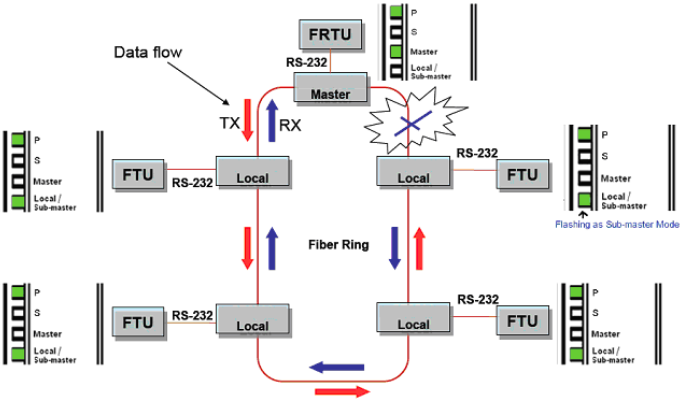
LED status– when Link Failure, scenario 1



LED status– when Link Failure, scenario 2



LED status – when Link Failure, scenario 3



2. Table of Contents

3. Introduction

3.1. Overview

This Industrial Serial to Ethernet Fiber Modem is a two serial ports to two Ethernet ports Industrial Self-Healing Ring Fiber Modem. It is an easy and reliable solution for bringing your serial based equipments to the Fast Ethernet networks. This Industrial Serial to Ethernet Fiber Modem supports ring topology and an ability of auto-switch to other data path when either link path fails. The Self-Healing Ring solution ensures the data is uninterrupted and in time notice administrator when any link fails. This function provides redundant network connection for the serial devices connected to this Industrial Serial to Ethernet Fiber Modem.

3.2. Features

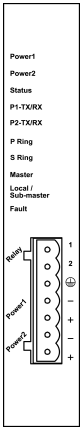
- Flexible Serial Ports: Supports 2 ports of RS-232/422/485.
- Dual LAN Ports: Supports network connection Self-Healing Ring function.
- Fiber Option: Supports single-mode and multi-mode fiber optics for both LAN ports.
- Redundant Power Input: Two Terminal Block power inputs ensure the continuous electrical stability.
- DNP3.0 transparency: Allows DNP protocol passed through.
- Flexible Installation Method: Aluminum housing with panel and DIN-Rail mounting.
- Warning: Inform user by relay output in case of power failure.
- Simple Configuration: Supports DIP switch for Master/Local settings.

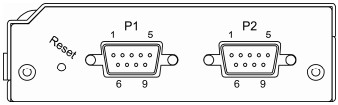
4. Getting Started

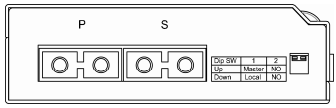
4.1. Packaging

- Industrial Serial to Ethernet Fiber Modem x 1
- Industrial Serial to Ethernet Fiber Modem Quick Start Guide x 1
- Product CD containing user's manual x 1

4.2. Interfaces







Industrial Serial to Ethernet Fiber Modem Interfaces

LED	State	Indication
System		
Power 1 Power 2 (Green)	Steady	Power on
	Off	Power off
Status (Green)	Steady	Functioned
	Flashing	Reset
Fault (Orange)	Steady	Power or port link fails
	Off	Well Functioned
Machine mode		

