TOSHIBA

Carrier

TCS-NET RELAY INTERFACE

Installation Manual

TCS-NET Relay Interface

Model name:

BMS-IFLSV4UL

- Thank you very much for purchasing this TOSHIBA / Carrier TCS-NET Relay Interface.
- Please read this manual carefully beforehand for proper installation of the relay interface.

Contents

1 Precautions for safety 2
2 Introduction 3
3 Before installation 4
4 Installation 4
5 Connection of power cables / earth wires / communication cables 5
6 Setting. 8
7 Test run. 9

1 Precautions for safety

- Read these “Precautions for Safety” carefully before installation.
- The precautions described below include important items regarding safety. Observe them without fail. Understand the following details (indications and symbols) before reading the body text, and follow the instructions.
- After the installation work has been completed, perform a test run to check for any problems. Explain how to use and maintain the unit to the customer.
- Ask customer to keep this Manual at accessible place for future reference.

Indication	Meaning of Indication
⚠WARNING	Text set off in this manner indicates that failure to adhere to the directions in the warning could result in serious bodily harm (*1) or loss of life if the product is handled improperly.
⚠CAUTION	Text set off in this manner indicates that failure to adhere to the directions in the caution could result in serious bodily injury (*2) or damage (*3) to property if the product is handled improperly.

*1: Serious bodily harm indicates loss of eyesight, injury, burns, electric shock, bone fracture, poisoning, and other injuries which leave aftereffect and require hospitalization or long-term treatment as an outpatient.
*2: Bodily injury indicates injury, burns, electric shock, and other injuries which do not require hospitalization or long-term treatment as an outpatient.
*3: Damage to property indicates damage extending to buildings, household effects, domestic livestock, and pets.

Symbols	Meaning of Symbols
	“⃠" Indicates prohibited items. The actual contents of the prohibition are indicated by a picture or text placed inside or next to the graphic symbol.
	“❗" Indicates compulsory (mandatory) items. The actual contents of the obligation indicated by a picture or text placed inside or next to the graphic symbol.

⚠WARNING	
	• **Ask an authorized dealer or qualified installation professional to install or reinstall this unit.** Inappropriate installation may result in electric shock or fire. • **Electrical work must be performed by a qualified electrician in accordance with this installation manual.** **The work must satisfy all local, national and international regulations.** Inappropriate work may result in electric shock or fire. • **Be sure to turn off all main power supply switches before starting any electrical work.** Failure to do so may result in electric shock.
	• **Do not modify the unit.** A fire or an electric shock may occur.

⚠CAUTION	
	• **Do not install this unit where flammable gas may leak.** If gas leaks and accumulates around the unit, it may cause a fire.
	• **Perform wiring correctly in accordance with specified the current capacity.** Failure to do so may result in short-circuiting, overheating or fire. • **Use predefined cable and connect them certainly. Keep the connecting terminal free from external force.** It may cause an exothermic or a fire.

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2 Introduction

■ Applications / functions / specifications

Applications

- The TCS-NET Relay Interface is used to connect air conditioners (with TCC-LINK installed) to the air conditioning control system or BACnet system.

Functions

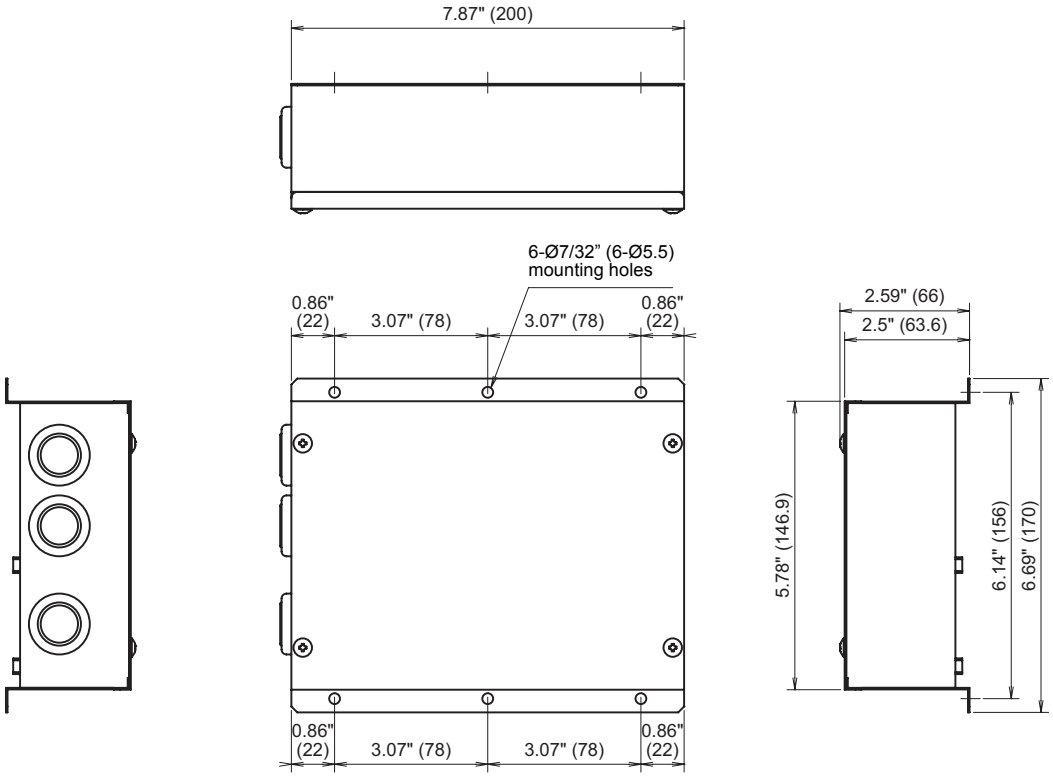
- The TCS-NET Relay Interface converts signals between TCC-LINK and RS-485.

