

# OPTI-Solar RS485 MODBUS Card

## User Manual



**Before you start to install this card, please read this User Manual carefully**

Thanks for choosing OPTI-SOLAR RS485 MODBUS Card which is a highly reliable product made by OPTI-Solar Company with its innovative design and perfect quality control.

This User manual contains important and detailed Safety Instructions, Installation and Operation Guides of this OPTI-SOLAR RS485 MODBUS Card. You should read this manual carefully before installing and using the Card.

If you encounter any problem during installing and using the Card, please check with this manual again before contacting the local Dealer or distributor. Most of the problems you may encounter will be dealt with and solved by this User manual.

Thank you for choosing this product again. Please keep this User Manual with you for your pleasant application of this card.

**Safety Instructions for installation and application:**

To avoid risk of electric shock when installing and configuring this OPTI-SOLAR RS485 MODBUS Card into the system, first disconnect all AC and DC voltage sources of the system. Then check carefully all parts of the card. Any damage such as cut, scratch mark may cause electric short. Never insert a card with such damage or mark into the system

This OPTI-SOLAR RS485 MODBUS Card is designed to be used in inverter. Do not take it out or expose it to rain or sunshine.

The most suitable temperature range for applying this OPTI-SOLAR RS485 MODBUS Card is  $-25^{\circ}\text{C} \sim +55^{\circ}\text{C}$ . Do not apply this card in an environment with a temperature out of this range and always keep this card away from sunlight.

**Introduction to OPTI-SOLAR RS485 MODBUS card**

1) This card is compatible with various models of Inverter

OPTI-SOLAR RS485 MODBUS card is a inverter-monitoring interface. It can be applied to various models of inverters, transmitting data with up to 9600 bits per second.

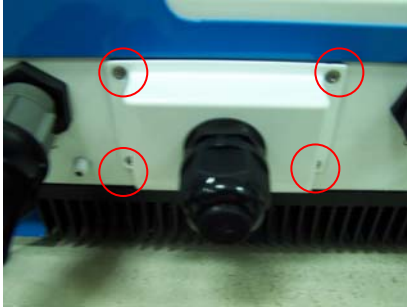
2) It is compact and easy for installation

OPTI-SOLAR RS485 MODBUS card is compact and easy for installation into the inverters. The embedded RS485 connector supports 2 sets of RS485 transfer channel for serial connection of inverters. Or it can connect the inverter directly to PC for inverter performance monitoring.

## Installing OPTI-SOLAR RS485 MODBUS card to inverters / PC

### 1. Installing OPTI-SOLAR RS485 MODBUS card to Inverter

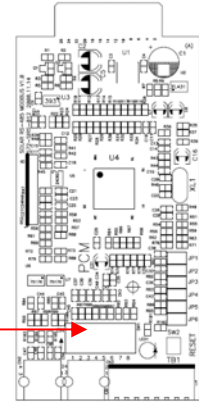
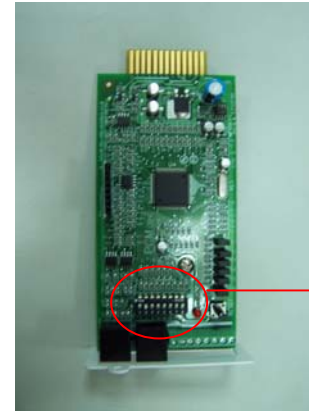
- 1) Get ready the Inverter and turn off Inverter.(Both AC and DC side)
- 2) Remove the Extension slot Cover on the Inverter. Then remove the 4 screws from the case.



- 3) Get ready the 4-wire twisted-pair shielded cables.
- 4) Get OPTI-SOLAR RS485 MODBUS card ready



- 5) Setup the MODBUS address.



Please use the SW1 dip switch.

If use the address 1: Please turn off the number 1 switch.(Address number is 1)

ON		■	■	■	■	■	■	■
OFF	■							
Switch number	1	2	3	4	5	6	7	8
Address number	1	2	4	8	16	32	64	128

If use the address 2: Please turn off the number 2 switch.(Address number is 2)

ON	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OFF	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Switch number	1	2	3	4	5	6	7	8
Address number	1	2	4	8	16	32	64	128

If use the address 4: Please turn off the number 3 switch.(Address number is 4)

ON	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OFF	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Switch number	1	2	3	4	5	6	7	8
Address number	1	2	4	8	16	32	64	128

If use the address 3: Please turn off the number 1 and 2 switch.(Address number is 1+2=3)

ON	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
OFF	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Switch number	1	2	3	4	5	6	7	8
Address number	1	2	4	8	16	32	64	128

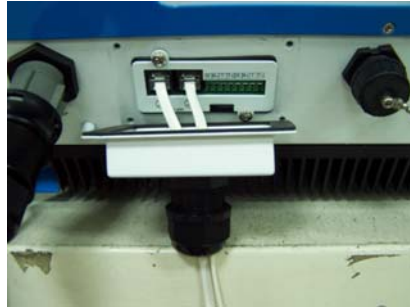
If use the address 5: Please turn off the number 1 and 4 switch.(Address number is 1+4=5)

ON	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
OFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Switch number	1	2	3	4	5	6	7	8
Address number	1	2	4	8	16	32	64	128

The other address is same the above rule. The maximum address number is 255.

6) Insert wires to RS485 Terminal Block or RJ11 and lock them firmly with the screws on the block.

7) Then insert OPTI-SOLAR RS485 MODBUS card into the OPTI-SOLAR RS485 MODBUS Extension Slot.



8) Lock the Cable Lock to the Inverter with the 4 screws.

9) Lock the Seal (Middle Cable Lock) to the Cable Lock.

