Multi-area user terminal

■ Description

The Multi-area user terminal (model QJ-1201C00_0) is a digital indicating user terminal for building air conditioning systems.

This is a multitasking user terminal. One device can set 8 air conditioning areas.

In addition to setting and indicating temperature, humidity, air volume (fan speed) and on/off control, the Multi-area user terminal can show and set the CO_2 concentration, providing comfortable and healthful room conditions.

The Multi-area user terminal is easy to clean and sanitize because of its flat design. Its flat shape and compact size are perfectly suited to a wide variety of offices.

■ Features

- Operation
  Turning the air conditioning units and lights ON/OFF, setting the temperature/humidity, CO_2 concentration, and airflow for air conditioning units, and scheduling or extending air conditioning unit operation in up to eight areas can be performed with one Multi-area user terminal unit.
  The Multi-area user terminal allows you to turn equipment in multiple areas ON/OFF at once.
- Display
  The temperature/humidity and CO_2 concentration of air conditioning units in up to eight areas can be displayed with one Multi-area user terminal unit.
  Since the outdoor temperature/humidity and rainfall information are displayed, users can check weather information from inside the room.
- Password function
  User access is restricted by password.
  One password can be set for each Multi-area user terminal unit.
- Design
  The terminal has a flat, buttonless design with an LCD touch panel and bezel touch keys.
  Equipped with a backlight, the Multi-area user terminal can be operated even in a dark room.
- Easy-to-understand screen display
  The simple icons and symbols allow intuitive operation.
- Open communication protocol
  This product is a controller compatible with BACnet MS/TP which is an open protocol.

CE

Safety Precautions

Please read instructions carefully and use the product as specified in this manual.
Be sure to keep this manual nearby for quick reference.

Restrictions on Use

This product was developed, designed, and manufactured for general air conditioning use.

Do not use the product in a situation where human life may be at risk or for nuclear applications in radiation controlled areas. If you wish to use the product in a radiation controlled area, please contact Azbil Corporation.

Particularly when the product is used in the following applications where safety is required, implementation of fail-safe design, redundant design, regular maintenance, etc., should be considered in order to use the product safely and reliably.

- Safety devices for protecting the human body
- Start/stop control devices for transportation machines
- Aeronautical/aerospace machines

For system design, application design, instructions for use, or product applications, please contact Azbil Corporation.

Azbil Corporation bears no responsibility for any result, or lack of result, deriving from the customer's use of the product.

■ Caution for Instrumentation Design

Considering unexpected failures or contingencies, be sure to design and check safety of the system and equipment.

■ Recommended Design Life

It is recommended that this product be used within the recommended design life.

The recommended design life is the period during which you can use the product safely and reliably based on the design specifications.

If the product is used beyond this period, its failure ratio may increase due to time-related deterioration of parts, etc.

The recommended design life during which the product can operate reliably with the lowest failure ratio and least deterioration over time is estimated scientifically based on acceleration tests, endurance tests, etc., taking into consideration the operating environment, conditions, and frequency of use as basic parameters.

The recommended design life of this product is 10 years.

■ Warnings and Cautions

 WARNING	Alerts users that improper handling may cause death or serious injury.
 CAUTION	Alerts users that improper handling may cause minor injury or material loss.

■ Symbols

	Notifies users that specific actions are prohibited to prevent possible danger. The symbol inside the ⃠ graphically indicates the prohibited action. (For example, the sign on the left means that disassembly is prohibited.)
	Instructs users to carry out a specific obligatory action to prevent possible danger. The symbol inside the ● graphically indicates the actual action to be carried out. (For example, the sign on the left indicates general instructions.)

⚠ WARNING	
	Do not use the product where it is exposed to direct sunlight. Doing so may cause the internal temperature to rise which will result in an accident or device failure.
	Before wiring or maintenance, be sure to turn off the power to this product. Failure to do so may result in electric shock or device failure.
	Do not touch the terminals or insert conductive material between the terminals while the power is on. Doing so may result in electric shock.
	Do not touch electrically charged parts. Doing so may cause electric shock.

⚠ CAUTION	
	Take anti-lightning surge measures based on regional and building characteristics. Lightning may cause fire or critical damage to this product if protective measures are not taken.
	Keep this product in the package for storage. Failure to do so may damage or stain the product.
	Install, wire, and use this product under the conditions specified by this manual. Failure to do so may cause fire or device failure.
	Take anti-noise measures if this product is installed in a location near source of electric noise. Failure to do so might cause malfunction or device failure.
	Installation and wiring must be performed by personnel with special skills who are qualified for instrumentation work and electric work. Failure to abide by this may result in fire or electric shock.
	After installing this product, check that it is steady and does not move. Otherwise it may fall or fail.
	All wiring must comply with applicable codes and ordinances. Otherwise there is a danger of fire.
	Do not use an uninterruptible power supply (UPS) that outputs rectangular waves. Doing so may cause the device to fail.
	Provide a power circuit breaker for the power source to this product. The product does not have a power switch.

⚠ CAUTION	
	Strip the insulation from cables as specified in this manual. If the length of exposed wire is longer than specified, it may cause electric shock or short circuit between adjacent terminals. If it is too short, it may not make proper contact.
	Do not allow wire clippings, metal shavings, and other refuse to enter into the product. Doing so may cause fire or product damage.
	Do not disassemble this product. Doing so may cause device failure.
	Do not allow chemicals (e.g., solvents, oil, or cleaning agents) to come in contact with this product. Doing so may damage the case.

