MITSUBISHI ELECTRIC

<ORIGINAL>

UK CA CE

microSDHC™

Air Conditioning Control System
BM ADAPTER
BACS-AP50

Instruction Book (Detailed Operation)

Contents

Before using the controller, please read this Instruction Book carefully to ensure proper operation.
Retain this manual for future reference.

Safety precautions

► Observe these precautions carefully to ensure safety.

► After reading this manual, pass the manual on to the end user to retain for future reference.

► The user should keep this manual for future reference and refer to it as necessary. This manual should be made available to those who repair or relocate the units. Make sure that the manual is passed on to any future air conditioning system user.

⚠ WARNING	: indicates a hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	: indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
CAUTION	: addresses practices not related to personal injury, such as product and/or property damage.

General precautions

⚠ WARNING

Do not install the controller in areas where large amounts of oil, steam, organic solvents, or corrosive gases (such as ammonia, sulfuric compounds, or acids), or areas where acidic/alkaline solutions or special chemical sprays are used frequently. These substances may significantly reduce the performance and corrode the internal parts, resulting in electric shock, malfunction, smoke, or fire.

To reduce the risk of short circuits, current leakage, electric shock, malfunction, smoke, or fire, do not wash the controller with water or any other liquid.

To reduce the risk of electric shock, malfunction, smoke, or fire, do not touch the electrical parts, USB memory, or touch panel with wet fingers.

To reduce the risk of injury or electric shock, before spraying a chemical around the controller, stop the operation and cover the controller.

To reduce the risk of injury, keep children away while installing, inspecting, or repairing the controller.

If you notice any abnormality (e.g., burning smell), stop the operation, turn off the controller, and consult your dealer. Continuing the operation may result in electric shock, malfunction, or fire.

Properly install all required covers to keep moisture and dust out of the controller. Dust accumulation and the presence of water may result in electric shock, smoke, or fire.

⚠ CAUTION

To reduce the risk of fire or explosion, do not place flammable materials or use flammable sprays around the controller.

To reduce the risk of electric shock or malfunction, do not touch the touch panel, switches, or buttons with a sharp object.

To avoid injury from broken glass, do not apply excessive force to the glass parts.

To reduce the risk of injury, electric shock, or malfunction, avoid contact with the sharp edges of certain parts.

Consult your dealer for the proper disposal of the controller. Improper disposal will pose a risk of environmental pollution.

Precautions for relocating or repairing the unit

⚠ WARNING

The controller must be repaired or moved only by qualified personnel. Do not disassemble or modify the controller. Improper installation or repair may result in injury, electric shock, or fire.

Additional precautions

CAUTION

To avoid discoloration, do not use benzene, thinner, or chemical rag to clean the controller. When the controller is heavily soiled, wipe the controller with a well-wrung cloth that has been soaked in water with mild detergent, and then wipe off with a dry cloth.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

1. Introduction

This manual is the Instruction Book for BACS-AP50 and BACS-AP50 BACnet Setting Tool. The BACnet Setting Tool is dedicated software to set network settings, group settings and settings related to BACnet communication (also including object selection and COV/Event notification) and then set the settings to the BACS-AP50. This manual describes the setting procedures for those settings.

1-1. Screen images used in this manual

Screen images used in this manual are from Microsoft® Windows® 10 or 11. The layout of screens for software other than the BACnet Setting Tool (e.g., installation screens) that are displayed in this Instruction Book may differ depending on factors such as the settings of the PC used.

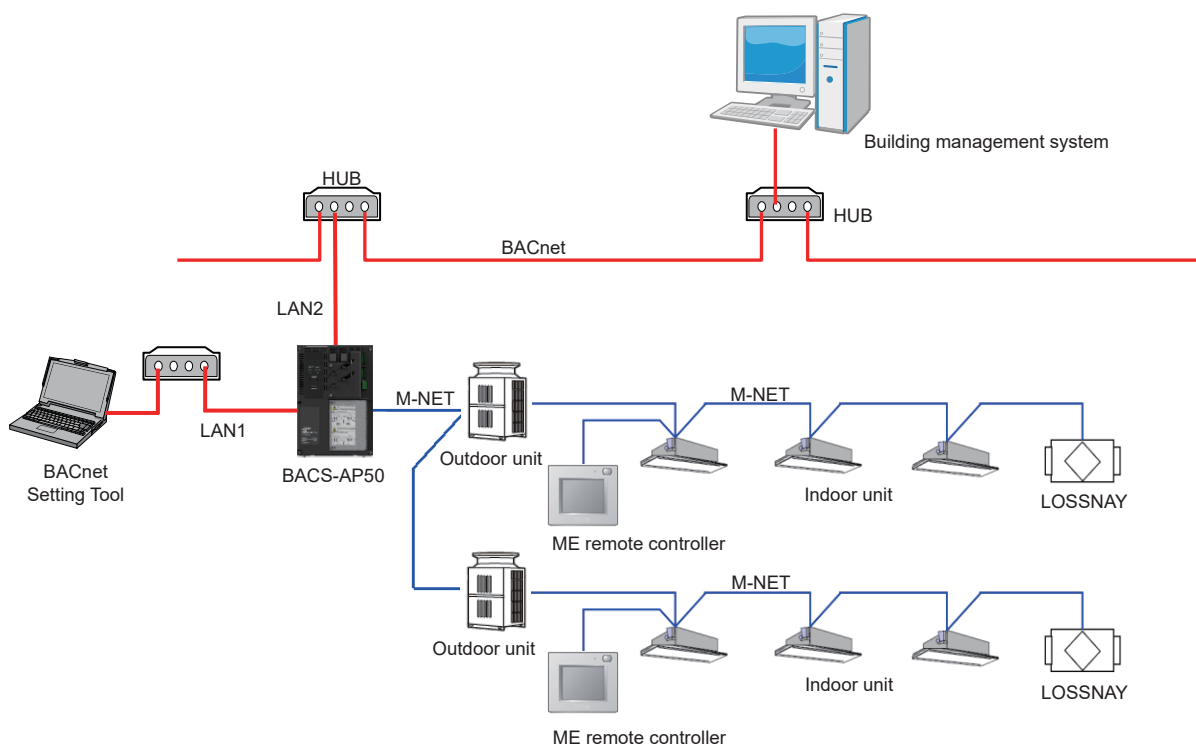## 1-2. BACnet Setting Tool version

Use the latest BACnet Setting Tool.
(Compatible with previous versions)

1-3. Connection method

The BACnet Setting Tool connects with the BACS-AP50 using a LAN. [*1]
Connect the PC with the BACnet Setting Tool installed to the LAN1 connector of the BACS-AP50 via a HUB (refer to the figure below). For the LAN cable, use a cable that is compatible with category 5 or higher.

*1   Connect the BACnet Setting Tool with the BACS-AP50 using IPv4.

Before performing BACnet settings for the BACS-AP50 using the BACnet Setting Tool, it is necessary to set indoor unit group settings on the BACS-AP50 Initial Setting Tool. Refer to section 6-4 "Initial setting procedure" for details.
For systems that use multiple BACS-AP50, set all BACS-AP50 connected to BACnet individually using the BACnet Setting Tool.
After completion of BACS-AP50 BACnet settings, connect the BACS-AP50 LAN2 and BACnet.

1-4. PC environment

The PC operating environment for using the installed tools is as follows.
Ensure that the PC is connected to the same network as the BACS-AP50.

PC operating environment

Item	Requirements	(2) BACnet Setting Tool		Remarks
		(1) Browser		
CPU	1.0 GHz or more	○	○	
RAM	4 GB or more	○	○	
Image resolution	1024 × 768 or more	○	○	
Supported OS	Microsoft Windows 11 (64-bit) *1	○	○	
	Microsoft Windows 10 (64-bit) *1	○	○	
	MacOS®	○		
Operating environment	.NET Framework 4.8 or higher		○	
Supported browser	Microsoft Edge	○		
	Google Chrome	○		
	Safari	○		
LAN port	100Base-TX or higher	○	○	

*1 Operation confirmed on Pro versions of Windows.

Tablet/smartphone is not supported.

2. Setting the operating environment

Set the operating environment of the PC to be used for the BACnet Setting Tool.

2-1. Setting the IP address of the PC

Set the IP address of the PC to be used for the BACnet Setting Tool. Set an IP address for the PC that does not duplicate the IP address of LAN1 of each BACS-AP50 (initial value: 192.168.1.1) but is an IP address of the same network.

For example, when the IP address of LAN1 of the BACS-AP50 is the default value [192.168.1.1] and the subnet mask is the default value [255.255.255.0], set [192.168.1.101] for the IP address of the PC to be used for the BACnet Setting Tool. In this case, [192.168.1] is the network address.

Connecting terminal	Default value	Remarks
LAN1	192.168.1.1	(Used for air conditioning system)
LAN2	192.168.2.1	(Used for BACnet communication)

Open the control panel.
Windows® 10 or 11
   Search for the control panel using the search box.

(1)   Click [Control Panel] in the Start menu.
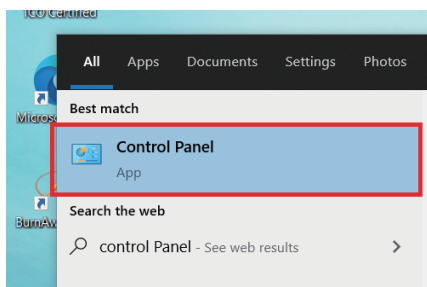
(2)   In the [Control Panel] window, click [View network status and tasks].
      * Select "Category" in "View by."
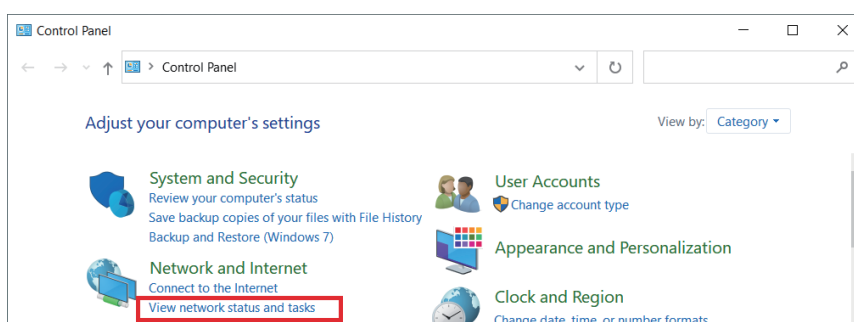
(3)   In the [Network and Sharing Center] window, click [Change adapter settings].
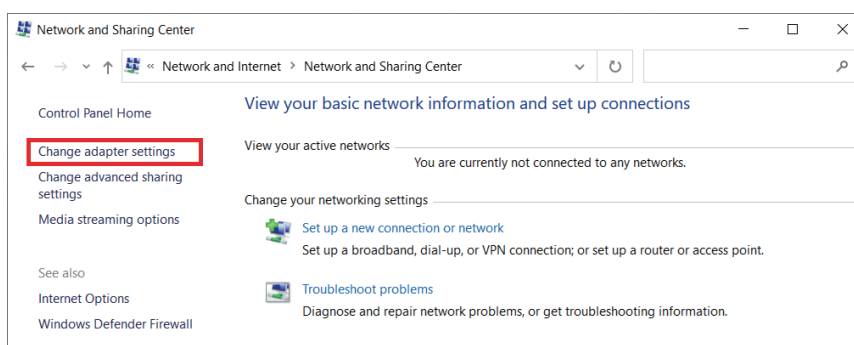
(4) In the [Network Connections] window, double-click the [Ethernet] icon.
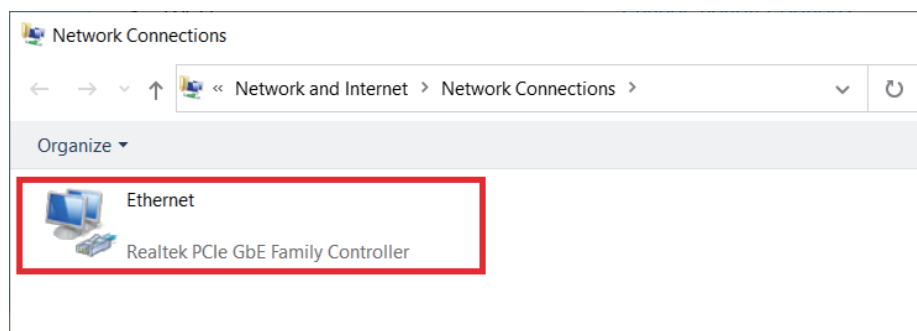
(5) In the [Ethernet status] window, click [Properties].
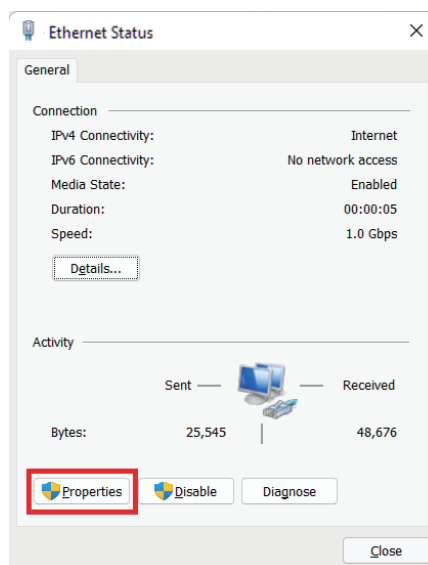
(6) In the [Ethernet Properties] window, click [Internet Protocol Version 4 (TCP/IPv4)] to select it, and click [Properties].
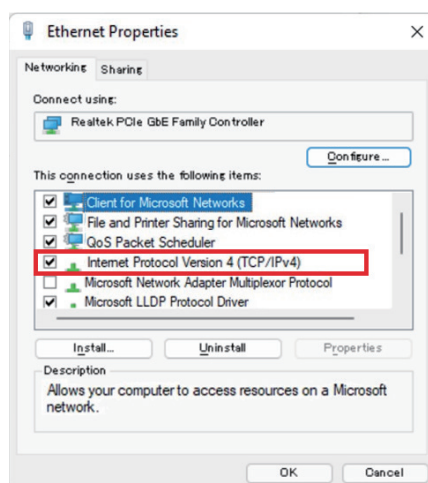
(7) In the [Internet Protocol Version 4 (TCP/IPv4) Properties] window, check the radio button next to [Use the following IP address].
Enter the IP address (e.g., [192.168.1.101]) in the [IP address] field, and enter the subnet mask (e.g., [255.255.255.0]) in the [Subnet mask] field.
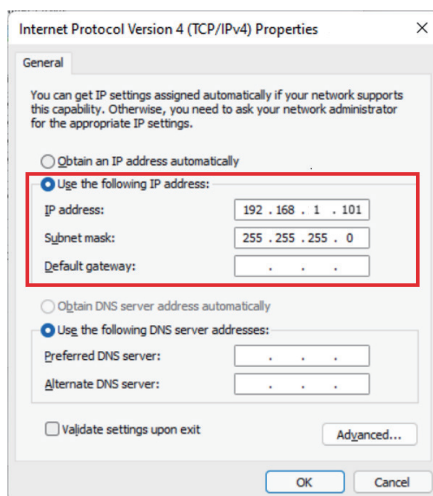
(8) Keep clicking [OK] or [Close] to close all windows.

2-2. Disabling a proxy server

Configure the settings for the IP connection environment of the PC (disable a proxy server).

(1) Open the Network and Sharing center as follows.
Windows® 10 or 11
Search for the control panel using the search box, and click [Network and Sharing].

(2) Click [Internet options].

(3) In the [Internet Options] window, click the [Connections] tab.
Click [LAN settings] under [Local Area Network (LAN) settings].
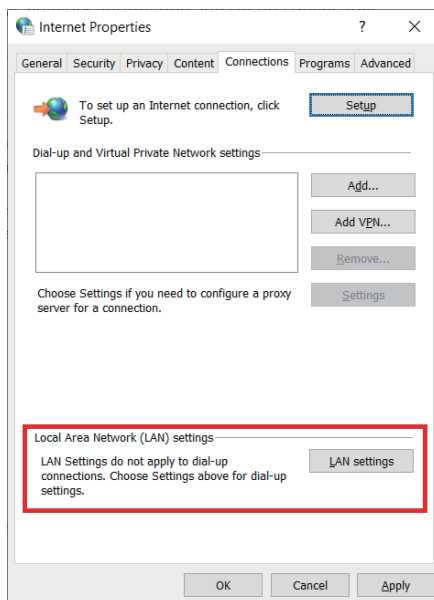
(4) In the [Local Area Network (LAN) Settings] window, remove the check from the checkbox next to [Use a proxy server for your LAN] under [Proxy server].
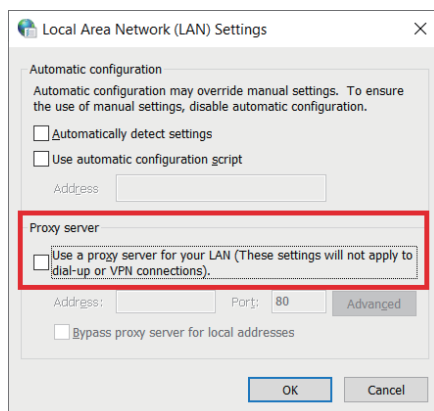
(5) Keep clicking [OK] or [Close] to close all windows.

2-3. Installing .NET Framework

(1) If .NET Framework 4.8 is not already installed, download the .NET Framework 4.8 installer from the URL shown below, and then install it.

https://go.microsoft.com/fwlink/?LinkId=2085155

3. Installation and uninstallation of the BACnet Setting Tool

This chapter explains how to install the BACnet Setting Tool (SetBACnet) to a PC and how to uninstall it.
If you click [Cancel] in any of the steps during the installation or uninstallation, the installation or uninstallation will be canceled. Also, to return to the previous screen, click [Back].
If the installation fails, uninstall the BACnet Setting Tool, and install it again.