10) Lock the Pressing Screw to the Cable Lock so as to fix up seal. The OPTI-SOLAR RS485 MODBUS card and cables are now safely installed to Inverter

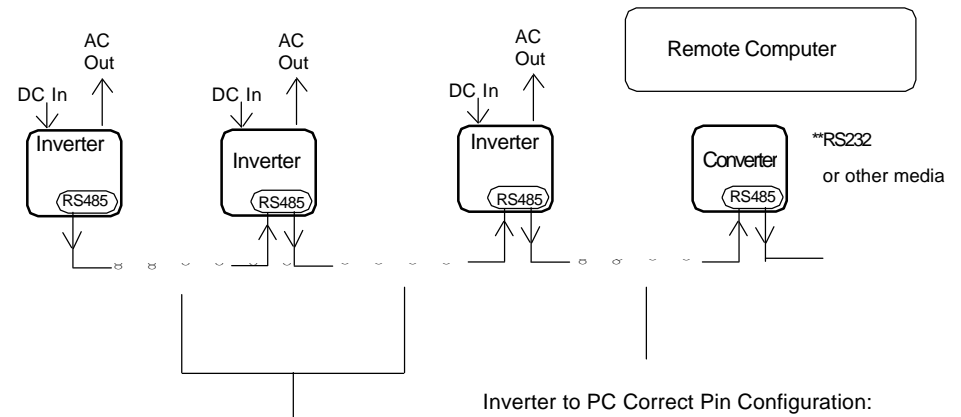


11) Turn on inverter - AC and DC side.

## 2. Wiring OPTI-SOLAR RS485 MODBUS card From Inverter to Converter and then to PC

When wiring OPTI-SOLAR RS485 MODBUS card from inverter to inverter, we connect the RS485 pins of the same assignment (signal) together. That is, we connect the Receive Pin to Receive Pin, and Transmit Pin to Transmit Pin.

However, when wiring OPTI-SOLAR RS485 MODBUS card from Inverter to Converter, we connect the RS485 pins of the opposite assignment (signal) together. That is, we connect the Receive Pin to Transmit Pin, and Transmit Pin to Receive Pin.



Inverter to Inverter Correct Pin Configuration:

RS485 Pin T+(Transmit+ ) to T+(Transmit+)  
 Pin T-(Transmit-) to T-(Transmit-)  
 Pin R+(Receive+) to R+(Receive+)  
 Pin R-(Receive-) to R-(Receive-)

If use the half duplex RS485(2 wire),  
 Please connect together T+ and R+,  
 T- and R-.

Inverter to PC Correct Pin Configuration:

### 1. Use Full duplex RS485 or RS422(4 wire)

RS485 Pin T+(Transmit+ ) to R+(Receive+)  
 Pin T-(Transmit-) to R-(Receive-)  
 Pin R+(Receive+) to T+(Transmit+)  
 Pin R-(Receive-) to T-(Transmit-)

### 2. Use Half duplex RS485(2 wire)

RS485 Pin T+ R+(Transmit+ ) to D+(Receive+)  
 Pin T- R-(Transmit-) to D-(Receive-)

PS. T+ and R+ connect together

T- and R- connect together

## Specification

MODEL		OPTI-SOLAR RS485 MODBUS Card
Output	Transmission mode & Baud Rate	full duplex or half duplex; 9600 bps, compatible with all inverters
	Golden Finger	1x4 pin golden edge interface for 2 sets of RS485 transfer: Data Transfer Mode: RS485, full duplex or half Data Transfer Rate: 9600 bps Configuration compatibility: Compatible with all inverters
	Cables for connection	2 x twisted-pair shielded cables for full duplex RS485; 1 x twisted-pair shielded cables for half duplex RS485; Max. applicable length from card to card or device : 1200M(4000ft) (The maximum length can be applicable only under very low EMC and with proper cable
Physical	Net Weight Kg(lbs)	55g
	Dimension (mm) W x D x H	68 x 42 x 132 mm
Interface (Free software)	Connector	1x8 pin connector for 2 sets of RS485 transfer configuration: Set TB1 Pin assignment: T+, T-, R+, R- Set TB2 Pin assignment: T+, T-, R+, R-
Environment	Ambient Operation	3,500 meters max. elevation, 0-95% humidity non-condensing, -25-55°C
	Audible Noise	<30dBA (1 meter from surface)

## 3. Frequently Asked Questions

1) Can we apply OPTI-SOLAR RS485 MODBUS card to an inverter other than Inverter.

No, we cannot apply OPTI-SOLAR RS485 MODBUS card to an inverter other than Inverter. In case the OPTI-SOLAR RS485 MODBUS card is applied to an inverter not of make, the hardware system is in great risk of damage and break down.

2) If communication with OPTI-SOLAR RS485 MODBUS card fails, what should we do?

If communication with OPTI-SOLAR RS485 MODBUS card fails, please:

- (1) check whether Inverter runs normally;
- (2) check whether the utility supporting OPTI-SOLAR RS485 MODBUS card interface is set up properly;
- (3) check whether the OPTI-SOLAR RS485 MODBUS cards and wiring are set up properly;
- (4) check whether the OPTI-SOLAR RS485 MODBUS cards are too long for proper transmission;
- (5) check whether the ambient temperature is within -25°C ~ +55°C.
- (6) check whether the OPTI-SOLAR RS485 MODBUS cards are of correct specification.
- (7) check the COM port setup of your computer.

3) Where can we fetch the up-to-date OPTI-SOLAR RS485 MODBUS interface software support?

Please visit OPTI-Solar official website to download the up-to-date OPTI-SOLAR RS485 MODBUS card interface software support:  
[www.opti-solar.com](http://www.opti-solar.com)