DAIKIN
AIR INTELLIGENCE™

DG_DCM014A51_02-19

intelligent Touch Manager™ (iTM) BACnet® Server Gateway

DCM014A51

DESIGN GUIDE

DAIKIN NORTH AMERICA LLC

Contents

Part 1. Overview

1. DCM014A51 *iTM* BACnet® Server Gateway

The *intelligent Touch Manager™* (*iTM*) is now capable of serving as a *BACnet* interface for Building Management System (BMS) integration. The *iTM BACnet* Server Gateway option (DCM014A51) will provide BMS integrators the ability to monitor and control *VRV* indoor units via the *BACnet*/IP protocol. The *iTM BACnet* Server Gateway option eliminates the need for an additional hardware interface for the BMS to monitor and control a *VRV* system. The *iTM BACnet* Server Gateway option provides seamless control-logic integration between the *iTM* and BMS.

Figure 1. iTM BACnet® Server Gateway

1.1 Features:

- Direct connection on *iTM* using the *BACnet*/IP Protocol.
- ***BACnet* virtual router** function implemented:
  - » **Individual *BACnet* device ID** assigned to each indoor unit group address.
  - » Indoor unit group names created in the *iTM* are visible on the BMS.
- Easy commissioning using CSV file.
  - » Available objects can be configured for each indoor unit.
- Support Change of Value (COV) notifications to BMS.
- Configurable as a *BACnet* foreign device if BBMD exists on a different subnet within *BACnet* network.
- Independent heating and cooling setpoints for occupied and unoccupied periods.
- Individual min/max **Setpoint Range Limitation** for heat and cool modes.
- The *iTM's* auto-changeover, setpoint range limitation, setback, dual setpoint logic, and schedule can be accessed by the BMS.

The *intelligent Touch Manager* (hereinafter referred to as "*iTM*") supports the *BACnet* 2004 protocol (hereinafter referred to as "*BACnet* specifications"). The *iTM* operates as a *BACnet* server that provides *BACnet* objects to monitor/operate indoor units connected to the DIII network in response to requests from a Building Management System (BMS), i.e., *BACnet* client.

This document describes the operation for the BACnet® Server Gateway option for the *iTM*.

1.2 *BACnet* Compatibility

- Packaging of the *VRV* indoor unit objects:
  - » Compatible with *BACnet* (ANSI / ASHRAE-135).
  - » Compatible with *BACnet* / IP (ISO16484-5).
- Conforming to Safety and Electromagnetic Compatibility (EMC) rules and regulations.

1.3 System Outline

1. Typical *BACnet* Server Gateway Application:

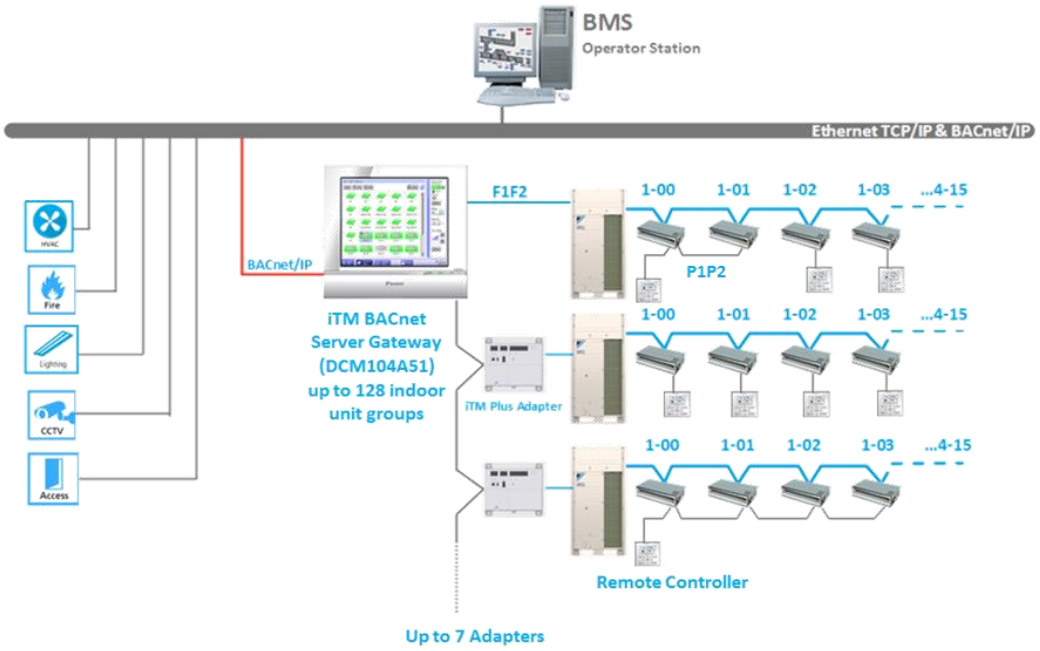


Figure 2. Typical Daikin *VRV* System

2. The *iTM BACnet* Server Gateway (DCM014A51) software option provides communication between the *VRV* system and the BMS. The operation and monitoring of the *VRV* systems through *BACnet* communication uses the *BACnet*/IP protocol.
3. Up to 128 indoor unit management points can be controlled and monitored through the *iTM BACnet* Server Gateway.
4. Up to 7 additional DIII-Net communication systems can be added with optional *iTM* Plus Adaptors. The *iTM* Plus Adaptor is intended for use with the *iTM*, and shall not be used independently.

2. VRV System Overview

The Daikin *VRV* system consists of outdoor units, indoor units, zone controllers, centralized controllers, and BMS interfaces. The customizable Daikin control system is built around the *VRV* system, and does not require advanced field engineering (i.e., programming) for the control of the *VRV* system, except for field settings configurations. The *iTM BACnet* Server Gateway can be used for monitoring, scheduling, control, and interlock operation. A BMS can be used in conjunction with the Daikin controllers to share operation workload to reduce project costs.

2.1 Types of Daikin *VRV* Systems

The *VRV* system can consist of either a Heat Recovery system, Heat Pump systems, or system that has a combination of both.

1. Heat Recovery systems can provide simultaneous cooling and heating to each indoor unit served by the same outdoor unit with use of Branch Selector Boxes (BS Box).

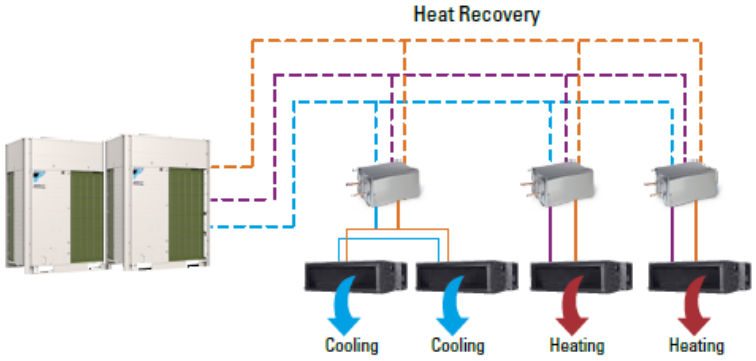


Figure 3. Heat Recovery System

2. Heat Pump systems only allow each outdoor unit and its connected indoor units to operate in either cooling or heating mode. Multiple Heat Pumps systems can be installed to operate independently in either cooling or heating mode.

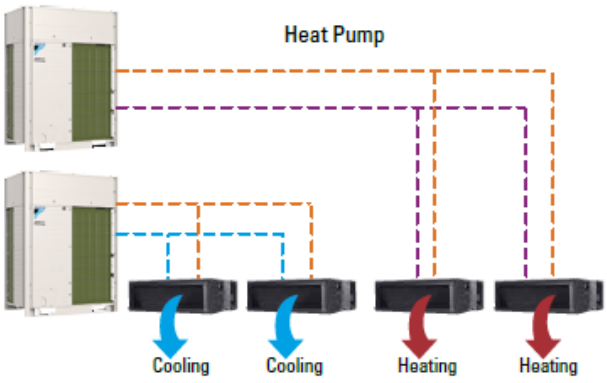


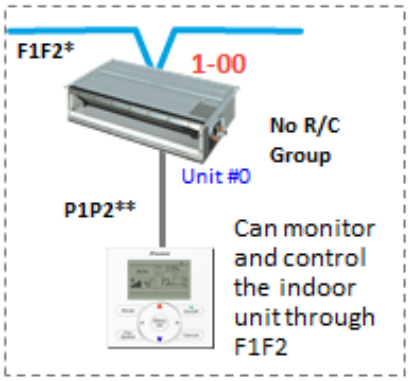
Figure 4. Heat Pump System

2.2 DIII-Net System and Group Addresses

1. The DIII-Net system consists of the following:
   a. Up to 10 *VRV* outdoor units (daisy chained).
   b. Up to 128 indoor units.
2. The *iTM* (central controller) and DIII-Net system consists of the following:
   a. Up to 10 *VRV* outdoor units (daisy chained).
   b. Up to 64 indoor unit groups (128 indoor units).
   c. Up to 7 *iTM* Plus Adaptors can be connected to a single *iTM*. Each adaptor can contain up to 64 group addresses and 10 outdoor units.
3. When a centralized controller is connected to the DIII-Net system, a unique group address must be created for each indoor unit to be monitored and controlled by the central controller.
4. Group Address:
   a. Indoor units are assigned unique group addresses (up to 64 per DIII-Net system) manually during the *VRV* commissioning.
   b. Addresses are as follows: 1-00 to 1-15, 2-00 to 2-15, 3-00 to 3-15, 4-00 to 4-15.
   c. With the use of the *iTM* Plus Adaptor, up to 8 DIII-Net systems can be connected to a single *iTM*. Each DIII-Net system will be assigned a port number with the *iTM* being port 1. For example, an indoor unit connected to the *iTM* will have the complete group address of 1:1-00. Similarly, each additional system will be assigned a port number 2 to 8 (2:1-00, 3:1-00, etc.).

