

# SER-4485-SI-M USER'S MANUAL

2019 Edition



Titan Electronics Inc.  
Web: [www.titan.tw](http://www.titan.tw)

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## Contents

INTRODUCTION .....	3
FEATURES .....	4
SPECIFICATIONS .....	5
HARDWARE SETTINGS.....	6
Block Diagram of SER-4485-SI-M .....	6
Installation .....	7
PIN-OUT INFORMATION .....	9
Terminal Block (TB3) Pin-out .....	9
Terminal Block (TB1) Pin-out .....	9
APPLICATIONS.....	10
1. Connect to a RS-232 port of computer.....	10
2. Connect to existing RS-485 bus.....	10
3. Connect to a RS-232 port for more RS-485 devices .....	11
4. Connect to existing RS-485 bus for more RS-485 devices .....	11

## INTRODUCTION

The SER-4485-SI-M is an industrial-grade RS-232/485 to optically isolated 4-port RS-485 repeater/splitter/hub. This RS-485 hub is designed to expand a RS-485 channel in the RS-485 network to four RS-485 channels. It has one RS-232/RS-485 upstream input port and four independent downstream RS-485 output ports. Data received from the input channel will be simultaneously transmitted to all the four downstream RS-485 channels. Data received from the downstream RS-485 ports is forwarded back to the upstream port only, and is not sent to any other RS-485 ports in the loop. Each RS-485 output port is designed with an individual driver. The failure of any RS-485 ports in the downstream loop will not affect the normal function of the other RS-485 ports to ensure reliable operation.

The SER-4485-SI-M 4-Port RS-485 hubs can be added to RS-485 network to increase the maximum nodes up to 512 nodes of RS-485 devices and to increase the transmission distance more than 1.2km with stable and reliable performance.

The SER-4485-SI-M is optically isolated with 3000VDC optical isolation. The optical isolation protects your PC or RS-485 devices from spikes and surges on the RS-485 network, by converting the electrical pulse into an optical signal and then changing it back into an electrical pulse. Your computer or related RS-485 device is well protected, since the surges and spikes cannot cross the optical link. The SER-4485-SI-M is protected by surge protector to withstand electrostatic discharge and power surges up to 600W. Surge suppression on all signals prevent from damages caused by lightning or high voltage.

The SER-4485-SI-M provides failure warning and protected circuit for 4 independent RS-485 output ports. It is an effective solution for the connection of multiple RS-485 devices and reliability enhancement. The failure warning and protected circuit can suffice to protect the communication system. When any of the RS-485 ports has incorrect signals or reversed connection, the protected circuit can breakdown the RS-485 port automatically. The breakdown port will be isolated to ensure that other RS-485 devices work normally. The user can locate the failed port or devices connected using the failure indication LEDs.

## FEATURES

- Industrial-grade 4 port RS-485 hub/splitter/repeater with rugged metal case
- Isolates and protects RS-485 devices from a RS-485 bus
- Electrical isolation up to 3000VDC from RS-485 upstream port to RS-485 downstream port
- Suitable for DIN-rail mounting
- 600W surge protection circuit on all RS-485 bus (downstream and upstream ports)
- RS-232 and RS-485 input interface options
- Supports transmission data rate up to 230.4kbps
- Provides failure warning and protected circuit for four RS-485 downstream ports
- LEDs for power, communication and error status indication
- Input power connector with screw holes to lock the power cable
- 12VDC power adapter included
- With diode bridge circuit to avoid wrong polarity input DC power
- Wide ambient temperature operation 0°C to 60°C (32°F to 140°F)
- CE, FCC approval

## SPECIFICATIONS

Interface		
Ports	Input (upstream)	1 RS-485 port (Data+, Data-) or 1 RS-232 port (TxD, RxD, GND)
	Output (downstream)	4 RS-485 ports (Data+, Data-)
Transmission Media		2P twisted-pair or shielded cable
Transfer Distance		1.2km at 9.6kbps 400m at 115.2kbps
Max. Devices Supported		128 devices each channel
Speed		300bps to 230.4kbps
ESD Protection		15kV
Isolation		3000VDC
Connection		6-pin terminal block for upstream 10-pin terminal block for downstream

LED Indicators		
LEDs	Power	1 (PWR, Red)
	Port Status	2 (TxD: Green, RxD: Yellow)
	Error Status	4 (Err1, Err2, Err3, Err4: Red)

