TOSHIBA

INSTALLATION MANUAL

ENERGY MONITORING RELAY INTERFACE

BMS-IFWH3E

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

CONTENTS

Precautions for Safety

- Read this "Precautions for Safety" carefully before installation.
- The precautions described below include important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem. Follow the Owner's Manual to explain how to use and maintain the unit to the customer. Ask the customer to keep this Installation Manual together with the Owner's Manual.

⚠ WARNING

- **Ask an authorized dealer or qualified installation professional to install or reinstall the relay interface.**
  Improper installation may result in electric shock or fire.

- **Perform installation work properly according to this Installation Manual.**
  Improper installation may result in electric shock or fire.

- **Do not modify the unit.**
  Any modification may cause a malfunction, resulting in overheating or fire.

⚠ CAUTION

- **Perform wiring correctly in accordance with the specified current capacity.**
  Failure to do so may result in short-circuiting, overheating, or fire.

- **Connect the specified cables for the terminals securely to prevent external forces from affecting them.**
  Failure to do so may result in disconnection, overheating, or fire.

Introduction

• Applications

The Energy Monitoring Relay Interface is used to measure and distribute the power of the air conditioner.

• Functions

The interface calculates output power pulses with connected power meters, and then sends the calculation result to the Intelligent Server.

• Specifications

Power supply	220 - 240 V, AC 50/60 Hz
Power consumption	2.8 W
Operating temperature/ humidity	0 to 40°C, 10 to 90% RH
Storage temperature	-20 to +60°C
Chassis material	Galvanized sheet metal 0.8t
Dimensions	66(H) x 193(W) x 246(D) mm
Mass	1.65 kg

Power meter input	Input type	photo-coupler insulation
	Input point	8 points
	Input registance	9 k ohm
	Input "ON" current	1 mA
	Input pulse condition	50 m - 1000 m sec