2.3 Remote Controller Group and Group Address

1. A remote control group consists of 1 -16 indoor units connected (via P1P2 daisy chain) to the same remote controller. The indoor unit group allows for a maximum of 2 remote controllers to be connected to the same remote controller group. It is not required to have a remote controller connected to an indoor unit. If no remote controllers are used there should be a centralized method for monitoring and controlling the indoor units.
2. Assigning a group address to a single indoor unit (typical configuration):



*** F1F2 = DIII-Net** **** P1P2 = Remote Controller line**

Figure 5. Assigning Group Address to a Single Indoor Unit

3. Assigning one group address to a remote controller group:

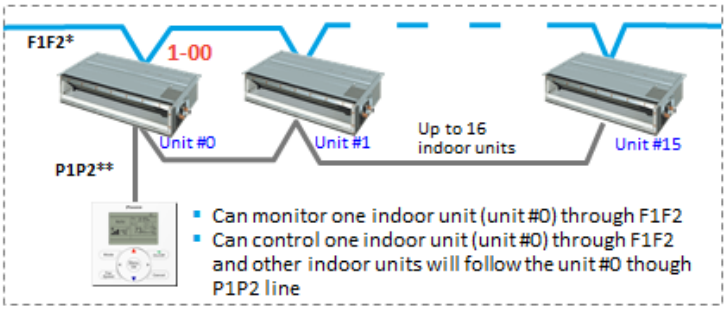


Figure 6. Assigning One Group Address to a Remote Controller Group

4. Assigning a group address to each indoor unit in a remote controller group:

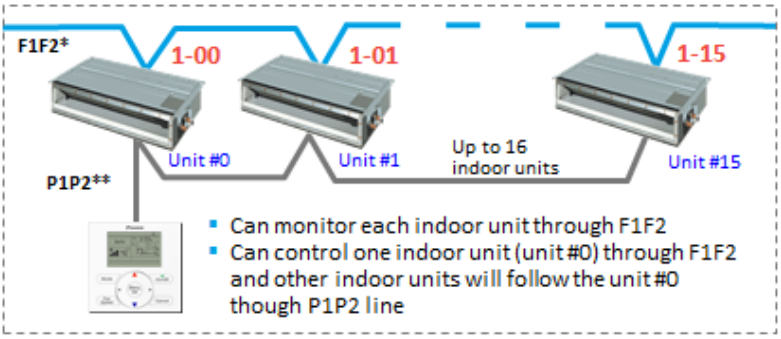


Figure 7. Assigning a Group Address to Each Indoor Unit in a Remote Controller Group

Note: As shown in the figures above, a remote controller group consists of several indoor units wired to the same remote controller. A remote controller group consists of 1-16 indoor units that can be started or stopped simultaneously. For units without a remote controller, each unit is treated as a group.

2.4 Commanding Mode Change for Heat Recovery and Heat Pump Systems

What is a Changeover Master?

1. When the *VRV* contractor has commissioned a Heat Pump system, an indoor unit can be nominated as the changeover master. This allows the nominated unit to change the mode of operation for all units connected to the same outdoor unit.

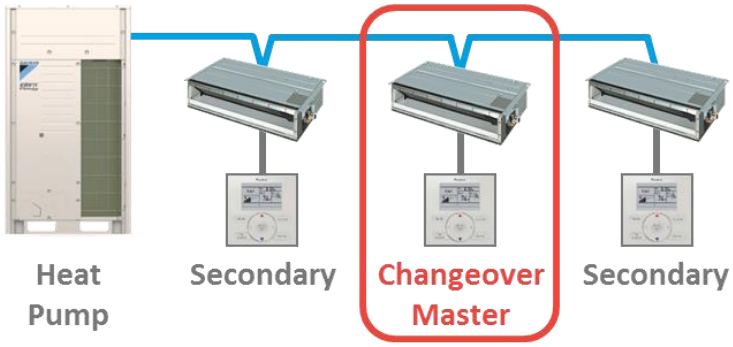


Figure 8. Heat Pump System

2. A Heat Recovery system can utilize BS Boxes to provide simultaneous heating and cooling for each zone.

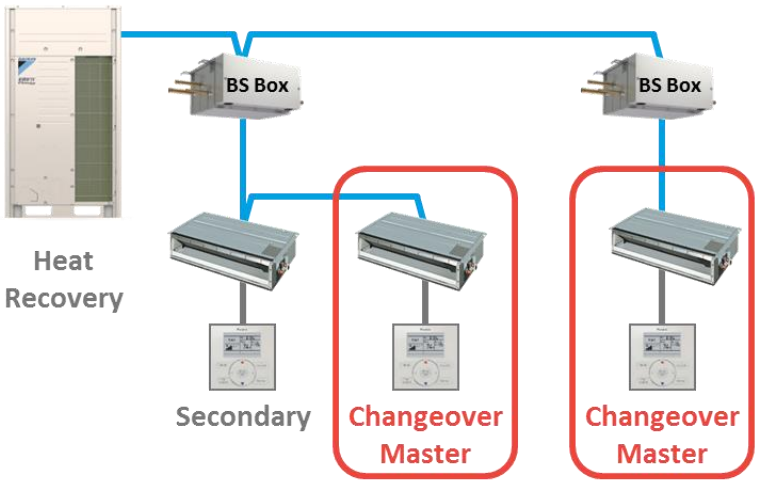


Figure 9. Heat Recovery System

3. Every unit or group of units connected to a BS Box port can either be in cooling or heating mode, i.e., units connected to the same BS Box port operate as a mini Heat Pump system.

2.5 Changeover Master and Secondary (Non-Master) Indoor Units

1. Cool and heat modes are only available for selection on the cool/heat changeover master indoor unit. The following table indicates the available operating modes for secondary indoor units in the system based on the selected mode of the master indoor unit.

When the master indoor unit is set to:	Secondary indoor units in the system can be set to:			
	Cool	Dry	Heat	Fan
Cool mode	●	●		●
Dry mode	●	●		●
Heat mode			●	●
Fan mode				●

2.6 Indoor Unit Logic

1. The indoor unit contains control logic to maintain room temperature by adjusting the refrigerant flow and has the following data points:
   a. Unit ON/OFF.
   b. Operation Mode – Cool, Heat, Fan, Dry, Auto (Auto mode is not recommended as it can create large temperature differentials between mode changes).
   c. Setpoint – 60°F to 90°F, 1°F basis (16°C to 32°C, 0.1°C basis).
   d. Room Temperature (read only).
   e. Fan Speed – L, ML, M, MH, H, Auto (depends on indoor unit type).
   f. Airflow Direction (if the indoor unit has louvers).
   g. Alarm Status (read only).
   h. Malfunction Code (read only).
2. Indoor Unit Sequence of Operation
   a. During the cooling thermo-on (call for cooling) period, the indoor unit fan will operate based upon the fan setting from the local controller, *iTM*, or BMS.
   b. During the cooling thermo-off (cooling satisfied) period, the fan will continue to operate based on the setting from the local controller, *iTM*, or BMS fan speed setting. However, the fan can be turned OFF during the thermo-off period with a field setting (depends on the indoor unit type). Also, the fan should not be OFF when an indoor unit receives outside air.
   c. During the heating thermo-on (call for heating) period, the indoor unit fan will operate based on the fan setting from the local controller, *iTM*, or BMS.
   d. During the heating thermo-off (heating satisfied) period, the fan will continue to operate in LL (Low Low) speed (default). The fan can be set to ON (H, MH, M, ML, L), LL or completely OFF with a field setting (depends on the indoor unit type). However, the fan should not be OFF when an indoor unit receives outside air.

3. Dry Mode
   a. When selected, the setpoint is based on the room temperature as not to over cool.
      1. Setpoint = Return Air (when the Return Air ≤ 75°F).
      2. Setpoint = Return Air – 1°F (when the Return Air > 76°F).
   b. The current setpoint is not displayed on the local controller, *iTM*, or the *BACnet* Server setpoint present value during Dry mode.
   c. In Dry mode (or Fan mode), the BMS can write the cooling and heating setpoints to the *iTM*, and are set to the IDU management point in the *iTM*. However, the cooling and heating setpoints are not sent to the indoor unit.
4. Room Temperature Sensing
   a. The room temperature can be measured by the following:
      1. Indoor unit return air sensor (depending on indoor unit model).
      2. Remote temperature sensor (KRCS01-1B/4B).
      3. Sensor in the BRC1E73 (local remote controller).
   b. The sensing local method depends on the indoor unit configuration (field setting).
   c. The BMS cannot send the room temperature to the indoor unit due to the fact that the room temperature is a read only point for the BMS.

3. iTM Overview

3.1 Indoor Unit Management Point

1. The *iTM* manages the indoor unit groups as an Indoor Unit Management Point only when a group address is assigned (see 2.3 Remote Controller Group and Group Address) to an indoor unit(s).

One (1) indoor unit management point consists of the following on the *iTM*:

Function	Monitor	Control
On/Off	X	X
Operation Mode	X	X
Occ Cooling/Heating Setpoint	X	X
Unocc Cool/Heat Setpoint	X	X
Fan Speed	X	X
Vane Position	X	X
Remote Controller Prohibit (On/Off, Mode, Setpoint)		X
Room Temperature	X	
Setpoint Range Limitation (Cool/Heat Min/Max)		X
Error Status	X	
Malfunction Code	X	
Override Timer		X
Setpoint Tracking		X
Minimum Setpoint Differential		X

2. Setpoints
   a. Independent cool and heat dual setpoints in the occupied period. Single setpoint mode is available with 0°F min setpoint differential and setpoint tracking enabled.
   b. Occupied setpoint range for cooling and heating are configurable by Setpoint Range Limitation within 60°F – 90°F as a default. The cooling setpoint cannot be set lower than the heating setpoint and the heating setpoint cannot be set higher than the cooling setpoint.
   c. Minimum Cool/Heat Setpoint Differential refers to the difference between the cooling and heating setpoint values. The differential can be set between 0°F – 7°F.
   d. Setpoint tracking is used to lock in the Min. Setpoint Differential for cooling and heating to a fixed value.
   e. The setback setpoints (cooling and heating) in the unoccupied period are adjustable between 50°F – 95°F.
   f. The setback setpoints can only be set outside of the occupied setpoint range with a 2°F differential. The setback (unoccupied) setpoint will reduce the occupied setpoint range automatically to maintain a 2°F fixed differential from the highest (cooling) and lowest (heating) possible occupied setpoints.

