

For Installer Company Use

For Maintenance and Inspection Use

**TABUCHI
ELECTRIC**

Model

EOW-MBX03-US

Master Box for Three-phase Inverter

Installation Manual

Operation Manual

- The content of this Installation Manual is meant for installers.
- After installation/configuration, give this manual to the person responsible for maintenance and inspection and store it in a safe place.
- Also refer to Inverter Unit Installation Manual.


- This product must be properly installed in order for it to perform and function according to specifications, and to ensure safety.
- Read all instructions prior to installing the product. Be sure to read the section titled "Safety Requirements" on page 2.
- To ensure safety, have a qualified person install wiring in accordance with all laws and regulations.


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Safety Requirements





Electrical wiring work should be handled by a qualified person dispatched from the seller or installation company. Be sure to carry out work according to the following precautions. Failure to do so may result in electric shock.

 **DANGER** Improper handling may lead to serious injury or death of the installer or user.


 **WARNING** Improper work may lead to serious injury or death of the installer or user.

 **CAUTION** Improper work may result in minor injury or property damage.





The symbols used in this text have the following meanings:

	Risk of electric shock		Be sure to connect the earth ground.
	Do not touch		Prohibited


DANGER

 • **Turn the Distribution Panel Breaker, Inverter Unit Output Breaker, and Power SW to "OFF" when installing the Master Box.**
Failing to do so may result in electric shock.



WARNING

 Prohibited	<ul style="list-style-type: none"> • Do not operate when your hands or body are wet. Doing so may result in electric shock. 	 Follow Instructions	<ul style="list-style-type: none"> • Wear low voltage rubber gloves when working with electrical wiring. Not doing so may result in electric shock. • Use only the included parts or specified materials when installing and wiring the unit. Failing to do so may result in electric shock or cause a fire.
 Disassembly Prohibited	<ul style="list-style-type: none"> • Never install in a location that is not listed in the Installation Manual or Electric Wiring Work Manual. Never disassemble or modify the unit. Doing so may cause the unit to drop, or may result in electric shock or cause a fire. 		<ul style="list-style-type: none"> • Leave the Inverter Unit Output Breaker and Power SW "OFF" when wiring or when the system is not being operated. Failing to do so may result in electric shock due to high voltage.
 Connect to earth ground	<ul style="list-style-type: none"> • Make sure the earth ground is connected. Not doing so may cause electric shock or cause a fire. 		<ul style="list-style-type: none"> • Use a dedicated crimp tool to crimp power cable terminals, and fasten to the specified torque. Failing to do so could result in electric shock or cause a fire.

⚠ WARNING

 <p>Prohibited</p>	<p>Do not install in the following locations:</p> <ul style="list-style-type: none">• Do not install the Master Box in locations where it may be exposed to steam. Doing so may worsen insulation, resulting in fire or electric shock.• Do not install the Master Box in regions where it may be exposed to salty conditions. (Locations that are within 500 m of coastlines or that are directly exposed to salt winds.)• Do not install the Master Box in locations that may flood. Doing so may cause a fire or result in electric shock.• Do not install the Master Box in locations that are very humid or that are poorly ventilated. Installation in a location with high humidity may worsen insulation, resulting in fire or electric shock.• Do not install the Master Box in locations that may become very hot (40° or higher) or that remain shut (such as in attics, closets, storage rooms, or under floors). Doing so may cause the output suppression function to run, reducing performance. It may also degrade parts, resulting in smoke or fire.• Do not install the Master Box in locations in which oily smoke is emitted, such as in kitchens. Doing so may degrade electric circuits and parts, causing burnout or fire.• Do not install the Master Box in locations where it may be exposed to corrosive gas or liquids (such as in chicken coops, barns, or places where chemicals are handled). Doing so may degrade parts, causing smoke or burnout.• Do not install the Master Box in locations where it may be exposed to cold air. Doing so may cause frost to build up on the product, causing a short circuit or burnout.• Do not install the Master Box upside down, sideways, or horizontally. Do not install it at an angle. Doing so may reduce internal radiation, degrading parts and causing smoke or fire.
---	--

⚠ CAUTION

 <p>Follow Instructions</p>	<ul style="list-style-type: none">• Install the Master Box in a location that adheres to the measurements listed in this manual. Otherwise, the product may be unable to radiate properly. In addition to reducing performance, this may cause errors.
 <p>Prohibited</p>	<ul style="list-style-type: none">• Do not paint the Master Box. Doing so may cause the temperature inside the enclosure to rise abnormally due to irradiance, resulting in errors.• Do not install the Master Box between broadcasting office transmission antennas and residential receiver antennas. Depending on the installation location, this may cause reception problems with devices such as radios and television receivers.• Do not install in locations with strict noise restrictions.• Do not install in locations with strict electrical noise restrictions.• Do not install near medical instruments. Doing so may cause medical instruments to malfunction.• Do not install in near amateur radio antennas.

Safety Requirements (Continued)

<Installer Qualifications>

This Installation Manual assumes knowledge related to handling electrical equipment.

Mounting, operating, servicing, and inspecting this product should be performed by a qualified service person according to regulations. "Qualified person" refers to someone who fulfills the following conditions:






- Has read this Installation Manual thoroughly and understands the content.
- Skilled in mounting, operating, servicing, and inspecting this electrical equipment, and understands its inherent dangers.
- Has received training on operating, servicing, and inspecting this electrical equipment.

<Precautions>

- Before handling, touch a metallic object to discharge static electricity.
Static electricity may cause the product to malfunction.

Overview/Functions

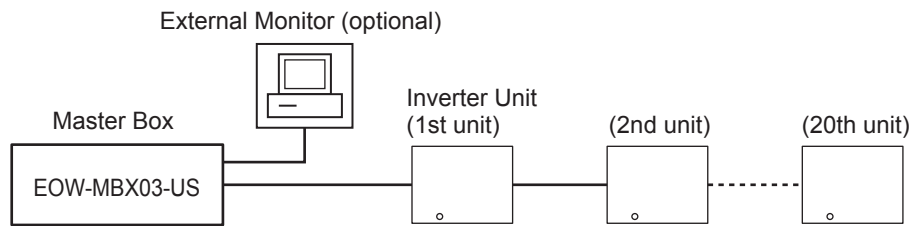
To provide following functions

- Starting/Stopping Operation of the entire system/individual inverter  Page 25
- Displays the status of power generation for the entire system/individual inverter  Page 27
- Displays System Status Information for the entire system/individual inverter  Page 29
- Displays System/Parameter Setting for the entire system/individual inverter  Page 35
- Outputs Data of the entire system to an External Monitor by using Tabuchi Original or Modbus protocol.  Page 20



<Master Box Connection Example>

(1) Controlling with a single Master Box

- A single Master Box can control up to 20 inverters.



<Master Box>

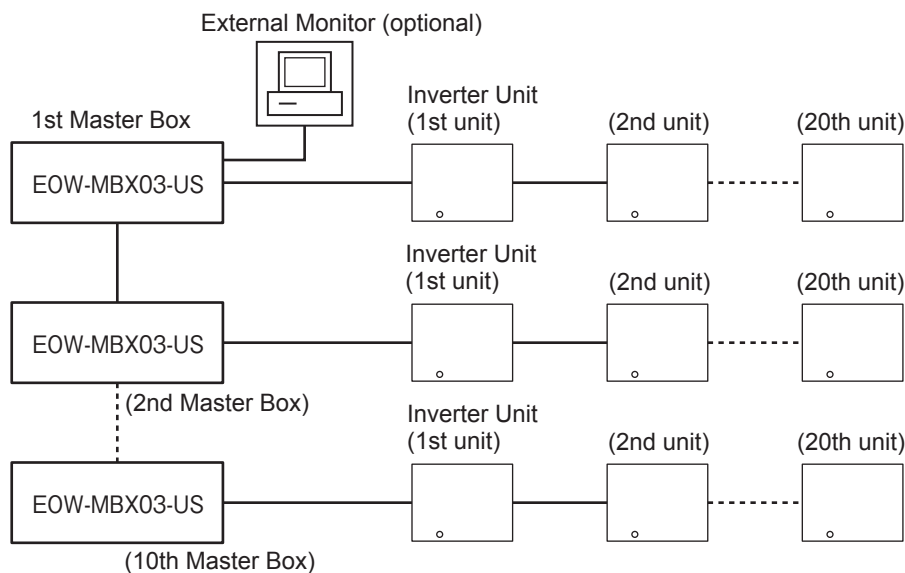
- Wiring and Setting the Master Box  Page 16
- Wiring the External Monitor (Optional)  Page 20

<Inverter Unit>




- Wiring and Setting the Inverter  Page 18

(2) Connecting Two or More Master Boxes


- A maximum of 10 Master Boxes can be connected.



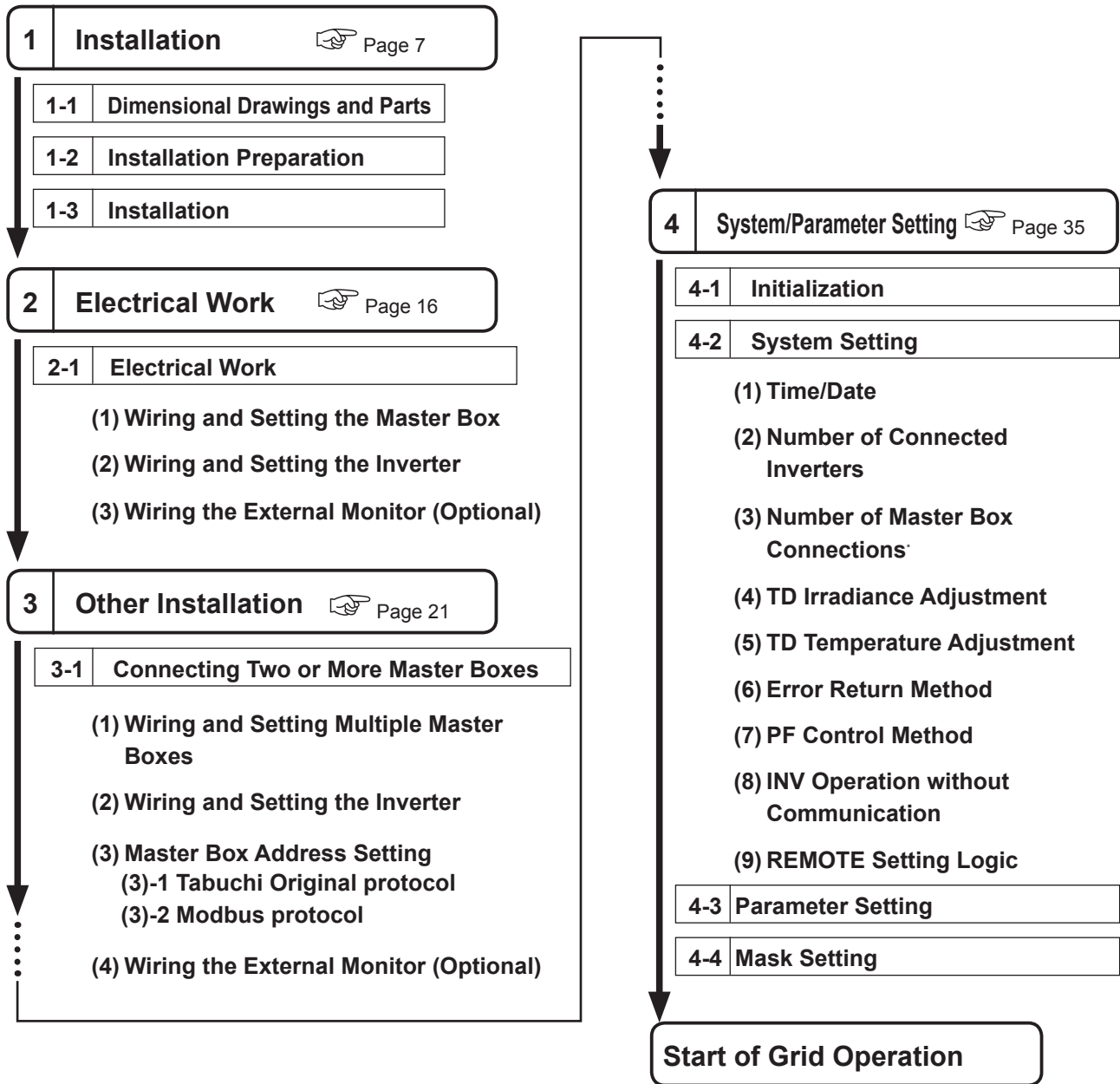
<Master Box>

- Wiring and Setting the Master Box  Page 16
- Connecting Two or More Master Boxes  Page 21
- Wiring the External Monitor (Optional)  Page 20