3-1. Installation

(1) Starting the BACnet Setting Tool setup program

Double-click the SetBACnetBACS_V***.msi.
Read the displayed information, and click [Next] to proceed.
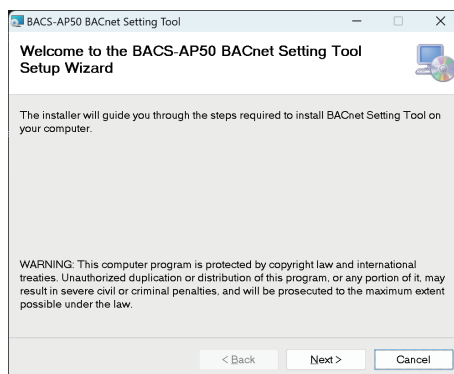
(2) License agreement

Read the license agreement, select [I Agree] to accept the terms, and click [Next].

* If you do not agree to the terms of the license, click [Cancel] to cancel the installation.
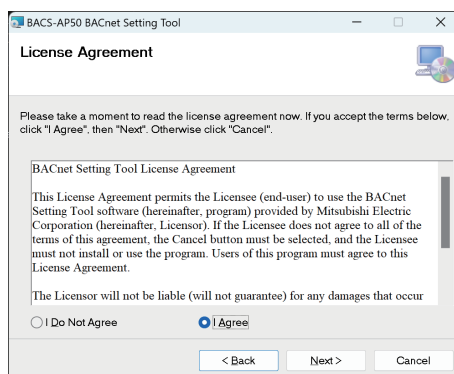
(3) User information

Enter the user name and the company name, and click [Next].
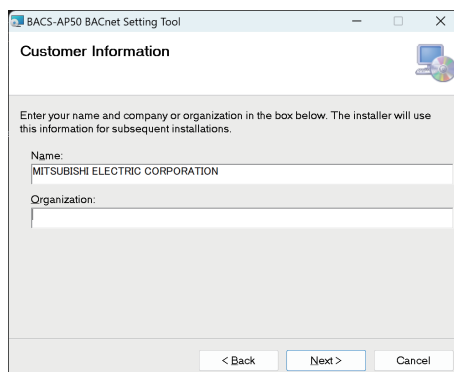
(4) Selecting the installation destination folder

Select the folder in which to install the program.
Click [Browse...] to select a different installation destination folder.
When done selecting the folder, click [Next] to proceed.
The default installation destination folder location is [C:\Program Files (x86)\MITSUBISHI ELECTRIC CORPORATION\BACS-AP50 BACnet Setting Tool].
Clicking [Disk Cost...] will display the disk capacity of each drive of the PC.
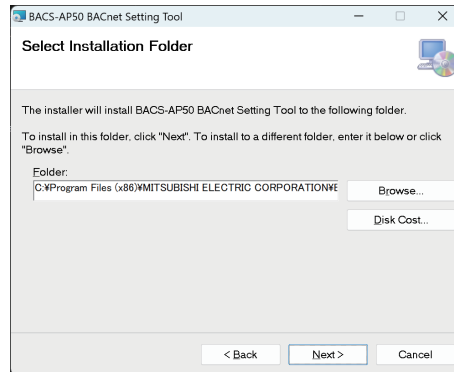
(5) Executing the installation program

Click [Next] to execute the installation program.
Click [Cancel] to cancel the installation.
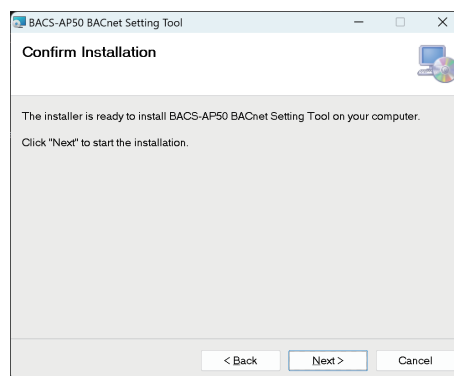
(6) Confirming completion of installation

Click [Close] on the window to complete the installation process.
Check that the "BACS-AP50_SetBACnet" icon ( ) is displayed in the start menu.
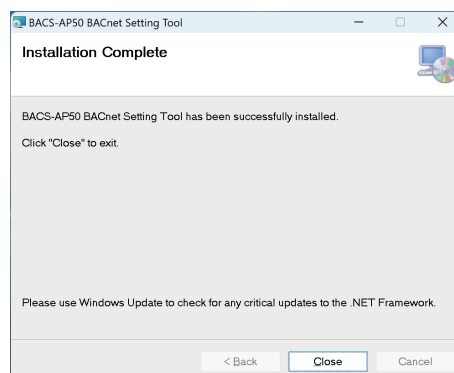
(7) Importing using the tool

Click the root certificate in the tool menu on the Windows Start menu.
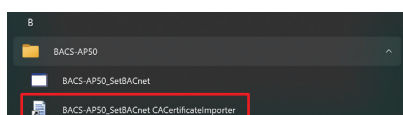
3-2. Uninstallation

Take the following steps to uninstall the BACnet Setting Tool (SetBACnet).
(Uninstallation is usually not necessary.)

(1) Ensure that the BACnet Setting Tool (SetBACnet) is not running.
Quit the program if it is.

(2) Click [Control Panel] in the Start menu, and click [Uninstall a program].

(3) In the [Programs and Features] window, click [BACS-AP50_SetBACnet] to uninstall it. Or, click [BACS-AP50 BACnet Setting Tool], right-click, and select [Uninstall].

4. Initial settings for the controller

4-1. Quick IP address (LAN1) setting

The IP address (LAN1) and the network settings of the BACS-AP50 can be set using the rotary switch (SW1). (Set SW1 to 1 to F.)
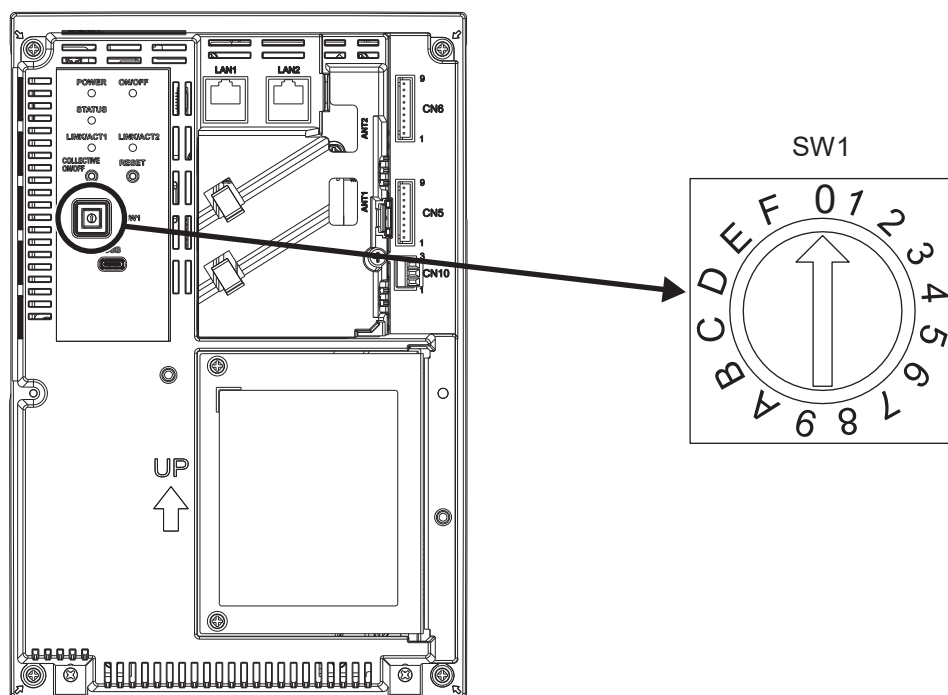
SW1	IP address (LAN1)	Subnet mask	Gateway
0	User setting (Set the IP address, subnet mask, and gateway address using the Initial Setting Tool.)		
0	Factory default 192.168.1.1	Factory default 255.255.255.0	Factory default 0.0.0.0
1	192.168.1.1	255.255.255.0	0.0.0.0
2	192.168.1.2		
3	192.168.1.3		
4	192.168.1.4		
5	192.168.1.5		
6	192.168.1.6		
7	192.168.1.7		
8	192.168.1.8		
9	192.168.1.9		
A	192.168.1.10		
B	192.168.1.11		
C	192.168.1.12		
D	192.168.1.13		
E	192.168.1.14		
F	DHCP (Not used)		

Setting using the SW1 (1 to E)

Step
1. Turn off the BACS-AP50.
2. Point the arrow of the SW1 at the alphanumeric character you want to select.
3. Turn on the BACS-AP50.

The BACS-AP50 will start with the address (192.168.1.1 to 14) corresponding to the alphanumeric character you selected with the SW1.

Setting using the BACnet Setting Tool

Step
1. Set the IP address and the network settings using the BACnet Setting Tool.
2. Point the arrow of the SW1 at 0.
3. Restart the BACS-AP50.

The BACS-AP50 will start with the address set with the BACnet Setting Tool.

Note
• Do not point the arrow of the SW1 between alphanumeric characters.
• To set the address, use a precision screwdriver [(-), 2.0 mm (W)] to avoid damaging the rotary switch.
  (Specified torque: 19.6 m N·m)

4-2. Software updates

[1] Before updating software

(1) PC environment settings

Software updates can be performed via a Web browser or USB flash drive.

When updating via a Web browser, configure the PC as follows.
1) Installing .NET Framework
    For details, refer to 2-3 "Installing .NET Framework".
2) Installing the BACnet Setting Tool
    For details, refer to 3-1 "Installation".
3) Importing the root CA certificate
    For details, refer to 3-1 "Installation".
4) Setting the IP address of the compute
    For details, refer to 2-1 "Setting the IP address of the PC".

(2) Obtaining consent from customers in advance

Before performing a software update, inform the customer of the following and obtain their consent.
1) In the case of system configurations without local remote controllers or Mr. SLIM models, inform the customer that air conditioning units may experience an abnormal stoppage during the update.
    For configurations other than above, although the local remote controller of the air conditioning unit may display an error, the air conditioning unit will continue operating and can be controlled by the local remote controller.

(3) Preparing for the update

1) Acquire the update file (BACS_FW####.dat).
    Note: #### can be any number (software version).
2) If using a PC for initial settings, update the BACnet Setting Tool as well.

(4) Precautions during updates

1) Do not turn off the BACS-AP50 during the BACS-AP50 update.
2) If using a USB flash drive:
    • Do not remove the USB flash drive until the update is complete.
    • Do not insert and then immediately remove the USB flash drive.
      Doing so may prevent the controller from recognizing the USB flash drive.

[2] Software updates using a Web browser

(1) Setting the IP address of the update PC

Check that the update PC satisfies the requirements given in "PC environment."
Set the IP address of the update PC so that it can connect to the BACS-AP50 via LAN.

For update using a Web browser on a PC that is connected to an internal LAN, request your network administrator to provide the IP address, subnet mask, etc.
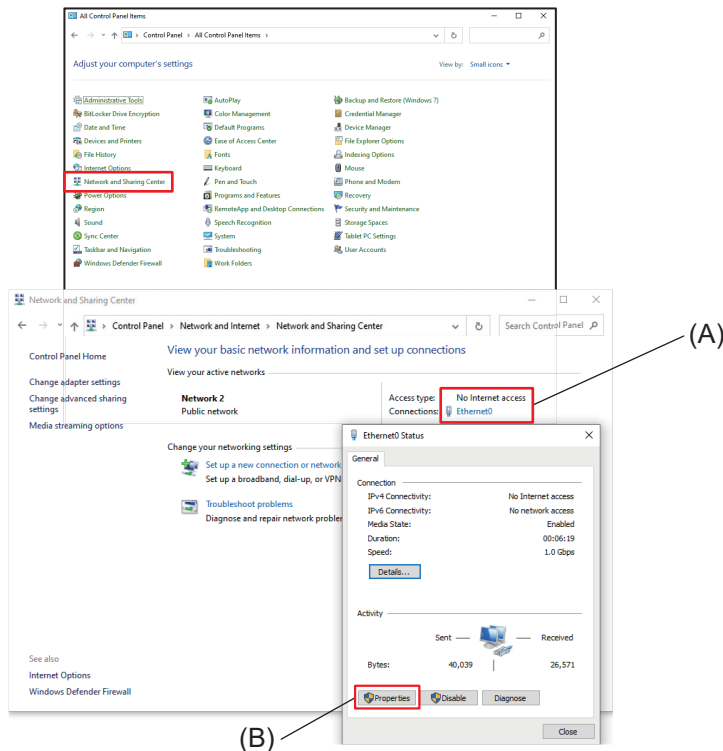
Step

1. Click [Control Panel] on the Start menu to open the Control Panel.
2. Click [Network and Sharing Center].
3. Click (A).
4. Click (B).
5. Select (C) and click (D).
6. Select (E).
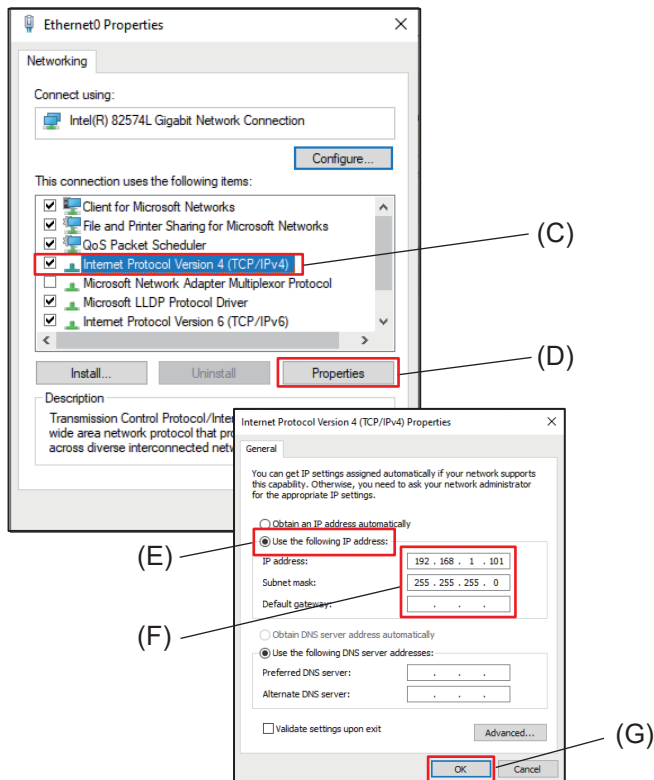
7. In (F), enter the IP address and subnet mask.
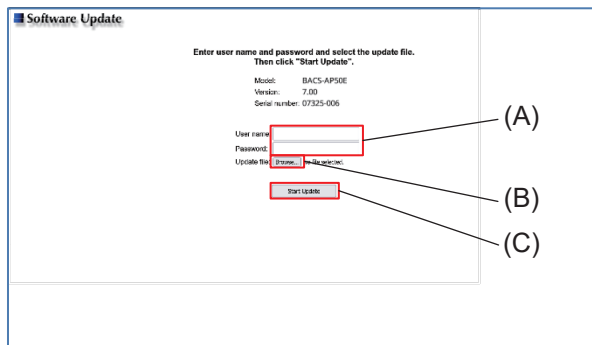
The factory default IP address of the BACS-AP50 is 192.168.1.1.

If the IP address of the BACS-AP50 is 192.168.1.1, set the IP address to 192.168.1.2 by entering the same value up to the third digit and making the fourth digit different.

If no particular subnet mask is specified, enter 255.255.255.0.

8. Enter a default gateway if necessary.
9. Click (G).

(2) Update operation

Step

1. Connect the update PC and the LAN1 port on the BACS-AP50 using a LAN cable.

2. Use a Web browser to access the following Web page address.
The factory default IP address of the BACS-AP50 is 192.168.1.1.
https://192.168.1.1/swupdate/

3. Enter the user name and password in (A).

The default settings are as follows:
User ID: initial
Password: Init + DP

For DP, refer to the back cover of the Instruction Book (supplied with the controller).
ex.) When DP is 123456, the password will be Init123456.

4. Click (B) to configure the update file.
5. Click (C).

The STATUS LED will blink during the update.
The controller will automatically reboot once the update is complete.
Unplug the LAN connection once the update is complete.

When accessing a Web page address
The screen on the left will appear if the security certificate is invalid.
1) Click [Proceed to 192.168.1.1 (unsafe)].
2) A security warning screen will appear. Click [Yes].
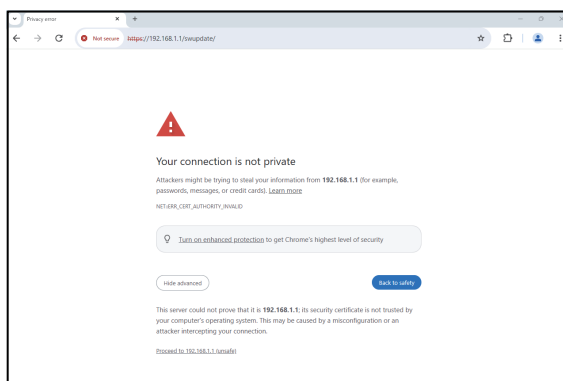
Note

The update proceeds as follows.

It takes approximately 10 minutes to complete the update.

Step No	STATUS LED		Remarks
	Color	Status	
1	Off	Off	Update start
2	Blue	Blinking	
3	Off	Off	BACS-AP50 will restart automatically, then the update complete.

[3] Software updates using a USB flash drive

(1) Preparing the USB flash drive

Save the update file (BACS_FW####.dat) to the root folder of the USB flash drive.
Note: #### can be any number (software version).

(2) Update operation

Step
1. Power off the BACS-AP50.
2. Connect the USB flash drive containing the update file.
3. Turn on the power while holding down the ON/OFF button.
   Hold down the button until the STATUS LED lights up in blue (approx. 1 minute).
   Start the update.
4. Remove the USB flash drive once the update is complete.
5. Reset the power of the BACS-AP50.

Note
The update proceeds as follows.
It takes approximately 10 minutes to complete the update.