External View

2
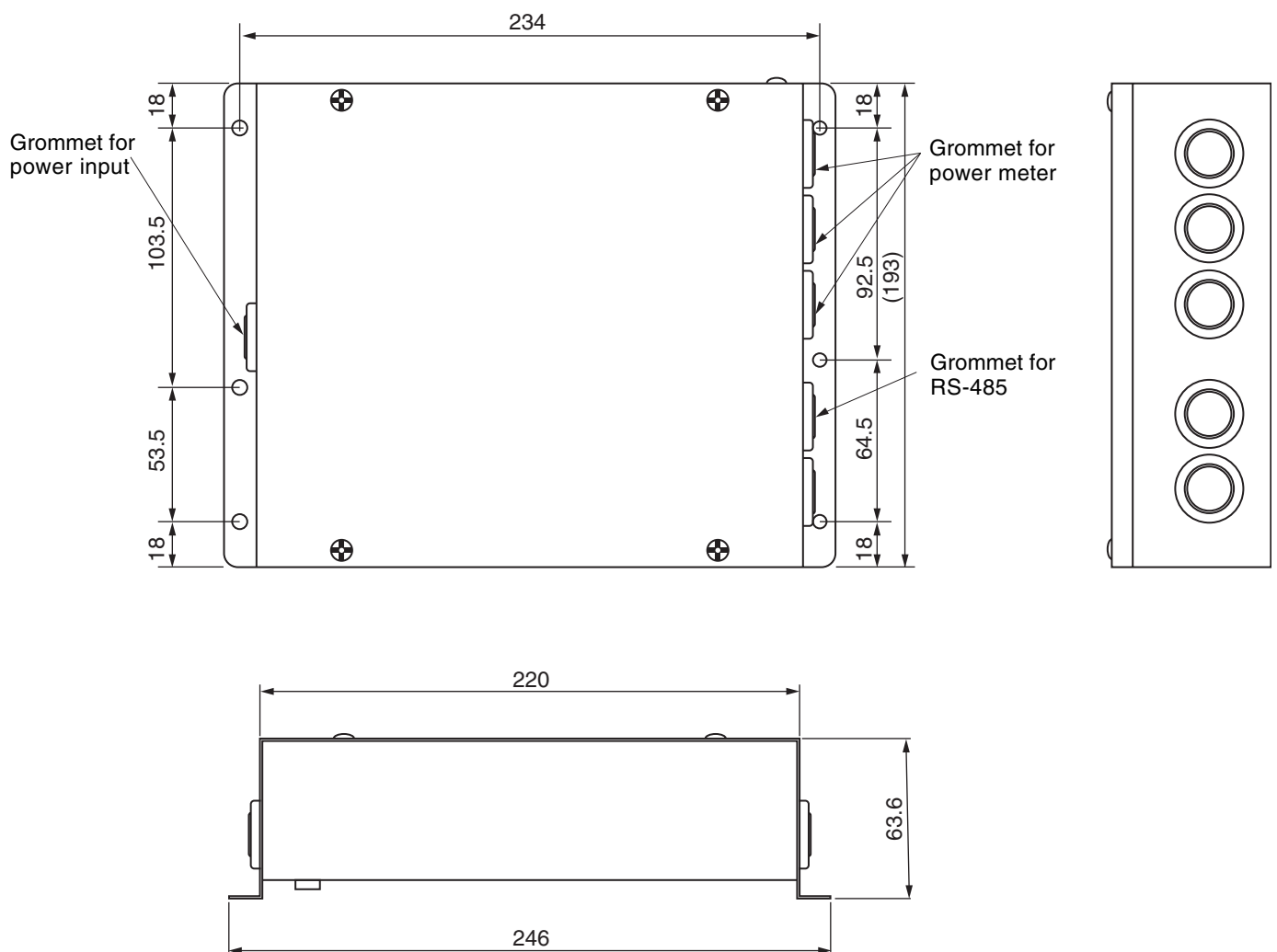
Before Installation

Check the following package contents.

No.	Item	Quantity	Remarks
1	ENERGY MONITORING RELAY INTERFACE	1	
2	Installation Manual	1	
3	Screw	4	M4 x 12mm tapping screws
4	Pin terminal	2	

Use the following wiring materials to connect signal lines. (Procured on site)

No.	Signal line	Description	
1	For RS-485	Type	2-core shield wire
		Wire size	$1.25\ mm^2$, 500m max. (total length)
		Length	
2	For connection to power meter	Type	2-core wire
		Wire size	$0.3mm^2$, 100m max.
		Length	

1 Installation

Energy Monitoring 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.

No good
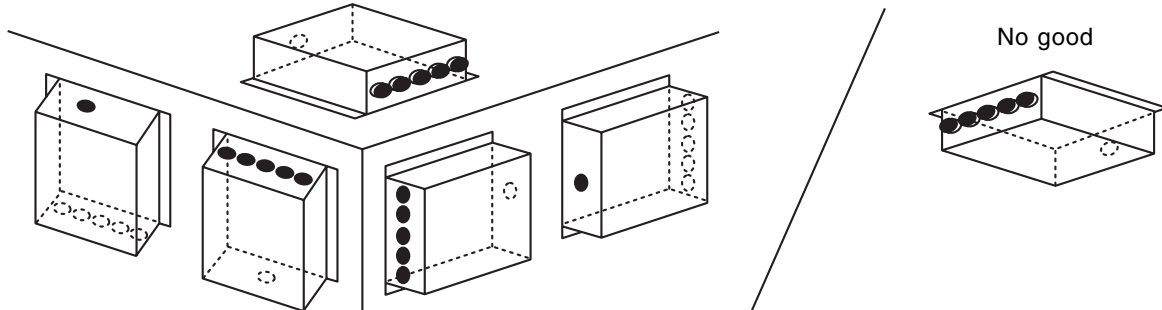
REQUIREMENT

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.

100mm

100mm

100mm
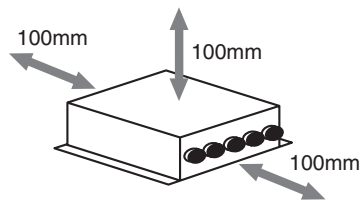
# 2 Connection of Power cables/Earth wires/ Signal wires

⚠ CAUTION

The RS-485 signal wire has polarity. Connect A to A, and B to B. If connected with incorrect polarity, the unit will not work.

REQUIREMENT

Install a breaker an the primary side of the power supply.