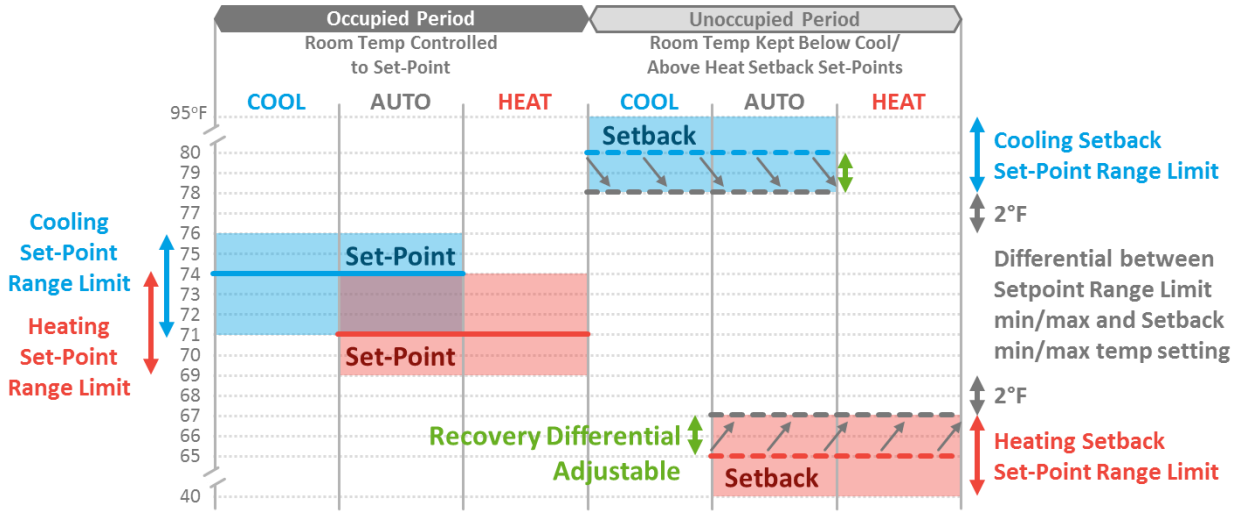


Figure 10. Relationship between Setpoints, Setback, and Setpoint Range Limitation

3. Setback
   a. The Setback function keeps the room temperature at a moderate level with the setback setpoints when the indoor unit is off (when the room is unoccupied). The indoor unit only turns on if the room temperature rises to meet the Cool Setback Setpoint in cooling mode, or if the room temperature falls to meet the Heat Setback Setpoint in heating mode. Once the room temperature has recovered and the guard timer has expired, the indoor unit is turned off.
   b. A guard timer keeps the indoor unit on for at least 30 minutes after the Setback function turns on the indoor unit.
   c. If the indoor unit is set to Fan or Dry mode, the setback function will not work.
   d. The *iTM* setback provides independent setback setpoints for cooling and heating.
   e. By default the setback setpoints are disabled and can be enabled by the schedule, interlock, and setting features.
      1. The default setback setpoint for cooling is 80°F (configurable).
      2. The default setback setpoint for heating is 64°F (configurable).
      3. Independent Setback Recovery Temp (hysteresis) for cooling (-4°F default) and heating (+4°F default). Configurable from 2°F to 10°F.
   f. Setback Control Logic
      1. Room temperature and setback setpoint are evaluated every five minutes for each indoor unit.
      2. If the indoor unit is turned on by the *iTM* manually (or by the Schedule function), the normal operation is maintained, i.e., the indoor unit maintains the room temperature from the setpoint.
      3. When the Setback function turns on the indoor unit (unless it is turned off by the *iTM* manually, by the Schedule function, or by a remote controller), the Setback function maintains the room temperature below (or above) the setback setpoint.

4. Timer Extension
   a. The Timer Extension is used to turn the indoor unit off (after a specified time has expired) when it is turned on manually by the *iTM* or remote controller during unoccupied hours. It can be set for 30, 60, 90, 120 (default), 150, or 180 minutes. The Timer Extension must be enabled to operate during the unoccupied period.
   b. Timer Extension function will not turn off an indoor unit that was turned on by the Setback function.

3.2 Automatic Control

1. Scheduling
   a. Independent cool and heat setpoints and independent setback setpoints allow for one schedule to be set to run year round.

Figure 11. Year round setpoint schedule

   b. Up to 100 schedule programs can be created.
   c. A 7 day, 5+2 (Weekday + Weekend), 5+1+1 (Weekday + Saturday + Sunday) and 1 (Everyday) schedules can be created in the *iTM*.
   d. Up to 20 events can be registered each day.
   e. Special Day (such as holiday) events can be created:
      1. Up to 5 special day patterns can be registered.
      2. Up to 20 events can be registered each day.
      3. Events can be set by calendar date or by week and day of the month (Ex. July 4th or 1st Monday in September).
   f. The *iTM* schedule can provide an Optimum Start function to insure the room temperature achieves setpoint at the scheduled event time. Optimum Start calculates the time when the target indoor units turn on, according to the room temperature and the setpoint for the current operation mode. Optimum Start evaluates and adjusts the turn-on time appropriately. The schedule and Optimum Start feature can only be set via the *iTM* schedule function and cannot be configured by the BMS.

g. The Daylight Savings Time (DST) setting automatically adjusts the *iTM* clock to insure scheduled operation times are met.

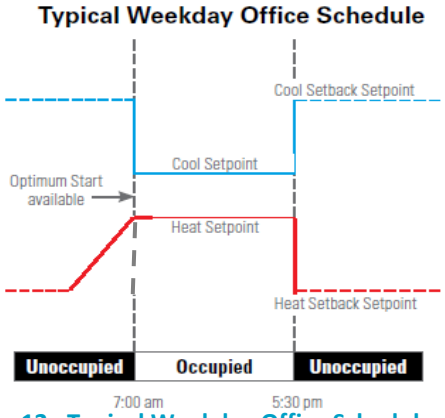


Figure 12. Typical Weekday Office Schedule

2. *iTM* Auto-Changeover
   a. Using the advanced auto-changeover functions in the *iTM*, the BMS programming time is significantly reduced. Automatic changeover is available for both Heat Pump and Heat Recovery systems. The changeover is automatically controlled to occur in the following two cases:

Case 1: Changeover at the primary changeover temperature after the guard timer expires.

1. The changeover is evaluated by how much the room temperature has deviated from the cooling or heating setpoint. For example, when the room temperature exceeds the primary changeover deadband from the cooling setpoint, *iTM* initiates a change from heating mode to cooling mode.
2. By default, the primary changeover setpoint is 1°F above the cooling setpoint or 1°F below heating setpoint, which are configurable between 1°F – 4°F.
3. The guard timer can be set to 15, 30, or 60 (default) minutes.
   a. The initiation of the guard timer is built in to help prevent frequent changeovers which may cause energy loss.
   b. When the setpoint is changed manually or by the schedule, the guard timer is not active.

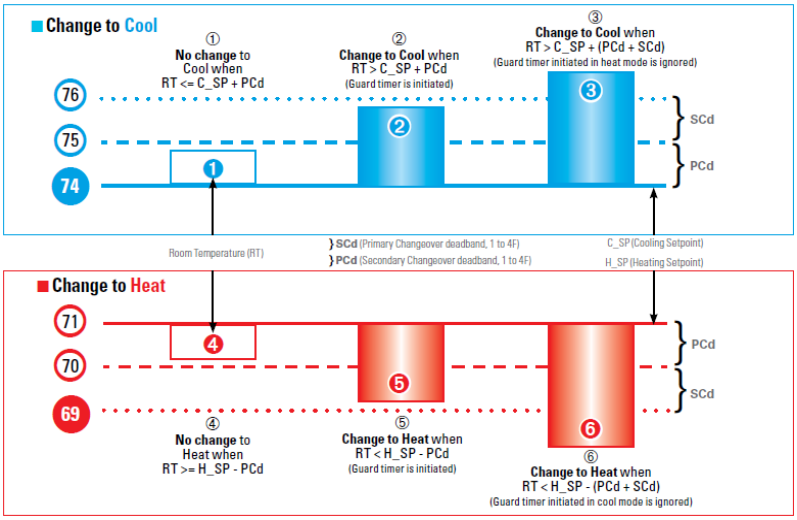


Figure 13. Cool/Heat Changeover Logic

Case 2: Changeover at the secondary changeover temperature.

1. By default, the secondary changeover temperature is 1°F above the primary changeover temperature for cooling, or 1°F below the primary changeover temperature for heating, which is configurable between 1°F – 4°F.
2. Case 2 will happen while the guard time is active in Case 1.
3. The *iTM* auto-changeover is applicable to both Heat Pump and Heat Recovery systems.
   a. The *iTM* provides four changeover methods to meet a variety of expectations in a project. Fixed, Individual, Average, or Vote methods can be specified in the changeover group with targeted indoor units, as well as Primary/Secondary Changeover deadbands.
      1. Fixed Method:
         a. Changeover is evaluated with the representative indoor unit.
         b. Changeover affects all indoor units.
         c. Good method for prioritizing the representative indoor unit for the Heat Pump system (or multiple units on the same port of the BS Box in Heat Recovery system).

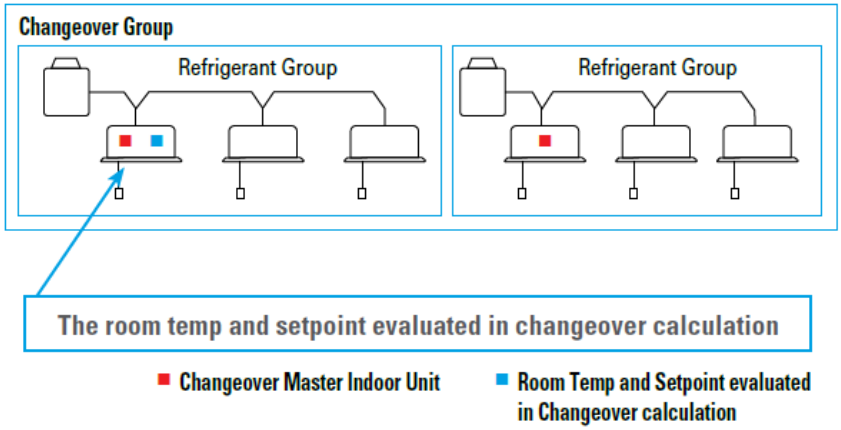


Figure 14. Fixed Method

2. Individual Method:
   a. Changeover is evaluated by, and affects, each indoor unit individually.
   b. Used in application with the Heat Recovery system.