Step No	STATUS LED		Remarks
	Color	Status	
1	Off	Off	Update start
2	Blue	On	
3	Blue	Blinking	
4	Off	Off	BACS-AP50 will restart automatically.
5	Blue	Blinking	
6	Blue	On	Update complete

5. Connecting and starting up the BACnet Setting Tool

5-1. Connecting the BACnet Setting Tool

The BACnet Setting Tool communicates with the BACS-AP50 using a LAN.

Before connecting the BACnet Setting Tool to the BACS-AP50, first disconnect the BACS-AP50 from BACnet (check that a cable is not connected to LAN2). Then, connect LAN1 and the PC with the BACnet Setting Tool installed using a LAN cable.

The BACnet Setting Tool can only be connected to a single BACS-AP50 at a time. Accordingly, when using a configuration that connects multiple BACS-AP50 units, configure BACnet settings for each BACS-AP50.

- **When the IP address of BACS-AP50 overlaps the IP address of another machine inside the network, not only can BACS-AP50 not carry out BACnet communication normally but other devices also cannot carry out BACnet communication normally. Check that the IP address used on BACS-AP50 is configured correctly before connecting BACS-AP50 to BACnet.**
- **When the settings are changed with the BACnet Setting Tool, if the BACS-AP50 BACnet connection mode is changed to [Offline], the monitoring and operation of the BACS-AP50 with the central monitoring device may become no longer possible and a communication error or other alarm may be detected by the central monitoring device so contact the system administrator in advance.**

5-2. Starting up the BACnet Setting Tool

Double-click the BACnet Setting Tool icon (BACS-AP50_SetBACnet) to start up the BACnet Setting Tool shown in the figure on the left below.

Select [New Settings] from [File] in the menu bar or select [Acquire settings] from [BACS-AP50] in the menu bar to display the screen shown in the figure on the right below.
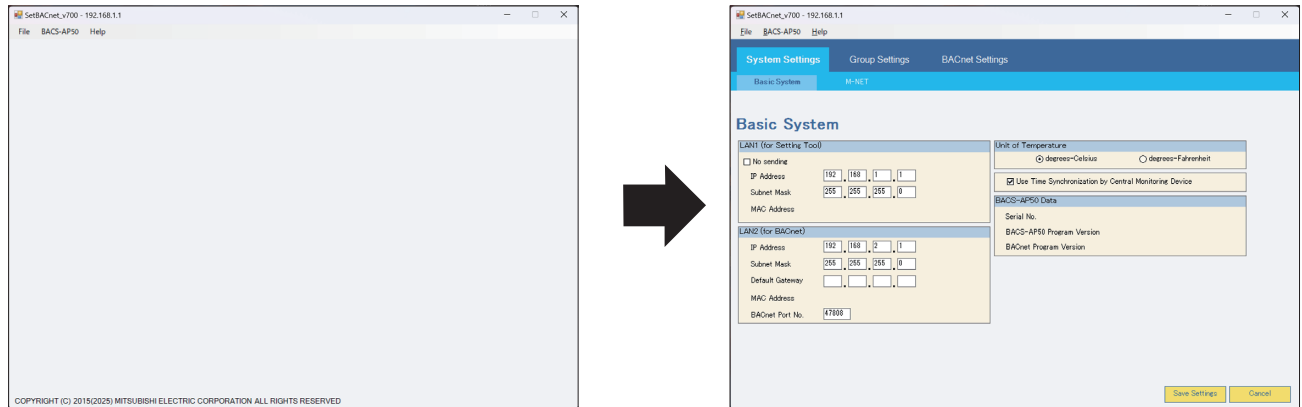
If [Acquire settings] is selected when the BACnet Setting Tool (PC) is not connected with the BACS-AP50 unit or when a connection is not established, a communication error pop-up screen as shown below appears after approximately 30 seconds.
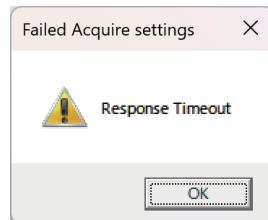
If a communication error occurs, check the following.
- Is the BACS-AP50 running? (About 10 minutes is required to complete the start-up process of BACS-AP50.)
- Is the cable between the PC and BACS-AP50 (LAN1) connected correctly?
- Is the IP address of the PC set to an IP address of the same network as LAN1 of the BACS-AP50? (Refer to 2-1 "Setting the IP address of the PC" for details.)
- Does the destination IP address setting of the BACnet Setting Tool match the IP address of LAN1 of the BACS-AP50? (Refer to 8-2-1 "Property" for details.)

5-3. Exiting the BACnet Setting Tool

To exit the BACnet Setting Tool, click ⊠ at the top right of the BACnet Setting Tool screen or select [Exit] from [File] in the menu bar.
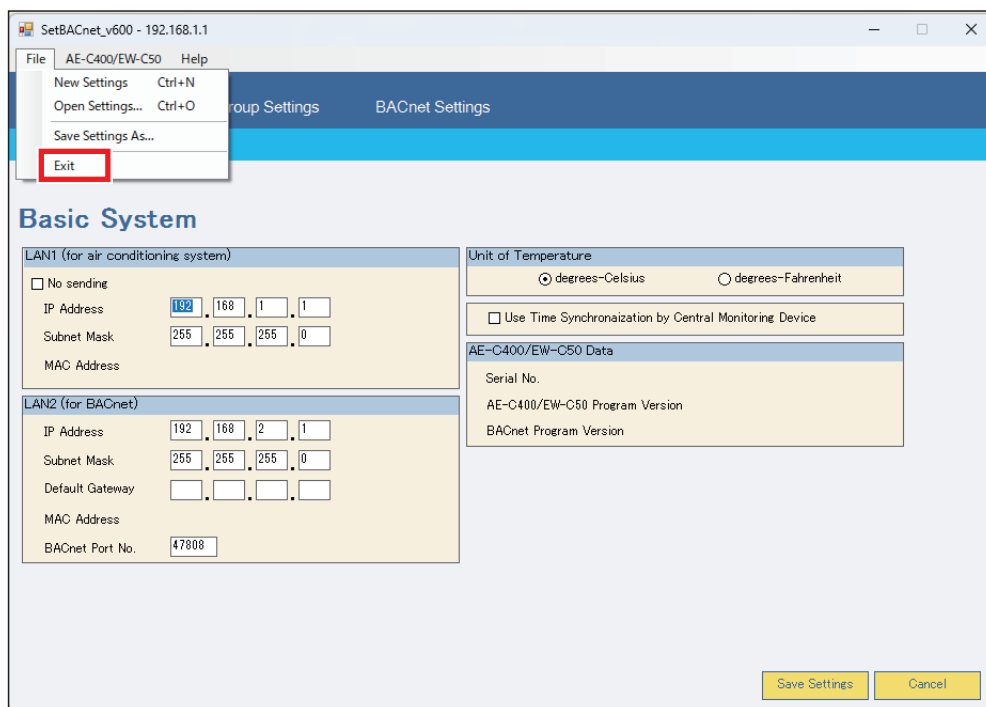
6. BACnet Setting Tool screens and setting items

6-1. Screen configuration

The screen configuration of the BACnet Setting Tool is shown below. To switch the settings screens, select menus on the menu bar, main tabs, or sub tabs.
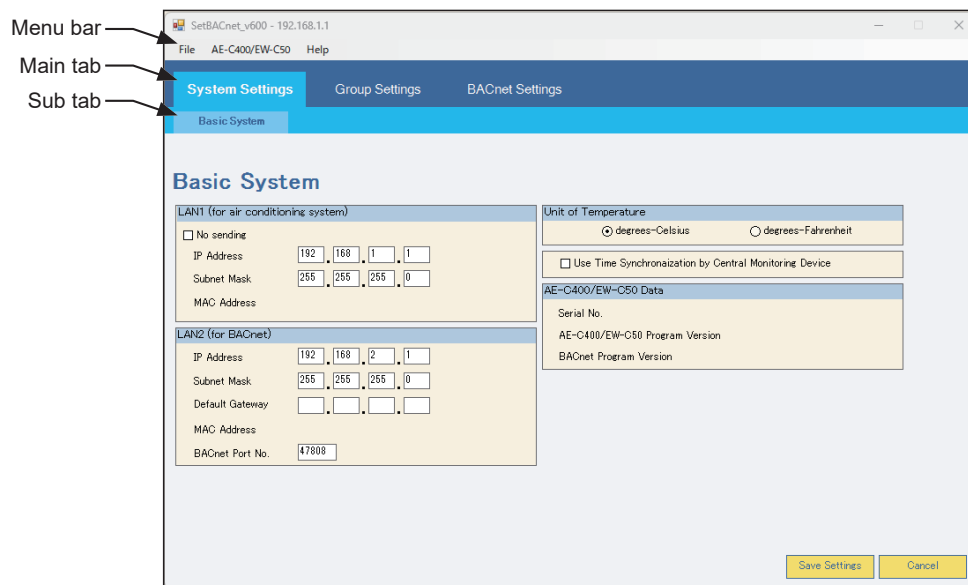
6-2. Menu bar configuration

Setting and operation items available from the menu bar are shown below.

Menu	Sub menu	Setting and operation items
File	New Settings	Displays the settings screen form making new settings.
	Open Settings...	Opens an existing settings data file, and apply the settings data contained in the file to the BACnet Setting Tool.
	Save Settings As...	Saves BACnet Setting Tool settings data to a specific folder with a specific file name.
	Exit	Exits the BACnet Setting Tool.
BACS-AP50	Property	Sets the LAN1 IP address for the BACS-AP50 to communicate with.
	Acquire settings...	Acquires the settings data from the BACS-AP50.
	Send settings...	Sends the settings data to the BACS-AP50.
	Mode Setting	Sets the BACnet connection mode (Online/Offline).
	Date and Time	Sets the current date and time in the BACS-AP50.
Help	About	Displays the version of the BACnet Setting Tool.

6-3. Setting tab configuration

Settings screens that are selected in the main tab and sub tab are as follows, and the items that can be set on each settings screen are as below.

Main tab	Sub tab	Setting items
System Settings	Basic System	Sets IP address information for BACS-AP50 LAN1 (for Setting Tool) and LAN2 (for BACnet connection), and time synchronization for air conditioning unit to connect. This screen also displays the BACS-AP50 serial number, BACS-AP50 program version, and the BACnet program version.
	M-NET	M-NET-related settings
Group Settings	Group	Group settings for the air conditioning unit, remote controller, and system controller; and OC settings
	LOSSNAY	Interlocked LOSSNAY settings
BACnet Settings	BACnet	Sets BACnet settings including BACS-AP50 device numbers, device names, APDU settings, and I-Am transmission periods; and air conditioning unit settings including dry mode usage Y/N, fan speed Mid1/Mid2 usage Y/N, and operation mode status automatic display Y/N.
	Network and Device	Registers notification destination devices for COV and event notifications.
	COV Notification	Registers device number, process ID, and notification type (with confirmation, without confirmation) for COV notification destinations.
	Event Notification	Registers device number, process ID, and notification type (with confirmation, without confirmation) for event notification destinations.
	Object	Selects the object to use, the requirement for COV/event notification and the notification destination, and sets the event notification (Event_Enable, Notify_Type).
	Other	Set the notification destination at reset.
	ForcedOff Reset	Used when using the Settings Tool to cancel a BACS-AP50 emergency stop originating from the central monitoring device (BACnet). Settings not required.

6-4. Initial setting procedure

6-4-1. BACnet function initial settings flow

Perform the following BACS-AP50 BACnet function settings. Refer to this manual for detailed procedures and settings details for BACS-AP50 BACnet settings.

```
┌─────────────────────────────────────────────────────────────────────┐
│   Ensure that the LAN2 (for BACnet) of BACS-AP50 is not connected.   │
└─────────────────────────────────────────────────────────────────────┘
                                  ↓
┌─────────────────────────────────────────────────────────────────────┐
│  Ensure that the LAN1 (for Setting Tool) of BACS-AP50 is not connected.│
└─────────────────────────────────────────────────────────────────────┘
                                  ↓
┌─────────────────────────────────────────────────────────────────────┐
│    Connect the PC (BACnet Setting Tool) to LAN1 of BACS-AP50.         │
└─────────────────────────────────────────────────────────────────────┘
                                  ↓
┌─────────────────────────────────────────────────────────────────────┐
│              Initial settings for BACnet related items               │
└─────────────────────────────────────────────────────────────────────┘
                                  ↓
┌─────────────────────────────────────────────────────────────────────┐
│           Remove the PC from LAN1 of BACS-AP50.                       │
└─────────────────────────────────────────────────────────────────────┘
                                  ↓
┌─────────────────────────────────────────────────────────────────────┐
│           Connect the BACnet to LAN2 of BACS-AP50.                    │
└─────────────────────────────────────────────────────────────────────┘
```

Set on the BACnet Setting Tool.
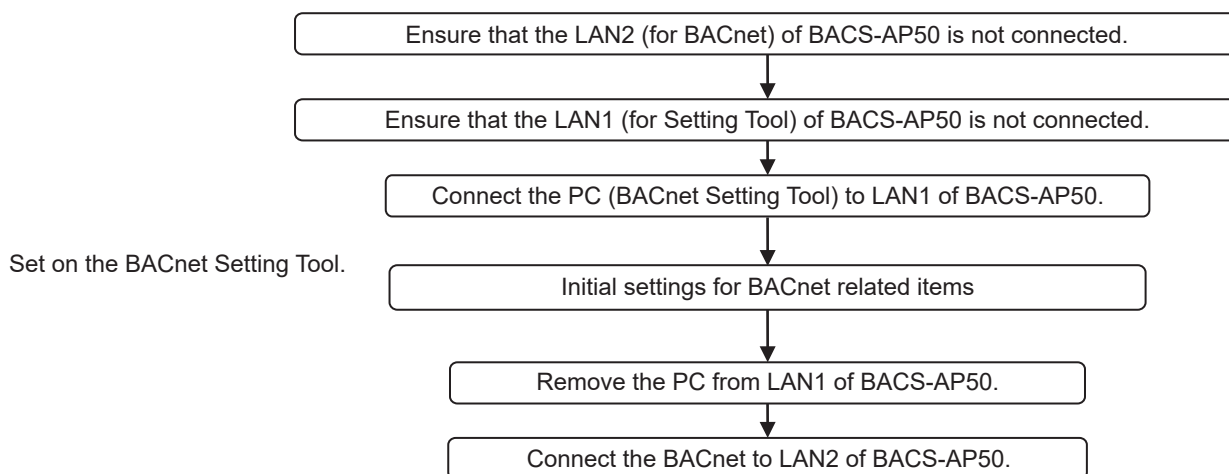
6-4-2. Initial settings procedure using the BACnet Setting Tool

Perform initial BACnet settings using the BACnet Setting Tool, using the following procedure.
("No." in the following table indicate the steps.)

No.	BACnet Setting Tool	Setting items
1	**Menu bar** [BACS-AP50] — [Property]	IP address of LAN1 (for Setting Tool) of BACS-AP50 (Refer to 8-2-1.)
2	[BACS-AP50] — [Mode Setting] ("Offline")	Set to [Offline]. (Refer to 8-2-4.)
3	[BACS-AP50] — [Acquire settings]	(Refer to 8-2-2.)
4	**Tab** System Settings — Basic System	Set the IP addresses of LAN1 and LAN2. (Refer to 9-2-1.)
5	BACnet Settings — M-NET-Settings	Setting the M-NET-related items. (Refer to 8-2-2.)
6	Group Settings — Group Settings	Set the M-NET groups. (Refer to 8-3)
7	Group Settings — Interlocked LOSSNAY	Set the interlock LOSSNAY.
8	BACnet Settings — BACnet	Select the revision No. Register the BACS-AP50 device number. (Refer to 9-4-1.)
9	BACnet Settings — Network and Device	Register other devices to be connected to BACnet. (Refer to 9-4-2.)
10	BACnet Settings — COV Notification	Set the COV No. and notification address. (Refer to 9-4-3.)
11	BACnet Settings — Event Notification	Set the notification class and notification address. (Refer to 9-4-4.)
12	BACnet Settings — Object	Select the objects to be used and configure the notification settings for each object. (Refer to 9-4-5.)
13	**Menu bar** [File] — [Save Settings As...]	(Refer to 8-1-3.)
14	[BACS-AP50] — [Send settings]	(Refer to 8-2-3.)
15	[BACS-AP50] — [Mode Setting] ("Online")	Set to [Online]. (Refer to 8-2-4.)
16	[BACS-AP50] — [Mode Setting] (Confirm)	Ensure that [Online] is set. (Refer to 8-2-4.) *1

*1 After performing [Send settings] to the BACS-AP50, check the followings.
　① Perform [Acquire settings] and check that the data has been properly set.
　② Check that the BACS-AP50 BACnet connection mode is "Online".

7. Saving settings data

7-1. Settings data flow

The figure below shows the flow image of the settings data when the BACnet Setting Tool is used.

[Save Settings As...]

[Acquire settings...]

[Open Settings...]

[Send settings...]

Storage *
(xml format)

BACnet
Setting Tool
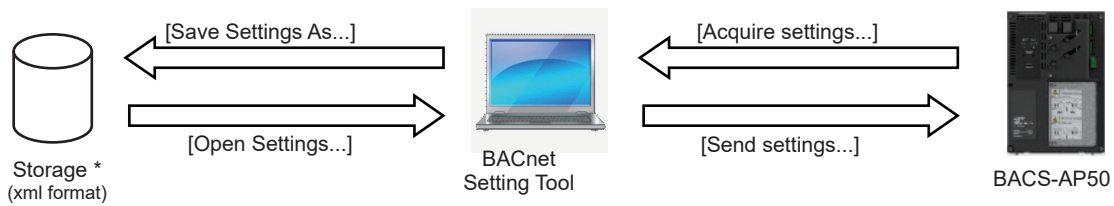
BACS-AP50

* HDD, USB memory, etc. for the BACnet Setting Tool PC

Note: Before changing the settings of the existing BACS-AP50, acquire the settings data from BACS-AP50. If the settings are changed without obtaining the settings data, the data on the unit may be overwritten with the wrong data.

Settings data includes all data that can be displayed or set using the BACnet Setting Tool, however the following are exceptions.
- Items that can be set from the menu [BACS-AP50] (destination IP address, BACnet connection mode, current time) are not included in settings data.