<Inverter Unit>

- Wiring and Setting the Inverter  Page 18

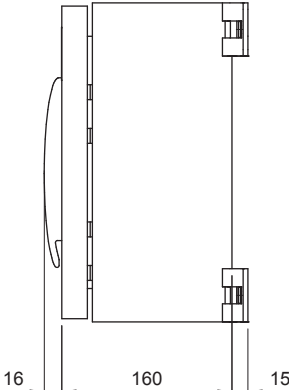
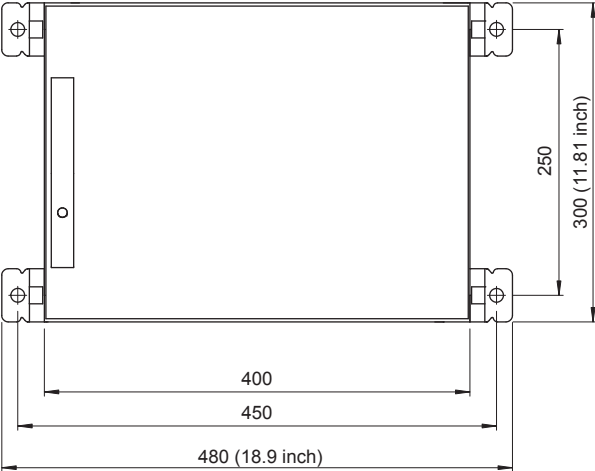
Prior to Starting Operation



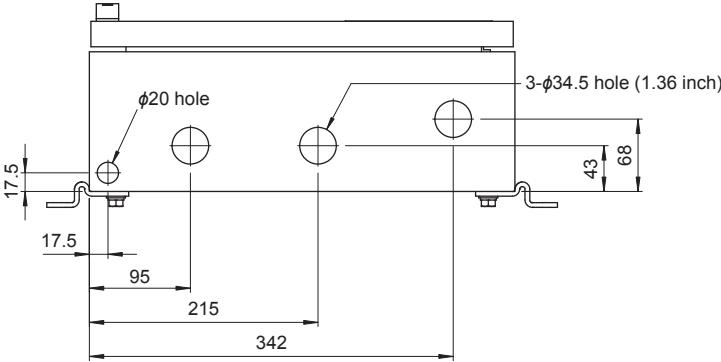
Dimensional Drawings and Parts

<Dimensional Outline Drawing>

Unit (mm)



Weight
Approx. 12 kg

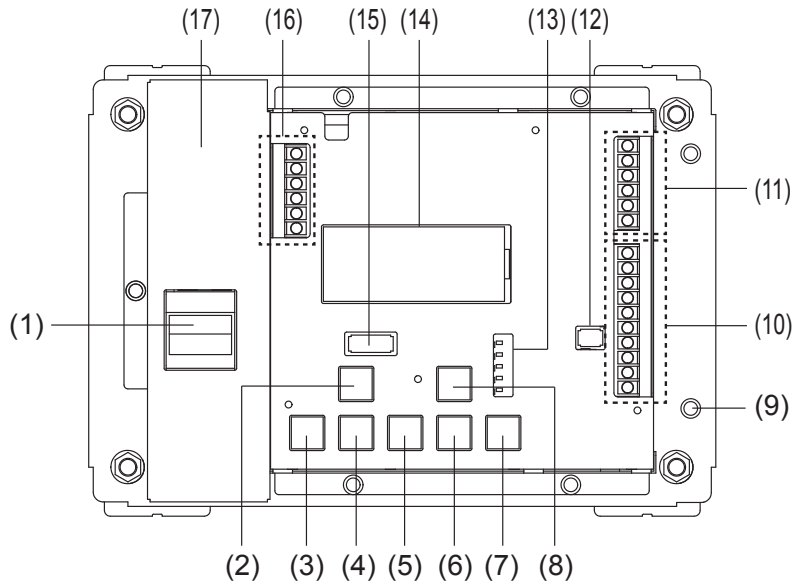


Accessories

Installation and Operation Manual	1
Ferrite Ring Core	1
Key	2

Dimensional Drawings and Parts (Continued)

<Internal View>



Ref. No	Name	Description
(1)	Power SW	Power switch to start the Master Box.
(2)	START/STOP Button	Starts/stops operation of connected inverters.
(3)	MODE Button	Switches between display and operation modes.
(4)	UP Button	Pressing this button changes the display for the power status, system information, and each setting.
(5)	DOWN Button	
(6)	BACK Button	
(7)	ENTER Button	
(8)	RE-START Button	Used to manually recover when a malfunction has occurred.
(9)	F.G	Frame GND
(10)	RS485 COM Terminal	Inverter Unit or Master Box are connected by a RS485 signal.
(11)	REMOTE Terminal	Not Used (Optional)
(12)	RS485 Termination SW	When the Master Box is placed at the end of RS485 line, this switch should be ON.
(13)	LED Display	Inverter status by setting, operation, stop, error, communication
(14)	LCD Display Panel	PV Power Status, System Information, Parameter Set
(15)	Master Box Address SW	Sets the address of each Master Box when two or more Master Boxes are connected.
(16)	TEMP Irradiance Terminal	Connected to cables running from the pyranometer and temperature meter.
(17)	Protective Cover	Only remove the protective safety cover when connecting to power.

<Terminal Area>

Details regarding the terminal area are shown below.

(16) TEMP Irradiance Terminal (TB1001)

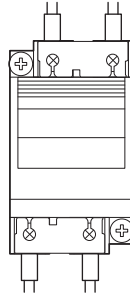
not used	+5V	1
not used	GND	2
TEMP	P	3
TEMP	N	4
IRRADIANCE	P	5
IRRADIANCE	N	6

(10) RS485 COM Terminal (TB1002)

BOX RS485 COM	BOX-P2	10
	BOX-N2	9
	BOX-G2	8
	BOX-P1	7
	BOX-N1	6
	BOX-G1	5
	SG	4
INV-485 COM	INV-P	3
	INV-N	2
	INV-G	1

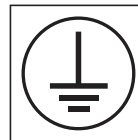
(17) Inside of Protective Cover

(1) Power SW Terminal



Commercial power supply
AC115V
60Hz

⊕ Earth GND

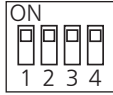


Dimensional Drawings and Parts (Continued)

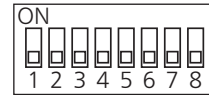
<Dip SW>

Used to set for the Master Box communicates. (👉 Page 17, Page 22)

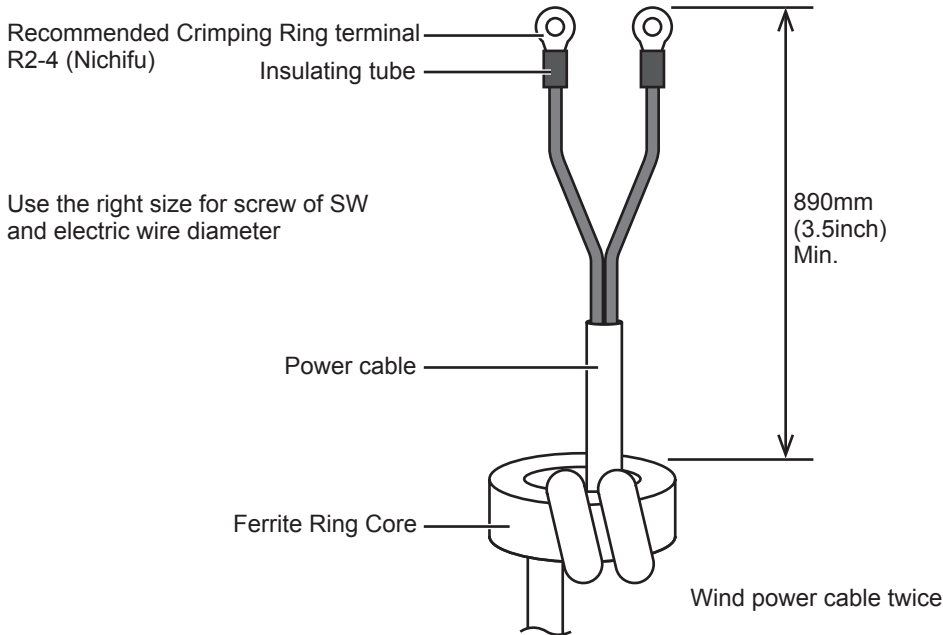
**(12) RS485 Termination SW
(SW1012)**



**(15) Master Box Address SW
(SW1001)**




<Using the Ferrite Ring Core attached Accessory>



Installation Preparation

Install the Master Box according to the location noted in the electrical diagram.

<Note>

- Be sure to follow the warnings and precautions on  pages 2 - 4.

This Master Box is for use outdoors. Be sure to follow the environmental conditions below:

<Usable Environmental Conditions> <Environmental conditions in which this product must not be used>

- Temperature:
-20 to +50°C
- Humidity: 90% or lower
(with no condensation)
- Elevation:
1,000 m or lower
- Locations exposed to direct sunlight.
- Locations exposed to direct heat from devices such as stoves.
- Locations subject to vibrations.
- Near devices that may emit sparks.
- Locations with dust, corrosive gas, salt, or combustible gas.
- Locations with noise restrictions such as places where people are and where sound may reverberate (such as classrooms or libraries).
- Residences (locations where people normally live).
- Locations where there is concern about the effect of high frequency noise from sources such as security cameras and radio guidance.
- Locations that cannot be easily inspected.

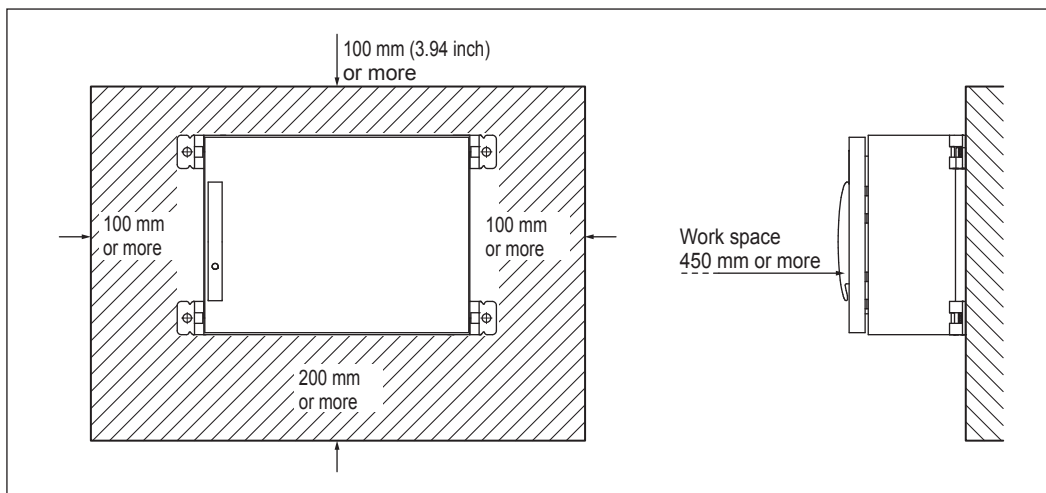
<Precautions>

- Confirm frames and walls used for installation can support the weight of the Master Box.

Weight *
Approx. 12 kg

* Weight does not include mounting brackets or frames.