Power cables/Earth wires/Signal wires

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

Secure each cable with a cable clamp.
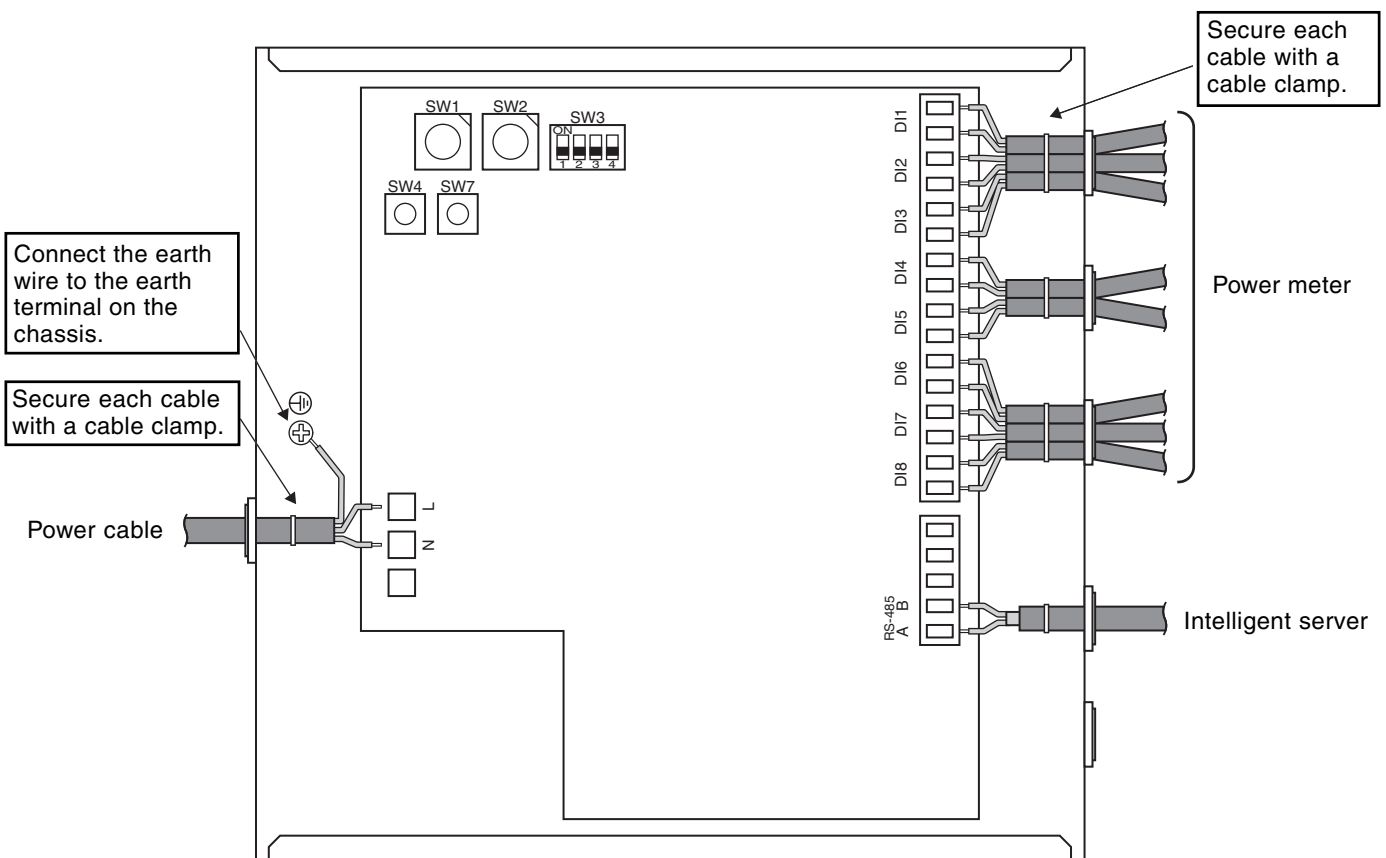
Power meter

Connect the earth wire to the earth terminal on the chassis.

Secure each cable with a cable clamp.

Power cable

Intelligent server

Length of stripped power cable

35 10

55 10
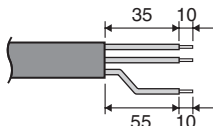
Length of stripped communication wire

35 6

Length of stripped power meter wire

35 6

Insert the wire by pushing the lever with a screwdriver. Check that the wire is inserted securely.