The BACnet Setting Tool can import settings data generated by the BACnet Setting Tool for the previous model, BAC-HD150. However, please note the following differences from the BAC-HD150 when importing configurations:
- It does not support configurations for connecting 150 units using an expansion controller. Please configure each unit individually.
- There is no Timeserver setting. Only the enable/disable setting for receiving the Time synchronization service is available (refer to 9-2-1-4 "Use Time Synchronaization by Central Monitoring Device").
- In the BACS-AP50, LAN1 is used for the setting tool and LAN2 is used for BACnet connection, which is the opposite of the BAC-HD150. The settings for LAN1 and LAN2 will be reversed when importing the configuration data, so please ensure that the settings are correct.

7-2. Backing up settings data

Ensure that backup data of settings data is kept on external storage for use in the event of recovering from an BACS-AP50 failure. Additionally, store this on the internal HDD of the BACnet Setting Tool PC.
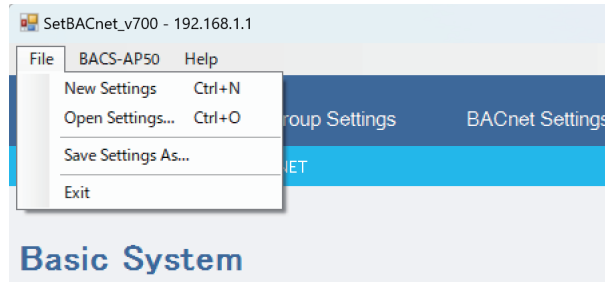The saved .xml format settings information data can be applied to the BACS-AP50 by going to the menu bar and selecting [Open Settings...], then opening the BACnet Setting Tool and selecting [Send settings...].

8. Menu bar

The menu bar has three items — [File], [BACS-AP50], and [Help].

8-1. File

Use [File] menu for the following operations and settings.

8-1-1. New Settings

Used to create new settings information. Displays the initial status settings screen (displays default values for screen). The initial status is the same as the factory default settings for the BACS-AP50.

8-1-2. Open Settings

Used when opening a settings data file in BACnet Setting Tool. Select the saved file name, click [Open Settings] to open the file and display settings details on the settings screen.

8-1-3. Save Settings As...

Specify the save folder, input the file name, and click [Save] to save the settings details as an xml format file (with ".xml" file extension).

8-1-4. Exit

Closes the BACnet Setting Tool. When settings details have been changed, before closing the BACnet Setting Tool, ensure that this has been saved using [Save Settings As...], and save the settings data file (xml format).

8-2. BACS-AP50

Use [BACS-AP50] menu for the following operations and settings.
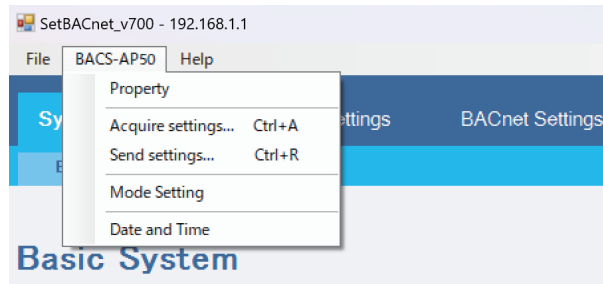

8-2-1. Property

Input the LAN1 IP address or the host name of the BACS-AP50 that is the BACnet Setting Tool destination, and click [OK] to set. Set the port number to 443 (fixed).

Enter the IP address or host name of LAN1 of the BACS-AP50 to which the BACnet Setting Tool is connected in the IP Address/Host Name field, enter the ID and password of the maintenance user in the ID and password fields, and click "OK" to complete the settings. Port No. is 443 (fixed).

Refer to the the supplied Instruction Book in detail of ID and password.
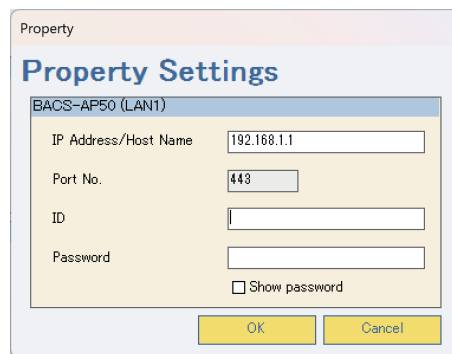
8-2-2. Acquire settings

Uses the BACnet Setting Tool to acquire the settings data set for the BACS-AP50, and displays this on the BACnet Setting Tool screen. When changing current settings data, ensure that you select [Acquire settings] to read the settings data before editing. Furthermore, if you select [Acquire settings] during editing of settings data, then this will discard the data being edited, and refresh using the data acquired from the BACS-AP50. Therefore, if it is necessary to save data that is being edited, then save the data before selecting [Acquire settings].

8-2-3. Send settings

Sets settings data created on the BACnet Setting Tool on the BACS-AP50. [Send settings] cannot be selected when the BACS-AP50 BACnet connection mode is [Online], therefore temporarily set the BACS-AP50 BACnet connection mode to [Offline] before selecting [Send settings].

Switching the BACS-AP50 BACnet connection mode from [Offline] to [Online] will restart the BACS-AP50. (Refer to 8-2-4 "Mode Setting" for switching Offline/Online and for display of current situation.)

Additionally, selecting [Send settings] will update the settings data stored in the BACS-AP50 with that from the BACnet Setting Tool. If there is no backup data for the settings data stored in the BACS-AP50, then perform a backup before selecting [Send settings], and save the settings data stored in the BACS-AP50 as below.

<<Method to backup settings data stored in the BACS-AP50>>
(1) Use [Save Settings As...] to save the data (a) set in the BACnet Setting Tool (a.xml).
(2) Use [Acquire settings] to acquire the settings data (b) stored in the BACS-AP50.
(3) Use [Save Settings As...] to save the acquired data (b) (b.xml).
(4) Use [Open Settings] to read the settings data (a) (a.xml) into the BACnet Setting Tool.
(5) Use [Send settings] to reflect the data (a) to the BACS-AP50.

Note: If an error message "Version Mismatch Error The version of this tool is not compatible with the version of BACS-AP50" pops up after [Send settings] is executed, refer to section 1-2 "BACnet Setting Tool version" for version compatibility.
Note: Do not restart the power supply within 1 minute after the settings are applied, or the BACS-AP50 may become inaccessible. Switch the BACnet connection mode to [Online] referring to 8-2-4 "Mode Setting", and restart the BACS-AP50.

8-2-4. Mode Setting

Sets the BACS-AP50 BACnet connection mode (Online/Offline). When switching the connection mode from [Offline] to [Online], the BACS-AP50 will automatically restart.
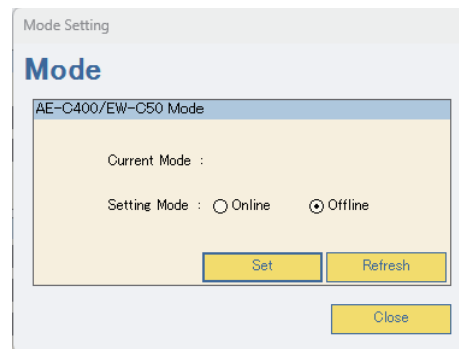
Online: The BACS-AP50 is communicating with the central monitoring device (BACnet)
Offline: The BACS-AP50 is disconnected from the central monitoring device (BACnet)
When performing [Send settings] to the BACS-AP50, set to [Offline].

* Important notes when selecting [Acquire settings] or [Send settings]

(1) Select [Send settings] after switching the BACS-AP50 BACnet connection mode to [Offline].
(2) If [Send settings] is selected when [Online], then the BACnet Setting Tool will display an error, and abort [Send settings].
(3) To close [Send settings] and return to the normal BACS-AP50 operational status, switch to [Online].
(4) After switching to [Online], the BACS-AP50 will restart.
(5) **After restart, check that the BACS-AP50 BACnet connection mode is [Online].**
Completion of start-up can be confirmed by either the BACS-AP50's LCD operating, or by being able to connect using a web browser.
(6) If the BACS-AP50 is [Offline], then BACnet communications are stopped. When using the central monitoring device to monitor the status of devices connected to BACnet, the central monitoring device may output an alarm, therefore when switching the BACS-AP50 BACnet connection mode to [Offline], first contact the system administrator.

8-2-5. Date and Time

Sets the date and time in the BACS-AP50. By selecting [Date and Time], the BACnet Setting Tool acquires from the BACS-AP50 the date and time stored in the BACS-AP50. Use [▲]/[▼] to set the current time, then click [Set] to update the date and time saved in the BACS-AP50. Additionally, click [Refresh] to display the current time of the BACS-AP50. If not connected to the BACS-AP50, then use of [▲]/[▼] is not possible.
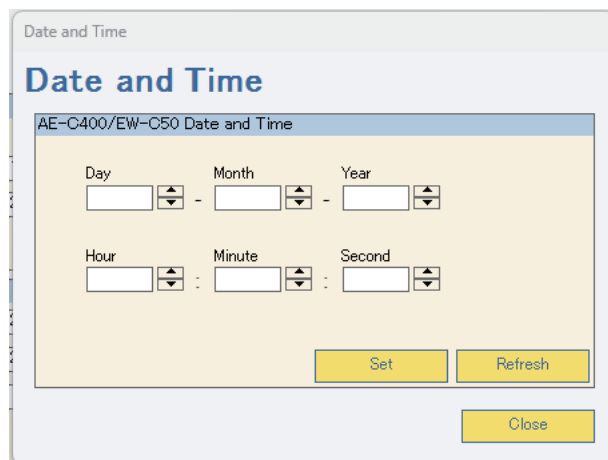
If [Use Time Synchronaization by Central Monitoring Device] is selected, this will be overwritten with the time on the central monitoring device. Refer to 9-2-1-4 "Use Time Synchronaization by Central Monitoring Device" for details.
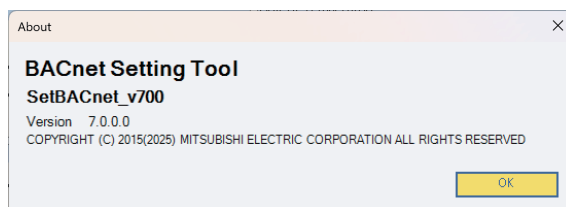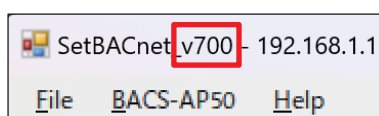
8-3. Help

[Help] menu shows the following.
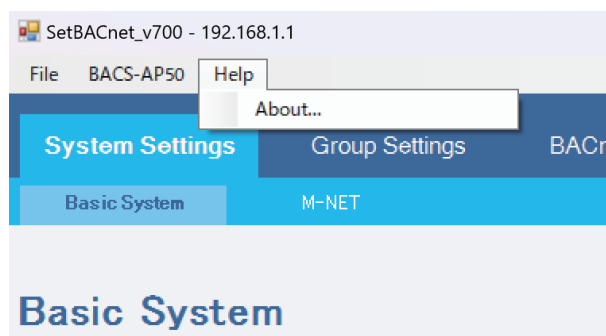
8-3-1. About

The BACnet Setting Tool program version is shown in a pop-up window. Click [OK] or ⊠ at the upper right to close the window.

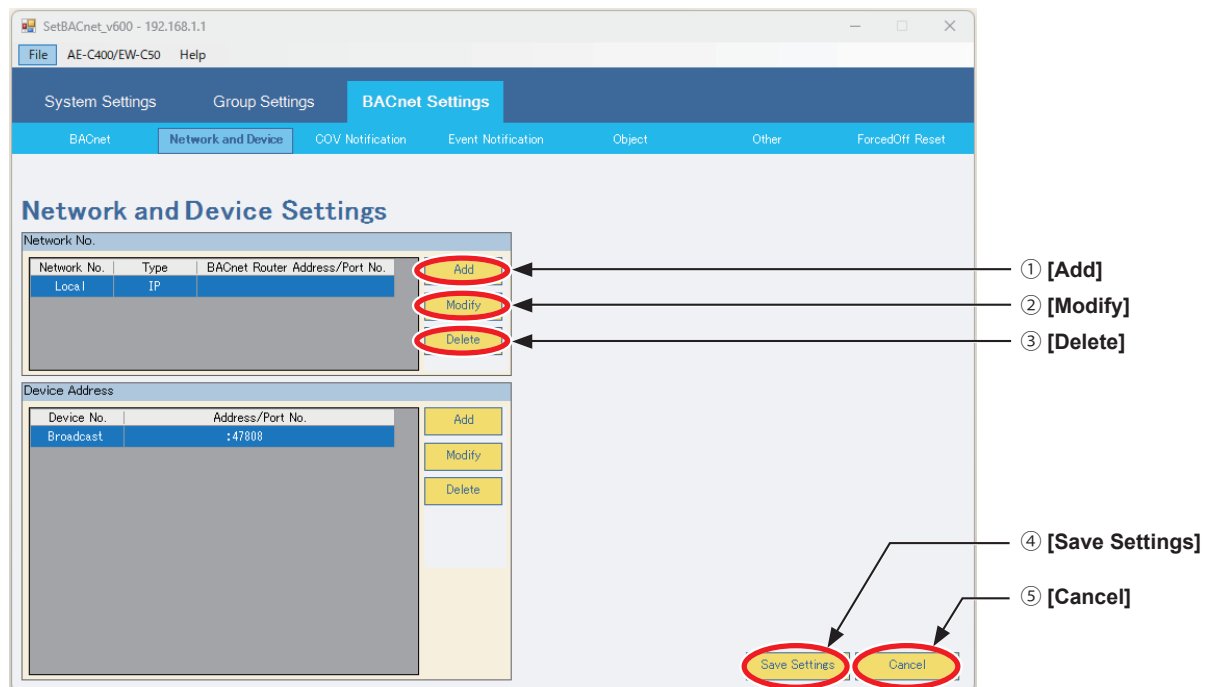Version information is always shown on the title bar of the BACnet Setting Tool window.

9. Setting screens
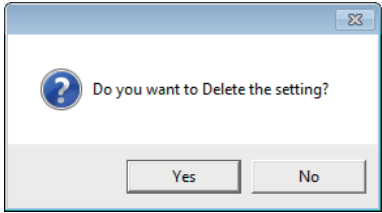
9-1. Explanation of screen buttons

This explains what operations occur when screen buttons are pressed.

9-1-1. Tab screen

The following shows the sample of the Setting Tool screen.

<Sample tab screen that shows buttons>

|	Button	Description
①	Add	Click to add a setting.
②	Modify	Click to change the selected setting.
③	Delete	Click to delete the selected setting. When clicked, a popup window as shown below appears. [Yes]: Deletes the selected setting. [No]: Returns to the settings screen without making any changes.
④	Save Settings	Click to temporarily save the displayed settings data. Selecting [Save Settings] enables switching to other tab screens. However, settings details are not sent to the BACS-AP50 at the point [Save Settings] is clicked. After configuring settings, select [Send settings] from the tool bar to send settings details to the BACS-AP50. Refer to 8-2-3 "Send settings" for details. Additionally, the settings file is not saved even after sending the settings data. To save the settings file, select [File], then select [Save Settings As...] from the tool bar.
⑤	Cancel	Click to discard changed settings details currently displayed on the screen, and display the temporarily saved settings details (before change).

9-1-2. Pop-up screen

9-1-2-1. [OK]

Reflects the settings details in the pop-up window to the BACnet Setting Tool, and closes the pop-up window.

9-1-2-2. [Cancel]

Closes the pop-up window, without reflecting the settings details in the pop-up window to the BACnet Setting Tool. (The settings screen will return to its previous content.)

9-1-3. Screen transition

When changing settings details on each tab screen, click [Save Settings] to temporarily save. When switching to a different tab screen without confirming changed details, the following pop-up window will be displayed.
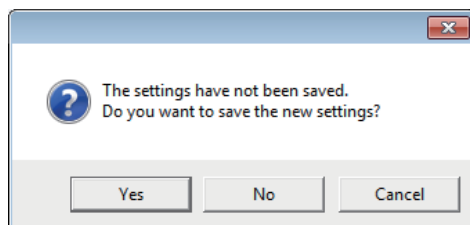
[Yes]: Temporarily saves changed settings details, then switch to the selected tab screen.

[No]: Switches to the selected tab screen without temporarily saving changed settings details.

[Cancel]: Returns to the previous tab screen while displaying the changed details.

9-2. System settings

[System Settings] tab contains the [Basic System] and [M-NET] and sub tabs.

9-2-1. Basic system

Set the IP addresses of BACS-AP50 LAN1 (for Setting Tool) and LAN2 (for BACnet).

9-2-1-1. LAN1 (for Setting Tool)

Set fields for the LAN1 (for Setting Tool) IP address. LAN1 can only use IPv4.

No.	Item	Default value
1	No sending	Unselected
2	IP Address	192.168.1.1 *1*2*3
3	Subnet Mask	255.255.255.0 *1
4	MAC Address	Displayed when [Acquire settings] is performed.

*1 Normally, set as in the following table based on the leading octet value of the IP address. (Figures within parentheses indicate the private IP address.)

No.	IP address leading octet value		Subnet mask to set
1	1 to 126	(10)	255. 0. 0. 0
2	128 to 191	(172)	255.255. 0. 0
3	192 to 223	(192)	255.255.255. 0

*2 LAN1 (for Setting Tool) and LAN2 (for BACnet) do not support the same network setting. Set a different network address, respectively.

*3 At the time of data acquisition, the current value of the IP address is returned, not the value you have set.

Note: Refer to section 9-2-1-2 "LAN2 (for BACnet)" for information on default gateway.

9-2-1-2. LAN2 (for BACnet)

Sets fields for the BACS-AP50 LAN2 (for BACnet) IP address (some items are display-only). LAN2 can only be set using IPv4.