■ System Configuration

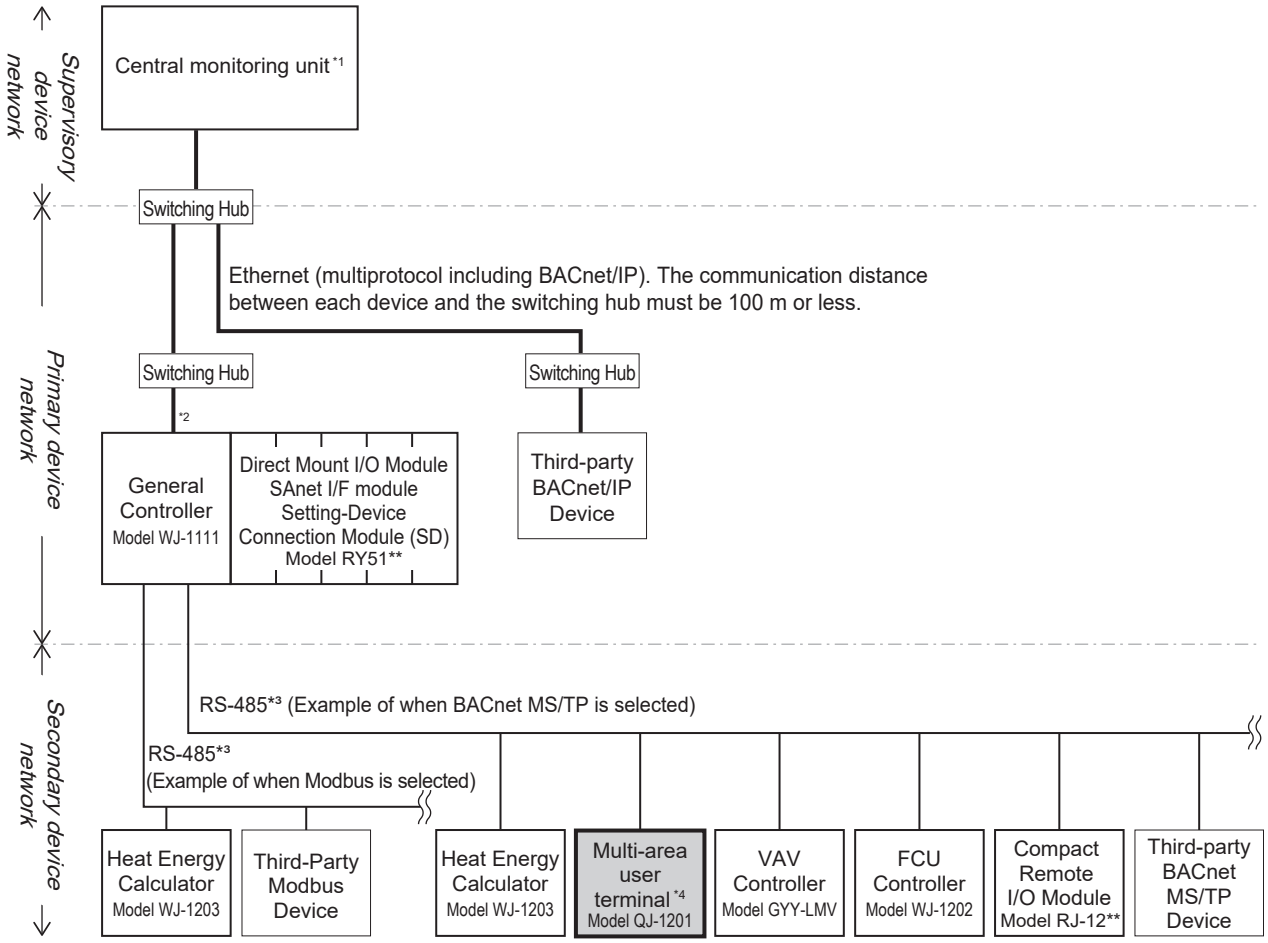


Figure 1 Example of System Configuration

*1 Azbil's Supervisory Controller (model BH-101G0W0000) or a third-party central monitoring unit using BACnet/IP communications can be used for central monitoring.

*2 The General Controller uses BACnet/IPv4 or BACnet/IPv6.
The IPv6 specification is based on BACnet-2012 (which conforms to the Institute of Electrical Installation Engineers of Japan's IEIEJ-G-D0006:2017 standard) with ANNEX U of BACnet-2016.

*3 The General Controller and Advanced Controller have two RS-485 communication channels.
For each channel, communication protocol can be selected from BACnet MS/TP, Modbus™ RTU, or Modbus™ ASCII.
- The number of devices that can be connected for BACnet MS/TP
  If only the Azbil devices are connected:
  50 devices/channel (VAV/FCU controllers, Compact Remote I/O Modules, heat energy calculator, etc.)
  The maximum number of the secondary devices that can be connected to one General Controller is 70, or 50 which is the sum of Azbil VAV and FCU Controllers. The Advanced Controller has no restrictions.
  If only the third-party devices are connected:
  31 devices/channel (when transmission speed is 76.8 kbps, 30 objects/device)
- The number of devices that can be connected for Modbus™
  31 devices/channel (when transmission speed is 76.8 kbps, 30 objects/device)

If the transmission speed and the number of objects are different among the third-party devices, or if the Azbil devices and third-party devices coexist on the same channel, the number of connected devices will vary. For details, please contact one of Azbil salespersons.

*4 Up to 10 Multi-area user terminal units can be connected to one channel of the General Controller with BACnet MS/TP.
Up to 20 Multi-area user terminal units can be connected to one General Controller.