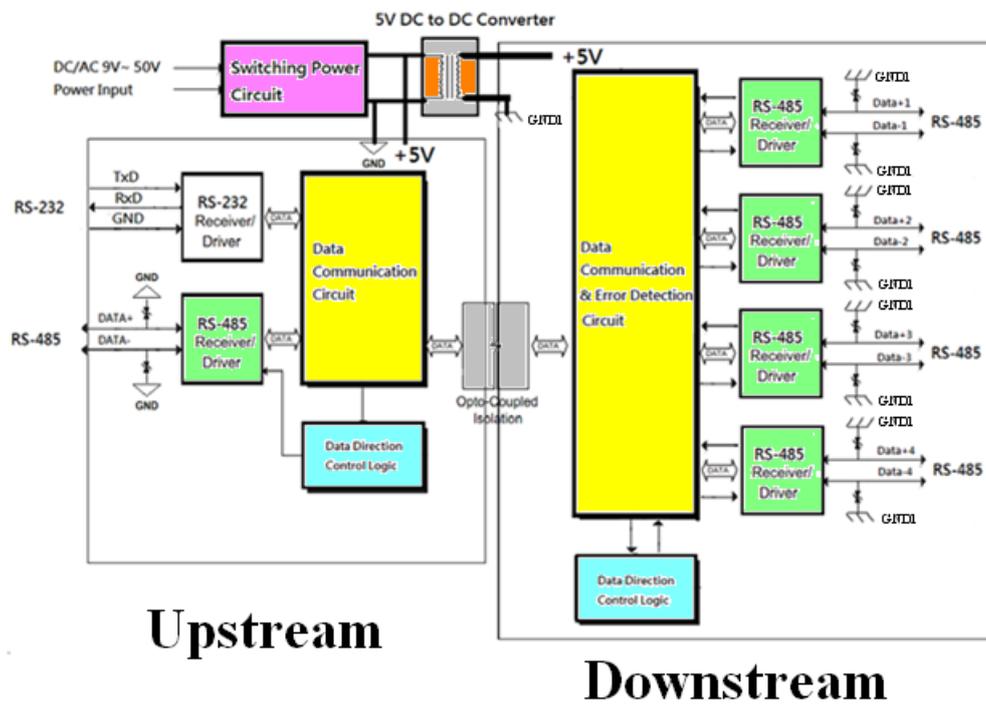
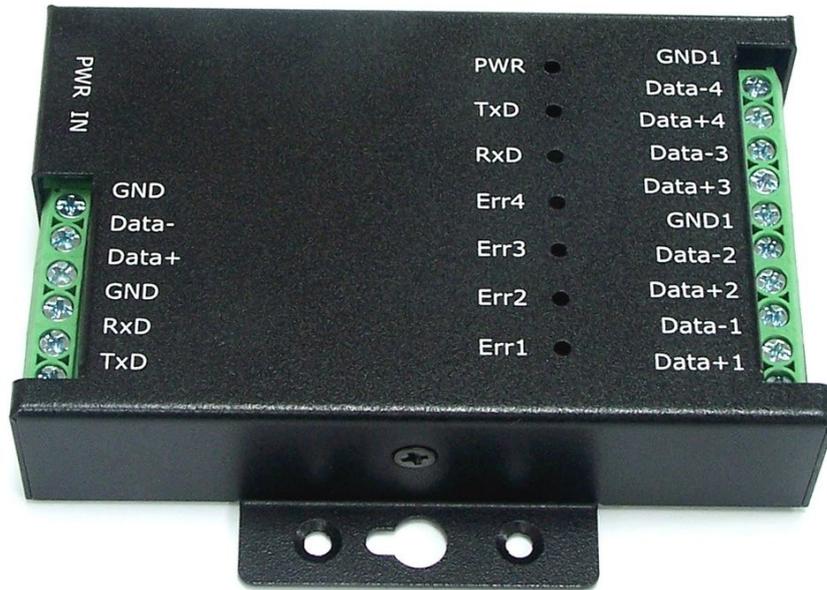
Power	
Input Power Range	DC or AC +9V~48V
Power Consumption	1.5W (max)

Mechanical	
Housing	Rugged metal case
Weight	200g
Dimensions	62mm × 93mm × 24mm (W × L × H) 85mm × 93mm × 24mm (W × L × H) with DIN-rail ears
Installation	DIN-Rail

Environment	
Operating Temperature	0°C to 60°C
Storage Temperature	-40°C to 85°C
Humidity	0 to 80% RH. Noncondensing