No.	Item	Description	Default value
1	IP Address	Set the IP address of BACS-AP50 (LAN2).	192.168.2.1 [*1][*2]
2	Subnet Mask	Set the IP address network address portion (LAN2).	255.255.255.0 [*1]
3	Default Gateway	When using an IP router for BACnet communications, set the IP address of the IP router (LAN2). If not using an IP router, do not set this.	(Blank)
4	BACnet Port No.	Display the port number used by the BACS-AP50 for BACnet communications. The port number can be changed to 47808 to 47823 or 49152 to 65535. However, do not use 49152, 49153, and 60000 because it may interfere with the communication between our product and the BACS-AP50.	47808

[*1] Normally, set as in the following table based on the leading octet value of the IP address. (Figures within parentheses indicate the private IP address.)

No.	IP address leading octet value		Subnet mask to set
1	1 to 126	(10)	255. 0. 0. 0
2	128 to 191	(172)	255.255. 0. 0
3	192 to 223	(192)	255.255.255. 0

[*2] LAN1 (for Setting Tool) and LAN2 (for BACnet) do not support the same network setting. Set a different network address, respectively.

Setting the wrong IP address may impact other devices connected to BACnet, therefore ensure the IP address used by the BACS-AP50 is set correctly.

9-2-1-3. Unit of Temperature

Select a desired temperature unit to be used. (Default setting: [degrees-Celsius])
Check the radio button next to [degrees-Celsius] to display the temperatures in ºC.
Check the radio button next to [degrees-Fahrenheit] to display the temperatures in ºF.

9-2-1-4. Use Time Synchronaization by Central Monitoring Device

If reflecting the time data sent from the central monitoring device to the BACS-AP50 or M-NET system (indoor units, remote controllers, or system controllers), select this check box. When selecting this check box, ensure that "Time Synchronization" is set to "No sync" on the Controller settings screen of the BACS-AP50.
(Default value: selected (do not synchronize time to BACS-AP50 or M-NET system))

9-2-1-5. BACS-AP50 Data

BACS-AP50-related data appears when [Acquire settings] is performed.

BACS-AP50 Data	
Serial No.	87124-203
BACS-AP50 Program Version	7.00
BACnet Program Version	7.00

(1) Serial No

BACS-AP50 serial number appears.

(2) BACS-AP50 Program Version

BACS-AP50 program version appears.
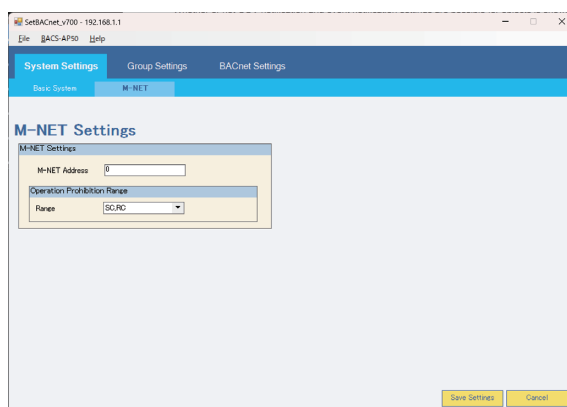
(3) BACnet Program Version

BACS-AP50 BACnet program version appears.

9-2-2. M-NET Settings

Click the [M-NET] tab on the [System Settings] tab to display the [M-NET Settings] window.
On this window, the M-NET-related items are configured.
The default settings are as shown in the figure below.

No.	Item	Description	Default value
M-NET Settings			
1	M-NET Address	Enter the M-NET address of BACS-AP50. (Setting range: 0, 201 -250) Normally set to [0]	0
Operation prohibition range			
2	Range	From the pulldown menu, select [SC, RC] to prohibit the operation from both the low-level system controllers and remote controllers, or select [RC] to prohibit operation from only the remote controllers when Prohibit local operation is enabled. Normally set to [SC, RC]	SC, RC

9-3. Group settings

The [Group Settings] tab contains the [Group] and [LOSSNAY] sub tabs.

9-3-1. Group settings

Take the following steps to configure the group settings (units, remote controllers, and system controllers for each group).
(The default settings for all items are blank.)

No.	Item	Description	Notes
1	Group No.	Group number (Group range: 1 -50)	
2	Unit	Configure the M-NET address of the units (air conditioning units, LOSSNAY, etc.) in the group.	*1 *3
3	Remote Controller	Configure the M-NET address of the remote controllers that control the group.	*2
4	System Controller	Configure the M-NET address of the system controllers that control the group.	*2

*1 The maximum number of units that can be configured into a group is 16.
   Each group can be comprised only of the same type of units
   (e.g., Air conditioning units cannot be grouped together with LOSSNAY units).

   When setting chiller (e-Series), the number of units should be limited to 6.

*2 The maximum number of remote controllers and system controllers that can be configured into a group is four, not including the BACS-AP50 unit. No more than two remote controllers can be included in each group.

*3 The number of units connected to M-NET (one system) must satisfy the following restrictions.
   • The maximum number of connected air conditioning units must be 50 or less (when converted to the number of indoor units).
   • Convert the number of units to the number of indoor units to determine the maximum number of connected units, referring to the table below.

	Converted number of units	Maximum number of connectable units
Air conditioning unit (CITY MULTI for buildings, PAC for stores and offices)	1	50
Ventilation equipment	1	50
Chiller (e-Series)	3	16 17 to 24*1
Hot water supply	2	24

*1: When 17 to 24 units are connected, other types of units must not be present in the system.

(1) Configuring the group setting for the units

Double-click the Unit address field of the group to be set to display the [Select Unit Address] popup window. Select the units to be included in each group on this window.

(a) Unit selection

   Click a unit address to select. Click the selected address to deselect.
   The unit selection status is indicated in different colors.
   Light gray indicates the units that are available for selection, and lime green indicates the units that are currently selected.
     Light gray: Units that do not belong to any group
     Lime green: Units that are currently selected
     Dark gray: Units that belong to other groups

(2) Configuring the group setting for the remote controllers

Double-click the Remote controller address field to display the [Select Remote Controller Address] popup window. Select the remote controllers to be assigned to each group on this window.

(a) Remote controller selection

   Click a remote controller address to select. Click the selected remote controller address to deselect.
   The remote controller selection status is indicated in different colors.
   Light gray indicates the remote controllers that are available for selection, and lime green indicates the remote controllers that are currently selected.
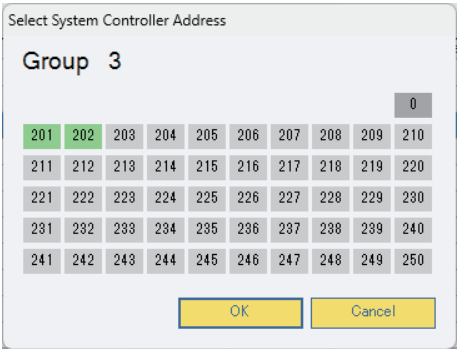   Light gray: Remote controllers that do not belong to any group
     Lime green: Remote controllers that are currently selected
     Dark gray: Remote controllers that belong to other groups

(3) Configuring the group setting for the system controllers

Double-click the System Controller address field to display the [Select System Controller Address] popup window. Select the system controllers to be assigned to each group on this window.


(a) System controller selection

Click a system controller address to select. Click the selected address to deselect.

The system controller selection status is indicated in different colors.

Light gray indicates the system controllers that are available for selection, and lime green indicates the system controllers that are currently selected.

Light gray: System controllers that do not belong to any group

Lime green: System controllers that are currently selected

Dark gray: BACS-AP50 address

9-3-2. OC settings

To use objects related to outdoor units (COP (AI_51zz01), etc.), enter their addresses in the OC settings.
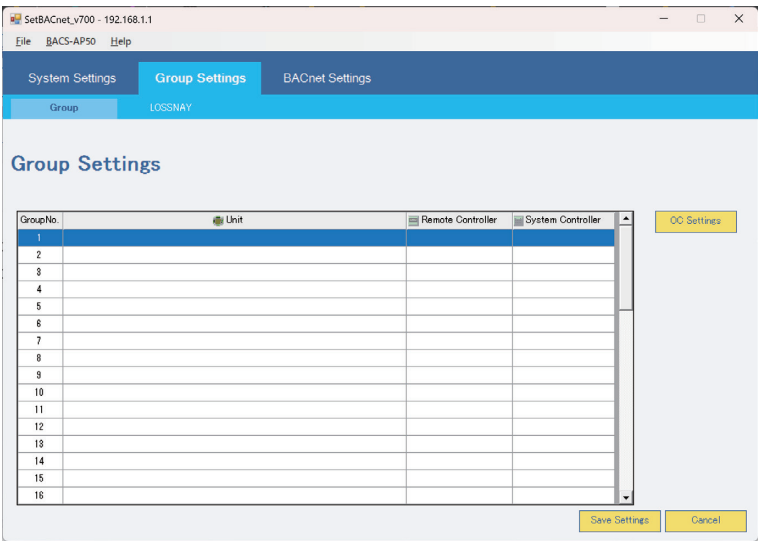
No.	Item	Description	Notes
1	OC settings	Button for displaying the Select OC Address popup window.	

(1) Configuring the outdoor unit settings

Click [OC Settings] to display the Select OC Address popup window.

(a) Outdoor unit selection

Click an outdoor unit address to select. Click the selected address to deselect.

The unit selection status is indicated in different colors.

Light gray indicates the units that are available for selection, and lime green indicates the units that are currently selected.

Light gray: Units that are available for selection
Lime green: Units that are currently selected

9-3-3. LOSSNAY settings

To interlock the operation of LOSSNAY and indoor units, enter their addresses in the appropriate fields.
(The default settings for all items are blank.)

No.	Item	Description	Notes
1	LOSSNAY	Address of the LOSSNAY unit to be interlocked with the indoor units	*1
2	IC	Address of the indoor units to be interlocked with the LOSSNAY unit	*2

*1 Only one LOSSNAY address can be entered in each field.

*2 The maximum number of indoor units that can be interlocked with each LOSSNAY unit is 16.
Each indoor unit can be interlocked with only one LOSSNAY unit.

(1) Configuring the interlock settings for the LOSSNAY units

Double-click the LOSSNAY address field to display the [Select LOSSNAY Address] popup window.

(a) Interlocking LOSSNAY address selection
  Click the address of the LOSSNAY unit to select. Click the selected address to deselect.
  Light gray indicates the units that are available for selection, and lime green indicates the units that are currently selected.
    Light gray: Indoor or LOSSNAY units that are not interlocked
    Lime green: LOSSNAY units that are currently selected
    Dark gray: Indoor or LOSSNAY units that are already interlocked

(2) Configuring the interlock settings for the indoor units

Double-click the LOSSNAY address field to display the [Select LOSSNAY Address] popup window.

(a) Indoor unit address selection
  Click the address of the indoor unit to select. Click the selected address to deselect.
    Light gray: Indoor or LOSSNAY units that are configured into a group, but not interlocked
    Lime green: Indoor units that are currently selected
    Dark gray: Indoor or LOSSNAY units that are not configured into a group or are interlocked

9-4. BACnet settings

[BACnet Settings] has [BACnet], [Network and Device], [COV Notification], [Event Notification], [Object], [Other], and [ForcedOff Reset] settings screens.
The following explains basic terminology used in BACnet.

<BACnet terminology>

Terminology	Description
Revision No.	Revision number in ANSI/ASHRAE Standard 135-2010, 2012 and 2016 (Revision No. 12-21). (For details, refer to "3-1. BACnet specifications" of the Instruction Book (BACnet function).)
Network No.	Number that identifies the BACnet router to which BACnet device (equipment) is connected. In this settings tool, on systems not using the BACnet router, this is "Local".
Device No.	Number that identifies the BACnet device (equipment). IP addresses are assigned on a per-device basis.
Object	Information regarding input/output and other internal status of the BACnet device (equipment).
COV notification	Abbreviation of Change Of Value. Function that notifies other BACnet devices of changes in the event of a change to an object PresentValue or StatusFlags.
Event notification	Notifications of detected alarms and events based upon algorithms defined in each object.
I-Am	BACnet services to communicate device information such as device No., APDU maximum value, segmentation support information, and vendor ID to destination devices.

9-4-1. BACnet

Sets BACS-AP50 device number, BACnet functions, and other settings. From [BACnet Settings], click the [BACnet] tab to display the [BACnet Settings] screen. Initial settings are as follows.

9-4-1-1. BACS-AP50 BACnet Settings

Sets items related to the BACS-AP50 device number and BACnet functions. (Items that cannot be changed are displayed in light gray.)

No.	Item	Description	Default value
1	Revision No.	Select the Revision No. of the BACnet Standard applied to the BACS-AP50 according to the central monitoring device to be communicated with. For details of the Revision No., refer to "3-1. BACnet specifications" of the Instruction Book (BACnet function).	Rev.12
2	Device No.	Set the BACS-AP50 device number. (Setting range: 0 to 4194302)	3
3	Device Name	Set the BACS-AP50 device name. Do not set the name that is being used for other BACnet devices. Enter a character string of 1 to 32 alphanumeric characters and symbols. Only three types of symbols can be used (-, _, and space). A character string that consists of only space is invalid.	Device Object
4	Segmentation *1	In BACnet communications, segmentation applies to both sending and receiving (fixed).	Both
5	APDU Segment Timeout	Set the monitoring time for segment responses to sent segmented data. (Setting range: 0 to 99999 ms) Leave [5000] as it is unless otherwise specified.	5000 (ms)
6	APDU Timeout *2	Set the monitoring time for responses to sent data. (Setting range: 0 to 99999 ms) Leave [6000] as it is unless otherwise specified.	6000 (ms)
7	APDU Retries	Set the number of send retries. (Setting range: 0 to 99) Leave [3] as it is unless otherwise specified.	3
8	I-Am Timer	Specify the BACS-AP50 "I-Am" send period (units: seconds). (If "0", only the initial "I-Am" is sent, with no subsequent periodic sends.)	0
9	Vender ID	BACS-AP50 vender ID appears. (MITSUBISHI ELECTRIC AC&R: 99 (fixed))	99
10	NetworkPort No.*3	The instance number of the NetworkPort object is displayed.	1 (Fixed)

*1 "Segmentation" means sending and receiving after segmenting the message when the length of the message exceeds the limit. "Both" indicates that segmentation applies to both sending and receiving.

*2 "APDU Timeout" is the time interval to resend the message when the response cannot be received after the message that requires response is sent.

*3 Not displayed when Rev. 12 is selected under Revision No.

9-4-1-2. Other Settings

Sets 5 other settings items for the BACS-AP50.

```
Other Settings
  ☐ Use Dry Mode
  ☐ Use Fan Speed Mid1/Mid2
  ☐ Not reflect communication error to alarm signal
  ☐ Use Operation Mode State Auto
  ☐ Old Model Compatibility Mode
  ☐ The operation of SC or RC is reflected to BO and MO.
```

No.	Item	Description	Default setting
1	Use Dry Mode	Check the checkbox to use an operation mode "Dry".	Unchecked
2	Use Fan Speed Mid1/Mid2	Check the checkbox to use fan speeds Mid1 and Mid2. [*1]	Unchecked
3	Not reflect communication error to alarm signal	Check the checkbox <u>NOT to reflect the communication error status</u> to an alarm signal (BI_01xx03), CH_ReprAlarmSignal (BI_71tt11) and CH_UnitAlarmSignal (BI_91uu11). Leave the checkbox unchecked unless otherwise specified.	Unchecked
4	Use Operation Mode State Auto	Check the checkbox to display "Auto" whenever the operation mode is set to "Auto". Uncheck the checkbox to display the actual operation mode (Heat or Cool).	Unchecked
5	Old Model Compatibility Mode	By enabling this setting, all indoor units that are connected to BACS-AP50 can be operated according to the setting for the single set point temperature.	Unchecked
6	The operation of SC or RC is reflected to BO and MO. [*2]	The function is enabled when the checkbox is checked. BO or MO object will change according to the changes made from the remote controllers or other devices.	Unchecked

*1 Depending on the unit model, in addition to High/Low, this may have 2 extra fan speeds (Mid1/Mid2). Refer to the Instruction Book for air conditioning unit for details of supported equipment. Fan speeds in this case are "High" > "Mid1" > "Mid2" > "Low".

*2 BO and MO objects will change according to the changes made from the remote controller, system controller, LCD, or Web browser. For example, in a building management system that detects the mismatch between the "On Off State" object value (Stop/Run) and the "On Off Setup" object value (Stop/Run) as an error, enabling the function will keep the mismatch from being recognized as an error.

Objects that are changed from remote controllers or other devices			Objects that change accordingly when the function is enabled	
Control item	Object ID		Control item	Object ID
On Off State	BI_01xx02	→	On Off Setup	BO_01xx01
Operation Mode State	MI_01xx06	→	Operation Mode Setup	MO_01xx05
Fan Speed State	MI_01xx08	→	Fan Speed Setup	MO_01xx07
Air Direction State	MI_01xx23	→	Air Direction Setup	MO_01xx22
Ventilation Mode State	MI_01xx36	→	Ventilation Mode Setup	MO_01xx35
Air To Water Mode State	MI_01xx38	→	Air To Water Mode Setup	MO_01xx37
Chiller OnOff State	BI_71tt02	→	Chiller OnOff Setup	BO_71tt01
Chiller Operation Mode State	MI_71tt04	→	Chiller Operation Mode Setup	MO_71tt03
Chiller Fan Mode State	MI_71tt06	→	Chiller Fan Mode Setup	MO_71tt05

NOTE

Even when the setting is made not to use BI or MI object, BO and MO objects will change according to the changes made from the remote controller, system controller, LCD, or Web browser.

9-4-1-3. Use Remote BBMD

Register the BACS-AP50 to the BBMD as an external device.