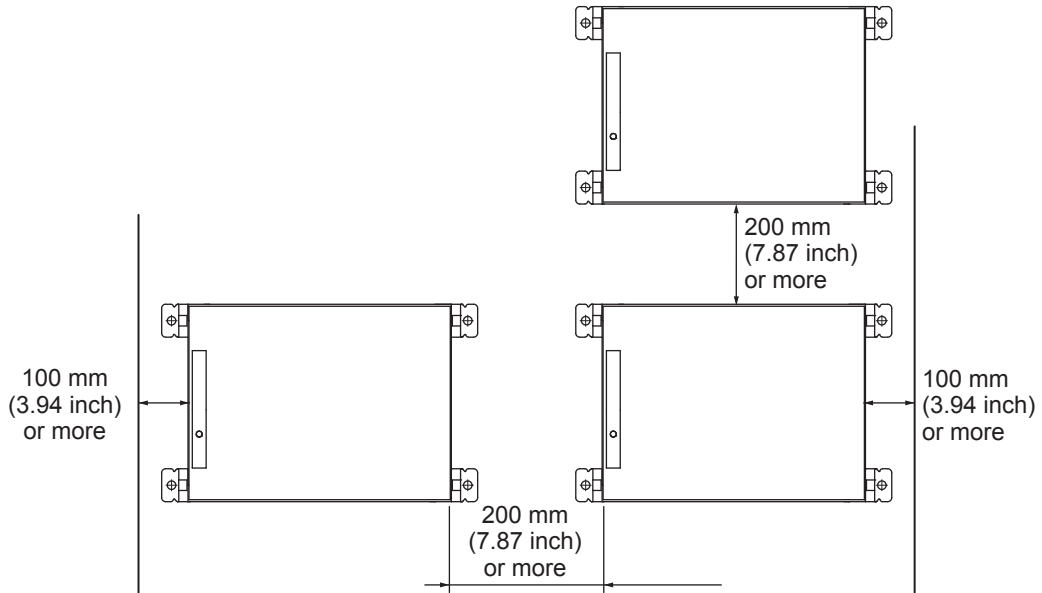
- Have the installer prepare a reinforced plate for the frame and the wall.
- Ensure the installation space as shown in the diagram below around the Master Box. (In order to provide space for ventilation, operation, and inspection, and to prevent being covered by snow or penetrated by water.)



Installation Preparation (Continued)

<When installing multiple units>

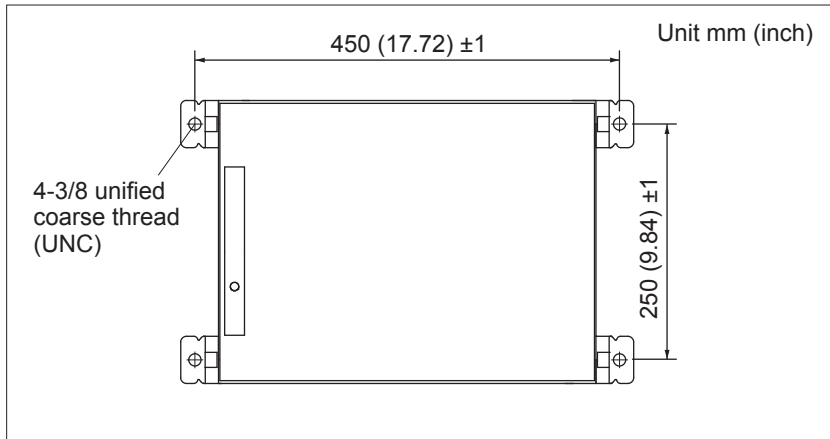
Refer to the following diagram when installing multiple Master Boxes:



<Installation hole positions>

Fixing bolt screw positions

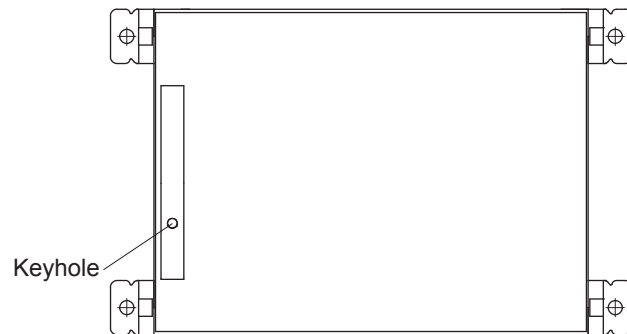
[When the mounting bracket is fixed in a lateral location]



Installation

1 Open the front panel.

(1) Unlock and open the front panel.



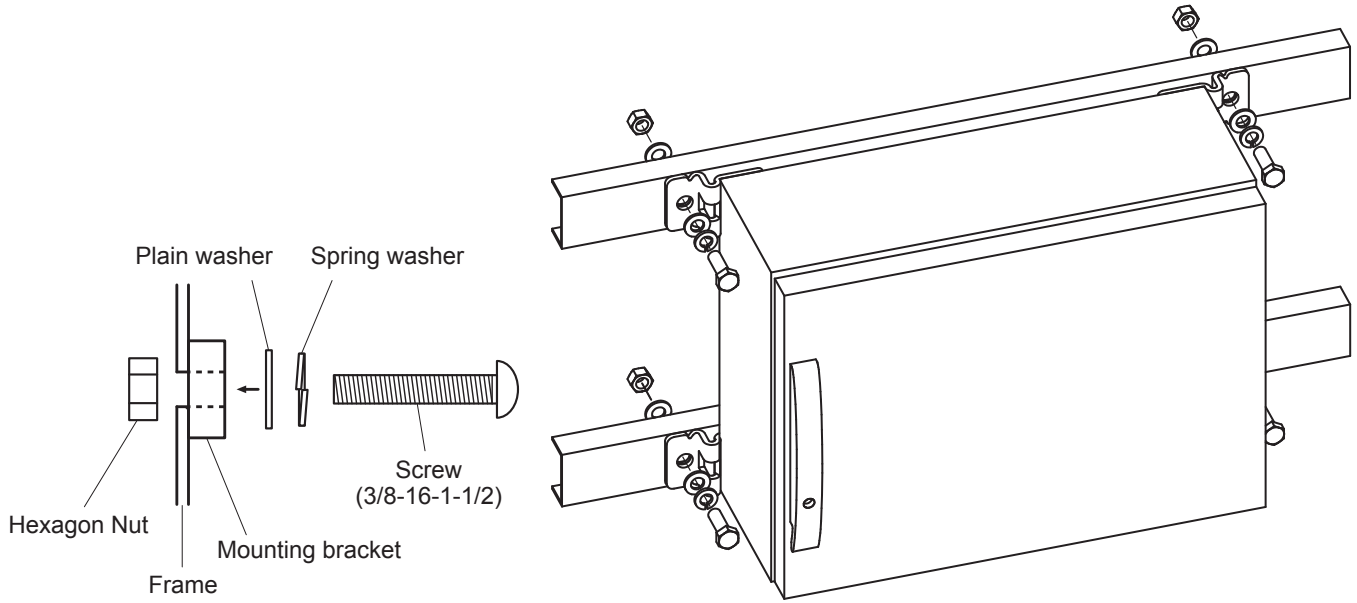
Installation (Continued)

2 Fix the main unit to the frame.

(1) Fix the main unit to the frame with the four bolts provided.

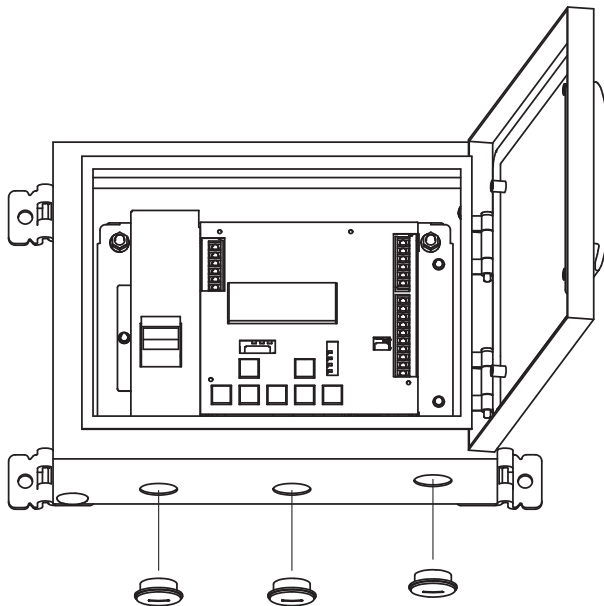
<Tightening torque: 11.1 to 13.5 N·m>

- Have the installer prepare the frame.



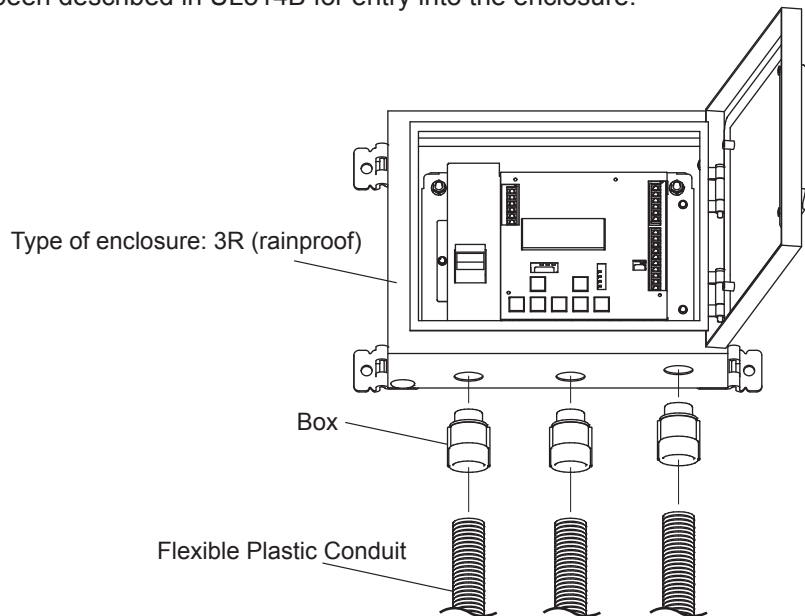
3 Pull the cables into the Master Box.

(1) Remove the three wiring caps on the bottom side.

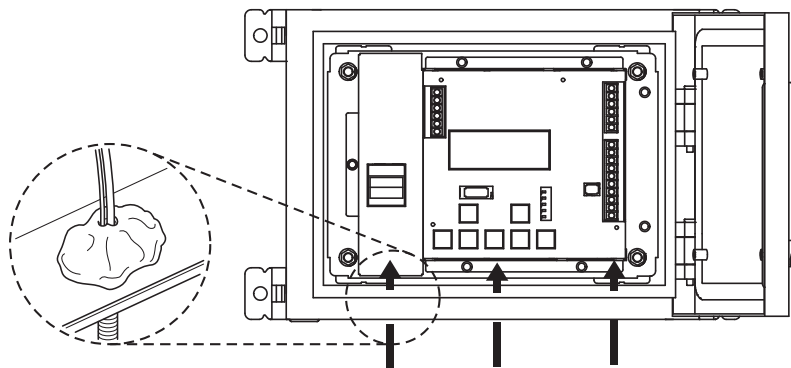


(2) Connect the flexible plastic conduit connectors to the wiring hole.

- Use rain-proof or wet location conduit that comply with the requirements in the Standard for Conduit, Tubing.
It has been described in UL514B for entry into the enclosure.



(3) Fill the inside of the wiring hole with putty.



5 Begin electrical work.

(1) Run wires to the Master Box and the Inverter. Configure both.

- Wiring and Setting the Master Box: Page 16
- Wiring and Setting the Inverter: Page 18

6 Close the front panel.

(1) Once electrical work is complete, close the front panel and lock it.

Electrical Work

Wiring and Setting the Master Box

1 Wire the power cable. (👉 Pages Page 9- 10)

(1) Remove the protective cover and wire a commercial power supply cable to the power SW terminal.

Make sure the power SW is OFF when working.

- Use 115 VAC for power.

(2) Return the protective cover to its original position once wiring is complete.