Specifications

Power supply	120 VAC, 60 Hz
Power consumption	3 W
Operating temperature / humidity	32 to 104 °F (0 to 40 °C), 10 to 90% RH (no condensation)
Storage temperature	-4 to 140 °F (-20 to +60 °C)
Chassis material	Galvanized sheet metal 0.8 t
Dimensions	2.59” (H) x 6.69” (W) x 7.87” (D) inch (66 (H) x 170 (W) x 200 (D) mm)
Mass	2.43 lb (1.1 kg)

■ External view

Unit: inch (mm)



3 Before installation

Check the following package contents.

No.	Item	Quantity	Remarks
1	TCS-NET Relay Interface	1	
2	Installation Manual	1	
3	Screw	4	5/32" x 0.47" (M4 x 12 mm) tapping screws
4	Cable clamp	1	

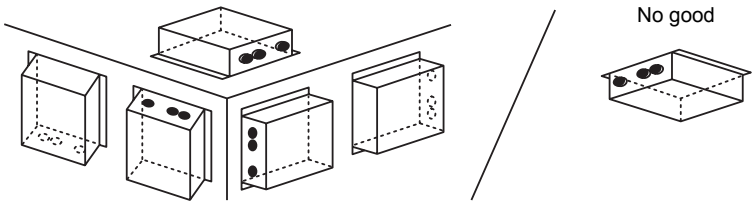
Use the following wiring materials to connect the communication cables and power cables. (locally procured)

No.	Line	Description	
1	For TCC-LINK	Type	2-core shielded wires
		Wire size	AWG16 (1.25 mm^2), 3200 ft (1000 m) max. AWG14 (2.00 mm^2), 6500 ft (2000 m) max. (total length including air conditioner area)
		Length	
2	For RS-485	Type	2-core shielded wires
		Wire size	AWG16 (1.25 mm^2), 1600 ft (500 m) max. (total length)
		Length	
3	For power	Type	UL, CSA approved power supply wire AWG18 (0.75 mm^2), 160 ft (50 m) max.
		Wire size	

4 Installation

■ TCS-NET Relay Interface installation method and orientation

There are five installation methods for this relay interface as shown below: surface mount and wall mounts. Use the attached screws.



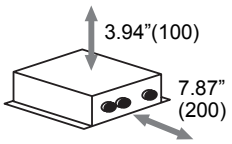
REQUIREMENT

Do not install the unit in any of the following places.

- Humid or wet place
- Dusty place
- Place exposed to direct sunlight
- Place where there is a TV set or radio within one meter
- Place exposed to rain (outdoors, under eaves, etc.)

■ Installation space and maintenance space

A side space for connecting through cable inlets and an upper space for maintenance must be reserved before installation.
The other sides can be adjacent to surrounding objects.



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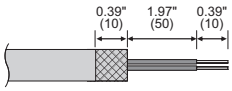
5 Connection of power cables / earth wires / communication cables

⚠ CAUTION

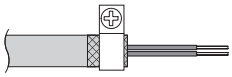
- The RS-485 communication cables have polarity. Connect A to A, and B to B. If connected with incorrect polarity, the unit will not work.
- The TCC-LINK communication cable have no polarity.