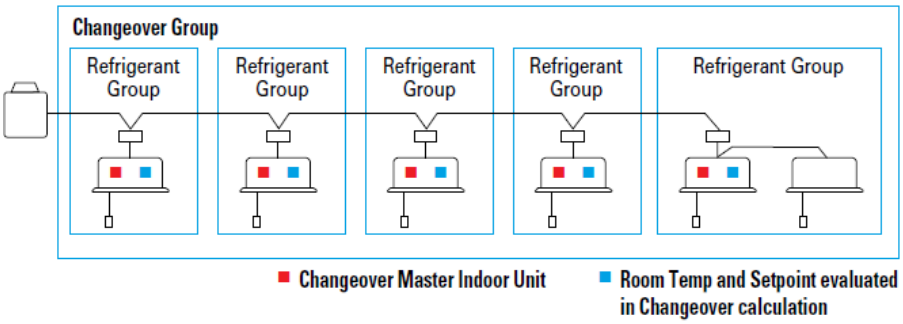


Figure 15. Individual Method

3. Average Method:
   a. Changeover is evaluated based on the average of the room temperature and average setpoints in the changeover group.
   b. A weight (0-3) can be added to each indoor unit demand in the changeover group. The default is 1.
   c. Changeover affects all indoor units in the changeover group.
   d. Used in applications with Heat Pump systems (or multiple units on the same port of the BS Box in the Heat Recovery system).

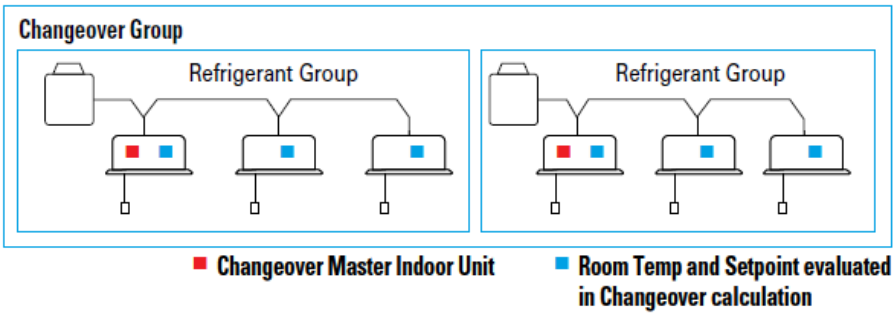


Figure 16. Average Method

4. Vote Method:
   a. Changeover is evaluated based on the total cooling demand and total heating demand. If the total cooling demand is greater than the heating demand, the *iTM* changes the indoor units in the changeover group to cool mode.
   b. When the changeover group is in cooling mode, the total cooling demand will decrease; at that point, the total heating demand may become greater than the cooling demand and change the mode to heating (a guard timer applies).

c. The setpoints can be different in each indoor unit within the changeover group. The demand is calculated based on the setpoints in comparison to room temperature for each indoor unit. The demand within the Primary Changeover deadband (PCd) is considered as *no demand*.
d. A good method for Heat Pump systems (or multiple units on the same port of the BS Box in Heat Recovery system) as a pseudo-simultaneous cooling and heating operation.
e. A weight (0-3) can be added to each indoor unit demand in the changeover group. The default is 1.
f. An option for heating override can be applied if there is an indoor unit which the heating demand exceeds [H_SP- (PCd + SCd)].

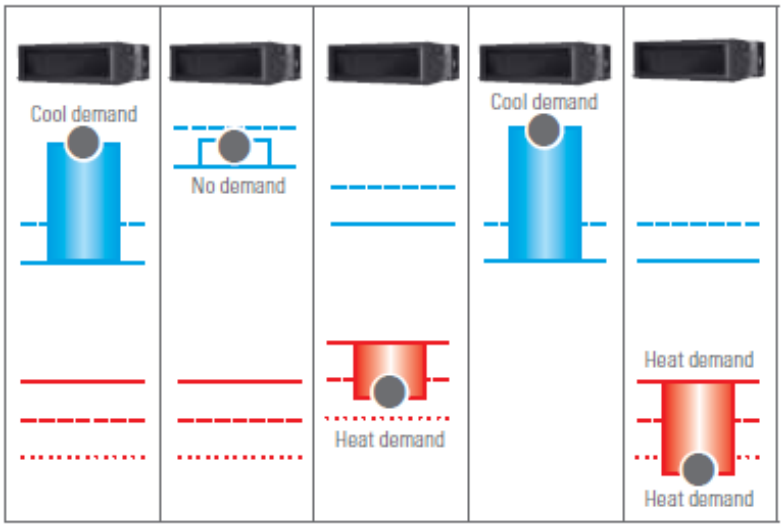


Figure 17. Vote Method

Part 2. Functional Specifications

1. Introduction

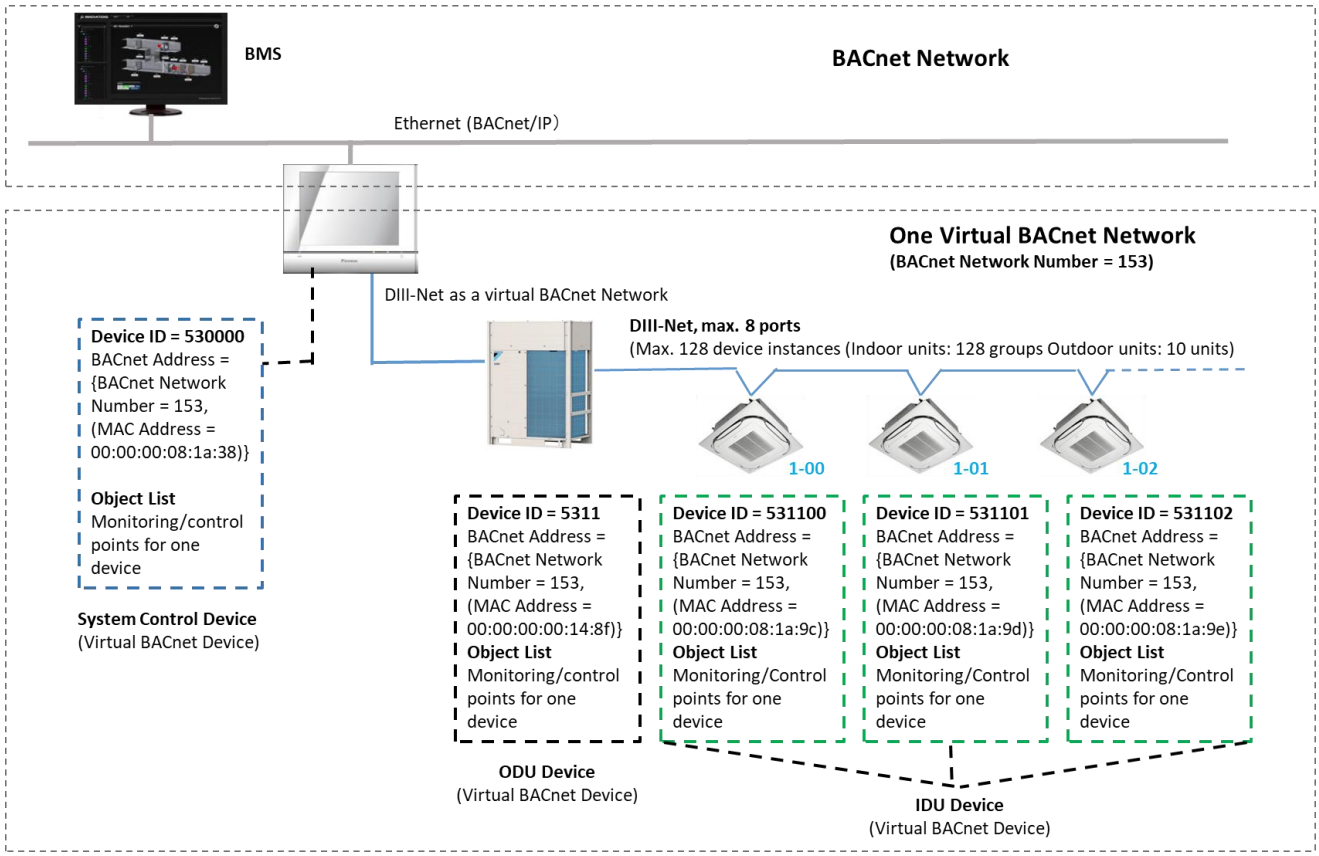
The Daikin *iTM* BACnet® Server Gateway operates as a *BACnet* interpreter using the services defined by *BACnet* to return the status of the indoor units connected to the DIII network. It also sends configuration commands to the indoor units, in response to requests from the BMS (i.e., *BACnet* Client) which supports the *BACnet* protocol (ISO16484-5, ANSI/ASHRAE135).

2. Network Topology

2.1 Visualization of Each Device on the *BACnet* Network

1. *iTM*: Operates as a *BACnet* router/gateway for the *VRV* indoor units.
2. Indoor unit device: One indoor unit management point is handled as one virtual *BACnet* device.
   a. In the *BACnet* specifications, the *VRV* communication line (DIII network) is handled as one virtual *BACnet* network.
   (See Annex H.1 and H.2 in the *BACnet* 2004 specifications.)
3. System control device: It is handled as a virtual *BACnet* device to receive settings (i.e., enable/disable and the like) for the *iTM* system configuration points.
4. For a typical *BACnet* network configuration, see chapters 4.2 and Annex in the *BACnet* 2004 specifications.

Figure 18. *BACnet* Network



2.2 *BACnet* Network Number

1. A *BACnet* Client access the virtual *BACnet* device of an indoor unit by specifying the *BACnet* network number mapped to the virtual *BACnet* network.
2. *BACnet* network numbers must be a unique number on the *BACnet* network and settable in the range defined in the *BACnet* specifications (1 to 65534) default is 100.