■ Model number

Model number							Specifications	Remarks
QJ-12								—
	01						Model: Multi-area user terminal	—
		C					Power supply: 24 V AC	—
			0				No selection	—
				0			No selection	—
					0	0	with Azbil logo	—
					1	0	without Azbil logo	—

■ Specifications

● Basic Specifications

Item			Specifications
Power		Input voltage	24 V AC (20.4–27.6 V AC)
		Input frequency	50/60 Hz ± 3 Hz
		Power consumption	2.5 VA or less
		Inrush current	21 A max. (at 24 V AC)
		Leakage current	0.25 mA max. (at 24 V AC)
		Insulation resistance	Between the power terminals and ground terminal: 100 MΩ or higher (500 V DC)
CPU			32-bit
Display		Type	3.5-inch LED-backlit TFT LCD
		Size	70.08 × 52.56 (mm)
		Resolution	320 x 240 (QVGA)
		Display color	65,536 colors
Operation			Capacitive touch switch
Communication	RS-485	Communication method	BACnet MS/TP
		Communication speed	9.6 / 19.2 / 38.4 / 76.8 kbps (default: 76.8 kbps)
		Communication distance	1000 m max.
Materials		Cabinet parts	PC resin
		Areas	Acrylic resin
Weight			0.15 kg
Environmental conditions	Operating conditions	Ambient temperature	0–40 °C
		Ambient humidity	10–90 % RH (without condensation)
		Altitude	2,000 m max.
		Vibration	1.96 m/s^2 max., 10–150 Hz
	Transport and storage conditions	Ambient temperature	−10–60 °C
		Ambient humidity	5–90 % RH (without condensation)
		Vibration	9.8 m/s^2 max., 10–150 Hz
	Other		• Keep out of direct sunlight. • Do not let the product get wet. No condensation allowed. • No corrosive gas should be present.
Installation location*1			Wall surface
Installation Method			Mounting plate: Mounting screws User terminal: Snap-fit

*1 Do not install the product on the floor, on a ceiling panel, etc.

■ Specifications for Wiring

Item	Recommended wire	Rating	Maximum length	Connection type	Remarks
Power supply*1	IV, CVV, or equivalent	Stranded wire 1.25–1.5 mm^2	–	Spring terminal block	For a daisy chain connection, use an external relay terminal block.
RS-485	–	LAN cable*3	1,000 m	RJ-45 modular connector*2	–

*1 Only 1 cable can be inserted into the terminal (round hole) for the power supply.
*2 Use the following connector.
Plug: model SS-37000-002 (manufactured by Stewart Connector Corp.)
The same type of plug is available from Azbil Corporation (model DY7207A0100, 100 pcs.).
*3 Use a category 5e (0.5 mm diameter x 8 core wires) or higher LAN cable compliant with EIA/TIA-568.
Wire with connector (model DY7210) and wire with connector for short-distance communication (model DY7220) are communication wires manufactured by Azbil Corporation using the connectors shown in *2.
If using a wire with outer diameter of 6 mm or more, check that there is sufficient space for performing maintenance (particularly in the back direction).

■ Dimensions

Height 120 mm, width 70 mm, depth 15 mm

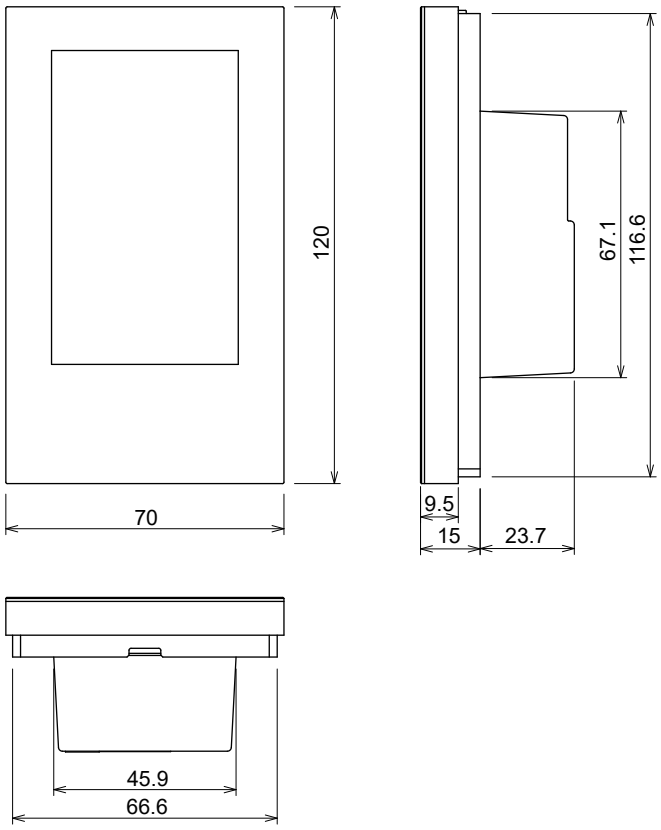


Figure 2 Product (user terminal) (mm)

