

# **TOSHIBA**

Leading Innovation >>>

## *TCS-NET RELAY INTERFACE* **Installation Manual**

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### **TCS-NET Relay Interface**

Model name:

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**BMS-IFLSV4E**

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



## Contents

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# 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 trial operation 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
 <b>WARNING</b>	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.
 <b>CAUTION</b>	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**

	<ul style="list-style-type: none"> <li>• <b>Ask an authorized dealer or qualified installation professional to install or reinstall this unit.</b> Inappropriate installation may result in electric shock or fire.</li> <li>• <b>Electrical work must be performed by a qualified electrician in accordance with this installation manual.</b> <b>The work must satisfy all local, national and international regulations.</b> Inappropriate work may result in electric shock or fire.</li> <li>• <b>Be sure to turn off all main power supply switches before starting any electrical work.</b> Failure to do so may result in electric shock.</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Do not modify the unit.</b> A fire or an electric shock may occur.</li> </ul>

## **CAUTION**

	<ul style="list-style-type: none"> <li>• <b>Do not install this unit where flammable gas may leak.</b> If gas leaks and accumulates around the unit, it may cause a fire.</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Perform wiring correctly in accordance with specified the current capacity.</b> Failure to do so may result in short-circuiting, overheating or fire.</li> <li>• <b>Use predefined cable and connect them certainly. Keep the connecting terminal free from external force.</b> It may cause an exothermic or a fire.</li> </ul>