Master (Green)	Steady	Master Mode
	Off	Off status
Sub-master/Local (Green)	Steady	Local Mode
	Flashing	Sub-master mode
	Off	Off status
Serial port		
Port 1 (TX/RX) Port 2 (TX/RX)	Flashing	Data transmitting
Ethernet port: 100Base-FX		
P Ring (Primary Ring) (Green)	Steady	A valid connection through Primary path
	Flashing	Ethernet port data transmitting
	Off	No valid connection established
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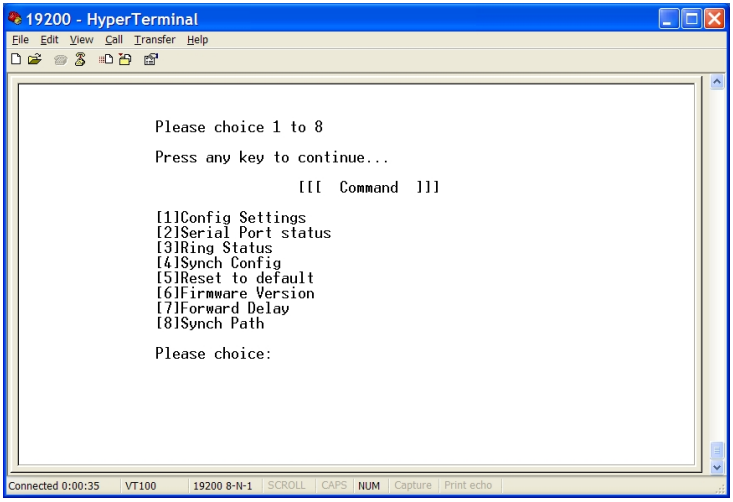
	Flashing	Ethernet port data transmitting
	Off	No valid connection established

Power Input Assignment			
Power1	+	12-32VDC	Terminal Block
	−	Power Ground	
Power2	+	12-32VDC	
	−	Power Ground	
⏚		Earth Ground	
Relay Alarm Assignment			
Relay	*Warning signal disable for following: The relay contact closes if Power1 and/or Power2 are failed.		

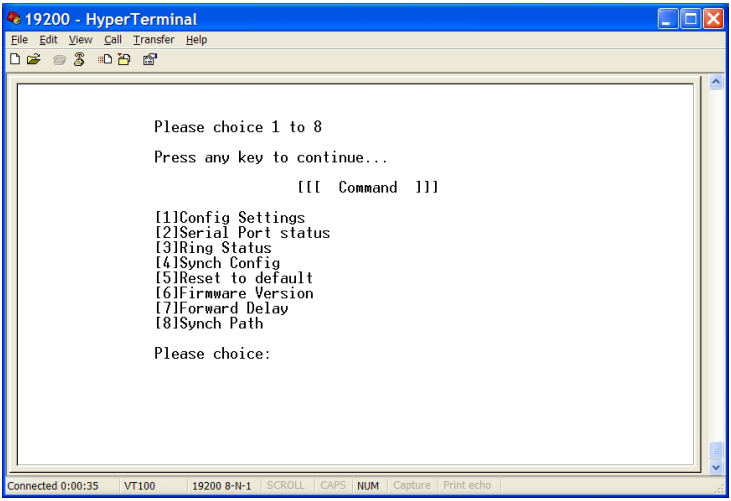
4.3. Console Configuration

- Connect to the console port: Connect the DB9 straight cable to the RS-232 serial port of the device and the RS-232 serial port of the terminal or computer running the terminal emulation application. Direct access to the administration console is achieved by directly connecting a terminal or a PC equipped with a terminal-emulation program (such as HyperTerminal) to the console port.
- Configuration settings of the terminal-emulation program:

Baud rate	Data bits	Parity	Stop bit	Flow control
19,200bps	8	none	1	none



5. Console Configuration



Command page

5.1. Config Settings

Please type “1” (Config Settings) and press <enter> to enter “Serial Communication Parameter Settings” page.

Serial Communication Parameter Settings	
[1]	ProtocolTimeoutDetect Settings
[2]	Baud Rate Settings
[3]	Data Bit Settings
[4]	Stop Bit Settings
[5]	Parity Settings
[6]	Mode Settings
[7]	Flow Control Settings
[8]	Use Delimiter 1 Settings
[9]	Use Delimiter 2 Settings
[10]	ForceTransmit Settings
[11]	Save Config
[12]	Serial Status

[Q]	Exit

5.1.1. ProtocolTimeoutDetect Settings

Please type “1” (ProtocolTimeoutDetect Settings) and press <enter> to enter “Protocol Timeout Detect” page. The default ProtocolTimeoutDetect Settings is “Disable”.

Protocol Timeout Detect	
[1]	Enable
[2]	Disable
[Q]	Exit

1. [1] – Enable:
Please type “1” (Enable) and press <enter> to enter “Set Protocol Timeout” page and enable Industrial Serial Self-Healing Ring Fiber Modem to automatically test the TCP connection to remote host. If the TCP connection is idle, the TCP connection will be closed and the serial port will be freed for other hosts.