■ Name of Parts

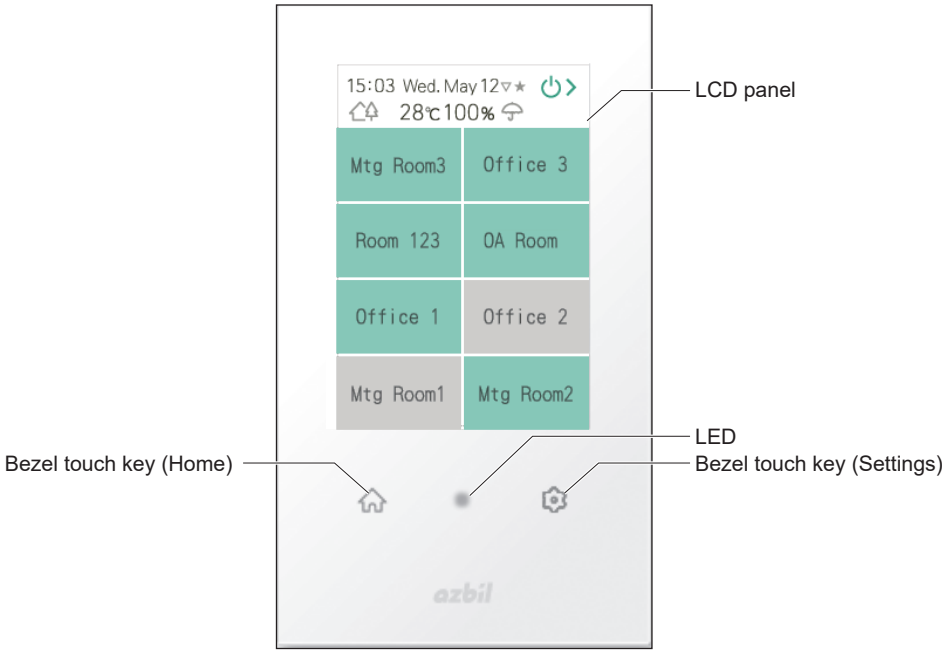


Figure 3

● Sample screen displays

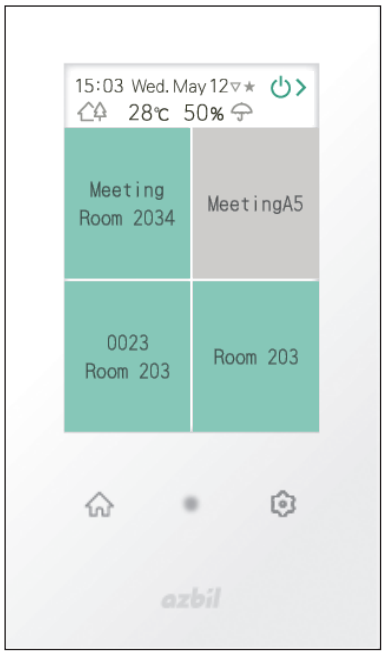


Figure 4 4 areas

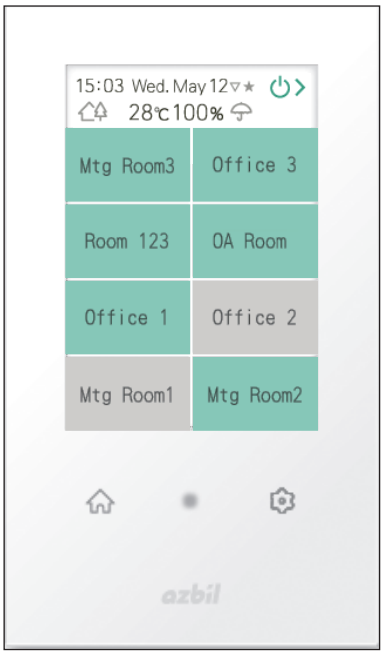


Figure 5 8 areas

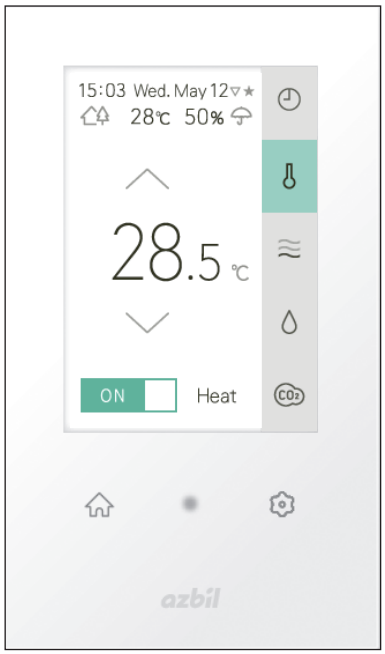


Figure 6 When used for a single area

■ Installation

⚠ CAUTION	
	Install, wire, and use this product under the conditions specified by this manual. Failure to do so may cause fire or device failure.
	Installation and wiring must be performed by personnel with special skills who are qualified for instrumentation work and electric work. Failure to abide by this may result in fire or electric shock.
	After installing this product, check that it is steady and does not move. Otherwise it may fall or fail.

● Installation Location

The following space should be secured around the product. The hatched areas is for maintenance.
Install this product about 1.5 m above the floor.

- To remove the product, a screwdriver must be inserted into the hole at the bottom, so leave at least 200 mm of space underneath it.
- Since the product is mounted by slightly sliding it, leave at least 10 mm of space above it.

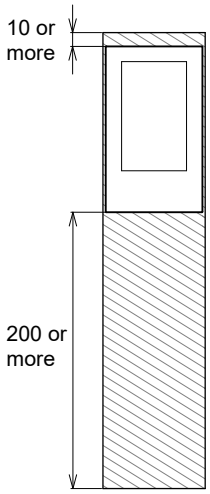


Figure 7 Maintenance space (mm)

Do not install this product on a room wall in the following conditions.

- Where it would be exposed to direct sunlight.
- Where water droplets are generated or sprayed.
- Where corrosive gas is present.

● Installation angle

- Fasten the product firmly with the screws so as not to wobble.

● Precautions for Installation

- When installing the mounting plate, do not fasten the mounting screws too tightly.
  Doing so may deform the mounting plate, making it impossible to mount the product on it.
  If the switch box cover is recessed deeply from the wall surface, do not fasten the screws so tightly that they deform the mounting plate.
- Mount the switch box and box cover firmly enough that they will not be displaced by the weight of the product or the impact of its operation.
- Mount the switch box and box cover so that they are not inclined.
- Make sure that the box cover will not protrude beyond the surface of the wall.
- Make sure that the wiring conduit, bolts, etc., connected to the switch box will not interfere with this product inside the box.
  Also, do not apply stress to the wiring-related parts.
- Make sure that the dimensions of the hole made in the wall (board) are greater than the dimensions of the convex part of the box cover and up to 60 mm in width and 100 mm in height.
  If the hole is too large, the box cover cannot be mounted, or the hole cannot be hidden by this product.
- Do not apply shock or impact to the surface of the product. Doing so may cause damage or scratches.