## 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.

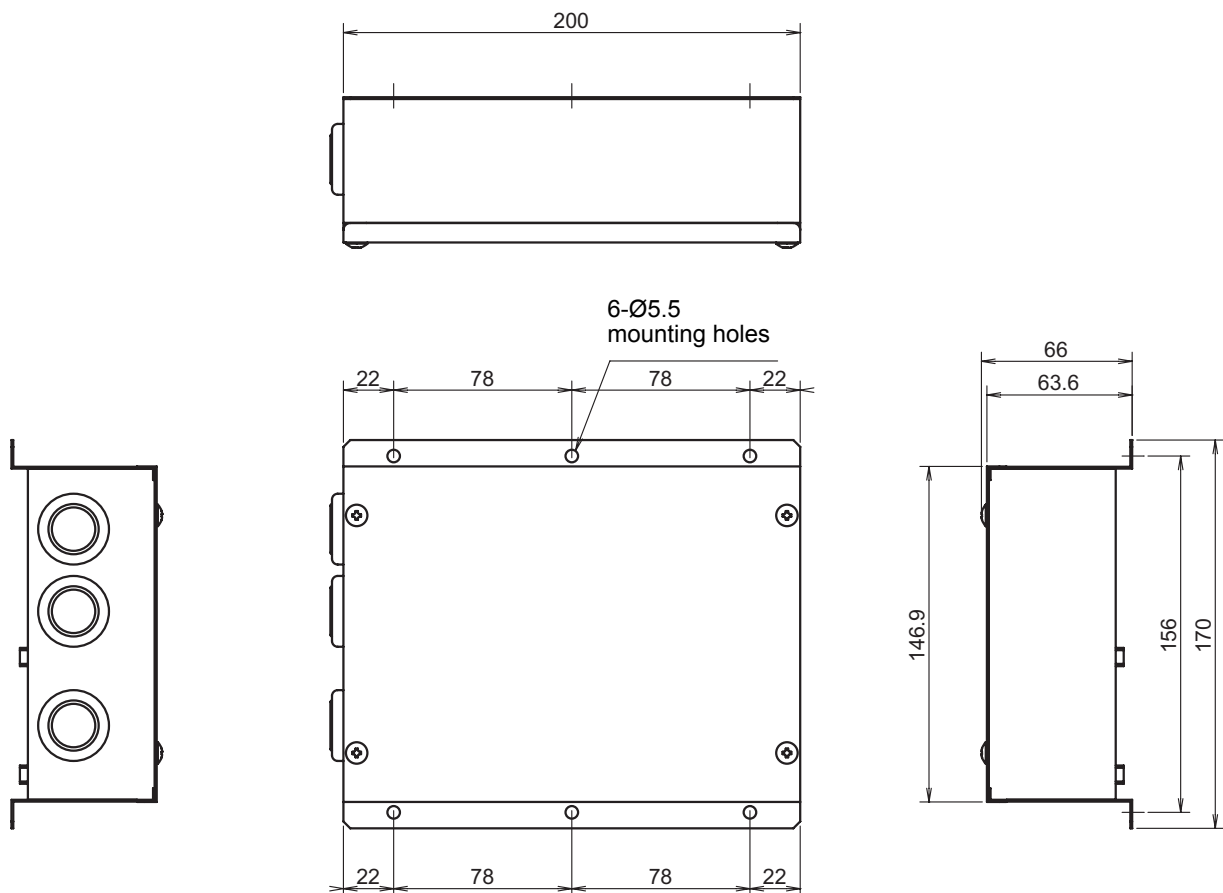
#### Functions

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

#### Specifications

Power supply	220 - 240 VAC, 50/60 Hz
Power consumption	8 W
Operating temperature/humidity	0 to 40 °C, 10 to 90% RH (no condensation)
Storage temperature	-20 to +60 °C
Chassis material	Galvanized sheet metal 0.8t (no coating)
Dimensions	66 (H) x 170 (W) x 200 (D) mm
Mass	1.1 kg

### ■ External View



# 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	M4 x 12mm tapping screws
4	Cable clamp	1	

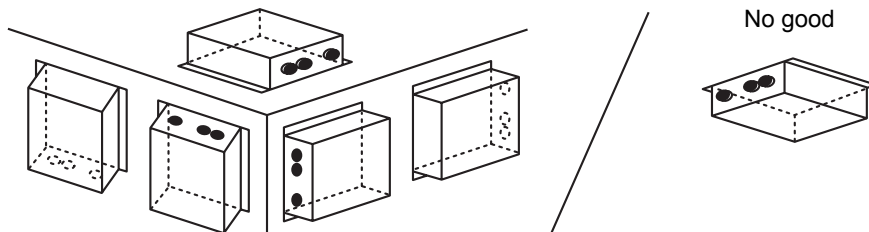
Use the following wiring materials to connect the communication cables and power cables. (locally procured)

No.	Line	Description	
1	For TCC-LINK	Type	2-core shielded wires
		Wire size	1.25 mm <sup>2</sup> , 1000m max. 2.00 mm <sup>2</sup> , 2000m max.
		Length	(total length including air conditioner area)
2	For RS-485	Type	2-core shielded wires
		Wire size	1.25 mm <sup>2</sup> , 500m max. (total length)
		Length	
3	For power	Type	H07 RN-F or 245IEC66
		Wire size	0.75mm <sup>2</sup> , 50 m max.

# 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

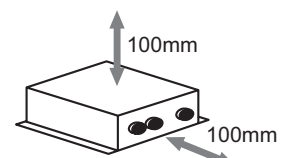
Do not install the unit in any of the following places.

- 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.