Set Protocol Timeout	
[0] ~ [99] ms	0 ~ 99 ms
[Q]	Exit

[0] ~ [99] ms:
Type a period of Protocol Timeout assigned to the serial port on the Industrial Serial Self-Healing Ring Fiber Modem. The connection will be closed and the serial port will be freed for connection with other hosts when serial port stops data transmission for a defined period of time (Protocol Timeout). The default Protocol Timeout is 0 ms.

[Q] - Exit:
Please type “Q” and press <enter> to exit to “Serial Communication Parameter Settings” page.

2. [2] – Disable:
Please type “2” (Disable) and press <enter> to disable

Industrial Serial Self-Healing Ring Fiber Modem to automatically test the TCP connection to remote host.

3. [Q] - Exit:
Please type "Q" (Exit) and press <enter> to exit to "Serial Communication Parameter Settings" page.

5.1.2. Baud Rate Settings

Please type "2" (Baud Rate Settings) and press <enter> to enter "Baud Rate" page. The default Baud Rate Settings is 9600 bps.

Baud rate			
[1]	50	[11]	4800
[2]	75	[12]	9600
[3]	110	[13]	19200
[4]	134	[14]	38400
[5]	150	[15]	57600
[6]	200	[16]	115200
[7]	300	[17]	230400
[8]	600	[18]	460800
[9]	1200	[Q]	Exit
[10]	2400		

1. Baud Rate:
Please type "1" ~ "18" (50 ~ 460800 bps) and press <enter> to set Baud rate for serial port.

2. [Q] - Exit:
Please type "Q" (Exit) and press <enter> to exit to "Serial Communication Parameter Settings" page.

5.1.3. Data Bit Settings

Please type "3" (Data Bit Settings) and press <enter> to enter "Data bits" page. The default Data Bit Settings is 8 bits.

Data bits

[1]	5
[2]	6
[3]	7
[4]	8
[Q]	Exit

1. Data bits:
Please type "1" ~ "4" (5 ~ 8 bits) and press <enter> to set Data bits for serial port.

2. [Q] - Exit:
Please type "Q" (Exit) and press <enter> to exit to "Serial Communication Parameter Settings" page.

5.1.4. Stop Bit Settings

Please type "4" (Stop Bit Settings) and press <enter> to enter "Stop bits" page. The default Stop Bit Settings is 1 bit.

Stop bits	
[1]	1
[2]	2
[Q]	Exit

1. Stop bits:
Please type "1" ~ "2" (1 ~ 2 bits) and press <enter> to set Stop bits for serial port.

2. [Q] - Exit:
Please type "Q" (Exit) and press <enter> to exit to "Serial Communication Parameter Settings" page.

5.1.5. Parity Settings

Please type "5" (Parity Settings) and press <enter> to enter "Parity" page. The default Parity Settings is "None".

Parity	
[1]	None

[2]	Odd
[3]	Even
[4]	Mark
[5]	Space
[Q]	Exit

1. Parity:
Please type “1” ~ “5” (None, Odd, Even, Mark, or Space) and press <enter> to set Parity for serial port.

2. [Q] - Exit:
Please type “Q” (Exit) and press <enter> to exit to “Serial Communication Parameter Settings” page.

5.1.6. Mode Settings

Please type “6” (Mode Settings) and press <enter> to enter “Mode” page. The default Mode Settings is “RS232”.

Mode	
[1]	RS232
[2]	RS485
[3]	RS422
[Q]	Exit

1. Mode:
Please type “1” ~ “3” (RS232, RS485, or RS422) and press <enter> to set Mode for serial port.

2. [Q] - Exit:
Please type “Q” (Exit) and press <enter> to exit to “Serial Communication Parameter Settings” page.

5.1.7. Flow Control Settings

Please type “7” (Flow Control Settings) and press <enter> to enter “Flow control” page. The default Flow Control Settings is “None”.

Flow control	
[1]	None
[2]	Hardware
[3]	Software
[Q]	Exit

1. Flow control:
Please type "1" ~ "3" (None, Hardware, or Software) and press <enter> to set Flow control for serial port.