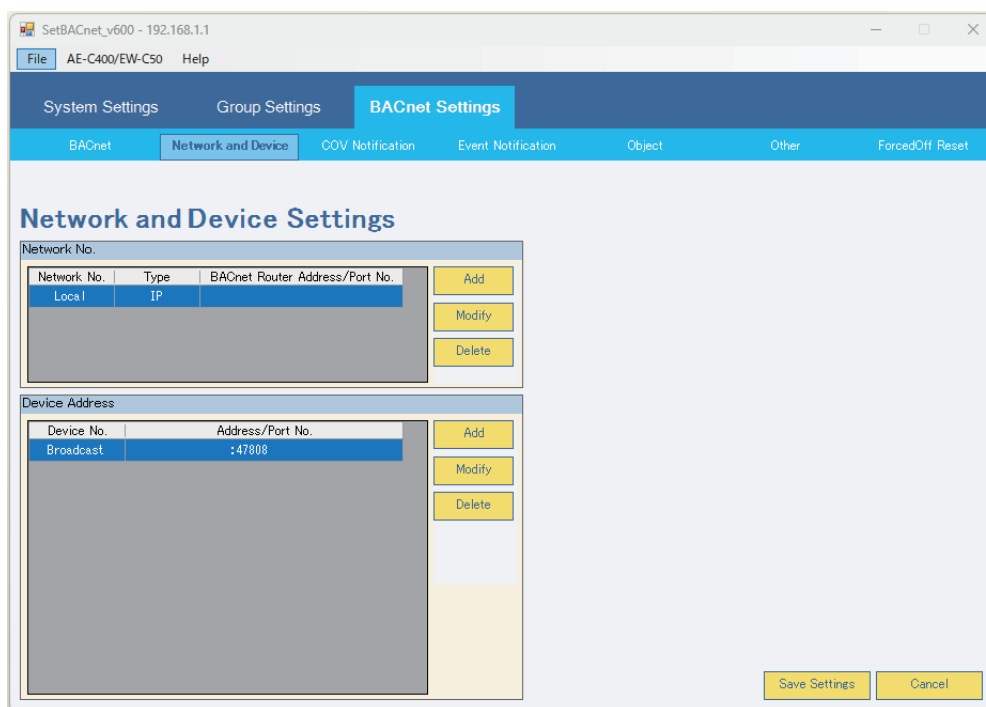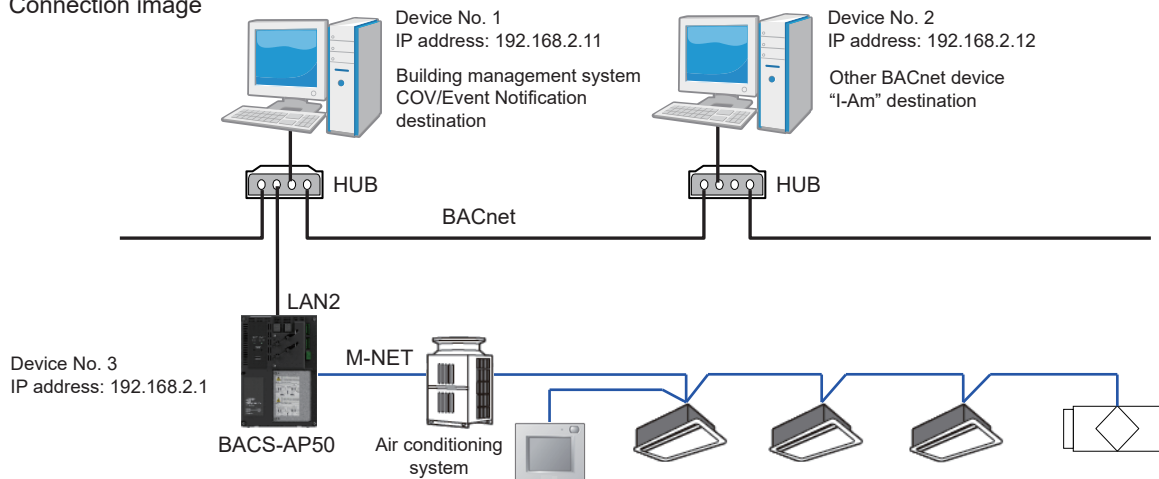| No.	Item	Description	Default
1	Use Remote BBMD	Check the checkbox to register the BACS-AP50 to the BBMD as an external device.	Unchecked
2	Time To Live	Set the time limit (in minute increments) for the BACS-AP50 to be registered to the BBMD as an external device. The setting is valid only when the checkbox is checked. (Setting range: 0 to 65535) Leave "0" as it is unless otherwise specified. ("0" means there is no time limit.)	0

9-4-2. Network and Device

From [BACnet Settings], click the [Network and Device] tab to display the [Network and Device Settings] screen.

Assign IP addresses and port numbers to network and device numbers.

This chapter covers settings for the following devices that exchange information with the BACS-AP50.

- Notification destination devices for COV notifications and Event notifications
- "I-Am" destination devices
- Restart notification destination devices

Connection image

Device No. 1
IP address: 192.168.2.11

Building management system
COV/Event Notification
destination

Device No. 2
IP address: 192.168.2.12

Other BACnet device
"I-Am" destination

HUB

HUB

BACnet

LAN2

Device No. 3
IP address: 192.168.2.1

M-NET

BACS-AP50

Air conditioning
system

9-4-2-1. Network No.

Network configuration is required only when a BACnet router is used.

(Only [Local] will appear in the Network No. column when no BACnet router is used.)

The maximum number of network that can be configured is 5 (including Local).

Click [Add] to display the [Network No.] popup window. Enter the network information in the fields.

No.	Item	Description	Default
1	Network No.	Enter the network number. (Setting range: 1 to 65534) Set to "65535" when using Global Broad Cast.	(Blank)
2	Type	IP (fixed)	IP
BACnet Router			
3	IP Address *1*2	Enter the IP address of the BACnet router to be connected to the network that was configured in No. 1 above. (The IP address of the BACnet router on the network to which the BACS-AP50 is connected.)	(Blank)
4	Port No. *3	The number of the port that the BACnet router uses for BACnet communication appears here. Leave [47808] as it is unless otherwise specified.	47808

*1 When Network No. is set to Local (0) or except Global (65534), the IP address of the device can be set as empty.
   In this case, the IP address of the device is obtained automatically.
   "Auto" is displayed on the [Network No.] screen.

*2 When the Network No. is any number from 1 to 65534, the router address and the IP address of the device can be set as empty.
   In this case, the router address and device IP address will be obtained automatically.
   Note: The router address and the IP address of the device should be entered together or not.
        For example, if one is left blank, the other should also be left blank.

*3 Port No. can be changed when Network No. is set to a value of the remote network (1 to 65534).

9-4-2-2. Device Address

Registers other devices such as central monitoring devices that send and receive data with the BACS-AP50. A maximum of 11 devices can be registered as communications devices (including broadcast).

(1) Registering communications device

Sets communications device information. Click [Add] to display the [Device Address] pop-up window.

No.	Item	Description	Default
1	Instance No.	Check the radio button to set the device number. Enter the device instance number. (Setting range: 0 to 4194302)	Checked (Blank)
2	Broadcast	Check the radio button to broadcast transmission.	Unchecked
3	IP Address	Enter the IP address of the device.	192.168.2.x
4	Port No.	The BACnet port number of the device is displayed here. Leave [47808] as it is unless otherwise specified. (Setting range: 47808 to 47823, 49152 to 65535)	47808

(2) Changing communications device

Changes device settings. Select the device to change and click [Modify], or double-click the [Address/Port No.] to change to display the [Device Address] pop-up window.
When changing or deleting the device IP address, ensure that you check the notification destination IP address set in 9-4-3 "COV Notification" and 9-4-4 "Event Notification". If settings are inconsistent, BACnet connection mode may not switch to "Online".

```
Device Address

Network No.Local     Type IP

Device Address
  Device No.
    ⊙ Instance No.  1
    ○ Broadcast


  IP Address  192 . 168 . 2 . 101
  Port No.    47808

         OK          Cancel
```

(3) Deleting communications device

Deletes registered devices. Select the communications device to delete, and click [Delete] to delete settings. Additionally, devices with device numbers set to "Broadcast" are used as an introductory sequence, therefore cannot be deleted.

9-4-3. COV Notification

From [BACnet Settings], click the [COV Notification] tab to display the [COV Notification Settings] screen.
This assigns device numbers registered on the [Network and Device] screen to the COV notification number. By using the COV notification number set here to set COV notifications for each control item in 9-4-5 "Object", send COV notifications such as changes in status of control items and start-stop status in accordance with each COV notification number. Below are the initial settings.

9-4-3-1. COV No.

Click the [Add] or [Modify] buttons under [COV No.] to display the following window. Input the COV No., and select the [OK] button. A maximum of 5 COV numbers can be registered. Note that the range 1 to 10 can be registered as COV No.

9-4-3-2. Notification Address

(1) Setting "Notification Address"

Sets the COV number notification destination device. Select the [COV No.] (left) for the device to set, and under [Notification Address] (right), click [Add] to display the [Notification Address] pop-up window. A maximum of 5 devices can be set for each COV No. (including broadcast).

No.	Item	Description	Default
Notification Address			
1	Network No.	Sets the network number for the COV notification destination device. Here, this is fixed to "Local".	Local
2	Device No.	Sets the device number for the COV notification destination device. (Select from device numbers set in 9-4-2 "Network and Device".)	Broadcast (When IPv4 is used)
3	Process Identifier	Sets the process ID for the COV notification destination address. (Setting range: 0 to 4294967295) Set to "0" unless otherwise specified.	0
Notification Type			
4	Unconfirmed/ Confirmed	Sets the type of the COV notification to send. Unconfirmed: Unconfirmed COV Notification Confirmed: Confirmed COV Notification	Unconfirmed

Click [Select] to display the [Network and Device Settings - Select BACnet Device] screen (figure below), from where you can select the COV notification destination device number. This screen shows the device list set in 9-4-2 "Network and Device".

Device Address

Network and Device Settings – Select BACnet Device

Network No.

Network No.	Type	BACnet Router Address/Port No.
Local	IP	

Device Address

Device No.	Address/Port No.
1	192.168.2.101 :47808
2	192.168.2.102 :47808
3	192.168.2.103 :47808
4	192.168.2.104 :47808
5	192.168.2.105 :47808
6	192.168.2.106 :47808
7	192.168.2.107 :47808
8	192.168.2.108 :47808
9	192.168.2.109 :47808
10	192.168.2.110 :47808
Broadcast	:47808

Select   Cancel

In the screen above, select (reflect) the device number and click [Select] to reflect the device information selected in [Device No.] in the [Notification Address] pop-up window.

Notification Address

COV No. 1

Notification Address

Network No.	Local ▼	Select
Device No.	1 ▼	
Process Identifier	0	

Notification Type

⦿ Unconfirmed   ○ Confirmed

OK   Cancel

(2) Changing "Notification Address"

Changes the COV notification destination address settings. Select the address to change, and click [Modify] to display the [Notification Address] pop-up window. Display screens and methods for changing are the same as in 9-4-3-2. (1) "Setting "Notification Address"".

(3) Deleting "Notification Address"

Deletes the COV notification destination address settings. Select the address to delete, and click [Delete] to delete settings for the selected notification destination address.

9-4-4. Event Notification

From [BACnet Settings], click the [Event Notification] tab to display the [Event Notification Settings] screen.
As in 9-4-3 "COV Notification", this assigns device numbers registered on the [Network and Device] screen to the notification destination class ID. By using the notification class set here to set event notifications for each control item in 9-4-5 "Object", send event notifications such as changes in status of control items and abnormality alarms in accordance with each notification class ID.
Below are the initial settings.

9-4-4-1. Notification Class

Click the [Add] or [Modify] buttons under [Notification Class] to display the following window. Set the notification class ID and priority order for event notifications. A maximum of 5 notification class IDs can be set.

No.	Item	Description	Default value
1	Notification Class ID	Set the instance number of notification class object. (Setting range: 0 to 4194302)	(Blank)
2	Priority	Sets the priority order of event notifications for generated events (settings range: 0 to 255, lower figures indicate higher priority). Set to "255" unless otherwise specified.	255

9-4-4-2. Notification Address

(1) Setting "Notification Address"

Sets the notification destination device to register in the notification class ID. Select the [Notification Class ID] for the device to set, and under [Notification Address], click [Add] to display the [Notification Address] pop-up window.

A maximum of 5 devices can be set for each notification class ID (including broadcast).

No.	Item	Description	Default
Notification Address			
1	Network No.	Sets the network number for the event notification destination device. Here, this is fixed to "Local".	Local
2	Device No.	Sets the device number for the event notification destination device. (Select from device numbers set in 9-4-2 "Network and Device".)	Broadcast
3	Process Identifier	Sets the process ID for the event notification destination address. (Setting range: 0 to 4294967295) Set to "0" unless otherwise specified.	0
Notification Type			
4	Unconfirmed/ Confirmed	Sets the type of the event notification to send. Unconfirmed: Unconfirmed Event Notification Confirmed: Confirmed Event Notification	Unconfirmed

Click [Select] to display the [Network and Device Settings - Select BACnet Device] screen (figure below), from where you can select the event notification destination device number. This screen shows the device list set in 9-4-2 "Network and Device".

In the screen above, select (reflect) the device number and click [Select] to reflect the device information selected in [Device No.] in the [Notification Address] pop-up window.

(2) Changing "Notification Address"

Changes the event notification destination address settings. Select the address to change, and click [Modify] to display the [Notification Address] pop-up window. Display screens and methods for changing are the same as in 9-4-3-2. (1) "Setting "Notification Address"".

(3) Deleting "Notification Address"

Deletes the event notification destination address settings. Select the address to delete, and click [Delete] to delete settings for the selected notification destination address.

9-4-5. Object

From [BACnet Settings], click the [Object] tab to display the [Object Settings] screen. Sets objects to use with the BACS-AP50 (control items), as well as details of COV notifications and event notifications for each object. Only those items set on this screen (Use: ☑) can be used as control items on the BACS-AP50. Below are the initial settings.

Leave the checkbox unchecked unless the object corresponding to the checkbox is used.

9-4-5-1. Selecting objects to be used

Select objects to use with the BACS-AP50 (control items) by selecting the check box in the [Use] field, (Use: ☑)/Not use: ☐). Check the check box to change the [Object Name] field from gray to white. Additionally, objects that are not used are displayed with [Object Name] in gray, and setting of COV notifications and event notifications is not possible. Note that setting of "DEV_xxxxxx (Device)", "CLS_xxxxxx (Notification Class)", and NP_xxxxxxx (NetworkPort) objects is not required.

(1) Objects used for temperature setting commands from the central monitoring device
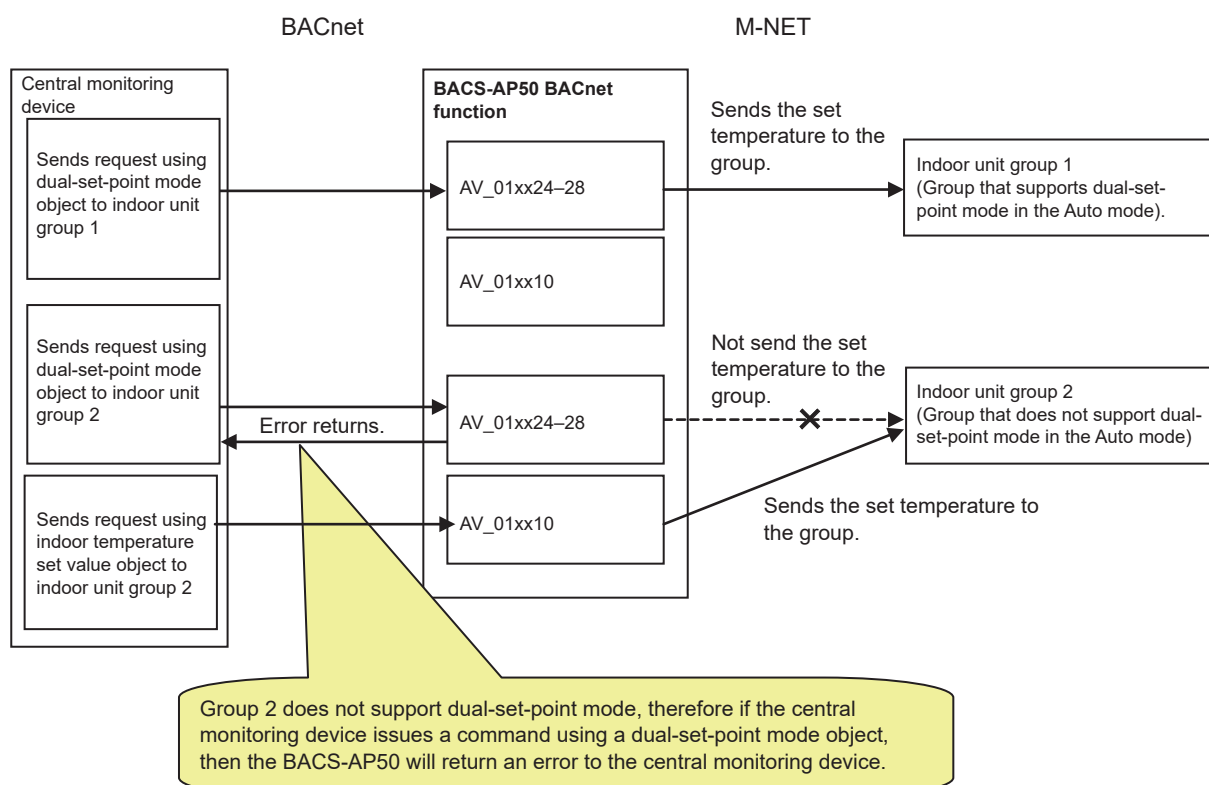
Temperature setting objects that can be used differ depending on indoor unit group configuration. When setting temperature from the central monitoring device, use temperature setting objects that match the indoor unit group configuration.

Groups for which "Old Model Compatibility Mode" is off, and groups within which all indoor units support "Dual-set-point mode in the Auto mode" are groups that support "Dual-set-point mode in the Auto mode".

Groups for which "Old Model Compatibility Mode" is on, or groups within which there are indoor units that do not support "Dual-set-point mode in the Auto mode" are groups that do NOT support "Dual-set-point mode in the Auto mode".

For groups supporting dual-set-point mode, issue commands using dual-set-point mode objects (AV_01xx24 to AV_01xx28); and for groups not supporting dual-set-point mode, issue commands using indoor temperature set value objects (AV_01xx10).