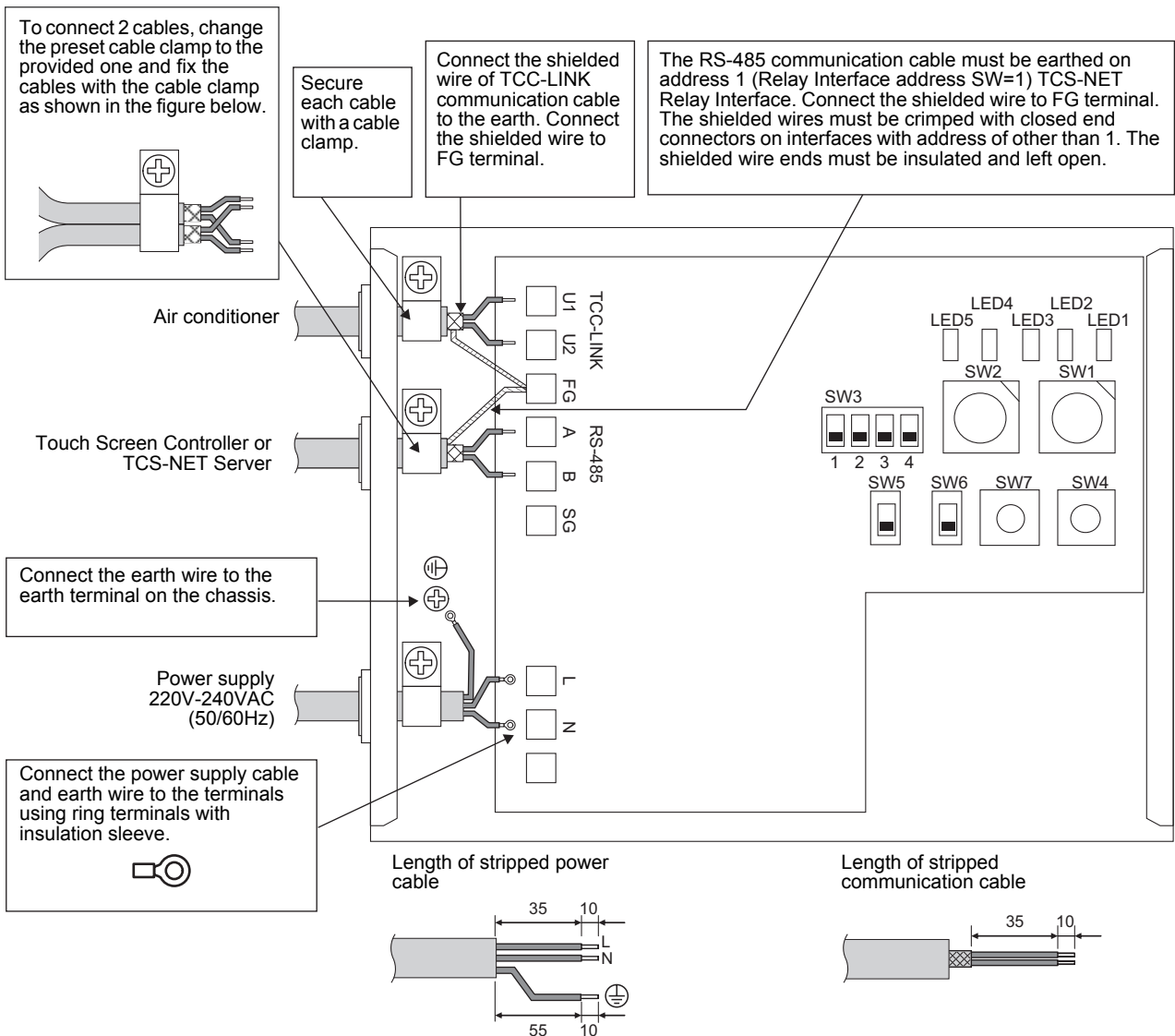
# 5 Connection of Power Cables/Earth Wires/Communication Cables