Connect power cables, earth wires, and communications cables to the specified terminals on the terminal block.

Length of stripped RS-485 communication cable (address 1)

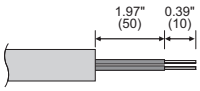


Clamping RS-485 communication cable (address 1)

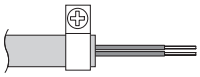


The RS-485 communication cable must be earthed on address 1 (Relay Interface address SW=1) TCS-NET Relay Interface. Fix the shielded wire of RS-485 communication cable with metal cable clamp and screw it to the chassis to earth it.

Length of stripped RS-485 (address of other than 1) and TCC-LINK communication cable

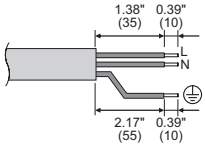


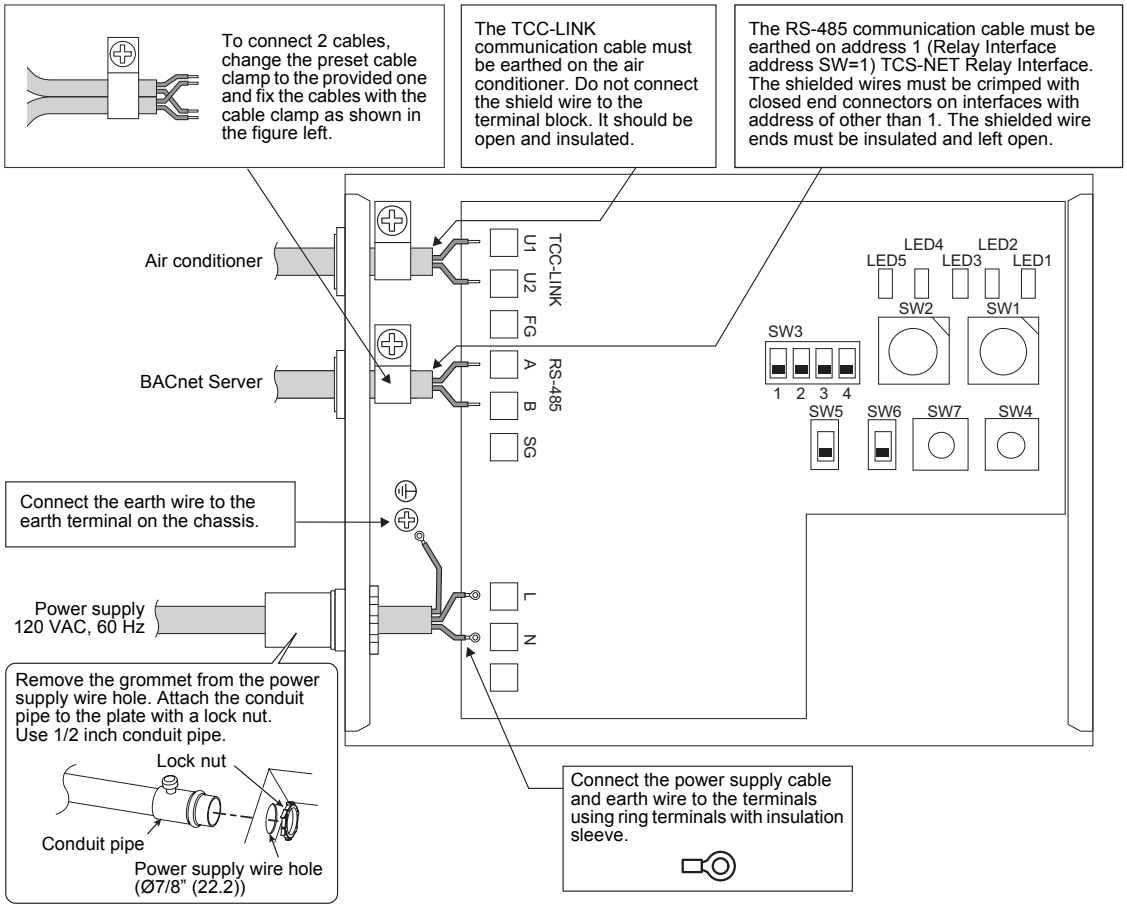
Clamping communication cable



Do not connect the shield wire to the earth. It should be open and insulated.

Length of stripped power cable





REQUIREMENT

Disconnect the appliance from the main power supply.
This appliance must be connected to the main power supply by a circuit breaker or switch with a contact separation of at least 3mm.
Fasten the screws to the terminal with torque of 0.5 Nm.