If the central monitoring device issues a command for groups that do not support dual-set-point mode using a dual-set-point mode object, then the BACS-AP50 will return an error to the central monitoring device.

Select the temperature setting objects according to the indoor unit group configuration in a given air conditioning system.

V: Available
—: Not available

| | Indoor unit group configuration in the air conditioning system | | |
| | Groups that do not support the dual-set-point mode in the Auto mode | Groups that support the dual-set-point mode in the Auto mode | |
		Dual-set-point mode *1	Single-set-point mode *1
AV_01xx10 Set Temp	V	—	—
AV_01xx24 Set TempCool	—	V	V
AV_01xx25 Set TempHeat	—	V	V
AV_01xx26 Set TempAuto	—	—	V
AV_01xx27 Set High Limit SetbackTemp	—	V *2	V *2
AV_01xx28 Set Low Limit SetbackTemp	—	V *2	V *2

*1 The mode can be switched from a remote controller. The mode cannot be switched on the Initial Setting Tool. (The mode can not be switched on some models of indoor unit.)

*2 These objects can be selected when the indoor unit group supports the Setback function.

9-4-5-2. Notification Setting

Select the [Use] check box (☑), and set notifications (COV Notification and Event Notification) for enabled control items (objects).

(1) Setting COV Notification and Event notification

Double-click the control items (objects) to set, and the [Notification Setting] pop-up window as below will be displayed. Display of pop-up windows for objects that have not been selected using check boxes in the [Use] field is not possible. Depending on object names, setting of event notifications and "COV Increment" may not be possible. (See table "Support for COV notifications and event notifications")
As shown below, initial status for both COV notification and event notification is disabled (Example: BI_01xx20 communications status).

No.	Item	Description	Default
Use COV			
1	Use COV	Check the checkbox to use COV notification.	Unchecked
2	COV No.	Set the COV No. (destination). *1	1
3	COV Increment	Set the "value change increment" for COV notifications responding to value changes. Only settings for temperature measurement value and temperature settings value notifications are possible. (Setting range: 0.000001 to 99.99999) Leave "1.0" as it is unless otherwise specified. (For systems that support room temperature setting in 0.5ºC increments, setting to "0.5" is recommended.)*2	1.0
Use Event			
4	Use Event	Check the checkbox to use Event Notification. When the checkbox is checked, the No. 6, 7, and 8 items are checked as well.	Unchecked
5	Notification Class ID	Set the Notification Class (destination). *3	1
Event-Enable			
6	To-Offnormal	Check the checkbox for event notifications resulting from Normal or Fault → Offnormal.	Checked
7	To-Fault	Check the checkbox for event notifications resulting from Normal or Offnormal → Fault.	Checked
8	To-Normal	Check the checkbox for event notifications resulting from Offnormal or Fault → Normal.*4	Checked
Notify Type			
9	Alarm	Check the checkbox when the Event Notification Type is "Alarm".	Checked
10	Event	Check the checkbox when the Event Notification Type is "Event".	Unchecked

*1   Select the "COV No." from the [COV Notification Settings - Select COV No.] pop-up window below, displayed by clicking [Select]. This screen shows the COV number list registered in 9-4-3 "COV Notification".

*2   COV notification is sent when there is a change by the increase/decrease portion set by the COV Increment. However, because the indication on the BACS-AP50's LCD and the Web display are rounded off using Swedish rounding, a difference from the notified value may occur.

*3   Select the [Notification Class] from the [Event Notification Settings - Select Notification Class ID] pop-up window below, displayed by clicking [Select]. This screen shows the notification class ID list set in 9-4-4 "Event Notification".

*4   If [To-Offnormal] or [To-Fault] is checked, ensure to check [To-Normal].

Whether or not COV notification and event notification settings are possible for objects is shown below.

Support for COV notifications and event notifications (V: Settable/—: Not settable)

Control item		Object ID	COV Notification	COV Increment	Event Notification
OnOffSetup		BO_01xx01	V	—	V
OnOffState		BI_01xx02	V	—	V
AlarmSignal		BI_01xx03	V	—	V
ErrorCode		MI_01xx04	V	—	—
OperationalModeSetup		MO_01xx05	V	—	—
OperationalModeState		MI_01xx06	V	—	—
FanSpeedSetup		MO_01xx07	V	—	—
FanSpeedState		MI_01xx08	V	—	—
RoomTemp [WaterTemp]		AI_01xx09	V	V	V
SetTemp [SetWaterTemp]		AV_01xx10	V	V	—
FilterSign		BI_01xx11	V	—	V
FilterSignReset		BV_01xx12	V	—	—
ProhibitionOnOff		BV_01xx13	V	—	—
ProhibitionMode		BV_01xx14	V	—	—
ProhibitionFilterSignReset		BV_01xx15	V	—	—
ProhibitionSetTemperature		BV_01xx16	V	—	—
ProhibitionFanSpeed		BV_01xx17	V	—	—
M-NETCommunicationState		BI_01xx20	V	—	V
SystemForcedOff *1	individual	BV_01xx21	V	—	—
	collective	BV_019921	V	—	—
AirDirectionSetup		MO_01xx22	V	—	—
AirDirectionState		MI_01xx23	V	—	—
SetTempCool		AV_01xx24	V	V	—
SetTempHeat		AV_01xx25	V	V	—
SetTempAuto		AV_01xx26	V	V	—
SetHighLimitSetbackTemp		AV_01xx27	V	V	—
SetLowLimitSetbackTemp		AV_01xx28	V	V	—
VentilationModeSetup		MO_01xx35	V	—	—
VentilationModeState		MI_01xx36	V	—	—
AirToWaterModeSetup		MO_01xx37	V	—	—
AirToWaterModeState		MI_01xx38	V	—	—
ThermoOnOffState		BI_01xx47	V	—	V
SystemAlarmSignal		BI_010048	V	—	V
ErrorCodeDetail		AI_01xx49	V	—	—
ExternalHeatSourceState		BI_01xx50	V	—	V
COP		AI_51zz01	V	V	V
TrendLogRoomTemp		LOG_01xx80	—	—	—
Device		DEV_xxxxxx	—	—	—
NetworkPort *2		NP_xxxxxxx	—	—	—
NotificationClass		CLS_xxxxxx	—	—	—
CH_OnOffSetup		BO_71tt01	V	—	V
CH_OnOffState		BI_71tt02	V	—	V
CH_OperationModeSetup		MO_71tt03	V	—	—
CH_OperationModeState		MI_71tt04	V	—	—
CH_FanModeSetup		MO_71tt05	V	—	—
CH_FanModeState		MI_71tt06	V	—	—

Control item	Object ID	COV Notification	COV Increment	Event Notification
CH_SetTempCool	AV_71tt07	V	V	—
CH_SetTempHeat	AV_71tt08	V	V	—
CH_ReprInletWaterTemp	AI_71tt09	V	—	V
CH_ReprOutletWaterTemp	AI_71tt10	V	—	V
CH_ReprAlarmSignal	BI_71tt11	V	—	V
CH_CommunicationState	BI_71tt12	V	—	V
CH_ProhibitionOnOff	BV_71tt15	V	—	—
CH_ProhibitionMode	BV_71tt16	V	—	—
CH_ProhibitionSetTemp	BV_71tt17	V	—	—
CH_UnitAlarmSignal	BI_91uu11	V	—	V

  * xx: Group number (01–50)
    tt: Group number of simultaneously operated units including a system representative unit (01-50)
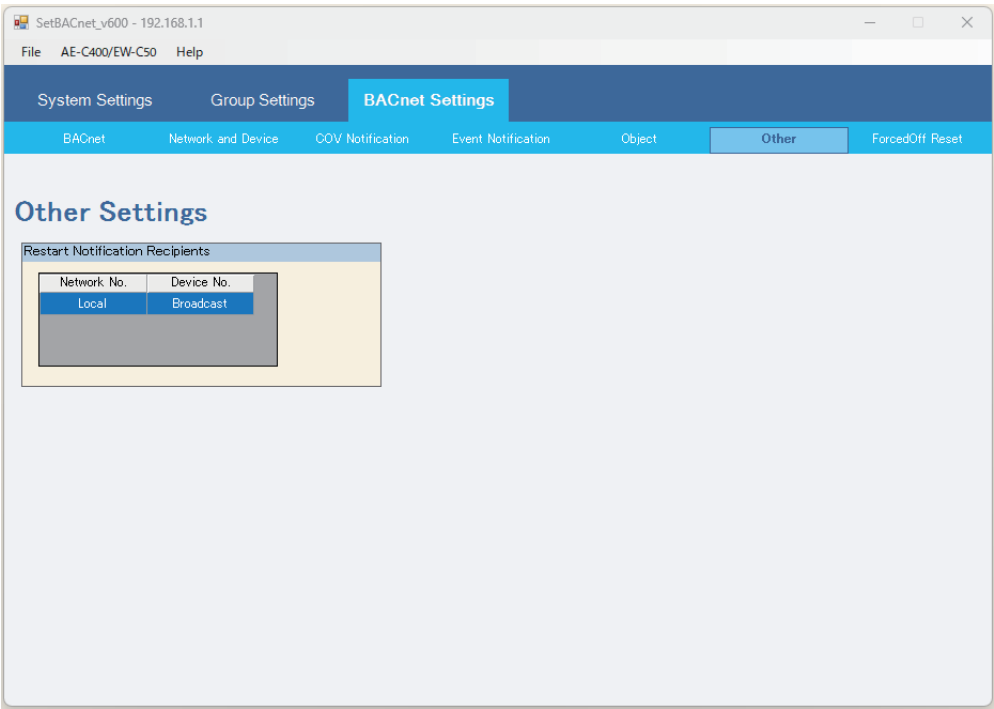   uu: Unit address (01–50)
    zz: Outdoor unit adress minus 50 (01-50)

*1   To use either "individual" or "collective," select the check box in the [Use] field for BV_01xx21.

*2   Not displayed when Rev. 12 is selected under Revision No.

9-4-6. Others

From [BACnet Settings], click the [Object] tab to display the [Other Settings] screen. This screen displays "Restart Notification Recipients" settings.

[1] Restart Notification Recipients

Displays introduction sequence at BACS-AP50 start-up, and "I-Am" periodic transmission destination device settings.

Default value settings are as follows. Additionally, settings values for these items cannot be changed.

No.	Item	Default setting
Restart Notification Recipients		
1	Network No.	Local
2	Device No.	Broadcast (192.168.2.255)

9-4-7. ForcedOff Reset

From [BACnet Settings], click the [ForcedOff Reset] tab to display the [ForcedOff Reset] screen. During an BACS-AP50 emergency stop, clicking the [ForcedOff Reset] button from the central monitoring device (BACnet) will cancel the BACS-AP50 emergency stop.

This function is used when canceling an BACS-AP50 emergency stop from the central monitoring device (BACnet) is not possible due to trouble with the central monitoring device (BACnet). When using this function to cancel an BACS-AP50 emergency stop, before executing this operation, first confirm with the building manager that there is no problem with canceling the emergency stop.
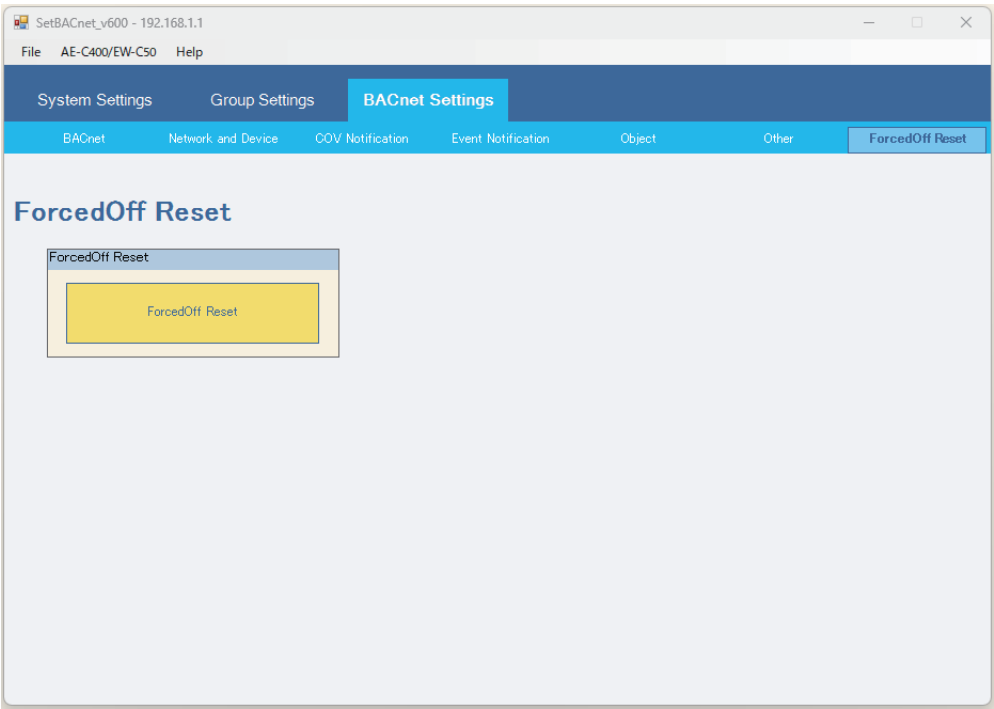
[1] ForcedOff Reset

No.	Item	Description
1	ForcedOff Reset button	Click to send the "ForcedOff Reset" command to BACS-AP50.

10.Maintenance functions

10-1. Common matters

Use a Web browser to access the following Web page address.
The factory default IP address of the BACS-AP50 is 192.168.1.1
https://192.168.1.1/maintenance

Screen transition

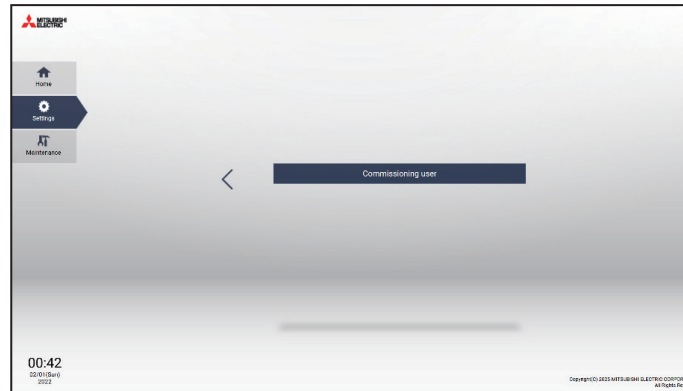|	Item		Function and description
(1)	Login		The login screen to access the operation management screen (2) will be displayed. Enter the user ID and password, and click [Login].
(2)	Operation management		
	Home		Return to the login screen (1).
	Settings		
		User registration	You can change your user id/passward.
	Maintenance		
		Utility	You can back up/import your settings data.

10-2. User management

10-2-1. User management overview

Only Commissioning user settings are possible in BACS-AP50.

■Commissioning user

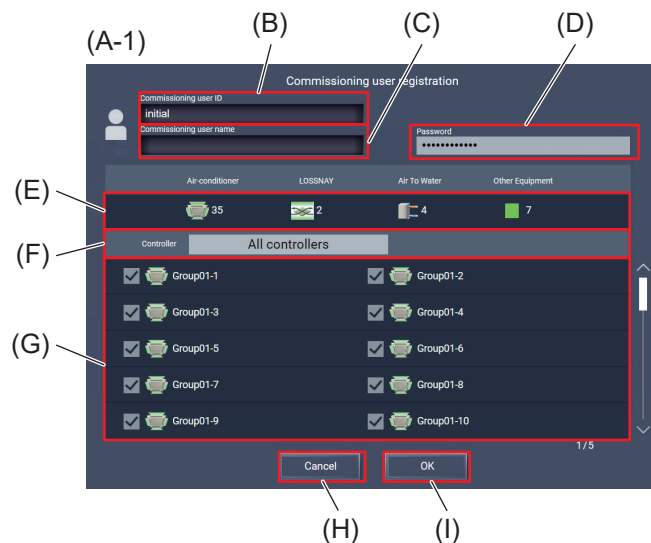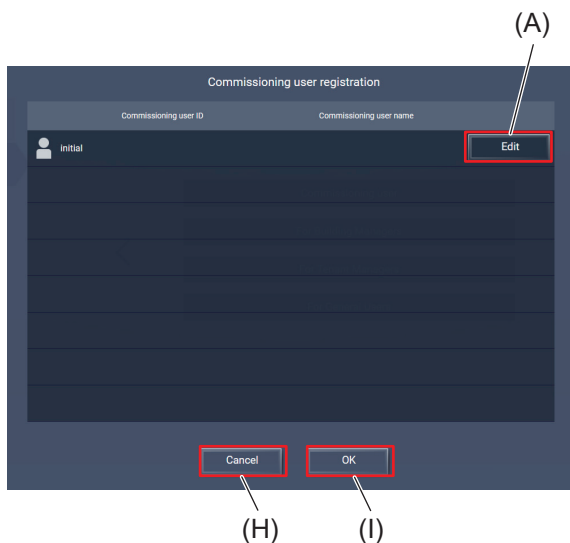Can perform initial settings and manage all air conditioning units.

Click [Settings] - [User Registration] on the operation management screen to display the user registration screen.