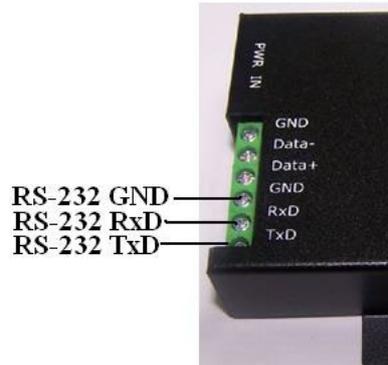
# HARDWARE SETTINGS

Block Diagram of SER-4485-SI-M

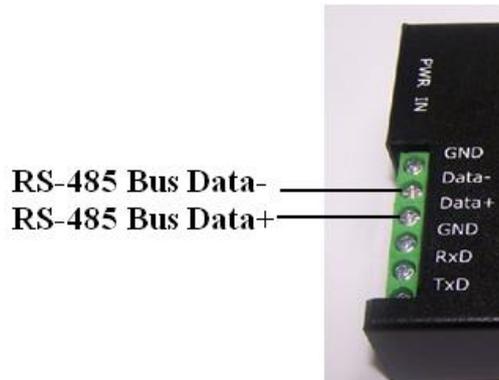


## Installation

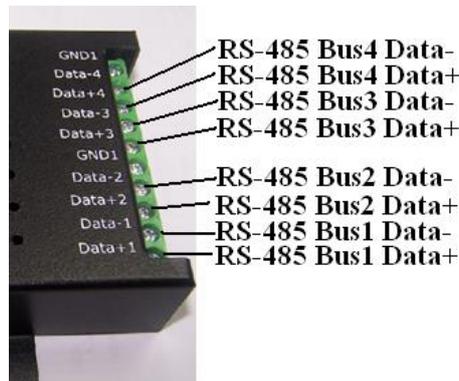
- For converting RS-232 to RS-485, connect the data cable to TxD, RxD and GND signals in upstream ports of SER-4485-SI-M. You need to connect the TxD pin to an external RS-232 TxD signal (pin3 of DB9), the RxD pin to an external RS-232 RxD signal (pin2 of DB9) and the GND pin to external RS-232 GND pin (pin5 of DB9).



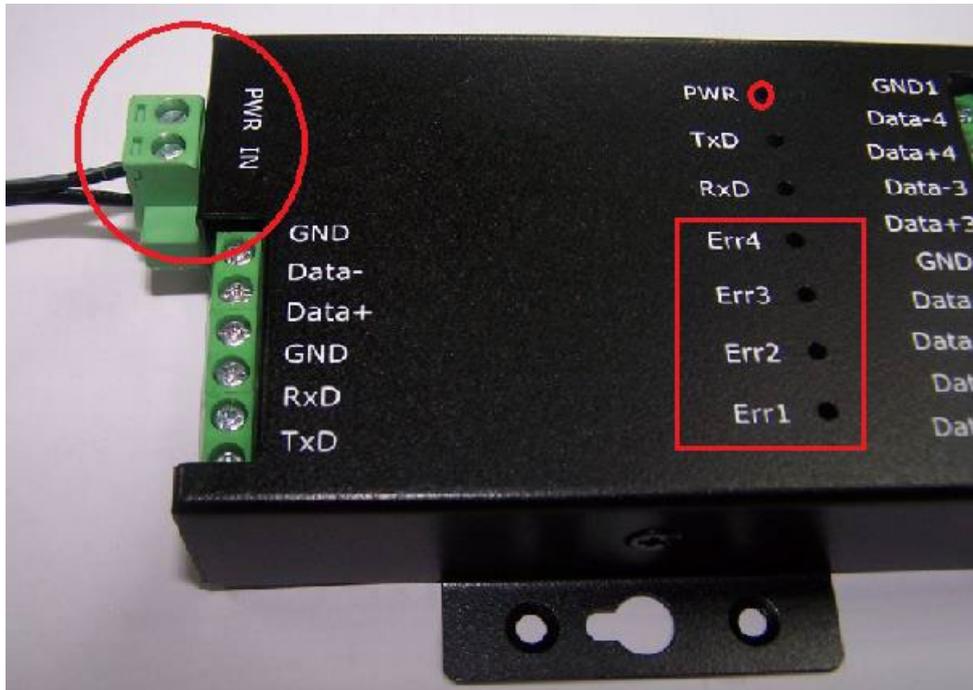
- For converting RS-485 to RS-485 hub, connect the data cable to the Data+, Data- in upstream ports of SER-4485-SI-M. You need to connect the Data+ pin to the Data+ signal of an external RS-485 bus and the Data- pin to the Data- signal of an external RS-485 bus.