2.3 Device ID (Device Instance Number)

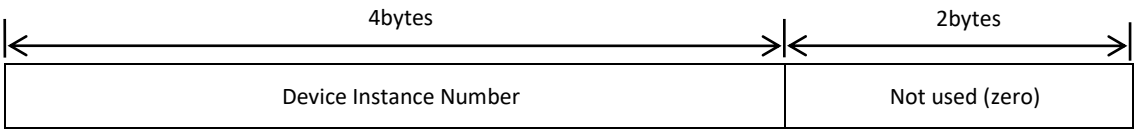
1. The Device ID must be a unique number per indoor unit and on the *BACnet* network. The setting range is 0 to 4194303.
2. The following Device ID is recommended to be used as the default for the System Device.
   a. For the Device ID:
      1. **53**0000 → 53 represents Daikin's *BACnet* vendor ID.
      2. 53**0000** → 0000 represents no port or group address assigned
2. The following Device ID calculation is recommended to be used as the default for each indoor unit unless otherwise specified by the BMS integrator. The default Device ID should follow the structure 53XXXX.
   a. For the Device ID 531100:
      1. **53**1100 → 53 represents Daikin's *BACnet* vendor ID.
      2. 53**1**100 → 1 represents the port number (1 = *iTM*, 2 – 8 = *iTM* Plus Adaptor address).
      3. 531**100** → 100 represents the DIII-Net group address 1-00.
3. The following Device ID calculation is recommended to be used as the default for each outdoor unit unless otherwise specified by the BMS integrator. The default Device ID should follow the structure 53XXX.
   a. For Device ID 5311
      1. **53**11 → 53 represents Daikin's *BACnet* vendor ID.
      2. 53**1**1 → 1 represents the port number (1 = *iTM*, 2 – 8 = *iTM* Plus Adaptor address).
      3. 531**1** → 1 represents the outdoor unit tag number CU-**1.**

2.4 What is a MAC Address?

1. The MAC address is a unique physical address to identify a network device.
2. Each physical medium in a network has a MAC address whose length varies depending on the physical medium.
3. MAC addresses used for physical media are defined by the *BACnet* specifications; see chapters 7 to 11 in the *BACnet* 2004 specifications.
4. Furthermore, when using *BACnet* IP, everything below the IP layer is considered the physical layer by definition so as to handle the 6 bytes composed of the IP address + UDP port number as the MAC address.
   (See paragraph J.1.2 in the *BACnet* 2004 specifications).
   Note that the MAC address of a virtual *BACnet* device is expressed as described above.
5. In the *BACnet* specifications, the address of the data source and destination are specified using the *BACnet* network number and this MAC address.
   For details, see paragraph 6.2.2.2 in the *BACnet* 2004 specifications.

2.5 MAC Address of a Virtual *BACnet* Device

1. The MAC address is a 6-byte long expression composed of the device instance number for the indoor unit and system control device, as indicated below: The MAC address of each device is represented by the hexadecimal conversion of the device Instance number.
   (Ex. Device instance number = 531100 → 00: 08:1a:9c:00:00 = MAC Address)



2. Settings related to the *BACnet* Server Gateway functions such as the device instance number can be done from the *BACnet* Server Gateway configuration in the *iTM* Service Settings menu. Refer to the *iTM BACnet* Server Gateway Commissioning manual for more details.

3. *iTM* and BACnet® Server Gateway Logic

3.1 *BACnet* Virtual Router Function

1. The *iTM BACnet* Server Gateway provides seamless control logic between the *iTM* and BMS.
2. The *BACnet* virtual router function allows the BMS to see each Indoor Unit Management Point as a separate device. This allows for each Indoor Unit Management Point to have its own independent device ID.

3.2 *iTM BACnet* Server Gateway Point Logic in the *iTM*

1. Each point exposed to the BMS from the *iTM BACnet* Server Gateway is linked to the logic in the *iTM*. This alleviates the need for the BMS integrator to create programming to control the *VRV* system. The image below identifies which *BACnet* points are linked to the *iTM* logic.

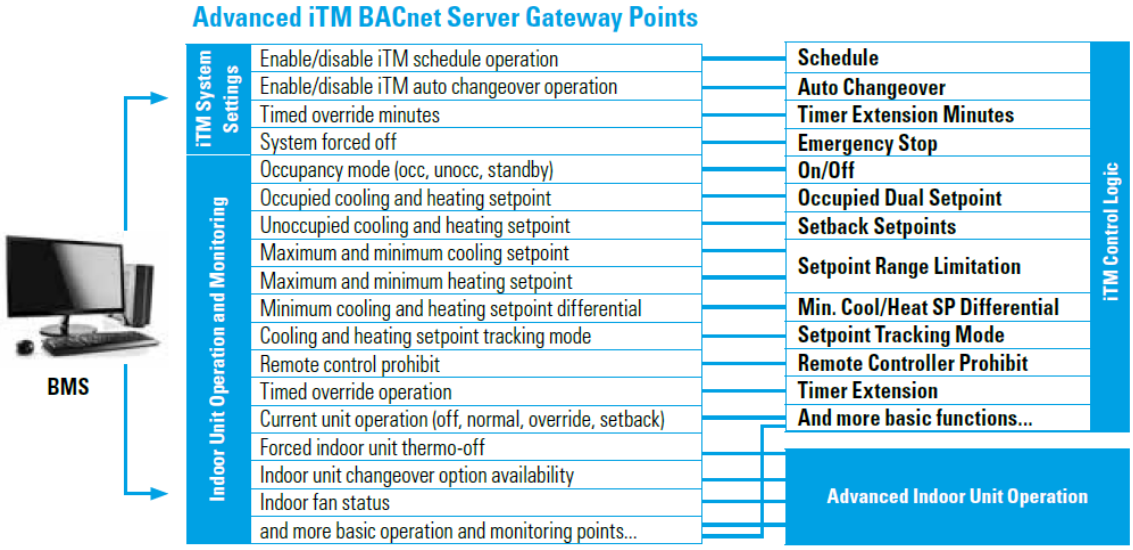


Figure 19. BACnet® Server Gateway Point and *iTM* Logic matchup

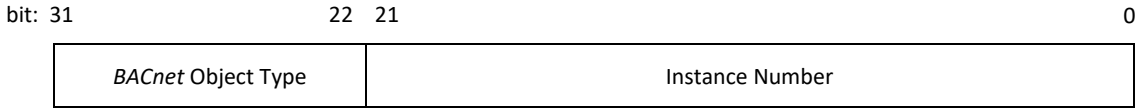
2. Each Indoor Unit Management Point can be assigned independent cooling and heating occupied and unoccupied setpoints.
   a. Setpoints set by the BMS are also updated in the *iTM*, and setpoints set at the *iTM* are updated to the BMS.
   b. The same logic applies to the setpoint range limitation as stated in Part 1., 3.1(2)(b) for the minimum and maximum setpoint for cooling and heating.
   c. To see how the occupancy mode is monitored and controlled, refer to 7.2.1.

3. Auto-changeover
   a. The *iTM* handles the cool/heat auto-changeover for the Changeover Group that consists of all indoor units in Heat Pump systems, or under BS units in Heat Recovery system.
   b. The Changeover Group is configured in the *iTM*.
   c. The changeover method is configured from one of the following: Fixed, Average, Individual and Vote which is selected in the *iTM*.
   d. Different changeover options can be selected for each Changeover Group.
   e. The Auto-changeover point (system point) allows the BMS to enable or disable all the Changeover Groups simultaneously when the Changeover Groups are configured in the *iTM*.
   f. The BMS Integrator should be provided with the Changeover Group configuration.
4. Scheduling
   a. The *iTM* can accommodate daily scheduling of the indoor unit groups.
   b. There are four types of schedules that can be set in the *iTM* 7 day, Weekday/Weekend, Weekday/Saturday/Sunday, and Every day.
   c. The BMS can use the “Enable *iTM* Schedule” point to enable or disable the schedule in the *iTM*. Typically the BMS Master Schedule is used to control the indoor units, and *iTM* Schedule is not used.
5. Forced System Shutdown
   a. The “Forced System Shutdown” point can be used to turn off all indoor unit groups connected to the *iTM* via the DIII-Net communication bus when an emergency signal has been received by the BMS. Emergency Stop program should be configured and enabled in advance.
   b. Indoor unit groups cannot be restarted from the remote controller until the Forces System Shutdown point is set to inactive.

4. VRV System Monitor/Control Objects

4.1 Member Objects

1. In BACnet®, a *BACnet* Object Identifier (hereinafter abbreviated as "ObjectID") is defined as follows:



4.2 Indoor Unit Device

1. Each indoor unit monitoring/control item (called Member Object) is mapped to a *BACnet* object (called indoor unit object) and to an ObjectID instance number, as indicated in the following table.
2. Each of the object types BI, BV, MI, MO, and MV sets the text shown in the following table in the Description Property in accordance with the value of the Present_Value.
3. The BMS cannot command an indoor unit from cool to heat (or from heat to cool) if the indoor unit is not designated as the changeover master.
4. When more than one indoor unit is connected to a single remote controller group, the BMS should only send commands to the indoor unit that is designated to receive the command for the remote controller group (unit #0). The BMS should not send commands to other indoor units in the remote control group. If commands are sent to the other indoor units in the

remote controller group, the indoor unit that receives the command will decide if it should follow the command.

5. During the *iTM BACnet* Server Gateway commissioning, the *BACnet* objects can be enabled and disabled. If an object is disabled, the object will not be available to be controlled and/or monitored by the BMS.
6. Indoor unit points list

Instance No.	Object_Name	Type	Inactive	Active							Remarks
			Text-1	Text-2	Text-3	Text-4	Text-5	Text-6	Text-7	Text-8	
1	Occupancy Mode	MO	Unocc	Occ	Standby						
2	Unit On_Off Status	BI	Off	On							
3	Alarm Status	BI	Normal	Alarm							Sets error code in the Description property.
4	Operation Mode	MV	Cool	Heat	Fan	Dry					See (1) below.
5	Room Temperature	AI									*1, *2
6	Occ Cooling Setpoint	AV									*1, *2
7	Occ Heating Setpoint	AV									*1, *2
8	Unocc Cooling Setpoint	AV									*1, *2, *4
9	Unocc Heating Setpoint	AV									*1, *2, *4
10	Max Cooling Setpoint	AV									*1, *2, *5
11	Min Cooling Setpoint	AV									
12	Max Heating Setpoint	AV									*1, *2, *5
13	Min Heating Setpoint	AV									
14	Min Setpoint Differential (Cooling & Heating)	AV									*1, *2
15	Cooling & Heating Setpoint Tracking Mode	BV	Disable	Enable							
16	Fan Speed	MV	Low	Reserved	Medium	Reserved	High	Reserved	Reserved	Auto	
17	Airflow Direction	MV	P0	P1	P2	P3	P4	Reserved	Reserved	P7	
18	Timed Override Operation	BV	Disable	Enable							
19	Current Unit Operation	MI	Off	Normal	Override	Setback					

(1) Values settable on an indoor unit vary depending on whether or not the Changeover option is available. However, *BACnet* objects can always send out commands independently of whether or not the values in them are settable, because the operation when a value that cannot be set is received is decided by the indoor unit.