● **Installation Method**

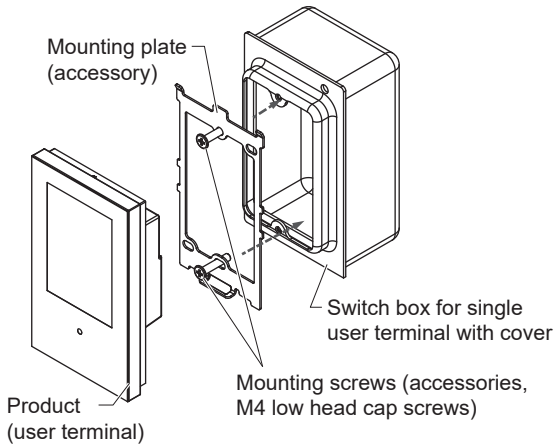


Figure 8 Mounting configuration for a new installation

● **Installation procedure**

(1) Attach the mounting plate to the switch box cover using the two mounting screws included with the product.

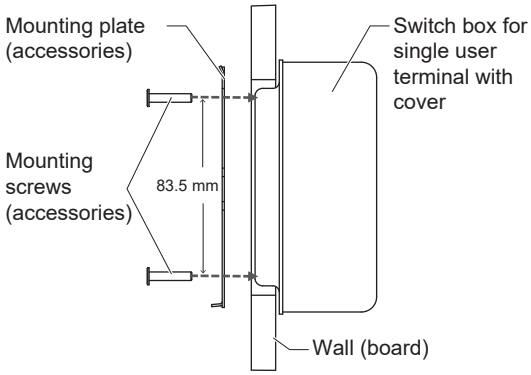


Figure 9 Mounting the User Terminal

(2) Connect the wires.
Connect the two power cables and two communication cables.

Note: Use of a screwdriver* is recommended for the power cables.
If a connected device is at the end of the line, a terminator will be connected to one side of it.

* Recommended screwdriver: SZF 0-0.4×2.5 model 1204504 made by Phoenix Contact.

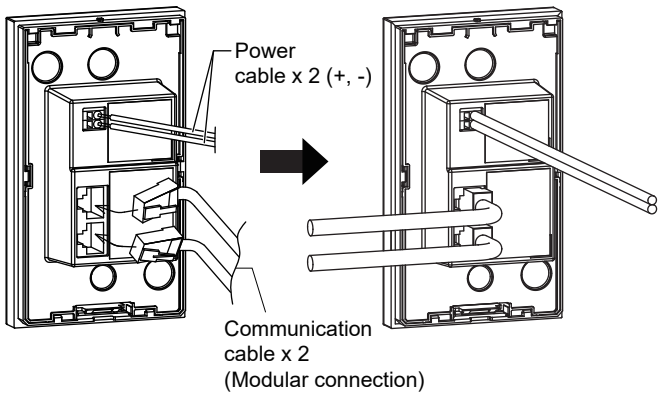


Figure 10

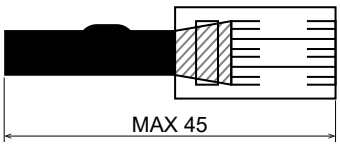


Figure 11 Terminator

(3) Hook the concave parts at the top of the rear side of the product (two locations) on the hooks at the top of the mounting plate by lowering the product from above.

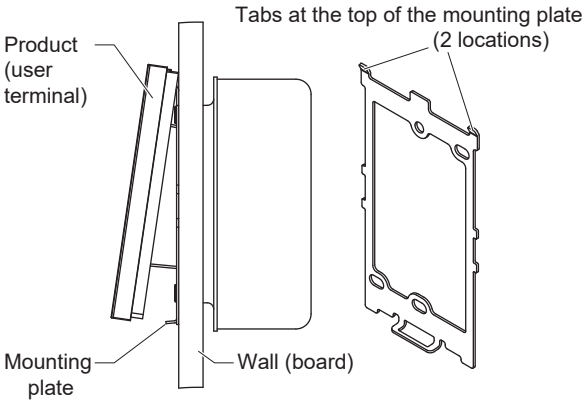


Figure 12

(4) Push the bottom part of the product toward the wall. (Fit the hook on the product into the hole at the bottom of the mounting plate).

Note: Push the product until the hooks click into place.

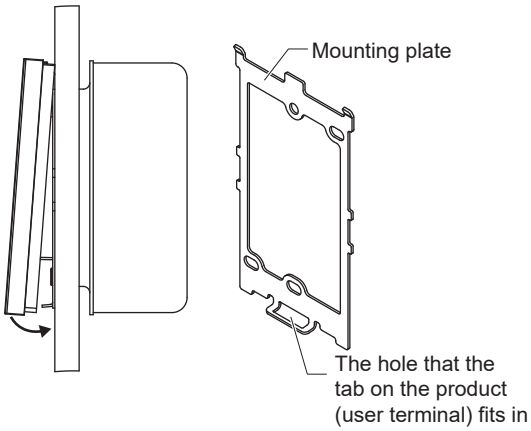


Figure 13

(5) Check that the product does not move and that there is no large gap between the product and the wall.

Switch box

Since the orientation of the RJ-45 modular jack is as shown in the figure, a shallow switch box cannot be used. Use a switch box with a cover (cover at least 13 mm, box depth at least 44 mm).