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■ Wiring connection

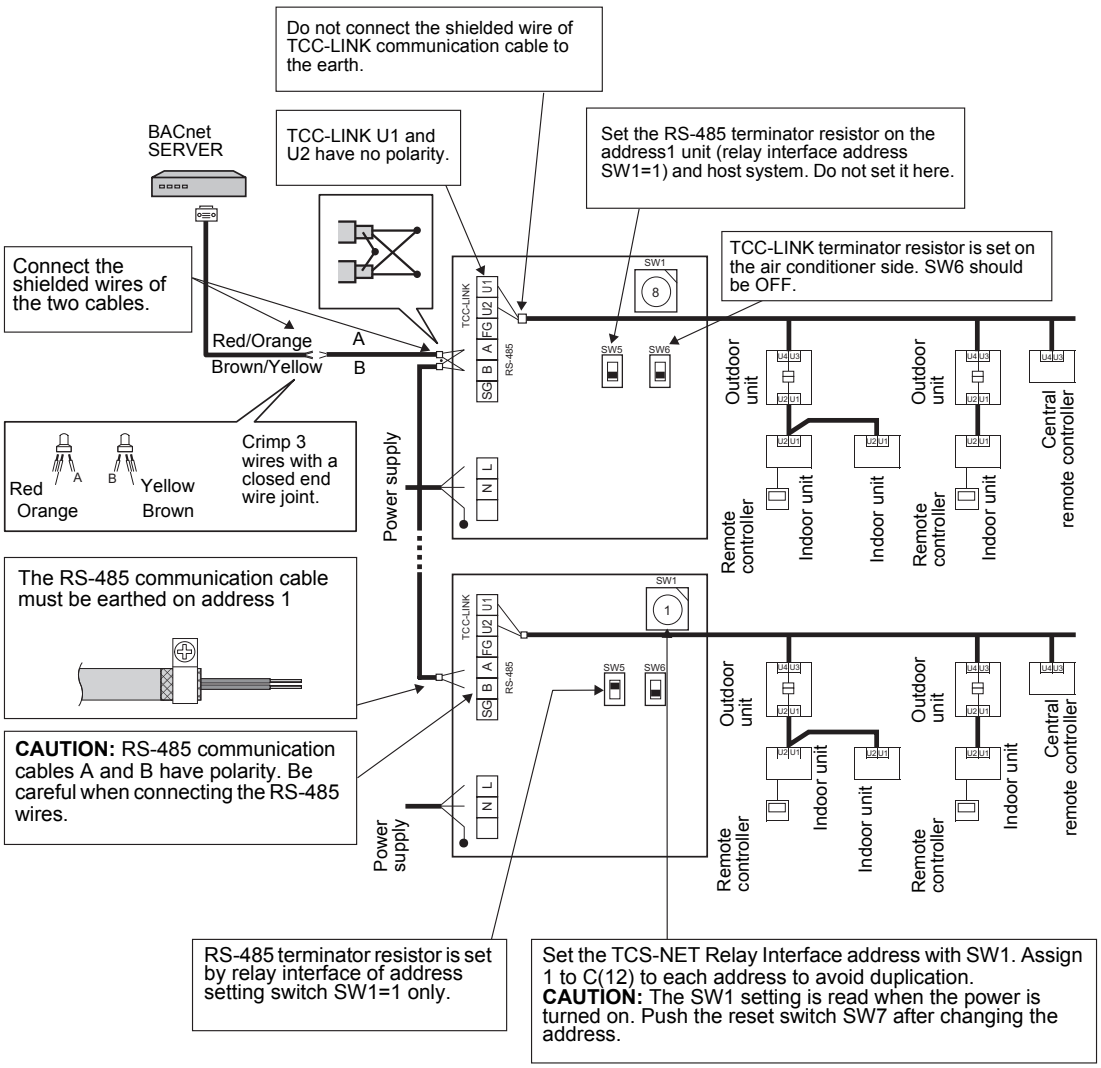
The following describes a connection example when two or more TCS-NET Relay Interface units are used.

Terminator resistor setting (See “6 Setting” for the setting method.)

- Set the RS-485 terminator resistor to “120 ohm” for address1 (Relay Interface address SW1=1) TCS-NET Relay Interface unit, and set to “open” for other units.
- Set the TCC-LINK terminator resistor to “open” as it is set on the air conditioner side.