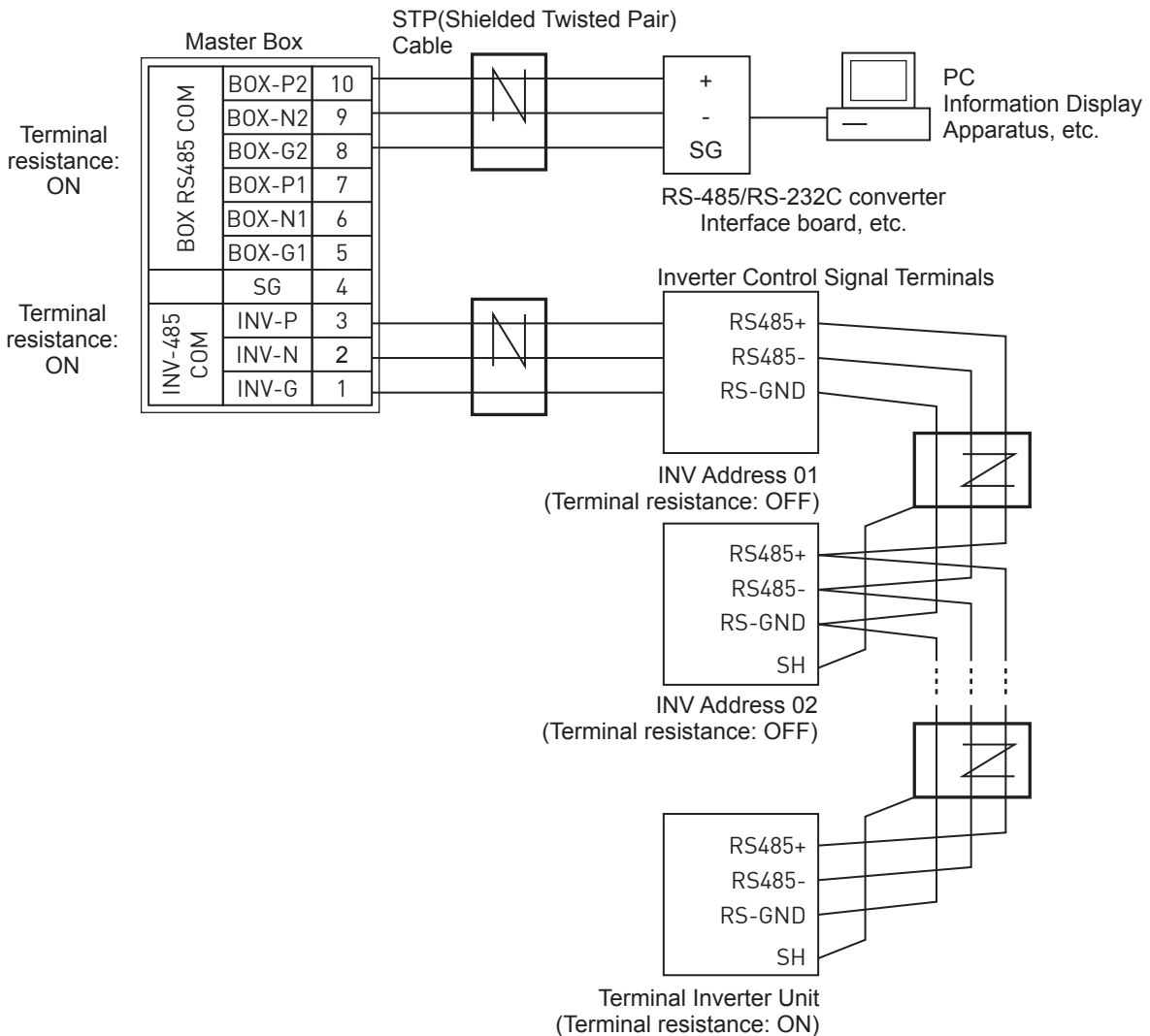
<Connecting a single Master Box>

2 Wire the control signal, etc.

(1) Wire signal cables to Signal Line Terminals 1 through 3. (TB1002).

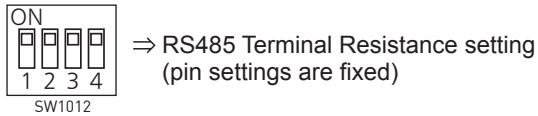
<Tightening torque: 0.88 to 1.08 N·m>

No	Terminal name	Signal
1	INV-G	RS-GND
2	INV-N	RS485-
3	INV-P	RS485+



3 Confirm the RS485 Terminal Resistance setting

- (1) Terminal resistance is applied to the Master Box for RS485 communication between the Master Box and the inverter. Therefore, use an RS485 connection terminal for the Master Box.
- (2) Confirm that the RS485 Termination Switch (SW1012) is configured as shown below:



- Connecting Two or More Master Boxes  Page 21

Wiring and Setting the Inverter

1 Wire the signal cable.

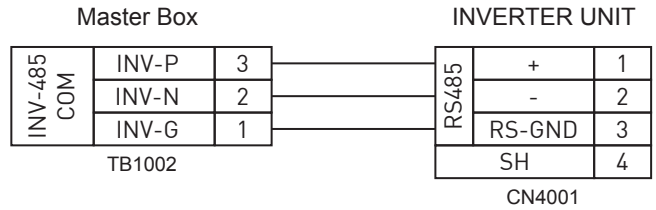
(1) Stop inverter operation, and turn OFF the Power SW of Master Box and all output breakers.

- Settings are not applied when current is flowing.
- For information on how to stop the Inverter Unit from operating, refer to “DC Switch-disconnector” for an individual inverter in the “Inverter Unit Installation Manual” on page 10.

(2) Wire the communication cable between the Master Box and the inverter.

<Tightening torque: 0.3 to 0.5 N·m>

- For information on wiring to the Inverter Unit, refer to “6.6 Communication Connection” in the Inverter Unit Installation Manual.

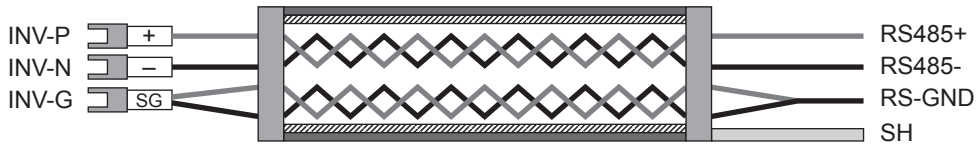


<RS485 Cable>

RS485 Cable (Required cable)

STP (Shielded Twisted Pair) , 2pair , AWG20 or AWG22

Diagram



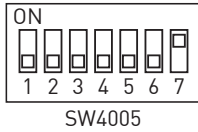
The shield must be tied to ground at only one point on the line

2 Configure communication.

(1) Use Dip SW4005 on the inverter to configure the “Address Setting.”

- For information on the “Address Setting,” refer to “Dip SW Setting” in the Inverter Unit Installation Manual. Refer to 6.6.1 Connecting the Inverter to the Master BOX Procedure

(Example)
Address 1



<Relationship between addresses and Dip SW>

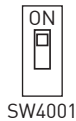
Address	Pin #3	Pin #4	Pin #5	Pin #6	Pin #7
1	OFF	OFF	OFF	OFF	ON
2	OFF	OFF	OFF	ON	OFF
3	OFF	OFF	OFF	ON	ON
4	OFF	OFF	ON	OFF	OFF
5	OFF	OFF	ON	OFF	ON
6	OFF	OFF	ON	ON	OFF
7	OFF	OFF	ON	ON	ON
8	OFF	ON	OFF	OFF	OFF
9	OFF	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON	OFF
11	OFF	ON	OFF	ON	ON
12	OFF	ON	ON	OFF	OFF
13	OFF	ON	ON	OFF	ON
14	OFF	ON	ON	ON	OFF
15	OFF	ON	ON	ON	ON
16	ON	OFF	OFF	OFF	OFF
17	ON	OFF	OFF	OFF	ON
18	ON	OFF	OFF	ON	OFF
19	ON	OFF	OFF	ON	ON
20	ON	OFF	ON	OFF	OFF

Set Pin#1 and Pin2 OFF

(2) Use Dip SW4001 on the Inverter to configure the “RS485 Terminal Resistance Setting.”

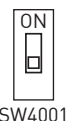
- For information on the “RS485 Terminal Resistance Setting,” refer to “6.6.1 Connecting the Inverter to the Master BOX” in the Inverter Unit Installation Manual.

Dip SW “ON”



⇒ RS485 Terminal Resistance setting

Dip SW “OFF”



⇒ RS485 relay setting

If multiple units are connected in sequence, configure the last Inverter as the terminal, and all other units as relays.

Wiring the External Monitor (Optional)

Wire as shown below if outputting signals from the entire system/individual inverters to an External Monitor, such as a PC or Information Display Apparatus.

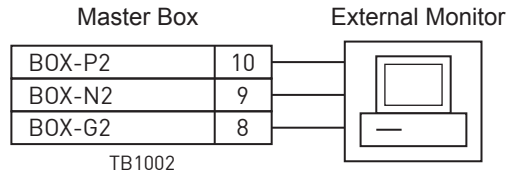
1 Wire the connection cable for the external monitor.

(1) Wire Signal Line Terminals 8 through 10 (TB1002).

<Tightening torque: 0.88 to 1.08 N·m>

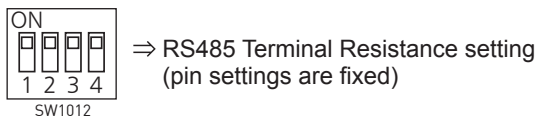
- If two or more Master Boxes are connected, wire the connection cable for terminals 8 through 10 of the 1st Master Box.

No	Terminal Name	Signal
10	BOX-P2	RS485+
9	BOX-N2	RS485-
8	BOX-G2	RS-GND



2 Confirm the RS485 Terminal Resistance setting.

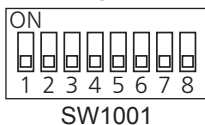
(1) Confirm the RS485 Termination Switch (SW1012) connected to the External Monitor is configured as shown below:



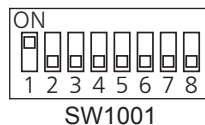
Wiring the External Monitor (Optional) Using Modbus protocol

- At Power-on, when SW 1001 pin 1 is OFF, Master Box communication is enabled (Modbus protocol is disabled), when SW1001 pin 1 is ON, Modbus protocol is enabled (Master Box original protocol is disabled).
- Reading of this DipSw is done only at Power-on, communication protocol is not changed even if DipSw is changed after Master Box Power-on.

Tabuchi Original protocol



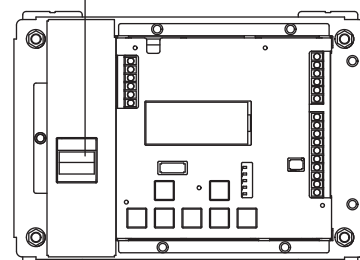
Modbus protocol



<Power-on reset>

Turn off the Power SW and turn it on again.