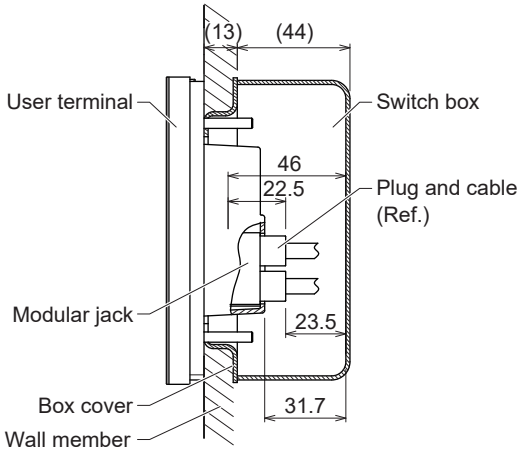


Figure 14 Dimensions inside the switch box behind the product (for ref.)

● **Removal procedure**

Insert the tip of the screwdriver into the hole at the bottom of the mounted product to push up the hook.
When the bottom of the product is moved away away from the wall (toward you), the product can be removed from the mounting plate.
Then, disconnect the wires.

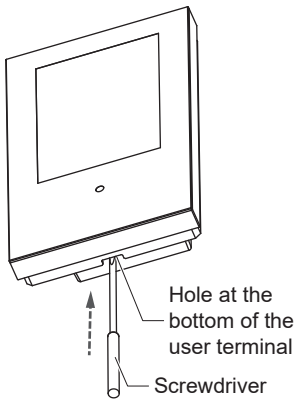
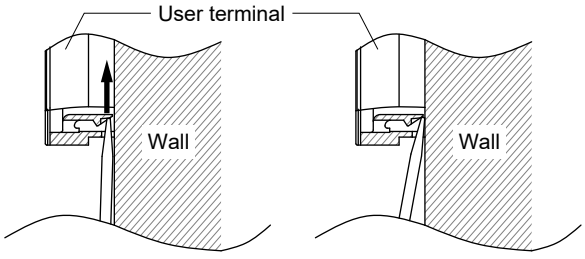


Figure 15

Slightly push up the hooks on the end of the product with the screwdriver to remove it from the mounting plate.

(Note)
1. Pushing too strongly may cause damage.
2. Position the screwdriver a little away from the wall and ensure that it pushes up the hook.
   If the screwdriver is pushed up while the tip of the screwdriver is against the wall, the screwdriver tip will enter the gap between the hook for removing the product and the wall, and the hook will not be pushed correctly, so that you are unable to remove the product.



Correct direction
(The tab is pushed.)

Incorrect direction
(The tab is not pushed and so the user terminal cannot be removed.)

■Wiring

⚠ WARNING	
	Before wiring, turn off the power to this product. Failure to do so may result in electric shock or device failure.
	Do not touch the terminals or insert conductive material between the terminals while the power is on. Doing so may result in electric shock.
	Do not touch electrically charged parts. Doing so may cause electric shock.

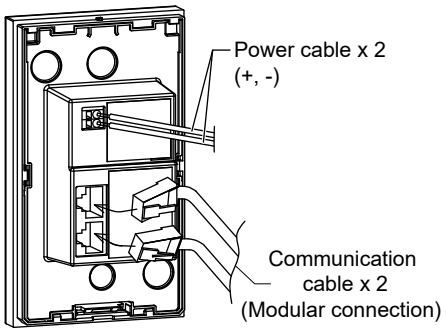
⚠ CAUTION	
❗	Installation and wiring must be performed by personnel with special skills who are qualified for instrumentation work and electric work. Failure to abide by this may result in fire or electric shock.
❗	All wiring must comply with applicable codes and ordinances. Otherwise there is a danger of fire.
🚫	Do not use an uninterruptible power supply (UPS) that outputs rectangular waves. Doing so may cause the device to fail.
❗	Provide a power circuit breaker for the power source to this product. The product does not have a power switch.
❗	Strip the insulation from cables as specified in this manual. If the length of exposed wire is longer than specified, it may cause electric shock or short circuit between adjacent terminals. If it is too short, it may not make proper contact.
🚫	Do not allow wire clippings, metal shavings, and other refuse to enter into the product. Doing so may cause fire or product damage.

IMPORTANT!!
- Do not test the withstand voltage of this product.
  Doing so may result in a malfunction.
- If more than the rated voltage is accidentally applied to this product, replace the product with a new one.
  The voltage may cause the product to malfunction.

● **Notes on Wiring**

- Wire using the specified cables.
- Do not use unused terminals on this product as relay terminals.
- Make sure there are no stray strands from the stripped wires.
- Incorrect wiring may cause the device to fail. Before turning on the power, check that all wires are correctly connected.

● **Wiring of the Power Supply Terminal Block**

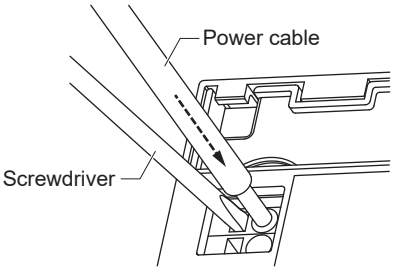


(1) Strip the wire sheath (8-9mm).

Make sure there are no stray strands from the stripped wire.

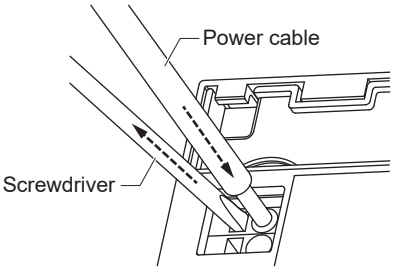
(2) Insert the flathead screwdriver* into the screwdriver insertion slot (square hole), leave the screwdriver in this state, and insert the wire into the terminal (round hole) until it reaches the back end.