Shield earthing

- The RS-485 communication cable must be earthed on address 1 (Relay Interface address SW=1) TCS-NET Relay Interface. Fix the shielded wire of RS-485 communication cable with metal cable clamp and screw it to the chassis to earth it. The shielded wires must be crimped with closed end connectors on interfaces with address of other than 1. The shielded wire ends must be insulated and left open.
- Do not connect the shield wire to the terminal block. It should be open and insulated. The TCC-LINK communication cable must be earthed on the air conditioner.



6 Setting

The following settings are necessary to use TCS-NET Relay Interface.

- SW1 TCS-NET Relay Interface address set switch
  When two or more TCS-NET Relay Interface are used, set a different address for SW1 to avoid address duplication.
  Assign addresses in an ascending order.

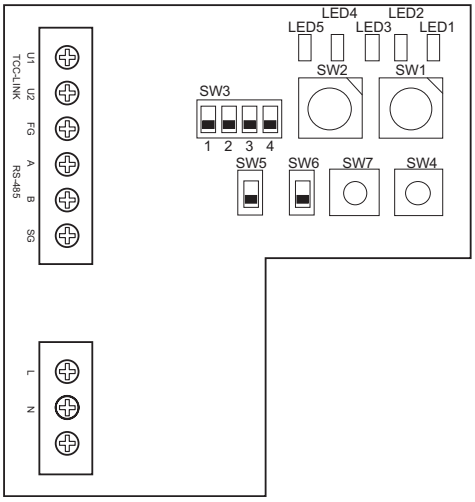
⚠ CAUTION

- **Set relay interface addresses according to the air conditioner address table.**
  For the relay interface whose address SW1=1, perform terminator resistor setting.
- **When the SW1 setting has been changed, push the reset switch SW7. The new address setting is read.**

- SW2 Test switch
- SW3 Test switch
- SW4 Test switch

Not used during operation.
Set these switches to zero (0) or "all OFF".

- SW5 RS-485 terminator resistor select switch
  Set "120 ohm" only when the relay interface address SW=1, and set "open" for other relay interfaces.
- SW6 TCC-LINK terminator resistor select switch
  The TCC-LINK terminator resistor is set on the air conditioner side. Set SW6 to "open".
- SW7 Reset switch
  When performing an address setting with SW1, push this reset switch after the address setting to read the set value.



SW1	Relay interface address set switch	
	1-C	Relay interface address
	0, D-F	Not used
SW2	Test switch (0 usually)	
SW3	Test switch (all OFF usually)	
SW4	Test switch	
SW5	RS-485 terminator resistor select switch	
		
	120 ohm	Open
SW6	TCC-LINK terminator resistor select switch	
		
	100 ohm	Open
SW7	Reset switch	
LED1	Power indicator	
LED2	RS-485 communication status indicator	
LED3	TCC-LINK Communication status indicator	
LED4	TCC-LINK Communication error indicator	
LED5	Test indicator	

REQUIREMENT

- **RS-485 terminator resistor select switch SW5.**
  Set "120 ohm" only when the TCS-NET Relay Interface address SW=1, and set "open" for other relay interfaces.
- **The TCC-LINK terminator resistor is set on the air conditioner side. Set SW6 to "open".**

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7 Test run

■ Before starting test run

Complete the air conditioner test run.
Turn on the power of the TCS-NET Relay Interface after all cable connections and settings are completed.
Then turn on power of the BACnet Server.

■ Test run

Check the TCC-LINK and RS-485 communication status of the TCS-NET Relay Interface by checking the blinking of the LEDs.

LED		Normal operation	Abnormal operation
LED1	Power indicator	ON	OFF
LED2	RS-485 communication status indicator	Blinking	OFF
LED3	TCC-LINK communication status indicator	Blinking	OFF
LED4	TCC-LINK communication error indicator	OFF	ON
LED5	TEST indicator	OFF	ON

LED1 Power indicator
- ON: While power is on
- OFF: When power is not turned on

LED2 RS-485 communication status indicator
- Blinking: When RS-485 communication with the host system is normal
- OFF: When RS-485 communication with the host system is disabled

LED3 TCC-LINK communication status indicator
- Blinking: When TCC-LINK communication with any of the air conditioners is normal
- OFF: When TCC-LINK communication with all air conditioners is disabled

LED4 TCC-LINK communication error indicator
- ON: This LED will be turned on, when there is no reply from the air conditioner response to signals from the Relay Interface.
- OFF: This LED will be turned off, when there is reply from the air conditioner response to signals from the Relay Interface.

LED5 Test indicator
- Not used in normal operation
- Displayed only in the test mode

Trademarks

- BACnet is a registered trademark of ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.).

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