Power SW



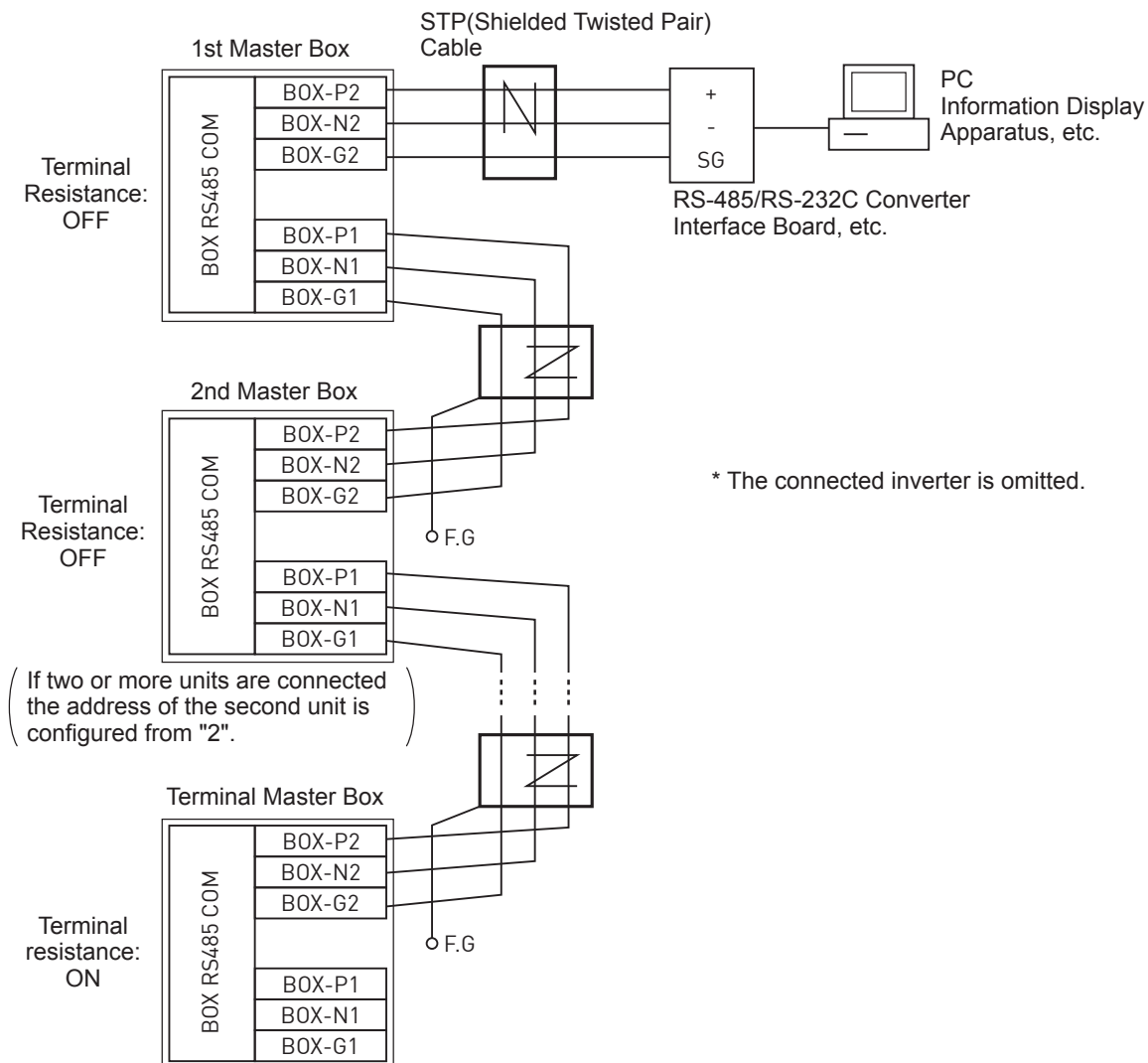
Connecting Two or More Master Boxes

Interwiring and Setting Master Boxes

1 Wire the Signal Line Terminal (TB1002) for each Master Box using a communication cable.

- (1) Wire the 1st Master Box and 2nd Master Box together (terminals 5 through 7) using a signal cable.
- (2) From the 2nd Master Box on, input to terminals 5 through 7, and output from terminals 8 through 10.
 - To connect an External Monitor, wire the communication cable for the external monitor to terminals 8 through 10 of the 1st Master Box.

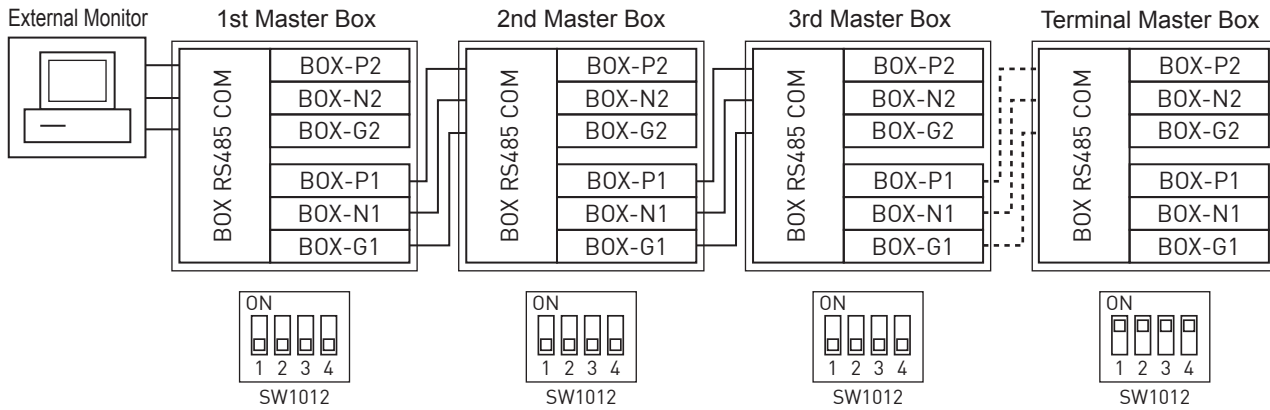
No	Terminal name	Signal
10	BOX RS485 COM	BOX-P2
9		BOX-N2
8		BOX-G2
7		BOX-P1
6		BOX-N1
5		BOX-G1



Connecting Two or More Master Boxes (Continued)

2 Use the RS485 Termination Switch (SW1012) to configure the RS485 Terminal Resistance Setting between Master Boxes.

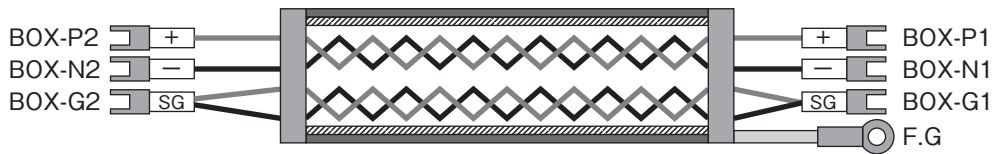
- (1) Set the all pins of the Master Boxes to “OFF”.
- (2) On the Terminal Box, set all pins to “ON”.



<RS485 Cable>

Required RS485 Cable

STP (Shielded Twisted Pair) , 2pair , AWG20 or AWG22



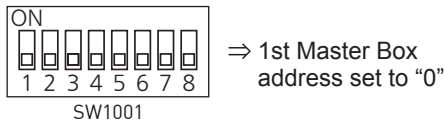
The shield must be tied to ground at only one point on the line

Address Setting to Connect Master Boxes to 1st Master Box

■ Tabuchi Original protocol

1 Configure using the Address Setting Switch (SW1001).

- (1) Set pin #1 through #8 on the 1st Master Box to “OFF”.
- (2) Set the address for the 2nd Master Box and any subsequent units to 2 through 10.
 - If two or more Master Boxes are connected, configure the address of the 1st Master Box to “0”.
 - Set the address of the 2nd Master Box and any subsequent units from “2”.
 - Refer to <Relationship between Addresses and Dip SW> for pin settings.



<Relationship between Addresses and Dip SW>

Address	Pin #3	Pin #4	Pin #5	Pin #6	Pin #7	Pin #8
0	OFF	OFF	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	OFF	OFF	ON
2	OFF	OFF	OFF	OFF	ON	OFF
3	OFF	OFF	OFF	OFF	ON	ON
4	OFF	OFF	OFF	ON	OFF	OFF
5	OFF	OFF	OFF	ON	OFF	ON
6	OFF	OFF	OFF	ON	ON	OFF
7	OFF	OFF	OFF	ON	ON	ON
8	OFF	OFF	ON	OFF	OFF	OFF
9	OFF	OFF	ON	OFF	OFF	ON
10	OFF	OFF	ON	OFF	ON	OFF

Connecting Two or More Master Boxes (Continued)

■ Modbus protocol

1 Configure using the Address Setting Switch (SW1001).

- (1) Set pin #1 through #8 on the 1st Master Box to “OFF”.
- (2) Set pin #1 on the Master Box to “ON”.
- (3) Set the address for the 1st Master Box and any subsequent units to 1 through 10.
 - If two or more Boxes are connected, configure the address of the 1st Master Box to “1”.
 - Set the address of the 2nd Master Box and any subsequent units from “2”.
 - Refer to <Relationship between Addresses and Dip SW> for pin settings.

<Relationship between Addresses and Dip SW>

Address	Pin #3	Pin #4	Pin #5	Pin #6	Pin #7	Pin #8
0	OFF	OFF	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	OFF	OFF	ON
2	OFF	OFF	OFF	OFF	ON	OFF
3	OFF	OFF	OFF	OFF	ON	ON
4	OFF	OFF	OFF	ON	OFF	OFF
5	OFF	OFF	OFF	ON	OFF	ON
6	OFF	OFF	OFF	ON	ON	OFF
7	OFF	OFF	OFF	ON	ON	ON
8	OFF	OFF	ON	OFF	OFF	OFF
9	OFF	OFF	ON	OFF	OFF	ON
10	OFF	OFF	ON	OFF	ON	OFF

* Invalid Master Box (Modbus protocol)

- If “Invalid Box Address!” is displayed, Master Box address is other than 1 to 10.
The Master Box does not work at this status.
Please change Master Box address to correct setting on Master Box Address SW (SW1001) and turn off the Power SW and turn it on again.

System state display
(Valid Master Box Address)

```
Oct01-12:00:00 BOX01
Status:
Power:
Stop INV:
```

System state display
(Invalid Master Box Address)

Invalid BOX Address!

Starting/Stopping Operation

Multiple inverters connected in a series can be started as an entire system or individually.

- A maximum of 20 inverters can be connected to a single Master Box.
- In addition to starting and stopping operation, the PV power status of the entire system and each inverter can be displayed. (👉 Page 27)

Entire System

1 Supply power to the Master Box.

Page 7: Turn the POWER SW ON.
The Time/Date Setting Screen is only shown during initial startup.

- Be sure to set the time and date during startup. (👉 Page 36)

```
[System Setup]
Time/Date ?
Nov/01/2015 - 12:00:00
^^^
```

Time/Date Setting Screen

2 Press to show the PV Power Status Screen for the entire system.

```
Nov 1 - 12:00:00   BOX 00
Status:           Conn
Power:            150.3kW
Stop INV:         Yes
```

PV Power Status Screen
(Entire system)

3 Press .

Start/stop operation of all connected inverters.

```
Nov 1 - 12:00:00   BOX 00
Status:           Disconn
Power:            0.0kW
Stop INV:         Yes
```

Stop Operation Screen
(Entire system)



Individual Inverter

1 Press to show the PV Power Status Screen for the entire system.

```
Nov 1 - 12:00:00   BOX 00
Status:           Conn
Power:            150.3kW
Stop INV:         Yes
```

PV Power Status Screen
(Entire system)

2 Press or to show the inverter as start or stop.

- The PV Power Status Screen of the connected inverter changes each time  or  is pressed.

```
Nov 1 - 12:00:00   INV 01
Status:           Ope
Power:            15.00kW
Bus Voltage:      880.0V
```

PV Power Status Screen
(Individual Inverter)

3 Press .

Start/stop operation of the displayed inverter.