Note: Only 1 cable can be inserted into the terminal (round hole).



* Recommended driver (made by Phoenix Contact)
SZF 0-0.4 x 2.5 model 1204504.

(3) Pull out the flathead screwdriver* while holding the cable in.



(4) Lightly pull on the cable to check that it does not come out.

Note: If you pull on the cable diagonally, it may be disconnected.

(5) Make sure there are no stray strands of wire.

- **Recommended cable**

  “■ Wiring Specifications”

- **Wiring of power supply and IO terminals**

  Use a 3.5-mm pitch, 2-pole spring connection, straight connector.

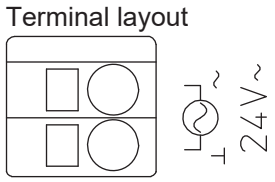


Figure 16

Terminal No.	Description	Display
1	AC input	
2	AC input	

- **BACnet MS/TP communication**

  Use an RJ-45 straight duplex modular jack.

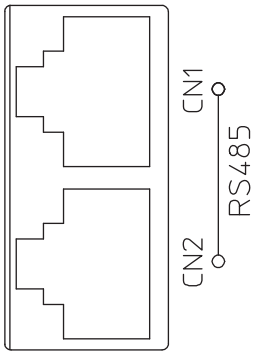
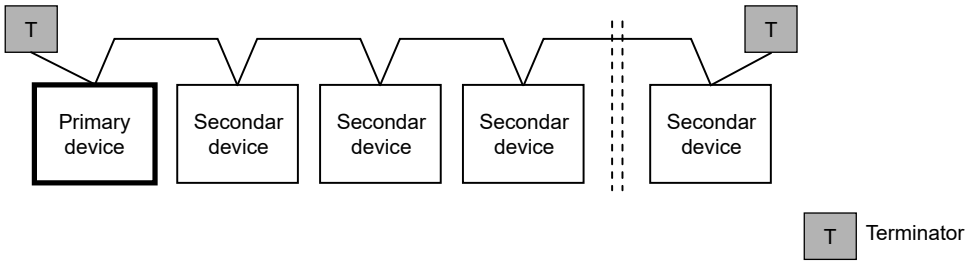


Figure 17

- **Wiring the RS-485 terminals**

  RJ-45 modular connectors are used for connection.

  Connect a terminator (120 Ω) to the last device connected to the RS-485.



* Use the terminators listed below.
Model 83162637-005, RS-485 terminator (×1)
Model 83162637-006, RS-485 terminators (×10)

Notes:
1. Do not branch wiring for RS-485 communication.
2. Branch wiring using Model DY7203A0000 is prohibited.

■ Software

Item	Function	Description	Remarks
Air conditioning operation	ON/OFF	Starts or stops the air conditioning units.	● For ON/OFF commands from the central monitoring unit, the last one has priority. ● It is possible to disable ON/OFF from the central monitoring unit. ● ON/OFF for up to eight areas is possible.
	Settings	Changes the temperature, humidity, and CO_2 concentration.	● For settings from the central monitoring unit, the last one has priority. ● High/Low limits for temperature settings can be specified for each control target. ● Dual settings are supported.*1 *2 ● Up to eight areas can be set. ● The setpoint range available to users can be restricted. For example, the range of temperature settings can be restricted.
	Fan speed control	Airflow from the fan coil unit can be switched between L, M, H, and AUTO.	● For airflow settings from the central monitoring unit, the last one has priority. ● Airflow switching for up to eight areas is possible.
	Scheduling Timer	Air conditioning unit ON time can be shifted earlier than the stop time scheduled by BMS.	● Scheduling operation for up to eight areas is possible. ● Scheduling for up to seven days (including the current day) is possible.
	Extension Timer	Air conditioning unit OFF time can be shifted later than the stop time scheduled by BMS.	● Extended operation for up to eight areas is possible.
	Managing groups	Multiple VAVs and fan coil units can be operated as a group (turning ON/OFF, setting the temperature, etc.).	—
Lighting	ON/OFF	Lighting can be turned ON/OFF.	● ON/OFF for up to eight areas is possible. ● Half-lighting control is not available.
Special operations	Last exit operation	All air conditioning units and lighting subject to operation by the Multi-area user terminal can be turned off at once.	—
	Operation restrictions	Uses passwords to restrict who can start/stop, schedule, and extend the operation of air conditioning units.	● It is not necessary to restrict who can change the settings/airflow and operate the lighting.
	Allow/Block	Permits or prohibits individual ON/OFF and setting operations for each area.	● It is also possible to permit ON/OFF but prohibit changing of settings.
Change view	Temperature indication	Switches the temperature display unit between Celsius (°C) and Fahrenheit (°F).	—

*1 Dual setting refers to separate settings for cooling and heating.
*2 Passwords are a number from 0001 to 9999. (One password can be set for each Muti-area user terminal unit)