Continued on next page.

Instance No.	Object_Name	Type	Inactive	Active						Remarks
			Text-1	Text-2	Text-3	Text-4	Text-5	Text-6	Text-7	Text-8	
20	Remote Controller Prohibit (On_Off)	MV	Permit	Prohibit	Stop Only						
21	Remote Controller Prohibit (Operation Mode)	BV	Permit	Prohibit							
22	Remote Controller Prohibit (Setpoint)	BV	Permit	Prohibit							
23	Filter Sign Status	BI	Normal	Alarm							
24	Filter Sign Reset	BV	Reset	Alarm							
25	Indoor Fan Status	BI	Off	On							
26	Communication Status	BI	Normal	Alarm							
27	Thermo-on Status	BI	Off	On							
28	Compressor Status	MI	Off	On	Defrost/ Hot Start						
29	Aux Heater Status	BI	Off	On							
30	Forced Thermo-off	BV	Disable	Enable							
31	Indoor Unit Changeover Option	BI	Not Available	Available							
32	Return Air Temperature	AI									*1, *2
33	Discharge Air Temperature	AI									*1, *2
34	Liquid Pipe Temperature	AI									*1, *2
35	Gas Pipe Temperature	AI									*1, *2
36	EV Position	AI									*2
37	Freeze Protection	BI	Off	On							*3

*1: The unit of temperature (Celsius or Fahrenheit) follows the iTM locale (regional settings).

*2: The number of valid digits for each object is shown in the table below.
If a value entered from BMS has a higher precision than the number of significant digits of an object, the digits after the significant digits are rounded.
(For example, when Occ Cooling Setpoint is "75.55" in degrees Fahrenheit, round it to "76".)
Regarding values in commands sent from the BMS, the iTM rounds them off to the number of the significant digits.
(For example, if the value in a command for Occ Cooling Setpoint is "75.55" in degrees Fahrenheit, it is rounded to "76".)

Object Name	Number of valid digits	
	Celsius	Fahrenheit
“Room Temperature”	One decimal place	One decimal place
"Occ Cooling Setpoint" "Occ Heating Setpoint" "Unocc Cooling Setpoint" "Unocc Heating Setpoint" "Max Cooling Setpoint" "Min Cooling Setpoint" "Max Heating Setpoint" "Min Heating Setpoint"	One decimal place	Integer
"Min Setpoint Differential (Cooling & Heating)”	Integer	Integer

*3: Only available with the following indoor units: FXEQ_P, FXFQ_T, FXTQ_TA, FXUQ_P, FXSQ_TA, and CXTQ_TA.

*4: When the Out_Of_Service property is TRUE, the setting items (Setback Temperature (Cool/Heat), Min Setpoint Differential (Cooling & Heating) that are mapped to the object are disabled. Therefore, a value set on the indoor unit management point remains unchanged even if Present_Value is changed.

*5: The Out_Of_Service property of "Max Cooling Setpoint" and "Min Cooling Setpoint" indicates the upper and lower limit of the Cool Setpoint change along with the Present_Value.
(When the Out_Of_Service property of either object is changed from FALSE → TRUE, the Out_Of_Service property of the other object also changes from FALSE → TRUE.)
The "Max Heating Setpoint" and "Min Heating Setpoint" which indicates the upper and lower limit of the Heat Setpoint also behaves in the same way.
When the Out_Of_Service property is TRUE, the setting items (Max and Min Setpoint) mapped to an object are disabled, so a value set for the indoor unit management point remains unchanged even when the Present_Value changes.

4.3 System Control Device

1. The instance numbers of the Object IDs are mapped to the system control settings on the iTM as shown in the table below.
2. Each of the BO and MV object types set the text shown in the table below for the Description Property in accordance with the value of Present_Value.

Instance No.	Object_Name	Type	Inactive	Active						Remarks
			Text-1	Text-2	Text-3	Text-4	Text-5	Text-6	Text-7	
1	Enable iTM Schedule Operation	BO	Disable	Enable						
2	Enable iTM Auto-Changeover Operation	BO	Disable	Enable						
3	Timed Override Minutes	MV	30	60	90	120	150	180		
4	System Forced Off	BO	Inactive	Active						

4.4 Restrictions

1. When a Present Value (PV) is set by the BMS, the BACnet® Server in *iTM* updates the PV and keeps the previous PV.

2. The *BACnet* Server in *iTM* sends the new PV to Management Point in *iTM*. The *BACnet* Server in *iTM* then starts a 10 minute timer.
3. If the value in Management Point is changed (i.e., the indoor unit accepted the new value and sent back the new status to *iTM*), the Management Point in *iTM* sends the new value to the *BACnet* Server in *iTM*. The *BACnet* Server in *iTM* updates the PV and resets the 10 minute timer.
4. If the value in Management Point is not changed (i.e., the indoor unit did not accept the new value and did not update the status to *iTM*) nothing happens. When the 10 minute timer expires, the *BACnet* Server in *iTM* resets to the previous PV.

EXAMPLE 1 – Cool SP Max

Step	BMS	BACnet® Server in *iTM*	Management Point in *iTM*
Pre-condition		• Unocc Cool SP: 80°F • Cool SP range: 70-76°F	• Cool Setback SP: 80°F • Cool SP range: 70-76°F
#1	• Sets Cool SP max 85°F	• ***PV: 85°F***, previous PV: 76°F • Start 10-min timer	
#2		• Sends 85°F to Management Point	• Cool SP max 85°F is rounded to 78°F due to Cool Setback SP 80°F. • Cool SP range: 70-***78°F (Changed)***
#3		• ***PV 78°F*** • Reset 10-min timer	• ***Updates 78°F to the BACnet® Server***
#1	• Sets Cool SP max 85°F again	• ***PV: 85°F***, previous PV: 78°F • Start 10-min timer	
#2		• Sends 85°F to Management Point	• Cool SP max 85°F is rounded to 78°F due to Cool Setback SP 80°F • Cool SP range: 70-78°F (No change)
#4		• ***When 10-min timer expires, PV back to 78°F***	

EXAMPLE 2 – Cool SP

Step	BMS	BACnet® Server in *iTM*	Management Point in *iTM*
Pre-condition		• Cool SP range: 70-78°F • Cool SP: 72°F	• Cool SP range: 70-78°F • Cool SP: 72°F
#1	• Sets Cool SP 68°F	• ***PV: 68°F***, previous PV: 72°F • Start 10-min timer	
#2		• Sends 68°F to Management Point	• Cool SP 68°F is rounded to 70°F due to Cool SP range 70-78°F • Cool SP: ***70°F (Changed)***
#3		• ***PV 70°F*** • Reset 10-min timer	• ***Sends 70°F to BACnet® Server***
#1	• Sets Cool SP 68°F again	• ***PV: 68°F***, previous PV: 70°F • Start 10-min timer	
#2		• Sends 68°F to Management Point	• Cool SP 68°F is rounded to 70°F due to the Cool SP range 70-78°F • Cool SP: 70°F (No change)
#4		• ***When 10-min timer expires, PV back to 70°F***	

EXAMPLE 3 – Operation Mode to Changeover Slave Unit

Step	BMS	BACnet® Server in *iTM*	Management Point in *iTM*	Indoor Unit
Pre-condition		• Operation mode: Cool	• Operation mode: Cool	• Operation mode: Cool
#1	• Sets Operation mode Fan	• PV: Fan, previous PV: Cool • Start 10-min timer		
#2		• Sends Fan mode to Management Point	• Send Fan mode to Indoor Unit	• Accepts Fan mode • Status update to *iTM* as Operation mode Fan
#3		• ***PV Fan*** • Reset 10-min timer	• Operation mode: ***Fan (Changed)*** • ***Send Fan to BACnet® Server***	
#1	• Sets Operation mode Heat	• ***PV: Heat,*** previous PV: Fan • ***Start*** 10-min timer		
#2		• Sends Heat to Management Point	• Send Heat to Indoor Unit	• Cannot accept Heat due to changeover slave unit
			• Operation mode: Fan (No change)	• Periodical status report to *iTM* as Operation mode Fan
#4		• ***When 10-min timer expires, PV back to Fan***		

4.5. Outdoor Unit Device

1. Each outdoor unit monitoring item (called object) is mapped to a *BACnet* object (called outdoor unit object) and to an ObjectID instance number, as indicated in the table below.
2. Both of the objects types BI and MI set the text shown in the table below in the Description Property in accordance with the value of Present_Value.