- Operation is not changed for inverters that are not displayed.



```
Nov 1 - 12:00:00   INV 01
Status:           Stop
Power:            0.00kW
Bus Voltage:      880.0V
```

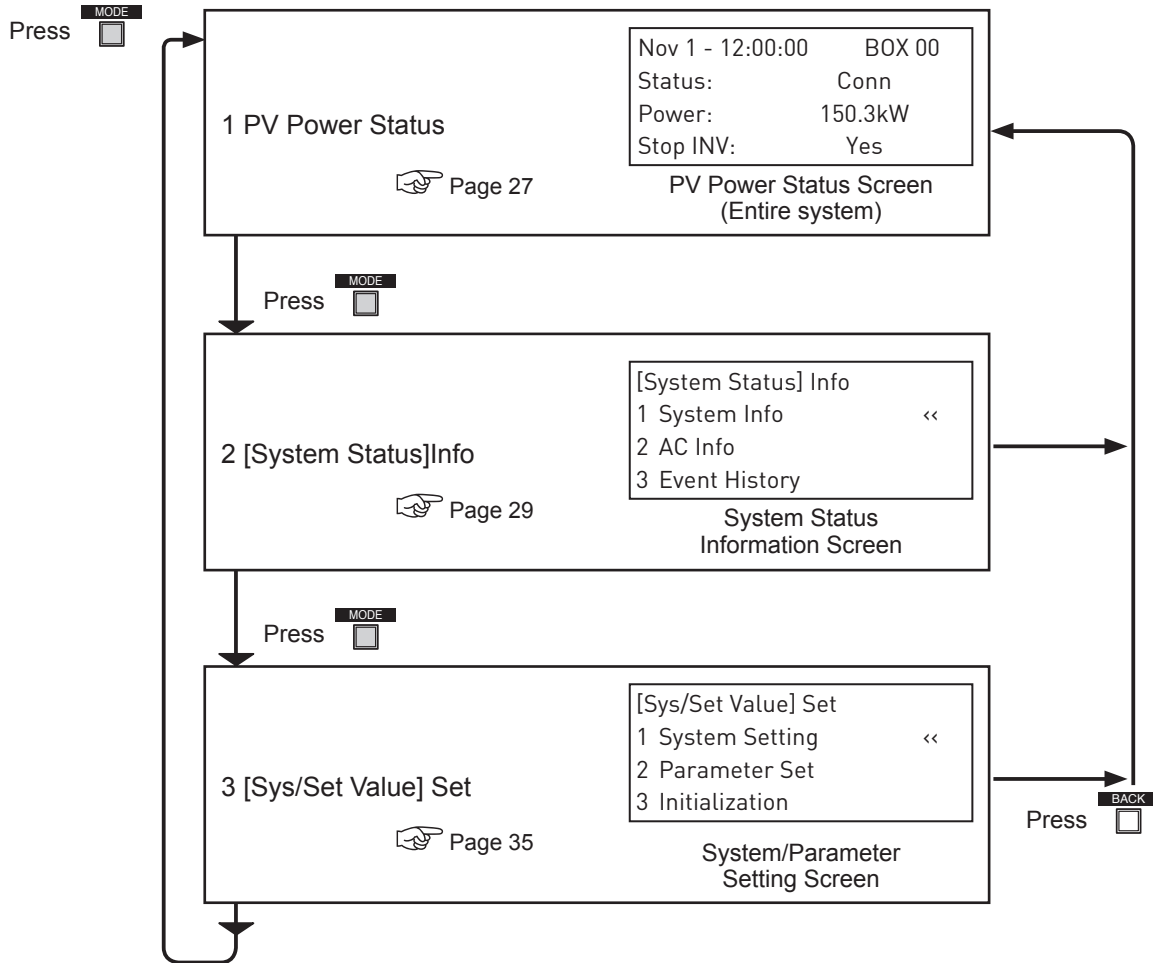
Stop Operation Screen
(Individual Inverter)

Mode Selection

The display switches between “PV Power Status,” “[System Status] Info,” and “[Sys/Set Value] Set”.

1 Repeatedly press to switch modes.

- The mode switches each time  is pressed, as shown below. Pressing  when in [System Status] Info MODE or [Sys/Set Value] Set MODE switches back to PV Power Status MODE.



1. PV Power Status MODE

The PV power status is displayed for the entire system or an individual inverter.

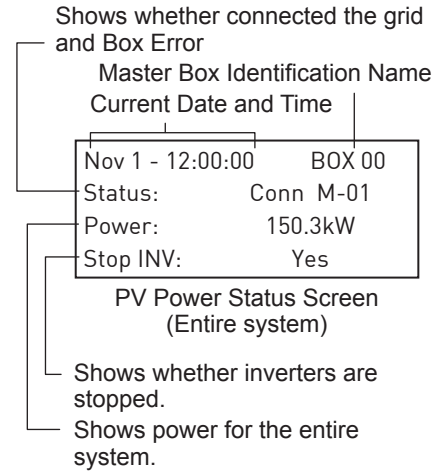
- The PV power status screen for each inverter can show the amount of power for each connected string.

PV Power Status Screen for the Entire System

1 Press **MODE** to show the PV Power Status Screen for the entire system.

- The operation of the entire system can be started or stopped from the PV Power Status Screen.

(Page 25)



PV Power Status Screen for Individual Inverters

1 Press **MODE** to show the PV Power Status Screen for the entire system.

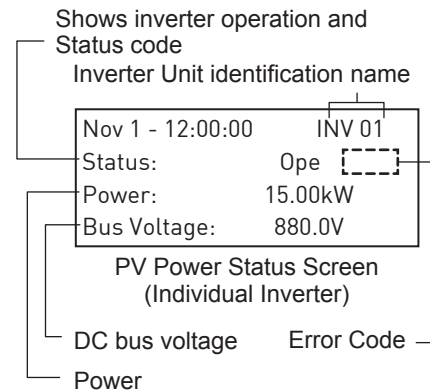
Nov 1 - 12:00:00	BOX 00
Status:	Conn
Power:	150.3kW
Stop INV:	Yes

PV Power Status Screen (Entire system)

2 Press **UP** or **DOWN** to select an inverter.

- The PV Power Status Screen of each connected inverter switches each time **UP** or **DOWN** is pressed.
- The operation of each inverter can be started or stopped from the PV Power Status Screen.

(Page 25)



3 Press **ENTER**.

The String PV Power Status Screen appears for the selected inverter.

- The power status of each DC input circuit is displayed (PV 1 through PV 6).
- Pressing **BACK** will return the display to the PV Power Status Screen of the selected inverter.

Nov 1 - 12:00:00	INV 01
PV1: 3000W	PV2:3000W
PV3: 3000W	PV4:3000W
PV5: 3000W	PV6:3000W

String PV Power Status Screen (PV1 through PV6)

1. PV Power Status MODE (Continued)

<Status Display>

■ Status display for the entire system

- “Conn” (connect to the grid): At least one inverter in the system is operating.
- “Disconn” (disconnect to the grid): All inverters in the system are stopped.

■ Status display for individual inverter

- Four statuses are displayed:
“Ope” (operation state), “Error” (error state) “Stop” (stop state) and “Stand-by” (stand-by state).

■ Status Code are displayed: Box Error Code, Inverter Controlled Code AND Error Code

Box Error Code

 Page 32)

Inverter Controlled Code

<Code list>

N-01	Voltage Regulation
N-02	Temperature Suppression
N-03	N-01 and N-02
N-04	Output Power Control
N-05	N-01 and N-04
N-06	N-02 and N-04
N-07	N-01, N-02 and N-04

Error Code

 Page 32)

2. [System Status] Info MODE

Displays “System Information,” “AC Information,” “Event History,” and “Total Power”.

- The history can be cleared from the “Event History” screen.

System Status Information

- 1 Repeatedly press  to display the System Status Information Screen.

[System Status] Info





```
1 System Info      <<
2 AC Info
3 Event History
```

System Status Information
Screen

- 2 Press  or , select an item, and press .

Information for the selected item is displayed.



<System Information items>

No.	Item	Display	Reference
1	System Information	1 System Info	 Page 30
2	AC Information	2 AC Info	 Page 30
3	Event History	3 Event History	 Page 31
4	Total Power	4 Total Power	 Page 34

- Press  to return to the System Status Information Screen.

2. [System Status] Info MODE (Continued)

1. System Information


- 1 Press  or  on the System Status Information Screen, and select “1 System Info”.

```
[System Status] Info
1 System Info      <<
2 AC Info
3 Event History
```

System Status Information Screen

- 2 Press  .

The System Information Screen appears.

- Press  to return to the System Status Information Screen.

```
[System Info]
No. of INV       : 01
BOX Software     : 05.01
```



System Information Screen

Applied Software Version (Current)

The number of connected inverters



■ Communication protocol indicator

When Modbus protocol is enabled,

- Press  displays a valid communication protocol on the system status information screen.
- Press  backs to the previous screen.

```
[System Info] BOX
BOX Software:     **.**
                  *
Comm Prot:        Modbus
```

2. AC Information


- 1 Press  or  in the System Status Information Screen, and select “2 AC Info”.

```
[System Status] Info
1 System Info
2 AC Info      <<
3 Event History
```

System Status Information Screen

- 2 Press  .

The AC Information Screen appears.

- Press  to return to the System Status Information Screen.



```
[AC Info]
Grid Voltage:    442.0V
Grid Freq:      60.0Hz
```

AC Information Screen

AC frequency

AC voltage

3. Event History

- 1 Press  or  on the System Status Information Screen, and select “3 Event History”.

```
[System Status] Info
1 System Info
2 AC Info
3 Event History <<
```

System Status
Information Screen




- 2 Press  .

The Event History Screen appears.

- 3 Press  or  , select an event history item, and press  .



Information for the selected event is shown.

<Event History Display Items>

No.	Item	Display	Reference
1	Error History	1 Error Hstry	 Page 31
2	Voltage Regulation History	2 V Reg Hstry	 Page 33
3	Temperature Suppression History	3 Temp Spprs Hstry	 Page 34

- Press  to return to the System Status Information Screen.

1. Error History



- (1) Press  or  on the Event History Screen, and select “1 Error Hstry”.

- (2) Press  .


The display appears.

- Information for the stopped inverter is displayed in order of the latest error event. (Date and time of occurrence, Inverter Unit Identification Name, Error Code, and Error Details)

Refer to <Error Code list> ( Page 32)

- Pressing  or  switches the display of the Error History for scroll.
- The Error History retains a maximum of 512 events. A four-digit Error Code is shown using alphanumeric characters depending on the details of the error.

* For details, ask your service person.

- Press  to return to the System Status Information Screen.

```
[Event History]
1 Error Hstry <<
2 V Reg Hstry
3 Temp Spprs Hstry
```

Event History Screen

```

Date and time of occurrence
Inverter Unit identification name
[Error] 001
Nov/01/2015-13:00:00
INV01-DC/DC1
D-12 Over V
```

Error History Screen

Error Code, Error Details
Inverter Unit, DC/DC
Identification Name

2. [System Status] Info MODE (Continued)

<Error Code list>

Error Code	Display	Error Description
G-01	AC Over V1	AC Over Voltage1
G-02	AC Under V1	AC Under Voltage1
G-03	AC Over F1	AC Over Frequency1
G-04	AC Under F1	AC Under Frequency1
G-05	Passive	Islanding Operation (Passive)
G-06	Active	Islanding Operation (Active)
G-08	Inst Over V	Instantaneous Over Voltage
G-10	DC Compo	DC Component Current
G-11	Inst Over C S	Instantaneous Over Current (Software)
G-13	AC Phase	AC Phase
G-20	AC Over V2	AC Over Voltage2
G-21	AC Over V3	AC Over Voltage3
G-22	AC Under V2	AC Under Voltage2
G-23	AC Under V3	AC Under Voltage3
G-24	AC Over F2	AC Over Frequency2
G-25	AC Under F2	AC Under Frequency2
G-26	Inst Over C H	Instantaneous Over Current (Hardware)






Error Code	Display	Error Description
E-01	DC Over V S	DC Over Voltage (Software)
E-02	DC Under V	DC Under Voltage
E-03	IPM	IPM
E-05	Middle Point V	Middle Point Voltage
E-06	Leak Crnt1	Leakage Current1
E-07	Leak Crnt2	Leakage Current2
E-08	Leak Crnt3	Leakage Current3
E-09	Leak Crnt4	Leakage Current4
E-10	Leak Self Test	Leakage Current Self Test
E-11	Riso Self Test	Insulation Resistance Self Test Fail
E-12	Riso Low	Low Insulation Resistance
E-13	Ground Fault	Ground Fault
E-21	REDY	REDY Signal
E-22	ISO5V	ISO5V
E-24	DC Over V H	DC Over Voltage (Hardware)
E-25	Fan Lock	Fan Lock
E-41	Remote Off	Remote Off
E-61	DCC Under V	DC/DC Under Voltage
E-86	BOX-INV Comm	BOX-INV Communication
E-90	EEPROM Comm	EEPROM Communication
E-91	Over Temp	Over Temperature
E-92	Under Temp	Under Temperature
E-93	EEPROM Sum	EEPROM Sum
E-94	Temp Loss	Inverter Temperature Data Loss
E-95	Minor Issue	Minor Issue1
E-96	Minor Issue	Minor Issue2
E-97	Minor Issue	Minor Issue3
E-98	Major Issue	Major Issue1
E-99	Major Issue	Major Issue2

Error Code	Display	Error Description
D-x2	Over V	DC/DC x Over Voltage
D-x3	DC Relay	DC/DC x DC Relay
D-x4	Over Temp	DC/DC x Over Temperature
D-x5	Temp Loss	DC/DC x Temperature Loss
D-x6	Over C	DC/DC x Over Current
D-x8	Arc Self Test	DC/DC x Arc Self Test Fail
D-x9	Arc Fault	DC/DC x Arc Fault

<BOX Error Code list>

Error Code	Display	Error Description
M-01	RTC Comm	BOX RTC Communication
M-02	RTC Data	BOX RTC Data
M-03	EEPROM Comm	BOX EEPROM Communication
M-04	EEPROM Sum	BOX EEPROM Sum
M-05	I2C Access OF	BOX I2C Access Overflow

Clear Error History

- (1) Press  or  and select “No History Data” page of [Error] menu.
- (2) Press  .
The Clear History Screen appears.
- (3) Press  .
All events in the Error History are cleared, and the system returns to the System Status Information Screen.
 - Pressing  returns to the Error History Screen without clearing the error history.