2. [Q] - Exit:
Please type "Q" (Exit) and press <enter> to exit to "Serial Communication Parameter Settings" page.

5.1.8. Use Delimiter 1 Settings

Please type "8" (Use Delimiter 1 Settings) and press <enter> to enter "Delimiter 1" page. The default Use Delimiter 1 Settings is "Disable". Enable Delimiter 1. The data will be transmitted if the Delimiter 1 is received. Enable Delimiter 1 and Delimiter 2. The data will be transmitted if the Delimiter 1 and Delimiter 2 are received.

Delimiter 1	
[1]	Enable
[2]	Disable
[Q]	Exit

1. [1] – Enable:
Please type "1" (Enable) and press <enter> to enter "Set Delimiter 1" page.

Set Delimiter 1	
[00] ~ [ff] hex	[00] ~ [ff]
[Q]	Exit

[00] ~ [ff] hex:
Please type "00" ~ "ff" and press <enter> to set Delimiter 1 for serial port.

[Q] - Exit:
Please type “Q” and press <enter> to exit to “Serial Communication Parameter Settings” page.

2. [2] – Disable:
Please type “2” (Disable) and press <enter> to disable Use Delimiter 1 Settings.

3. [Q] - Exit:
Please type “Q” (Exit) and press <enter> to exit to “Serial Communication Parameter Settings” page.

5.1.9. Use Delimiter 2 Settings

Please type “9” (Use Delimiter 2 Settings) and press <enter> to enter “Delimiter 2” page. The default Use Delimiter 2 Settings is “Disable”. Enable Delimiter 1. The data will be transmitted if the Delimiter 1 is received. Enable Delimiter 1 and Delimiter 2. The data will be transmitted if the Delimiter 1 and Delimiter 2 are received.

Delimiter 2	
[1]	Enable
[2]	Disable
[Q]	Exit

1. [1] – Enable:
Please type “1” (Enable) and press <enter> to enter “Set Delimiter 2” page.

Set Delimiter 2	
[00] ~ [ff] hex	[00] ~ [ff]
[Q]	Exit

[00] ~ [ff] hex:
Please type “00” ~ “ff” and press <enter> to set Delimiter 2 for serial port.

[Q] - Exit:

Please type “Q” and press <enter> to exit to “Serial Communication Parameter Settings” page.

2. [2] – Disable:
Please type “2” (Disable) and press <enter> to disable Use Delimiter 2 Settings.

3. [Q] - Exit:
Please type “Q” (Exit) and press <enter> to exit to “Serial Communication Parameter Settings” page.

5.1.10. ForceTransmit Settings

Please type “10” (ForceTransmit Settings) and press <enter> to enter “ForceTransmit” page. The default ForceTransmit Settings is 0 ms. Specify ForceTransmit for the serial port. The data will be transmitted when the ForceTransmit is reached.

ForceTransmit	
[0] ~ [999] ms	0 ~ 999 ms
[Q]	Exit

1. ForceTransmit:
Please type “0” ~ “999” (0 ~ 999 ms) and press <enter> to set ForceTransmit for serial port.

2. [Q] - Exit:
Please type “Q” (Exit) and press <enter> to exit to “Serial Communication Parameter Settings” page.

5.1.11. Save Config

Please type “11” (Save Config) and press <enter> to save configuration. Then press any key to exit to “Serial Communication Parameter Settings” page.

5.1.12. Serial Status

Please type “12” (Serial Status) and press <enter> to show status of serial port. Then press any key to exit to “Serial Communication Parameter Settings” page.

5.1.13. Exit

Please type “Q” (Exit) and press <enter> to exit to “Command” page.

5.2. Serial Port Status

Please type “2” (Serial Port Status) and press <enter> to show status of serial port. Then press any key to exit to “Command” page.

5.3. Ring Status

Please type “3” (Ring Status) and press <enter> to enter “MACs on the ring” page.

MACs on the ring	
[1]	All MACs
[2]	Refresh ring status
[Q]	Exit

5.3.1. All MACs

Please type “1” (All MACs) and press <enter> to show all MAC addresses on the ring.