- Connect the data cable to the Data+1~4, Data-1~4 in downstream ports of SER-4485-SI-M for four RS-485 bus or devices.



2. Connect your AC power adapter to SER-4485-SI-M 4-Port RS-485 hub. The red power LED will light when the hub is receiving power. The SER-4485-SI-M provides failure warning and protected circuit for 4 independent RS-485 downstream ports. The failure indication LEDs Err1~ Err4 will light, when any one of the RS-485 ports has incorrect signals or reversed connection. The user can locate the failed port or devices connected, according to the failure indication LEDs. Err1 indicates the RS-485 Bus1, Err2 the RS-485 Bus2, and so on.



The SER-4485-SI-M power input is designed with a diode bridge circuit. You don't need to care the input DC power polarity, and you can also use an AC to AC 9V ~ 48V power adapter for SER-4485-SI-M.

3. After the SER-4485-SI-M is connected to all external devices, you can start data communication program to transmit and receive serial data. When the upstream port of SER-4485-SI-M sends data to downstream ports, the green TxD LED will illuminate. When the upstream port receives data from downstream ports, the yellow RxD LED will illuminate.

## PIN-OUT INFORMATION

### Terminal Block (TB3) Pin-out

The following are the connector pin-outs for 6-pin terminal block connector.

Pin Number	Pin Type	Description
<b>1 TxD</b>	<i>Input</i>	Receive data from RS-232 TxD signal
<b>2 RxD</b>	<i>Output</i>	Send data to RS-232 RxD signal
<b>3 GND</b>	<i>Ground</i>	GND: signal ground
<b>4 Data+</b>	<i>Input/Output</i>	RS-485 transmit/receive data, positive polarity
<b>5 Data-</b>	<i>Input/Output</i>	RS-485 transmit/receive data, negative polarity
<b>6 GND</b>	<i>Ground</i>	GND: signal ground

### Terminal Block (TB1) Pin-out

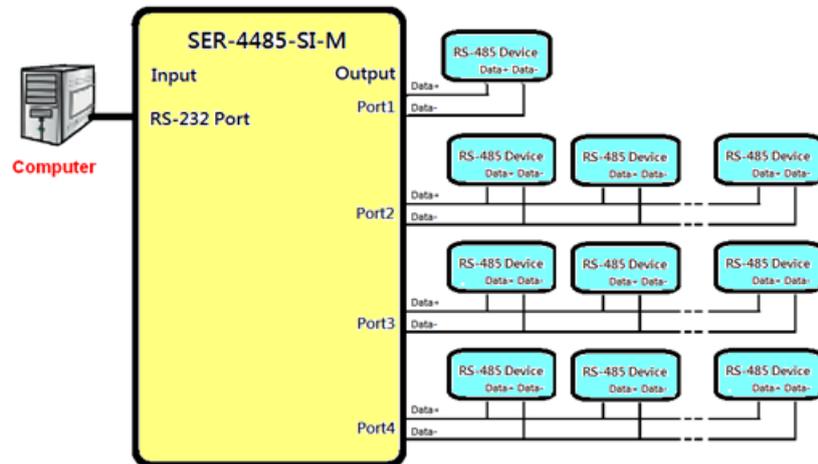
The following are the connector pin-outs for 10-pin terminal block connector (slave).

Pin Number	Pin Type	Description
<b>1 Data1+</b>	<i>Input/Output</i>	RS-485 Port 1: transmit/receive data, positive polarity
<b>2 Data1-</b>	<i>Input/Output</i>	RS-485 Port 1: transmit/receive data, negative polarity
<b>3 Data2+</b>	<i>Input/Output</i>	RS-485 Port 2: transmit/receive data, positive polarity
<b>4 Data2-</b>	<i>Input/Output</i>	RS-485 Port 2: transmit/receive data, negative polarity
<b>5 GND</b>	<i>Ground</i>	GND: isolated signal ground
<b>6 Data3+</b>	<i>Input/Output</i>	RS-485 Port 3: transmit/receive data, positive polarity
<b>7 Data3-</b>	<i>Input/Output</i>	RS-485 Port 3: transmit/receive data, negative polarity
<b>8 Data4+</b>	<i>Input/Output</i>	RS-485 Port 4: transmit/receive data, positive polarity
<b>9 Data4-</b>	<i>Input/Output</i>	RS-485 Port 4: transmit/receive data, negative polarity
<b>10 GND</b>	<i>Ground</i>	GND: isolated signal ground