[Error]
No History Data

Error History Screen

[Error]
Clearing data log ?
ENTER or BACK

Clear History Screen

2. Voltage Regulation History

- (1) Press  or  on the Event History Screen, and select “2 V Reg Hstry”.
- (2) Press  .
The Voltage Regulation History Screen appears.
 - Information on the inverter that initiated voltage control is displayed in order of latest control event.
(Date and time of occurrence or end, Inverter Unit Identification Name, control start or end)
 - Pressing  or  switches the Voltage Regulation History display for scroll.
 - Voltage Control History retains a maximum of 512 events.
 - Press  to return to the System Status Information Screen.






[Event History]
1 Error Hstry
2 V Reg Hstry <<
3 Temp Spprs Hstry

Event History Screen

— Date and time of occurrence or end
[V Reg] 001
Nov/01/2015 -13:30:00
— Inverter Unit identification name
INV01
— Control start or end
Status: END

Voltage Regulation History Screen

Clear Voltage Control History

- (1) Press  or  on the Voltage Regulation History Screen, and select “No History Data” page of [Error] menu.
- (2) Press  .
The Voltage Regulation History Clear Screen appears.
- (3) Press  .
All events in the Voltage Regulation History are cleared, and the system returns to the System Status Information Screen.
 - Pressing  returns to the Voltage Regulation History Screen without clearing the Voltage Regulation History.

[V Reg]
No History Data



Voltage Regulation History Screen

[V Reg]
Clearing data log ?
ENTER or BACK

Clear Voltage Regulation History Screen




2. [System Status] Info MODE (Continued)

3. Temperature Suppression History

(1) Press  or  on the Event History Screen, and select “3 Temp Spprs Hstry”.

(2) Press .

The Temperature Suppression History Screen appears.

- Information on the inverter that caused temperature control is displayed in order of latest control event.
(Date and time of occurrence or end, Inverter Unit Identification Name, control start or end)
- Pressing  or  switches the display of the Temperature Suppression History for scroll.
- Temperature Suppression History retains a maximum of 512 events.
- Press  to return to the System Status Information Screen.

```
[Event History]
1 Error Hstry
2 V Reg Hstry
3 Temp Spprs Hstry  <<
```

Event History Screen

Date and time of occurrence or end

```
[Temp Spprs]      001
Nov/01/2015 -13:30:00
INV01
Status: END
```

Temperature Suppression History Screen

Control start or end

Inverter Unit Identification Name

Clear Temperature Control History


(1) Press  or  on the Temperature Suppression History Display, and select “No History Data” page of [Error] menu.

(2) Press .

The Temperature Suppression History Clear Screen appears.

(3) Press .

All events in the Temperature Suppression History are cleared, and the system returns to the System Status Information Screen.

- Pressing  returns to the Temperature Suppression Screen without clearing the Temperature Suppression History.

```
[Temp Spprs]

No History Data
```

Temperature Suppression History Screen

```
[Temp Spprs]
Clearing data log ?
ENTER or BACK
```

Clear Temperature Suppression History Screen

4. Total Power




1 Press  or  on the System Status Information Screen, and select “4 Total Power”.

```
[System Status] Info
2 AC Info
3 Event History
4 Total Power  <<
```

System Status Information Screen

2 Press .

The Total Power Screen appears.

- Pressing  or  switches the display of the Total Power between the entire system and individual inverters.
- Press  to return to the System Status Information Screen.

Total Power for entire system

```
[Total Power]
TOTAL:      532030kWh  <<
INV01:      10010kWh
INV02:      10310kWh
```

Total Power Screen

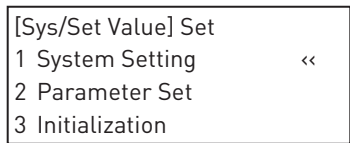
Total Power for Individual Inverter Units

3. [Sys/Set Value] Set MODE

Performs “System Setting,” “Parameter Setting,” “Mask Setting,” and “Setting Initialization”.

System/Parameter Setting

1 Repeatedly press  to display the System/Parameter Setting Screen.






System/Parameter Setting Screen

2 Press  or , select an item, and press .

Selection items are shown below.

<System/Parameter Setting Items>

No.	Item	Display	Reference
1	System Setting	1 System Setting	 Page 36
2	Parameter Set	2 Parameter Set	 Page 43
3	Initialization	3 Initialization	 Page 45

- Press  to return to the System/Parameter Setting Screen.

3. [Sys/Set Value] Set MODE (Continued)

1. System Setting

1 Press  or  on the System/Parameter Setting Screen, and select “1 System Setting”.

```
[Sys/Set Value] Set
1 System Setting      <<
2 Parameter Set
3 Initialization
```

System/Parameter Setting Screen

2 Press  .
The System Setting Screen is shown.

```
[System Setting]
1 Time/Date:      00:00 <<
2 No. of INV      : 01
3 No. of BOX      : 01
```

System Setting Screen









3 Press  or  to select a System Setting item, and press  .

Items listed on the Setting Screen are shown below.


```
[System Setting]
Time/Date ?
Nov/01/2015 -12:00:00
^^^
```

Setting Screen (example: date/time setting)



<System Setting Items>

No.	Item	Display	Reference
1	Time/Date	Time/Date	 Page 37
2	Number of Inverter Connections	No. of INV	 Page 37
3	Number of Master Box Connections	No. of BOX	 Page 38
4	TD Irradiance Adjustment	Irradiance Adj	 Page 39
5	TD Temperature Adjustment	Temp Adj	 Page 40
6	Inverter Operation at Arc Fault	Arc Fault	 Page 41
7	Fail Recovery Method	Fail Recov	 Page 41
8	Remote Logic	Remote Logic	 Page 42

* Set on 1st Master Box of a system with multiple Master Boxes connected.



- Press  to return to the System Setting Screen.
- If the system is not operated for 30 minutes when changing settings, it automatically returns to the PV Power Status Screen for the entire system.


1. Time/Date


(1) Press  or  on the System Setting Screen, and select "1 Time/Date".

(2) Press .


The Time/Date Setting Screen appears.


(3) Press  or  to change the value at the cursor point.

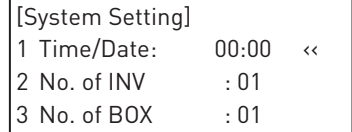
(4) Press  to move the cursor to next item.

Press  to move the cursor to previous item.

• If the system is not operated for 30 minutes when changing settings, it automatically returns to the PV Power Status Screen for the entire system.

(5) To save the changed date and time, move the cursor to seconds item, and press . The screen returns to the System Setting Screen.

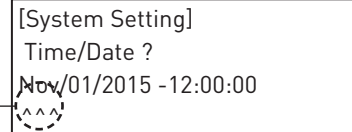
(6) To return to the System Setting Screen, move the cursor to month item, and press . The date and time is NOT set.



[System Setting]
1 Time/Date: 00:00 <<
2 No. of INV : 01
3 No. of BOX : 01

System Setting Screen

Cursor





[System Setting]
Time/Date ?
Nov/01/2015 -12:00:00

Time/Date Setting Screen

2. Number of Inverter Connections

• Up to 20 inverters can be connected to a single Master Box.

(1) Press  or  on the System Setting Screen, and select "2 No. of INV".

(2) Press .

The number of connected inverters appears.

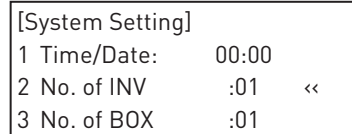
(3) Press  or  to change the value.

• If the system is not operated for 30 minutes when changing settings, it automatically returns to the PV Power Status Screen for the entire system.

(4) Press .

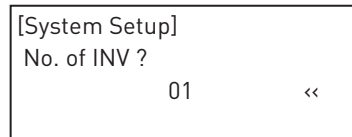
The changed values are set, and the system returns to the System Setting Screen.

• Press  to return to the System Setting Screen without changing settings.



[System Setting]
1 Time/Date: 00:00
2 No. of INV :01 <<
3 No. of BOX :01

System Setting Screen



[System Setup]
No. of INV ?
01 <<

Number of Inverter Connections Screen

3. [Sys/Set Value] Set MODE (Continued)

3. Number of Master Box Connections

- The number of Master Boxes connected to the 1st Master Box is set on the 1st Master Box.
- Up to 9 Master Boxes can be connected to the 1st Master Box.

(1) Press or on the System Setting Screen, and select "3 No. of BOX".

(2) Press .

The Number of Connected Inverters Screen appears.

(3) Press or to change the value.

- If the system is not operated for 30 minutes when changing settings, it automatically returns to the PV Power Status Screen for the entire system.

(4) Press .

The changed values are set, and the system returns to the System Setting Screen.

- Press to return to the System Setting Screen without changing settings.

```
[System Setting]
1 Time/Date:    00:00
2 No. of INV   :01
3 No. of BOX   :01  <<
```



System Setting Screen

```
[System Setup]
No. of BOX ?
                01  <<
```

Number of Master Box Connections Screen



4. TD Irradiance Adjustment

- If connecting a transducer (TD), set the “Irradiance Adjustment Value”.
- The factory default setting is “2”.

(1) Press  or  on the System Setting Screen, and select “4 Irradiance Adj”.

(2) Press .

The TD Irradiance Adjustment Screen appears.

(3) Press  or  to change the irradiance adjustment value.

- If the system is not operated for 30 minutes when changing settings, it automatically returns to the PV Power Status Screen for the entire system.

(4) Press .

The changed content is set, and the system returns to the System Setting Screen.

<Irradiance Adjustment Value>

Parameter	Details
0	0/0.8 V ~ 2000 W/m ² /4 V <Pyranometer 5μV/ (W/m ²)>
1	0/0.8 V ~ 1667 W/m ² /4 V <Pyranometer 6μV/ (W/m ²)>
2	0/0.8 V ~ 1429 W/m ² /4 V <Pyranometer 7μV/ (W/m ²)>
3	0/0.8 V ~ 1250 W/m ² /4 V <Pyranometer 8μV/ (W/m ²)>
4	0/0.8 V ~ 1111 W/m ² /4 V <Pyranometer 9μV/ (W/m ²)>
5	0/0.8 V ~ 1000 W/m ² /4 V <Pyranometer 10μV/ (W/m ²)>
6	0/0.8 V ~ 909 W/m ² /4 V <Pyranometer 11μV/ (W/m ²)>
7	0/0.8 V ~ 833 W/m ² /4 V <Pyranometer 12μV/ (W/m ²)>
8	0/0.8 V ~ 769 W/m ² /4 V <Pyranometer 13μV/ (W/m ²)>
9	0/0.8 V ~ 714 W/m ² /4 V <Pyranometer 14μV/ (W/m ²)>

<<200Ω>> 4-20 mA conversion fixed, transducer unit: 0-10 mV input fixed

- Press  to return to the System Setting Screen without changing settings.