Common Outdoor Points

Instance No.	Object_Name	Type	Inactive	Active							Remarks
			Text-1	Text-2	Text-3	Text-4	Text-5	Text-6	Text-7	Text-8	
1	Communication Status	BI	Normal	Alarm							
2	Operation Mode	MI	Cool	Heat	Fan	Heat & Cool					
3	Outdoor Unit Alarm Status	BI	Normal	Alarm							Sets error code in the Description Property
4	Defrost Mode	BI	Off	On							
5	Oil Return	BI	Off	On							
6	Electric Power (calculated)	AI									*2
7	Electric Current (calculated)	AI									*2
8	System Capacity Code	AI									*2
9	Outdoor Air Temperature	AI									*1, *2

Main Outdoor Unit Points

Instance No.	Object_Name	Type	Inactive	Active							Remarks
			Text-1	Text-2	Text-3	Text-4	Text-5	Text-6	Text-7	Text-8	
100	M_Condensing Pressure	AI									*2,*3
101	M_Evaporating Pressure	AI									*2,*3
102	M_Condensing Temperature	AI									*1,*2,*3
103	M_Evaporating Temperature	AI									*1,*2,*3
104	M_Inverter Compressor 1 Speed	AI									*2,*3
105	M_Inverter Compressor 2 Speed	AI									*2,*3
106	M_Fan Step	AI									*2,*3
107	M_EV Position 1	AI									*2,*3
108	M_EV Position 2	AI									*2,*3
109	M_Hot Gas Temperature (Compressor 1)	AI									*1,*2,*3
110	M_Hot Gas Temperature (Compressor 2)	AI									*1,*2,*3
111	M_Liquid Pipe Temperature	AI									*1,*2,*3
112	M_Liquid Pipe Temperature (HX Upper)	AI									*1,*2,*3
113	M_Liquid Pipe Temperature (HX Lower)	AI									*1,*2,*3
114	M_Liquid Pipe Temperature (Deicer)	AI									*1,*2,*3
115	M_Gas Pipe Temperature (HX Upper)	AI									*1,*2,*3
116	M_Gas Pipe Temperature (HX Lower)	AI									*1,*2,*3
117	M_Suction Temperature	AI									*1,*2,*3
118	M_Compressor Suction Temperature	AI									*1,*2,*3
119	M_Subcool Inlet Temperature	AI									*1,*2,*3
120	M_Subcool Outlet Temperature	AI									*1,*2,*3
121	M_Subcool EV Position	AI									*2,*3

Sub-1 Outdoor Unit Points

Instance No.	Object_Name	Type	Inactive	Active							Remarks
			Text-1	Text-2	Text-3	Text-4	Text-5	Text-6	Text-7	Text-8	
200	S1_Condensing Pressure	AI									*2,*3
201	S1_Evaporating Pressure	AI									*2,*3
202	S1_Condensing Temperature	AI									*1,*2,*3
203	S1_Evaporating Temperature	AI									*1,*2,*3
204	S1_Inverter Compressor 1 Speed	AI									*2,*3
205	S1_Inverter Compressor 2 Speed	AI									*2,*3
206	S1_Fan Step	AI									*2,*3
207	S1_EV Position 1	AI									*2,*3
208	S1_EV Position 2	AI									*2,*3
209	S1_Hot Gas Temperature (Compressor 1)	AI									*1,*2,*3
210	S1_Hot Gas Temperature (Compressor 2)	AI									*1,*2,*3
211	S1_Liquid Pipe Temperature	AI									*1,*2,*3
212	S1_Liquid Pipe Temperature (HX Upper)	AI									*1,*2,*3
213	S1_Liquid Pipe Temperature (HX Lower)	AI									*1,*2,*3
214	S1_Liquid Pipe Temperature (Deicer)	AI									*1,*2,*3
215	S1_Gas Pipe Temperature (HX Upper)	AI									*1,*2,*3
216	S1_Gas Pipe Temperature (HX Lower)	AI									*1,*2,*3
217	S1_Suction Temperature	AI									*1,*2,*3
218	S1_Compressor Suction Temperature	AI									*1,*2,*3
219	S1_Subcool Inlet Temperature	AI									*1,*2,*3
220	S1_Subcool Outlet Temperature	AI									*1,*2,*3
221	S1_Subcool EV Position	AI									*2,*3

Sub-2 Outdoor Unit Points

Instance No.	Object_Name	Type	Inactive	Active							Remarks
			Text-1	Text-2	Text-3	Text-4	Text-5	Text-6	Text-7	Text-8	
300	S2_Condensing Pressure	AI									*2,*3
301	S2_Evaporating Pressure	AI									*2,*3
302	S2_Condensing Temperature	AI									*1,*2,*3
303	S2_Evaporating Temperature	AI									*1,*2,*3
304	S2_Inverter Compressor 1 Speed	AI									*2,*3
305	S2_Inverter Compressor 2 Speed	AI									*2,*3
306	S2_Fan Step	AI									*2,*3
307	S2_EV Position 1	AI									*2,*3
308	S2_EV Position 2	AI									*2,*3
309	S2_Hot Gas Temperature (Compressor 1)	AI									*1,*2,*3
310	S2_Hot Gas Temperature (Compressor 2)	AI									*1,*2,*3
311	S2_Liquid Pipe Temperature	AI									*1,*2,*3
312	S2_Liquid Pipe Temperature (HX Upper)	AI									*1,*2,*3
313	S2_Liquid Pipe Temperature (HX Lower)	AI									*1,*2,*3
314	S2_Liquid Pipe Temperature (Deicer)	AI									*1,*2,*3
315	S2_Gas Pipe Temperature (HX Upper)	AI									*1,*2,*3
316	S2_Gas Pipe Temperature (HX Lower)	AI									*1,*2,*3
317	S2_Suction Temperature	AI									*1,*2,*3
318	S2_Compressor Suction Temperature	AI									*1,*2,*3
319	S2_Subcool Inlet Temperature	AI									*1,*2,*3
320	S2_Subcool Outlet Temperature	AI									*1,*2,*3
321	S2_Subcool EV Position	AI									*2,*3

*1 The unit of temperature (Celsius or Fahrenheit) follows the *iTM* setting.

*2 The number of valid digits for each object is shown in the table below.
Regarding values from BMS, they are rounded up to the number of significant digits.
(For example, if the value for Electric Power is "25.55", it is rounded up to "25.6")

*3 Objects are not generated for data that does not exist. Depending on the outdoor unit model, incompatible data may exist. Objects are not generated for such incompatible data.
(Example) If it is a model that has only one main outdoor unit, objects are not generated for Sub-1 or Sub-2.

[Temperature (Celsius / Fahrenheit) Objects]

Object Name	Number of valid digits	
	Celsius	Fahrenheit
Outdoor Air Temperature	Integer	Integer
M_Condensing Temperature		
M_Evaporating Temperature		
M_Hot Gas Temperature (Compressor 1)		
M_Hot Gas Temperature (Compressor 2)		
M_Liquid Pipe Temperature		
M_Liquid Pipe Temperature (HX Upper)		
M_Liquid Pipe Temperature (HX Lower)		
M_Liquid Pipe Temperature (Deicer)		
M_Gas Pipe Temperature (HX Upper)		
M_Gas Pipe Temperature (HX Lower)		
M_Suction Temperature		
M_Compressor Suction Temperature		
M_Subcool Inlet Temperature		
M_Subcool Outlet Temperature		
S1_Condensing Temperature		
S1_Evaporating Temperature		
S1_Hot Gas Temperature (Compressor 1)		
S1_Hot Gas Temperature (Compressor 2)		
S1_Liquid Pipe Temperature		
S1_Liquid Pipe Temperature (HX Upper)		
S1_Liquid Pipe Temperature (HX Lower)		
S1_Liquid Pipe Temperature (Deicer)		
S1_Gas Pipe Temperature (HX Upper)		
S1_Gas Pipe Temperature (HX Lower)		
S1_Suction Temperature		
S1_Compressor Suction Temperature		
S1_Subcool Inlet Temperature		
S1_Subcool Outlet Temperature		
S2_Condensing Temperature		
S2_Evaporating Temperature		
S2_Hot Gas Temperature (Compressor 1)		
S2_Hot Gas Temperature (Compressor 2)		
S2_Liquid Pipe Temperature		
S2_Liquid Pipe Temperature (HX Upper)		
S2_Liquid Pipe Temperature (HX Lower)		
S2_Liquid Pipe Temperature (Deicer)		
S2_Gas Pipe Temperature (HX Upper)		
S2_Gas Pipe Temperature (HX Lower)		
S2_Suction Temperature		
S2_Compressor Suction Temperature		
S2_Subcool Inlet Temperature		
S2_Subcool Outlet Temperature		

[Non-Temperature Objects]

Object Name	Number of valid digits
System Capacity Code	Integer
M_Inverter Compressor 1 Speed	
M_Inverter Compressor 2 Speed	
M_Fan Step	
M_EV Position 1	
M_EV Position 2	
M_Subcool EV Position	
S1_Inverter Compressor 1 Speed	
S1_Inverter Compressor 2 Speed	
S1_Fan Step	
S1_EV Position 1	
S1_EV Position 2	
S1_Subcool EV Position	
S2_Inverter Compressor 1 Speed	
S2_Inverter Compressor 2 Speed	
S2_Fan Step	
S2_EV Position 1	
S2_EV Position 2	
S2_Subcool EV Position	
Electric Power	One decimal place
Electric Current	
M_Condensing Pressure	Two decimal places
M_Evaporating Pressure	
S1_Condensing Pressure	
S1_Evaporating Pressure	
S2_Condensing Pressure	
S2_Evaporating Pressure	

5. Properties

5.1 Device Object Type

Property Identifier	Property Datatype	Compatible Class	Support ■ = Yes □ = No	R: Readable W: Writable	Remarks
Object_Identifier	BACnetObjectIdentifier	R	■	R	Configurable with BACnet® Server/ Gateway Configuration
Object_Name	CharacterString	R	■	R	Indoor unit name*
Object_Type	BACnetObjectType	R	■	R	DEVICE
System_Status	BACnetDeviceStatus	R	■	R	Fixed to OPERATIONAL
Vendor_Name	CharacterString	R	■	R	DAIKIN Industries LTD
Vendor_Identifier	Unsigned16	R	■	R	Fixed to 53 (= DAIKIN)
Model_Name	CharacterString	R	■	R	Fixed to "Indoor Unit"
Firmware_Revision	CharacterString	R	■	R	
Application_Software_ Version	CharacterString	R	■	R	
Location	CharacterString	O	□	—	
Description	CharacterString	O	■	R	Port No. + Group Address connected to DIII-NET Ex: "1:1-00"
Protocol_Revision	Unsigned	R	■	R	
Protocol_Services_ Supported	BACnetServiceSupported	R	■	R	RP, RPM, WP, WPM, I-Am, I-Have, TimeSync, Who-Is, Who-Has, UTCTimeSync, SubCOV
Protocol_Object_ Types_Supported	BACnetObjectTypesSupported	R	■	R	AI, AV, BI, BV, MI, MO, MV, Device
Object_List	BACnetARRAY[N] of BACnetObjectIdentifier	R	■	R	
Max_APDU_Length_ Accepted	Unsigned	R	■	R	1024
Segmentation_ Supported	BACnetSegmentation	R	■	R	SEGMENTED_BOTH
Max_Segments_ Accepted	Unsigned	O1	■	R	Fixed to 100
VT_Class_Supported	List of BACnetVTClass	O1	□	—	
Active_VT_Sessions	List of BACnetVTSession	O2	□	—	
Local_Time	Time	O3,4	■	R	Follows the *iTM* clock
Local_Date	Date	O3,4	■	R	Follows the *iTM* clock
UTC_Offset	Signed	O4	■	R	Follows the *iTM* clock
Daylight_Saving_Status	Boolean	O4	■	R	Follows the *iTM* clock

* The character code for indoor unit names is UTF-8

Continued from previous page.