## ⚠ 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.

### ■ Power Cables/Earth Wires/Communication Cables

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



### 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 0.5Nm.**

## ■ Wiring Connection

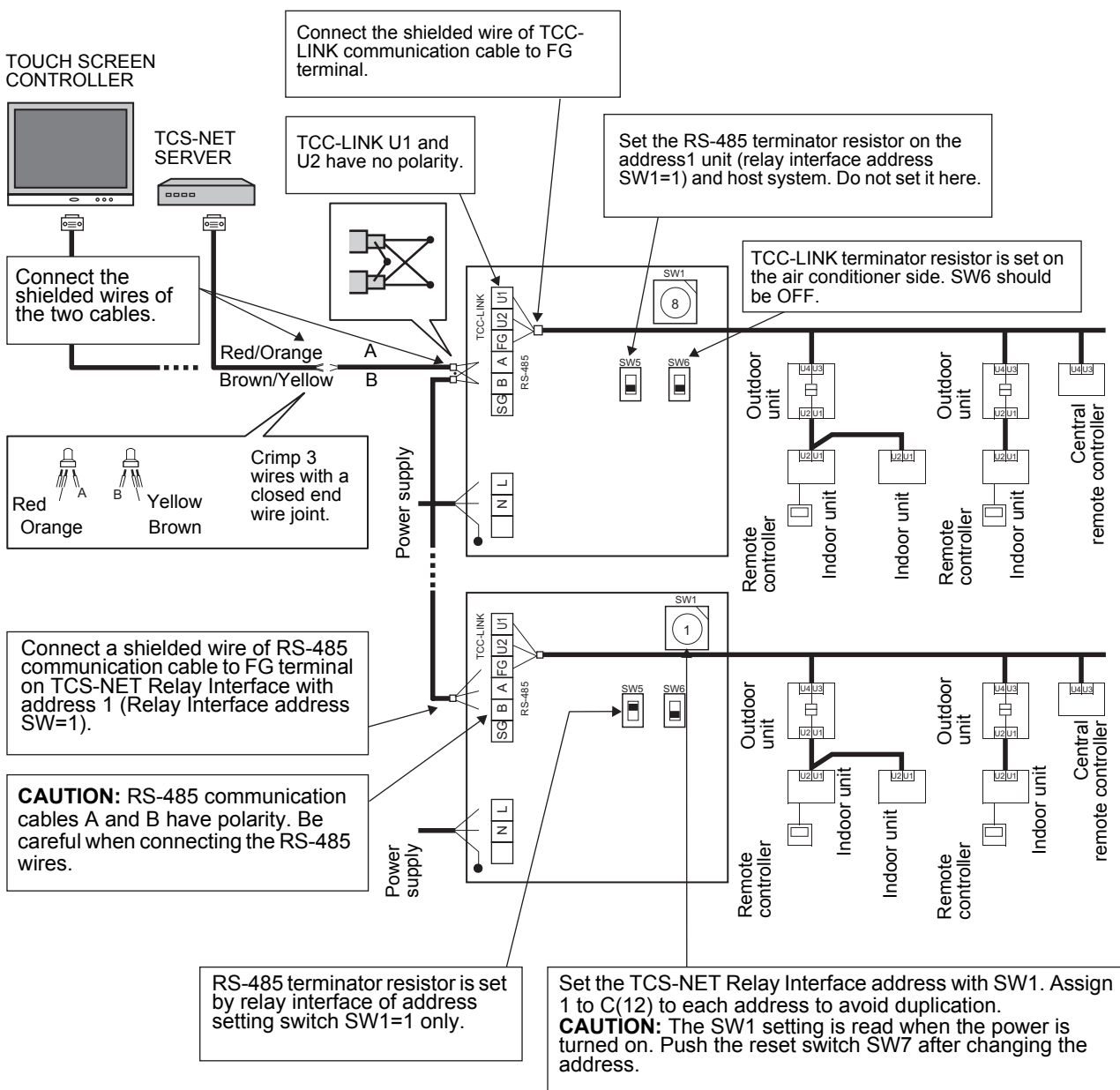
The following describes a connection example when two or more TCS-NET Relay Interface units are used.

### 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. Connect the shielded wire to FG terminal. 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 it to terminal blocks.
- Connect the shielded wire of TCC-LINK communication cable to FG terminal.



# 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.  
Connect the shielded wire of RS-485 communication cable to FG terminal on TCS-NET Relay Interface with address SW=1.
- **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
  - **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.
- } Not used during operation.  
Set these switches to zero (0) or “all OFF”.

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”.**



# 7 Trial Operation

## ■ Before Starting Trial Operation

Complete the air conditioner trial operation.

Turn on the power of the TCS-NET Relay Interface after all cable connections and settings are completed.

Then turn on power of the Touch Screen Controller or TCS-NET Server.

## ■ Trial Operation

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

### CAUTION

For the operation check of the Touch Screen Controller, refer to the Touch Screen Controller Installation Manual.

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.).