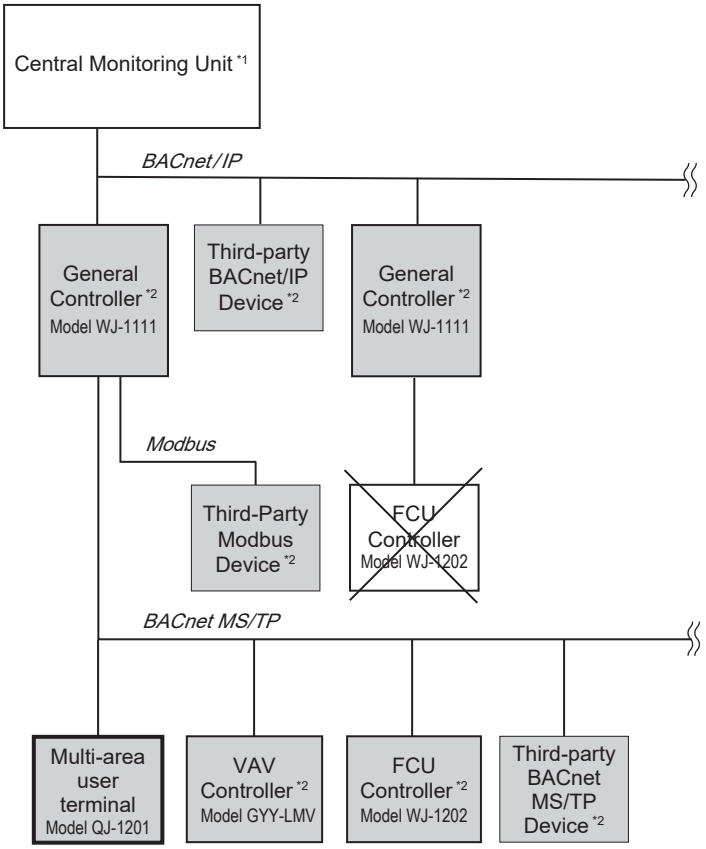


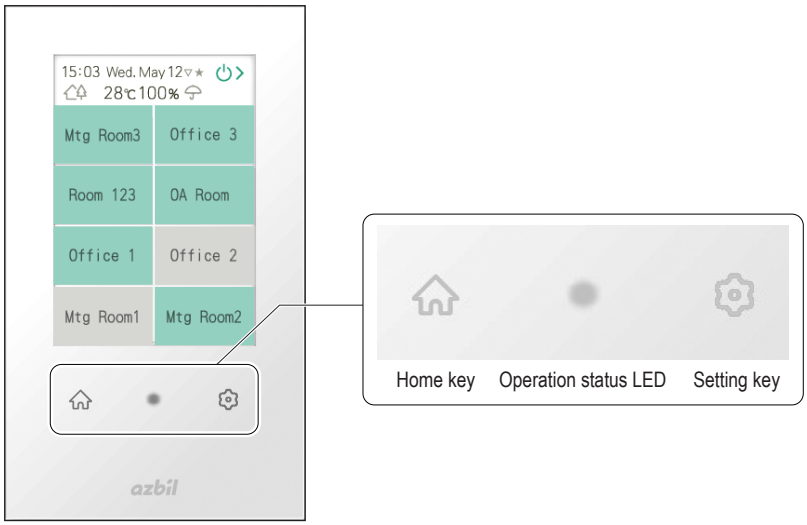
Figure 18 Remote units subject to operation

*1 Azbil's Supervisory Controller (model BH-101G0W0000) or a third-party central monitoring unit using BACnet/IP communications can be used for central monitoring.

*2 Device that can be operated from the Multi-area user terminal

■ Display

● Operation keys outside the screen and operation status LEDs



Position	Name	LED			Description	Remarks
		Color	State			
Left	Home key	White	ON		Always ON (unless screen is turned OFF)	Keys can be seen in the dark room.
			OFF		Can be turned off by touching Display OFF on the screen.	Turns ON again when a key is touched.
Center	Operation status LED	Blue green	When used for a single area	ON	ON when the air conditioning unit is running (unless screen is turned OFF)	—
				OFF	OFF when the air conditioning unit is stopped. (Can be turned off by touching Display OFF on the screen.)	The running/stopped display is shown again when a key is touched.
			When used for multiple areas	ON	ON when the air conditioning unit is running in at least one area (unless screen is turned OFF)	—
				OFF	Turns OFF when the air conditioning unit in all areas is stopped. (Can be turned off by touching Display OFF on the screen.)	The running/stopped display is shown again when a key is touched.
Right	Setting key	White	ON		Always ON (unless screen is turned OFF)	Keys can be seen in the dark room.
			OFF		Can be turned OFF by touching Display OFF on the screen.	Turns ON again when a key is touched.

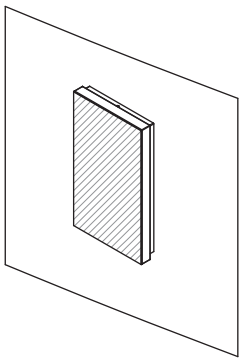
■ Handling

IMPORTANT!!
- Do not test the withstand voltage of this product.
  Doing so may result in a malfunction.
- If more than the rated voltage is accidentally applied to this product, replace the product with a new one.
  The voltage may cause the product to malfunction.

● Notes Before Power-On

- Check again that the wiring was done correctly
- Remove the protective films affixed to the panel on the front of the product.

  Note: Check that all protective sheets have been completely removed.



■ Maintenance

⚠ WARNING

Do not touch electrically charged parts.
Doing so may cause electric shock.

⚠ CAUTION

Do not disassemble this product.
Doing so may cause device failure.

Azbil personnel who have been trained on the product will carry out periodic maintenance.
Please contact us as necessary.

● Notes on cleaning

Do not use chemicals containing cleaning agents, solvents, etc., when removing dirt and dust from the product.

■ Disposal

When this product is no longer used, please dispose of it as industrial waste in accordance with local regulations.
Do not reuse all or part of this product.

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CE This product complies with the following harmonised standards of the Electromagnetic Compatibility Directive (EMCD).

EMCD: EN 61326-1 Class A, Table 2 (for use in an industrial electromagnetic environment)

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Specifications are subject to change without notice

Azbil Corporation
Building Systems Company

AB-7602
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If there are any mistakes including misspelled words and incorrect descriptions in this manual, please contact: ba.manual-feedback@azbil.com