When inserting two RS-485 communication wires into a single terminal for connection to another interface, crimp them using the attached pin terminal.

Wiring Connection

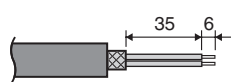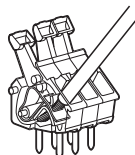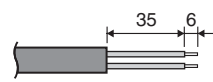The following describes wiring connections of the Energy Monitoring Relay Interface when it is used in the air conditioner control system.

• Terminator resistor setting

Set the RS-485 terminator resistor by the TCS-NET Relay Interface.
Do not set it by the Energy Monitoring Relay Interface.

• Shield earthing

The shield earth of the RS-485 signal wires should be single-point earth. Earth the wires on the Intelligent server side.
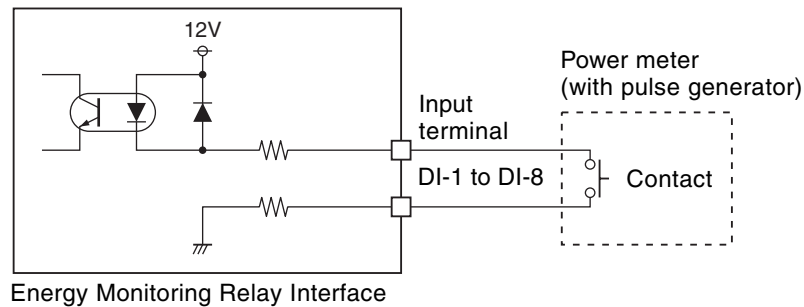Other shield lines should be closed, and the terminal end should be open and insulated.