10-2-2. User management settings

Commissioning user

On the Commissioning user registration screen, the commissioning user ID, commissioning user name, and password can be set.
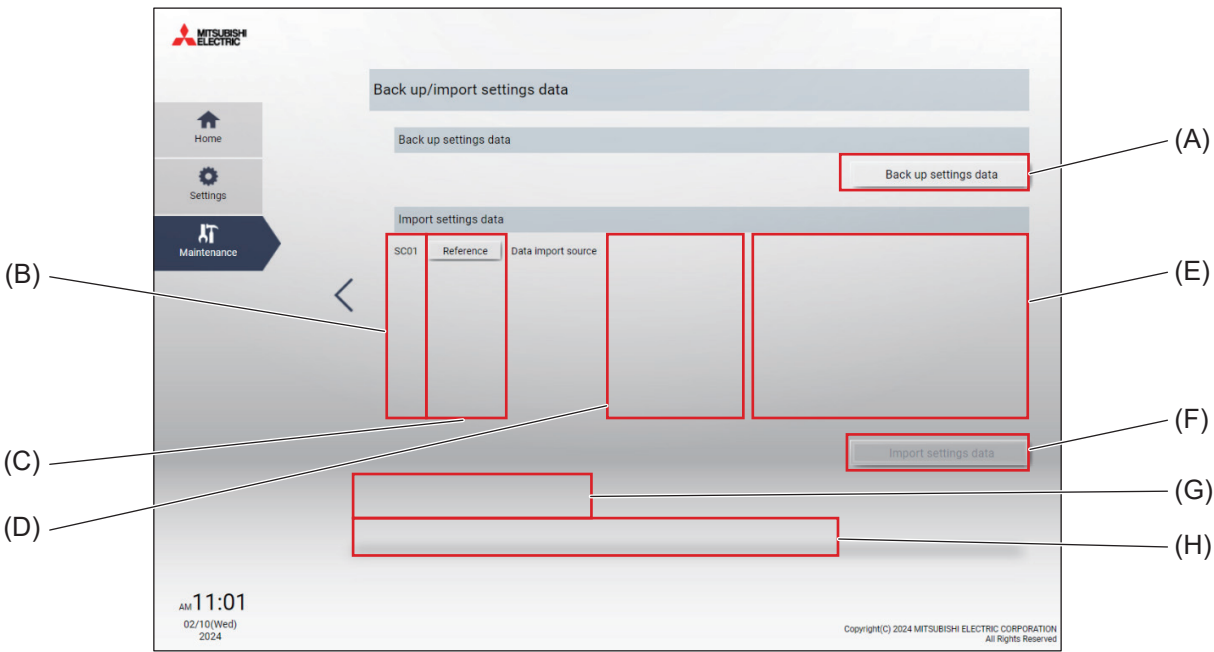

	Item	Function and description
(A)	[Edit]	Clicking this item will display the Commissioning user registration screen (A-1).
(B)	Commissioning user ID	Enter the commissioning user ID.
(C)	Commissioning user name	Enter the commissioning user name.
(D)	Password	Enter the password.
(E)	Number of control units	The number of units under operation is displayed by model.
(F)	Controller	ALL is displayed.
(G)	Operation target	All groups under management/operation are displayed.
(H)	[Cancel]	Click this button to go back to the previous screen without saving the setting changes.
(I)	[OK]	Click this button to save the setting changes.

10-3. Backing up/importing settings data

10-3-1. User management overview

Settings made with the Web browser or the BACnet Setting Tool can be backed up on a PC.
The exported data can be imported back to the BACS-AP50 to restore the previous settings after BACS-AP50 replacement. The settings data can be backed up or imported using the Web browser.

Display the operation management screen (2).
Click [Maintenance] - [Utility] - [Back up/import settings data] to display the Back up/import settings data screen.

	Item	Function and description
(A)	[Backup settings data]	Click this button to back up the BACS-AP50 settings data.
(B)	System controller number	The number of the BACS-AP50 (SC01) is displayed.
(C)	[Reference]	Click this button to refer to the imported file.
(D)	Data import source	The name of the imported file is displayed.
(E)	Messages for controllers	Messages for each controller are displayed.
(F)	[Import settings data]	Click these buttons to import the file specified in the Data import source area (D) to BACS-AP50.
(G)	System-wide message	System-wide messages are displayed.
(H)	Progress bar	The system-wide progress is displayed.

[1] Backing up settings data

Step

1. Click [Backup settings data] (A).

After creating settings data, a file download dialog will be displayed, and you can back up the BACS-AP50 settings data files all at once.

Note

• It takes a few minutes to create the settings data.

• The name of the settings data file will be "SettingData_SC01_[serial number].dat".

• The file structure is as follows.

(Web browser)

[Destination directory set by the Web browser]/

└──SettingData_SC01_12345-111.dat

[2] Importing settings data

Step

(Web browser)

1. Click [Reference] (C) on the Back up/import settings data screen.

2. Select a file you want to import, and click [Open].

3. Click [Import settings data] (F).

The settings data will be imported to the BACS-AP50.

Note

• It takes a few minutes to import the settings data.

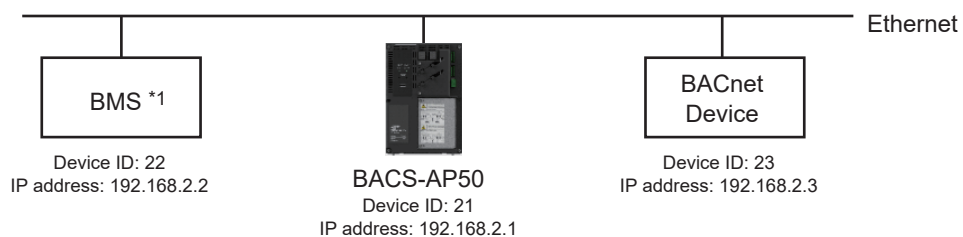# Appendix 1: BACnet network configuration and settings examples

The BACS-AP50 only supports BACnet/IP.

The following are types of BACnet network configuration.

	Network configuration	Description
(1)	Local network	Local network configuration, without going through a router
(2)	BACnet router connection	Configuration in which each network connects through a BACnet router
(3)	IP router connection	Configuration in which each network connects through an IP router
(4)	IP router + BBMD connection	Configuration in which each network connects through an IP router (with broadcast message transfer BBMD)
(5)	IP router + Remote BBMD connection	Configuration in which each network connects through an IP router (with broadcast message transfer remote BBMD)

(1) Local network

1. Sample local network configuration

BMS *1
Device ID: 22
IP address: 192.168.2.2

BACS-AP50
Device ID: 21
IP address: 192.168.2.1

BACnet Device
Device ID: 23
IP address: 192.168.2.3

Ethernet

*1 BMS: Building Management System

2. Configuring the Network and Device Settings
The [Network and Device Settings] screen below shows the settings for the sample local network configuration above.

(2) BACnet router connection

Multiple networks can be connected via BACnet routers.

1. Sample network configuration with the use of BACnet routers
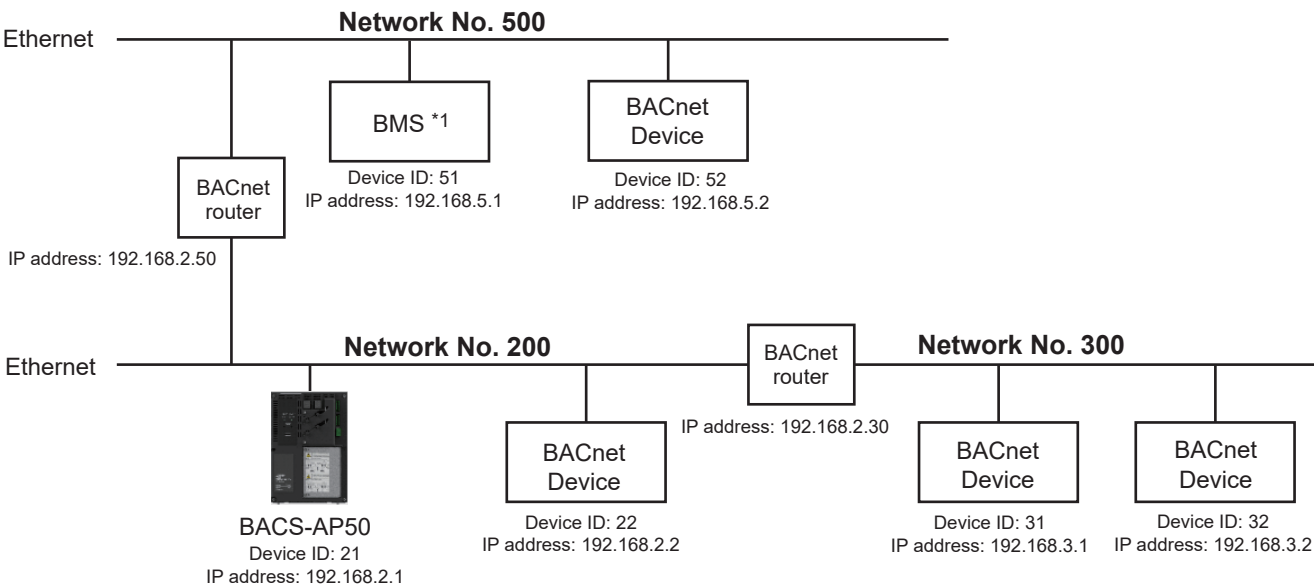
Ethernet ──────── **Network No. 500** ────────

BMS *1
Device ID: 51
IP address: 192.168.5.1

BACnet Device
Device ID: 52
IP address: 192.168.5.2

BACnet router
IP address: 192.168.2.50

Ethernet ──────── **Network No. 200** ──── BACnet router ──── **Network No. 300** ────

IP address: 192.168.2.30

BACS-AP50
Device ID: 21
IP address: 192.168.2.1

BACnet Device
Device ID: 22
IP address: 192.168.2.2

BACnet Device
Device ID: 31
IP address: 192.168.3.1

BACnet Device
Device ID: 32
IP address: 192.168.3.2

*1 BMS: Building Management System

2. Configuring the Network and Device Settings
The [Network and Device Settings] screen below shows the settings for the sample network configuration with the use of BACnet routers above.

<Local (Network No.200) settings>

Network and Device Settings

Network No.

Network No.	Type	BACnet Router Address/Port No.	
Local	IP		Add
300	IP	192.168.2.30 :47808	Modify
500	IP	192.168.2.50 :47808	Delete
Global	IP		

Device Address

Device No.	Address/Port No.	
22	192.168.2.2 :47808	Add
Broadcast	:47808	Modify
		Delete

<Network No.300 settings>

Network and Device Settings

Network No.

Network No.	Type	BACnet Router Address/Port No.	
Local	IP		Add
300	IP	192.168.2.30 :47808	Modify
500	IP	192.168.2.50 :47808	Delete
Global	IP		

Device Address

Device No.	Address/Port No.	
31	192.168.3.1 :47808	Add
32	192.168.3.2 :47808	Modify
Broadcast	:	Delete

<Network No.500 settings>

Network and Device Settings

Network No.

Network No.	Type	BACnet Router Address/Port No.	
Local	IP		Add
300	IP	192.168.2.30 :47808	Modify
500	IP	192.168.2.50 :47808	
Global	IP		Delete

Device Address

Device No.	Address/Port No.	
51	192.168.5.1 :47808	Add
52	192.168.5.2 :47808	Modify
Broadcast	:	Delete

<Global Broadcast settings>

Network and Device Settings

Network No.

Network No.	Type	BACnet Router Address/Port No.	
Local	IP		Add
300	IP	192.168.2.30 :47808	Modify
500	IP	192.168.2.50 :47808	
Global	IP		Delete

Device Address

Device No.	Address/Port No.	
Broadcast	:47808	Add
		Modify
		Delete

1. Configuring the Network and Device Settings – Auto IP address setting
   Note: You can obtain an IP address automatically without setting the BACnet router IP address and the device IP address.
   For possible combinations, refer to 9-4-2-2 "Device Address" table.

(3) IP router connection

Networks connect through an IP router.

1. Sample network configuration with the use of IP routers
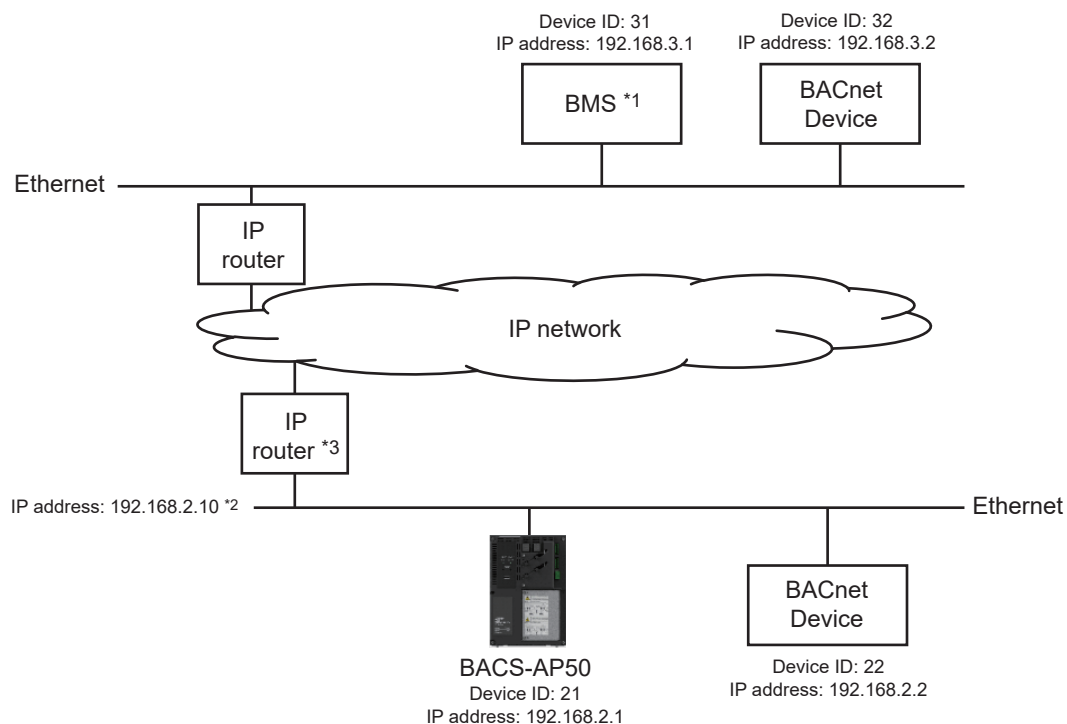
*1 BMS: Building Management System

*2 IP address of IP router for network to which BACS-AP50 is connected

*3 The IP router forwards unicast messages across networks, but not broadcast messages. If using broadcast messages, ensure design in order that these do not leave IP routers.

2. Configuring the Network and Device Settings
   The [Network and Device Settings] screen below shows the settings for the sample network configuration
   with the use of IP routers above. "Network No." is "Local".

The use of IP routers will require the default gateway setting to be configured beforehand.
(Refer to 9-2-1-2 "LAN2 (for BACnet)" for details.)

(4) IP router + BBMD connection

Multiple networks can be connected via IP routers. Broadcast messages across networks are transferred by BBMDs.

1. Sample network configuration with the use of IP routers and BBMDs
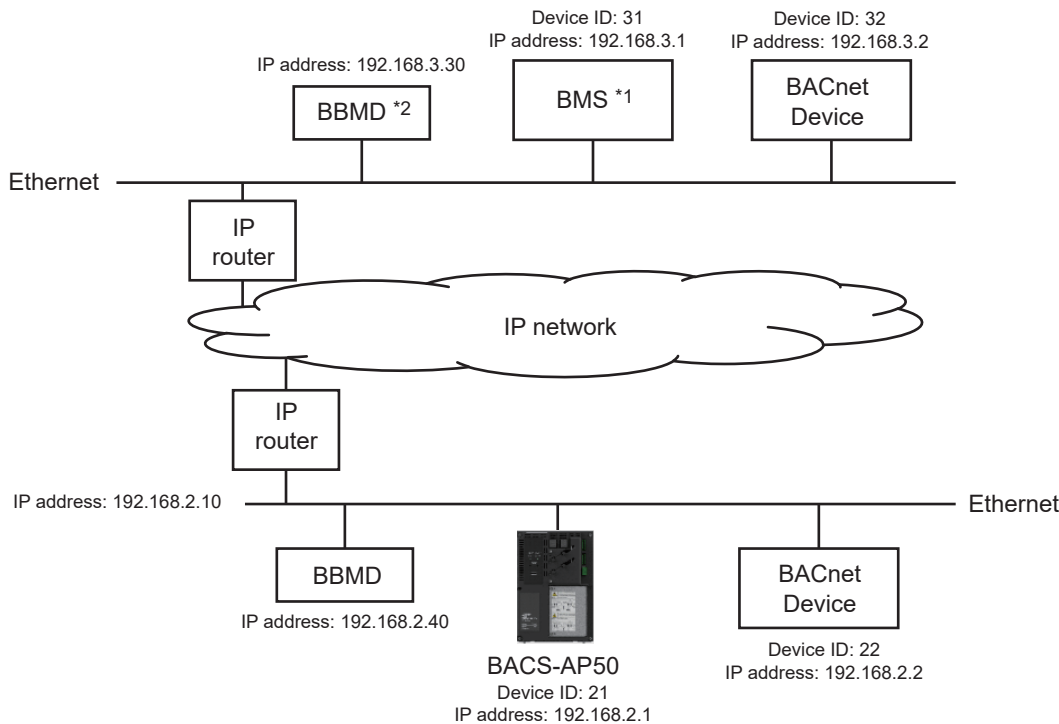
*1 BMS: Building Management System

*2 BBMD: BACnet®/IP Broadcast Management Device

2. Configuring the Network and Device Settings
   The [Network and Device Settings] screen below shows the settings for the sample network configuration with the use of IP routers above.
   "Network No." is "Local". Set the Device No. and Address.

The use of IP routers will require the default gateway setting to be configured beforehand.
(Refer to 9-2-1-2 "LAN2 (for BACnet)" for details.)

3. Message transmission across networks
   IP routers transfer unicast messages across networks, but not broadcast messages.
   BBMDs are used to transmit broadcast messages across networks.

   BBMD (transmission originator) transforms broadcast messages into BBMD transfer messages, and these
   messages are sent to the transmission destination BBMD through IP routers.
   (Originator BBMD ->IP router ->IP network -> IP router -> Destination BBMD)
   The transmission destination BBMD transforms the received BBMD transfer messages into broadcast
   messages and transmit them to the devices on the target network.

   BACS-AP50 sends broadcast messages to the following devices:
   • All devices that belong to the same network as the BACS-AP50
   • All devices connected to other networks via the BBMDs

Important

Transfering messages between BBMDs will require the BDT (Broadcast Distribution Table) settings on
the BBMDs to be made. It is assumed here that the BDT settings have already been made.

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