# APPLICATIONS

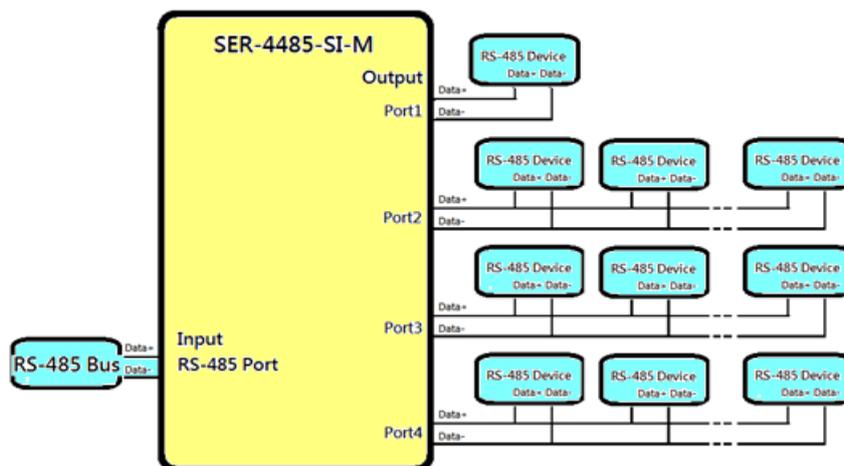
## 1. Connect to a RS-232 port of computer

The SER-4485-SI-M can convert RS-232 to RS-485 interfaces for extension to 4 highly reliable RS-485 interfaces.



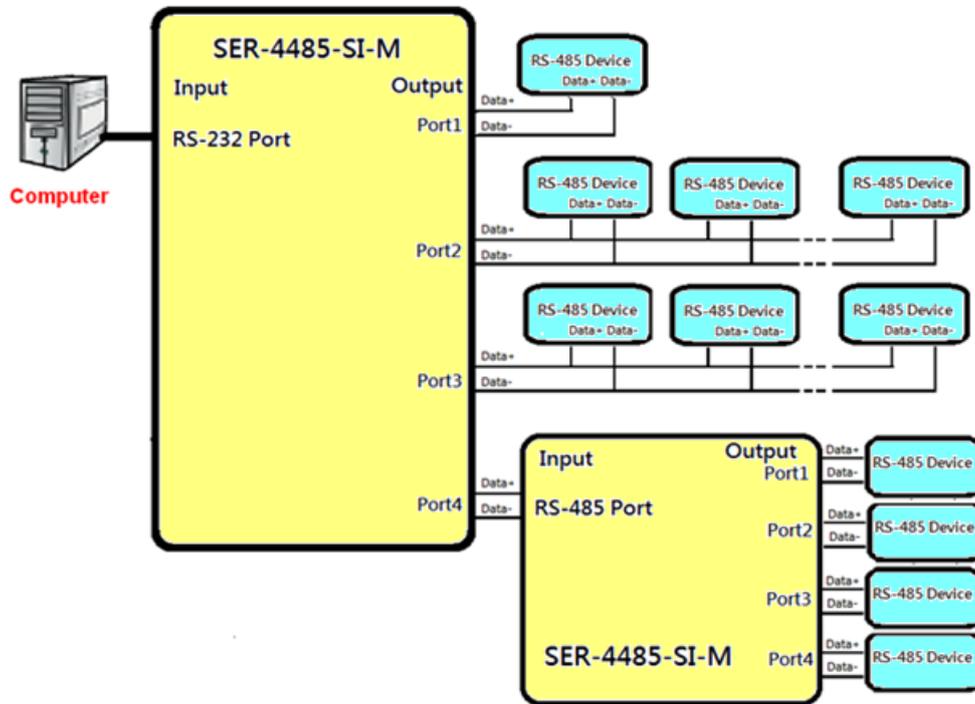
## 2. Connect to existing RS-485 bus

The SER-4485-SI-M can connect to existing RS-485 bus for extension to 4 highly reliable RS-485 interfaces, and as many as 128 RS-485 hubs are supported on each RS-485 bus.



### 3. Connect to a RS-232 port for more RS-485 devices

The SER-4485-SI-M can convert RS-232 to RS-485 interfaces for extension to more highly reliable RS-485 interfaces.



### 4. Connect to existing RS-485 bus for more RS-485 devices

The SER-4485-SI-M can connect to existing RS-485 bus for extension to more highly reliable RS-485 interfaces, and as many as 128 RS-485 hubs are supported on each RS-485 bus.