• Connection of power meter
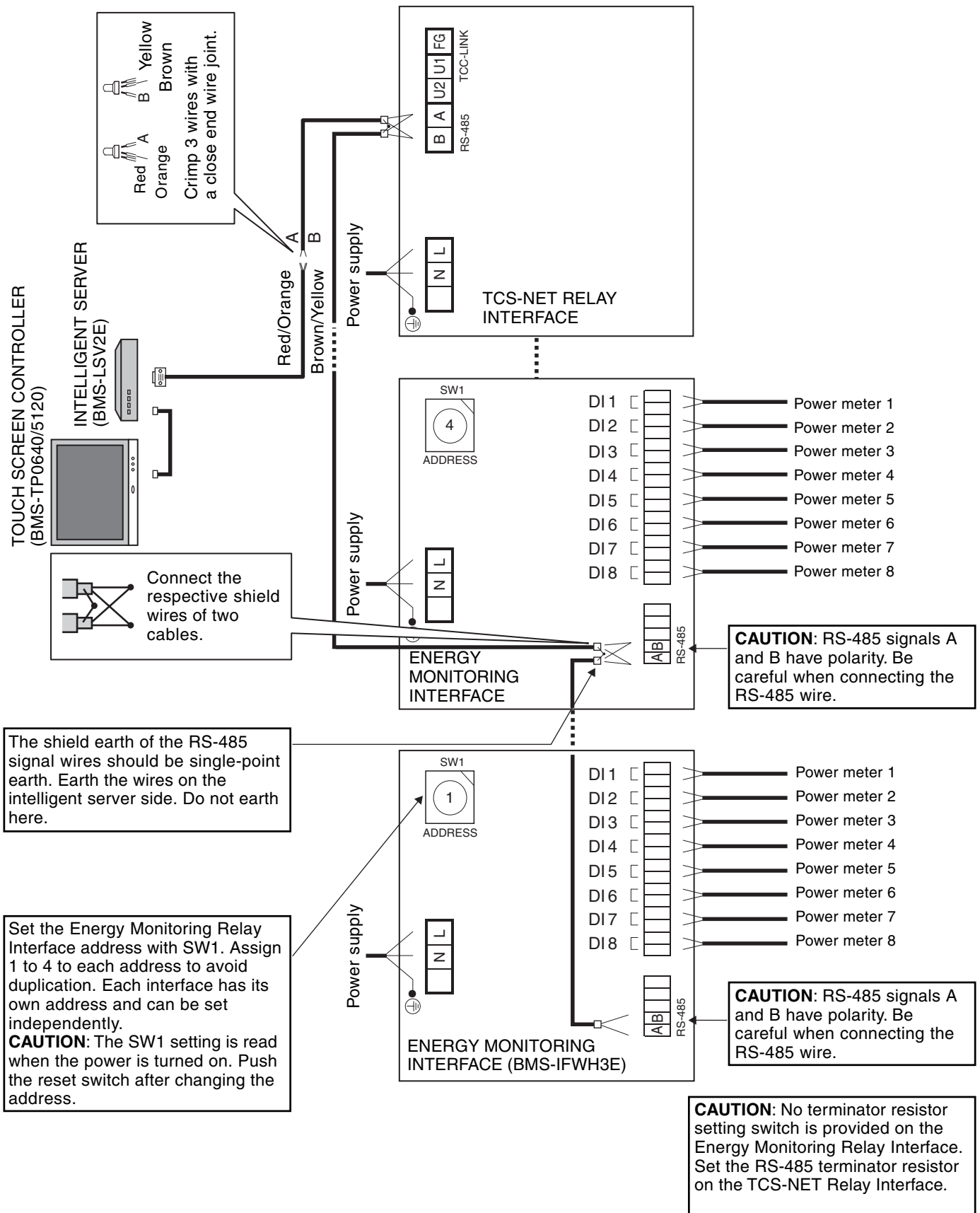
Use a power meter with a pulse generator.
Connect the non-voltage contact output of the power meter to the Energy Monitoring Relay Interface.
An external input circuit is shown below.
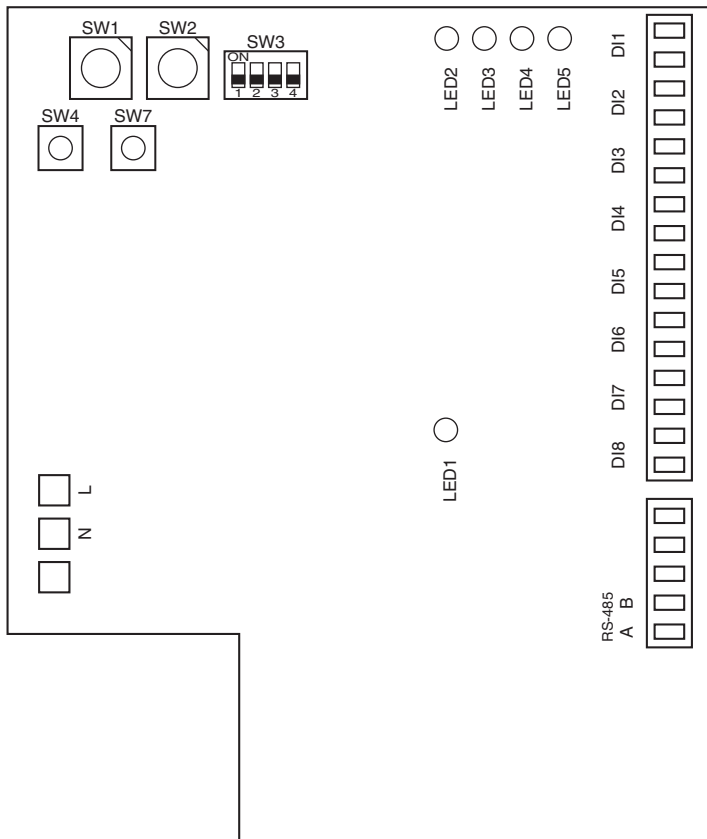Input signal is electrically isolated by photo-coupler.

Energy Monitoring Relay Interface

Connection diagram

TOUCH SCREEN CONTROLLER (BMS-TP0640/5120)

INTELLIGENT SERVER (BMS-LSV2E)

Red / Orange — A
Yellow
Brown — B
Crimp 3 wires with a close end wire joint.

Red/Orange A
Brown/Yellow B

B A U2 U1 FG TCC-LINK
RS-485

Power supply

N L

TCS-NET RELAY INTERFACE

Connect the respective shield wires of two cables.