5.3.2. Refresh Ring Status

Please type “2” (Refresh ring status) and press <enter> to refresh ring status. Then press any key to exit to “MACs on the ring” page.

5.3.3. Exit

Please type “Q” (Exit) and press <enter> to exit to “Command” page.

5.4. Synch Config

Please type “4” (Synch Config) and press <enter> to enter “Synch Config” page.

Synch Config	
[1]	Yes
[2]	No

1. [1] – Yes:
Please type “1” (Yes) and press <enter> to synchronize configuration. Then press any key to exit to “Command” page.

2. [2] – No:
Please type “2” (No) and press <enter> to exit to “Command” page.

5.5. Reset To Default

Please type “5” (Reset to default) and press <enter> to enter “Reset to default” page.

Reset to default	
[1]	Yes
[2]	No

1. [1] – Yes:
Please type “1” (Yes) and press <enter> to reset to default. This Industrial Serial to Ethernet Fiber Modem will reboot and back to “Command” page.

2. [2] – No:

Please type “2” (No) and press <enter> to exit to “Command” page.

5.6. Firmware Version

Please type “6” (Firmware Version) and press <enter> to show firmware version. Then press any key to exit to “Command” page.

5.7. Forward Delay

Please type “7” (Forward Delay) and press <enter> to enter “Set Forward Delay” page. The default Forward Delay is 10 seconds.

Set Forward Delay	
[10] ~ [100] second	10 ~ 100 seconds
[Q]	Exit

1. Set Forward Delay:

Please type “10” ~ “100” (10 ~ 100 seconds) and press <enter> to set Forward Delay for serial port.

2. [Q] - Exit:

Please type “Q” (Exit) and press <enter> to exit to “Command” page.

5.8. Synch Path

Please type “8” (Synch Path) and press <enter> to enter “Synch Path” page.

Synch Path	
[1]	Yes
[2]	No

1. [1] – Yes:

Please type “1” (Yes) and press <enter> to synchronize path.

2. [2] – No:
Please type “2” (No) and press <enter> to exit to “Command” page.

6. Specifications

6.1. Overview

Applicable Standards	IEEE 802.3u 100Base-FX
Switching Method	Store-and-Forward
Forwarding Rate	
100Base-FX	200Mbps full-duplex
Performance	148,810pps for 100Mbps
Cable	
100Base-FX	50 or 62.5/125μm multi-mode fiber (1310nm) up to 2km 9 or 10/125μm single-mode fiber (1310nm) up to 75km
Serial Port	
Interface	RS-232/422/485
Connector	DB9 (2-port RS-232/422/485)
Serial Communication Parameters	
Parity	None, Even, Odd, Mark, Space
Data Bits	5, 6, 7, 8
Stop Bit	1, 2
Flow Control	None, Hardware, Software
Speed	50bps to 460.8Kbps
LED Indicators	Per unit – Power status (Power 1, 2), Status, Fault, Master, Sub-master/Local Ethernet port – P Ring (Primary Ring), S Ring (Secondary Ring) Serial port – Port 1 TX/RX, Port 2 TX/RX
Dimensions	100mm (W) x 125mm (D) x 30mm (H) (3.94” (W) x 4.92” (D) x 1.18” (H))
Net Weight	0.3Kg (0.66lb.)
Power Input	Terminal Block: 12~32VDC
Power Consumption	5.76W Max. 0.48A @ 12VDC, 0.24A @ 24VDC
Operating Temperature	-10℃ to 60℃ (14℉ to 140℉)
Storage Temperature	-20℃ to 85℃ (-4℉ to 185℉)
Humidity	5%-95% non-condensing
Emission Compliance	CE Mark Class A FCC Part 15 Class A VCCI Class A

6.2. Pin Assignments

Pin assignments for serial port

DB-9:

Pin#	RS-232	RS-422 4-wire RS-485	2-wire RS-485
1	DCD	TxD+	
2	RxD	RxD-	D-
3	TxD	RxD+	D+
4	DTR		
5	Signal GND	Signal GND	Signal GND
6	DSR		
7	RTS	TxD-	
8	CTS		
9	RI		