[System Setting]	
2 No. of INV	:01
3 No. of BOX	:01
4 Irradiance Adj	: 2 <<

System Setting Screen

[System Setup]	
Irradiance Adj?	
	2: 7μV/(W/m ²) <<
Level:	0W/m ²

TD Irradiance Adjustment Screen

3. [Sys/Set Value] Set MODE (Continued)

5. TD Temperature Adjustment

- If connecting a transducer (TD), set the “Ambient Temperature Adjustment Value”.
- The factory default setting is “0”.

[System Setting]			
3	No. of BOX	:	01
4	Irradiance Adj	:	2
5	Temp Adj	:	0 <<

System Setting Screen

(1) Press or on the System Setting Screen, and select “5 Temp Adj”.

(2) Press .

The TD Temperature Adjustment Screen appears.

(3) Press or to change the setting.

- If the system is not operated for 30 minutes when changing settings, it automatically returns to the PV Power Status Screen for the entire system.

(4) Press .

The changed content is set, and the system returns to the System Setting Screen.

[System Setting]			
Temp Adj?			
	0:	-20~100°C	<<
	Level:	-20.0°C	

TD Temperature Adjustment Screen

<Ambient Temperature Adjustment Value>

Parameter	Details
0	-20°C/0.8V ~ 100°C/4V
1	-20°C/0.8V ~ 80°C/4V
2	-20°C/0.8V ~ 50°C/4V
3	-50°C/0.8V ~ 100°C/4V
4	-50°C/0.8V ~ 80°C/4V
5	-50°C/0.8V ~ 50°C/4V
6	0°C/0.8V ~ 100°C/4V
7	0°C/0.8V ~ 80°C/4V
8	0°C/0.8V ~ 50°C/4V

<Conversion table>

°C	°F	°C	°F
-20	-4	20	68
-15	5	25	77
-10	14	30	86
-5	23	35	95
0	32	40	104
5	41	45	113
10	50	50	122
15	59	55	131

$$[°F]=[°C]*1.8+32$$

<<200Ω>> 4-20 mA conversion fixed, transducer unit: 0-10 mV input fixed



- Press to return to the System Setting Screen without changing settings.

6. Inverter Operation at Arc Fault

- Operation to the inverter model without arc protection is ignored.
- Sets inverter operation when an ARC fault is detected.
- The factory default is “Stop”.

```
[System Setting]
4 Irradiance Adj:    2
5 Temp Adj:         0
6 Arc Fault:        Stop <<
```

System Setting Screen



(1) Press  or  on the System Setting Screen, and select “6 Arc Fault”.

(2) Press .

The Arc Protect Screen appears.

```
[System Setting]
Arc Fault?
                Stop <<
```

Inverter Operation at Arc Fault Screen

(3) Press  or  to change the Inverter Operation at Arc Fault.

- If the system is not operated for 30 minutes when changing settings, it automatically returns to the PV Power Status Screen for the entire system.

(4) Press .

The changed content is set, and the system returns to the System Setting Screen.

<Settings>

Display	Content
Stop	Stops operation of the inverter.
Operation	Continues operation of the inverter.



- Press  to return to the System Setting Screen without changing settings.

7. Fail Recovery Method

- Operation to the inverter model that can not change the fail recovery method is ignored.
- Switches between automatic/manual operation for error return.
- The factory default is “Manual”.

```
[System Setting]
5 Temp Adj:         0
6 Arc Fault:        Stop
7 Fail Recov:       Manu <<
```

System Setting Screen

(1) Press  or  on the System Setting Screen, and select “7 Fail Recov”.

(2) Press .

The Error Return Method Screen appears.

```
[System Setting]
Fail Recov ?
                Manual <<
```

Fail Recovery Method Screen

(3) Press  or  to change the Fail Recovery Method.

- If the system is not operated for 30 minutes when changing settings, it automatically returns to the PV Power Status Screen for the entire system.

(4) Press .

The changed content is set, and the system returns to the System Setting Screen.

<Settings>



Display	Content
Manual	Manual operation for error return.
Auto	Automatic operation for error return.

- Press  to return to the System Setting Screen without changing settings.

3. [Sys/Set Value] Set MODE (Continued)



8. Remote Logic

- Switches the contact point logic value for remote connection.
- The factory default setting is “a” (contact point a).

(1) Press  or  on the System Setting Screen, and select “8 Remote Logic”.

(2) Press .

The Remote Logic Setting Screen appears.

(3) Press  or  to change the Remote Logic.

- If the system is not operated for 30 minutes when changing settings, it automatically returns to the PV Power Status Screen for the entire system.

(4) Press .

The changed content is set, and the system returns to the System Setting Screen.

<Remote Logic Value>

Display	Content
a Contact	Sets the Remote Logic value to “Contact Point a”.
b Contact	Sets the Remote Logic value to “Contact Point b”.

- Press  to return to the System Setting Screen without changing settings.

```
[System Setting]
6 Arc Fault:      Stop
7 Fail Recov:    Manu
8 Remote Logic:   a  <<
```

System Setting Screen

```
[System Setting]
Remote Logic?
      a Contact  <<
```

Remote Logic Setting Screen

2. Parameter Setting





- 1** Press  or  on the System/Parameter Setting Screen, and select “2 Parameter Set”.

```
[Sys/Set Value] Set
1 System Setting
2 Parameter Set      <<
3 Initialization
```

System/Parameter Setting Screen

- 2** Press .

The Parameter Setting Screen appears.

- Pressing  or  to switch the parameter item.
- Press  to return to the System/Parameter Setting Screen.
- Refer to <Parameter Setting Items> ( Page 44)

```
[Parameter Set]
1 Over V1           <<
2 Over V1 Time
3 Over V2
```

Parameter Setting Screen

- 3** Press  or  to select the parameter item, and press .


The Change Parameter Screen of the selected parameter item is shown here.

```
[Parameter Set]
1 Over V1
           333.0V      <<
```

Change Parameter Screen
(Example: Over voltage level)

- 4** Press  or  to change the parameter, and press .

The changed parameters are set, and the system returns to the Parameter Setting Screen.

- If the system is not operated for 30 minutes when changing settings, it automatically returns to the PV Power Status Screen for the entire system.
- Press  to return to the Parameter Setting Screen.

3. [Sys/Set Value] Set MODE (Continued)

<Parameter Setting Items>

No.	Item	Display	Numerical Range	Initial Value	Step Width
1	Over voltage 1 level	Over V1	277 ~ 333[V]	333[V]	1
2	Over voltage 1 trip Time	Over V1 Time	0.10 ~ 0.16[s]	0.16[s]	0.01
3	Over voltage 2 level	Over V2	277 ~ 333[V]	305[V]	1
4	Over voltage 2 trip Time	Over V2 Time	1 ~ 13[s]	1[s]	1
5	Under voltage 1 level	Under V1	125 ~ 277[V]	125[V]	1
6	Under voltage 1 trip Time	Under V1 Time	0.10 ~ 0.16[s]	0.16[s]	0.01
7	Under voltage 2 level	Under V2	125 ~ 277[V]	166[V]	1
8	Under voltage 2 trip Time	Under V2 Time	1 ~ 11[s]	1[s]	1
9	Under voltage 3 level	Under V3	125 ~ 277[V]	244[V]	1
10	Under voltage 3 trip Time	Under V3 Time	1 ~ 21[s]	2[s]	1
11	Over frequency 1	Over F1	0.5 ~ 4.0[Hz]	0.5[Hz]	0.1
12	Over frequency 1 trip Time	Over F1 Time	1 ~ 300[s]	2[s]	1
13	Over frequency 2	Over F2	0.5 ~ 4.0[Hz]	2.0[Hz]	0.1
14	Over frequency 2 trip Time	Over F2 Time	0.10 ~ 10.00[s]	0.16[s]	0.01
15	Under frequency 1	Under F1	0.5 ~ 4.0[Hz]	0.5[Hz]	0.1
16	Under frequency 1 trip Time	Under F1 Time	1 ~ 300[s]	2[s]	1
17	Under frequency 2	Under F2	0.5 ~ 4.0[Hz]	3.0[Hz]	0.1
18	Under frequency 2 trip Time	Under F2 Time	0.10 ~ 10.00[s]	0.16[s]	0.01
19	Auto Recover Time	Auto Recov Time	2 ~ 300[s]	300[s]	2
20	Regulation voltage level	Reg V	304 ~ 332[V]	318[V]	2
21	Regulation voltage rate	Reg V Rate	0/50	50[%]	0/50
22	PF control rate	PF Ctrl Rate	-0.20 ~ +0.20	0.00	0.01
23	DC component current	DC Compo	100 ~ 999[mA]	150[mA]	50
24	DC component current trip Time	DC Compo Time	0.1 ~ 9.9[s]	0.5[s]	0.1
25	Grid connection Time	Grid Conn Time	5 ~ 300[s]	30[s]	5
26	Start PV level	PV Start V	200 ~ 500[V]	200[V]	10
27	Stop PV level trip time	PV Stop V Time	5 ~ 360[s]	60[s]	5

3. Initialization


- 1** Press  or  on the System/Parameter Setting Screen, and select “3 Initialization”.

```
[Sys/Set Value] Set
1 System Setting
2 Parameter Set
3 Initialization    <<
```

System/Parameter Setting Screen

- 2** Press  .

The Parameter/Mask Reset Screen appears.

- If the system is not operated for 30 minutes, it automatically returns to the PV Power Status Screen for the entire system.
- Press  to return to the System/Parameter Setting Screen.

```
[System Initialize]
Parameter Setting:
      Initialize?
      ENTER or BACK
```

Parameter/Mask Reset Screen

- 3** Press  .

The parameters and mask values are initialized, and the system returns to the System/Parameter Setting Screen.

<List of Initial Values>

Item		Initial Value
System Setting		
	Time/Date	Jan/01/2015-00:00:00
	Number of Inverter Connections	1
	Number of Master Box Connections	1
	TD Irradiance Adjustment	2
	TD Temperature Adjustment	0
	Inverter Operation at Arc Fault	Stop
	Fail Recovery Method	Manual
	Remote Logic	a

FCC Compliance

Note:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Specifications

Item		Specification
Product name		Master Box
Model number		EOW-MBX03-US
Display	LCD: 20 characters, 4 rows	F-STN liquid crystal, monochrome, 5x8 dots/character
	5 LED	SET, OPE, STOP, ERROR, COM
Operation SW	“START/STOP”	All inverters can be started or stopped together (Individual inverters can also be started or stopped)
	“RE-START”	A batch return (error clear) instruction can be given during an error stop
	“MODE,” “UP,” “DOWN,” “BACK,” “ENTER”	AC Information, Total Information, and Error Log Information can be confirmed Parameters and System Settings can be set together
Setting SW	Address SW	Master Box Address 0 ~ 10
	RS485 Termination SW	Termination ON/OFF
Measurement	Temperature	Attaching externally 4-20mA Transducer
	Irradiance (Pyranometer)	Attaching externally 4-20mA Transducer
Interface	Connected Master Box with RS485	max 10 sets
	Controlled Inverter Unit with RS485	max 20 sets
Enclosure type rating		UL50 Type 3R (In door / Out door IP65)
Operating Surrounding Temperature		-20 to +50°C (-4 to 122°F)
Storage temperature		-20 to +60°C (-4 to 140°F)
Weight		Approx. 12kg
Dimensions		480 mm W × 300 mm H × 191 mm D
Input Rating Current		Max 0.03A
Input Rating Voltage		115VAC
Rated power frequency		60Hz