Power supply

SW1
4
ADDRESS

Power supply

N L

ENERGY MONITORING INTERFACE

DI 1 — Power meter 1
DI 2 — Power meter 2
DI 3 — Power meter 3
DI 4 — Power meter 4
DI 5 — Power meter 5
DI 6 — Power meter 6
DI 7 — Power meter 7
DI 8 — Power meter 8

A B RS-485

CAUTION: RS-485 signals A and B have polarity. Be careful when connecting the RS-485 wire.

The shield earth of the RS-485 signal wires should be single-point earth. Earth the wires on the intelligent server side. Do not earth here.

Set the Energy Monitoring Relay Interface address with SW1. Assign 1 to 4 to each address to avoid duplication. Each interface has its own address and can be set independently.
CAUTION: The SW1 setting is read when the power is turned on. Push the reset switch after changing the address.

SW1
1
ADDRESS

Power supply

N L

ENERGY MONITORING INTERFACE (BMS-IFWH3E)

DI 1 — Power meter 1
DI 2 — Power meter 2
DI 3 — Power meter 3
DI 4 — Power meter 4
DI 5 — Power meter 5
DI 6 — Power meter 6
DI 7 — Power meter 7
DI 8 — Power meter 8

A B RS-485

CAUTION: RS-485 signals A and B have polarity. Be careful when connecting the RS-485 wire.

CAUTION: No terminator resistor setting switch is provided on the Energy Monitoring Relay Interface. Set the RS-485 terminator resistor on the TCS-NET Relay Interface.

3 Setting

SW1	Address set switch	
	1 - 4	Address
	0,5 - F	Not used
SW2	Operating mode set switch (0 usually)	
SW3	Test switch (all OFF usually)	
SW4	Test switch	
SW7	Reset switch	
LED1	Power indicator	
LED2	RS-485 communication status indicator	
LED3	Not used	
LED4	Test indicator	
LED5	Test indicator	

The following settings are necessary to use Energy Monitoring Relay Interfaces.

• SW1   Address set switch
When two or more Energy Monitoring Relay Interfaces are used, set a different address for each unit to avoid address duplication.
Assign addresses in an ascending order. (from 1, 2, 3 . . . n)

⚠CAUTION

• Set relay interface addresses according to the air conditioner address table.
• When the SW1 setting has been changed, push reset switch SW7. The new address setting is read.
• You can set the Energy Monitoring Relay Interface address independently from the TCS-NET Relay Interface address or the Digital Input/Output Relay Interface address.

• SW2   Operation mode set switch
• SW3   Test switch
• SW4   Test switch

These switches are not used during normal operation. Set zero (0) or "all OFF".

• SW7   Reset switch
When performing a address setting with SW1, push this reset switch after the address setting to read the set value.

4 Trial Operation Check

Before starting trial operation

Turn on the power of the Energy Monitoring Relay Interface after all wire connections and settings are completed. Turn on power of the air conditioning control system.

Trial operation

• Confirming connection to power meters

In the test mode, when the external inputs connected to the input terminals DI-1 to DI-8 are ON, the respective LEDs will goes on so you can confirm the connection.

Confirming procedure:

Set the operation mode switch SW2 to "3", and push the reset switch SW7 to enter the test mode.
Unless SW4 is pushed, respective input status of DI-1 to DI-4 is indicated by LED2 to LED5.
When SW4 is pushed, respective input status of DI-5 to DI-8 is indicated by LED2 to LED5.
(*) To return to the normal operation, reset SW2 to "zero (0)" and push SW7.

	LED2	LED3	LED4	LED5
SW4 OFF	Displays DI-1 input status.	Displays DI-2 input status.	Displays DI-3 input status.	Displays DI-4 input status.
SW4 ON	Displays DI-5 input status.	Displays DI-6 input status.	Displays DI-7 input status.	Displays DI-8 input status.

Input ON: LED lights
Input OFF: LED turns off

• Checking the RS-485 communication status

Use LED2 for checking the RS-485 communication status.
When RS-485 communication with Intelligent server is normal, LED-2 will blink.

		Normal	Abnormal
LED1	Power indicator	ON	OFF
LED2	RS-485 communication status indicator.	Blinking	OFF
LED3	Not used	OFF	OFF
LED4	Test indicator	OFF	OFF
LED5	Test indicator	OFF	OFF

Memo