Property Identifier	Property Datatype	Compatible Class	Support ■ = Yes □ = No	R: Readable W: Writable	Remarks
APDU_Segment_Timeout	Unsigned	O1	■	R	Configurable with BACnet® Server/Gateway Configuration (*)
APDU_Timeout	Unsigned	R	■	R	Configurable with BACnet® Server/Gateway Configuration (*)
Number_Of_APDU_Retries	Unsigned	R	■	R	Configurable with BACnet® Server/Gateway Configuration (*)
List_Of_Session_Keys	List of BACnetSessionKey	O	□	—	
Time_Synchronization_ Recipients	List of BACnetRecipient	O5	□	—	
Max_Master	Unsigned (1...127)	O6	□	—	
Max_Info_Frames	Unsigned	O6	□	—	
Device_Address_Binding	List of BACnetAddressBinding	R	■	R	
Database_Revision	Unsigned	R	■	R	
Configuration_Files	BACnetARRAY[N] of BACnetObjectIdentifier	O7	□	—	
Last_Restore_Time	BACnetDateTime	O7	□	—	
Backup_Failure_Timeout	Unsigned16	O8	□	—	
Active_COV_Subscriptions	List of BACnetCOVSubscription	O9	■	R	
Profile_Name	CharacterString	O	□	—	

(*) is a common group setting in the *iTM* system.

5.2 System Control Device

Property Identifier	Property Datatype	Compatible Class	Support ■ = Yes □ = No	R: Readable W: Writable	Remarks
Object_Identifier	BACnetObjectIdentifier	R	■	R	Configurable with BACnet® Server/ Gateway Configuration
Object_Name	CharacterString	R	■	R	Fixed to “Daikin iTM Server Control"
Object_Type	BACnetObjectType	R	■	R	DEVICE
System_Status	BACnetDeviceStatus	R	■	R	Fixed to OPERATIONAL
Vendor_Name	CharacterString	R	■	R	DAIKIN Industries LTD
Vendor_Identifier	Unsigned16	R	■	R	Fixed to 53 (= DAIKIN)
Model_Name	CharacterString	R	■	R	Fixed to "Daikin iTM Server Control"
Firmware_Revision	CharacterString	R	■	R	
Application_Software_ Version	CharacterString	R	■	R	
Location	CharacterString	O	□	—	
Description	CharacterString	O	■	R	Fixed to "Daikin iTM Server Control"
Protocol_Version	Unsigned	R	■	R	
Protocol_Revision	Unsigned	R	■	R	
Protocol_Services_ Supported	BACnetServiceSupported	R	■	R	SubCOV, RP, RPM, WP, WPM, I-Am, I-Have, TimeSync, Who-Is, Who-Has, UTCTimeSync
Protocol_Object_Types_ Supported	BACnetObjectTypesSupported	R	■	R	BO, MV, Device
Object_List	BACnetARRAY[N] of BACnetObjectIdentifier	R	■	R	
Max_APDU_Length_ Accepted	Unsigned	R	■	R	1024
Segmentation_Supported	BACnetSegmentation	R	■	R	SEGMENTED_BOTH
Max_Segments_Accepted	Unsigned	O1	■	R	Fixed to 100
VT_Class_Supported	List of BACnetVTClass	O1	□	—	
Active_VT_Sessions	List of BACnetVTSession	O2	□	—	
Local_Time	Time	O3, 4	■	R	Follows the *iTM* clock
Local_Date	Date	O3, 4	■	R	Follows the *iTM* clock
UTC_Offset	Signed	O4	■	R	Follows the *iTM* clock
Daylight_Saving_Status	Boolean	O4	■	R	Follows the *iTM* clock

Continued from previous page.

Property Identifier	Property Datatype	Compatible Class	Support ■ = Yes, □ = No	R: Readable W: Writable	Remarks
APDU_Segment_Timeout	Unsigned	O1	■	R	Configurable with BACnet® Server/ Gateway Configuration (*)
APDU_Timeout	Unsigned	R	■	R	Configurable with BACnet® Server/ Gateway Configuration (*)
Number_Of_APDU_Retries	Unsigned	R	■	R	Configurable with BACnet® Server/ Gateway Configuration (*)
List_Of_Session_Keys	List of BACnetSessionKey	O	□	—	
Time_Synchronization_ Recipients	List of BACnetRecipient	O5	□	—	
Max_Master	Unsigned (1...127)	O6	□	—	
Max_Info_Frames	Unsigned	O6	□	—	
Device_Address_Binding	List of BACnetAddressBinding	R	■	R	
Database_Revision	Unsigned	R	■	R	
Configuration_Files	BACnetARRAY[N] of BACnetObjectIdentifier	O7	□	—	
Last_Restore_Time	BACnetDateTime	O7	□	—	
Backup_Failure_Timeout	Unsigned16	O8	□	—	
Active_COV_Subscriptions	List of BACnetCOVSubscription	O9	■	R	
Profile_Name	CharacterString	O	□	—	

(*) is a common group setting in the *iTM* system.

5.3 Outdoor Unit Devices

Property Identifier	Property Datatype	Compatible Class	Support ■ = Yes □ = No	R: Readable W: Writable	Remarks
Object_Identifier	BACnetObjectIdentifier	R	■	R	Settable with the Trail Operation Tool
Object_Name	CharacterString	R	■	R	Outdoor unit name*
Object_Type	BACnetObjectType	R	■	R	DEVICE
System_Status	BACnetDeviceStatus	R	■	R	Fixed to OPERATIONAL
Vendor_Name	CharacterString	R	■	R	DAIKIN Industries LTD
Vendor_Identifier	Unsigned16	R	■	R	Fixed to 53 (= DAIKIN)
Model_Name	CharacterString	R	■	R	Fixed to "Daikin *iTM* Server Control"
Firmware_Revision	CharacterString	R	■	R	
Application_Software_ Version	CharacterString	R	■	R	
Location	CharacterString	O	□	—	
Description	CharacterString	O	■	R	DIII-Net connection part number + AirNet address eg.[1:1]
Protocol_Version	Unsigned	R	■	R	
Protocol_Revision	Unsigned	R	■	R	
Protocol_Services_ Supported	BACnetServiceSupported	R	■	R	RP, RPM, I-Am, TimeSync, Who-Is, Who-Has, UTCTimeSync
Protocol_Object_Types_ Supported	BACnetObjectTypesSupp orted	R	■	R	AI, MI, BI Device
Object_List	BACnetARRAY[N] of BACnetObjectIdentifier	R	■	R	
Max_APDU_Length_ Accepted	Unsigned	R	■	R	1024
Segmentation_Supported	BACnetSegmentation	R	■	R	SEGMENTED_BOTH
Max_Segments_Accepted	Unsigned	O1	■	R	Fixed to 100
VT_Class_Supported	List of BACnetVTClass	O1	□	—	
Active_VT_Sessions	List of BACnetVTSession	O2	□	—	
Local_Time	Time	O3, 4	■	R	Follows the *iTM* clock
Local_Date	Date	O3, 4	■	R	Follows the *iTM* clock
UTC_Offset	Signed	O4	■	R	Follows the *iTM* clock
Daylight_Saving_Status	Boolean	O4	■	R	Follows the *iTM* clock

* UTF-8 is the character code for Object_Names

Continued from previous page.

Property Identifier	Property Datatype	Compatible Class	Support ■ = Yes, □ = No	R: Readable W: Writable	Remarks
APDU_Segment_Timeout	Unsigned	O1	■	R	Configurable with the Trial Operation tool (*)
APDU_Timeout	Unsigned	R	■	R	Configurable with the Trial Operation tool (*)
Number_Of_APDU_Retries	Unsigned	R	■	R	Configurable with the Trial Operation tool (*)
List_Of_Session_Keys	List of BACnetSessionKey	O	□	—	
Time_Synchronization_ Recipients	List of BACnetRecipient	O5	□	—	
Max_Master	Unsigned (1...127)	O6	□	—	
Max_Info_Frames	Unsigned	O6	□	—	
Device_Address_Binding	List of BACnetAddressBinding	R	■	R	
Database_Revision	Unsigned	R	■	R	
Configuration_Files	BACnetARRAY[N] of BACnetObjectIdentifier	O7	□	—	
Last_Restore_Time	BACnetDateTime	O7	□	—	
Backup_Failure_Timeout	Unsigned16	O8	□	—	
Active_COV_Subscriptions	List of BACnetCOVSubscription	O9	□	—	
Profile_Name	CharacterString	O	□	—	

(*) is a common group setting in the iTM system.

5.4 Analog Input Object Type

Property Identifier	Property Datatype	Compatible Class	Support* ■ = Yes, □ = No	R: Readable W: Writable	Remarks
Object_Identifier	BACnetObjectIdentifier	R	■	R	
Object_Name	CharacterString	R	■	R	
Object_Type	BACnetObjectType	R	■	R	ANALOG_INPUT
Present_Value	REAL	R1	■	R	
Description	CharacterString	O	□	—	
Device_Type	CharacterString	O	□	—	
Status_Flags	BACnetStatusFlags	R	■	R	IN_ALARM (Always FALSE) FAULT (TRUE: Communication error) OVERRIDDEN (Always FALSE) OUT_OF_SERVICE (Always FALSE)
Event_State	BACnetEventState	R	■	R	Fixed to NORMAL
Reliability	BACnetReliability	O	■	R	NO_FAULT_DETECTED: Normal communication NO_SENSOR: Sensor error UNRELIABLE_OTHER: Communication error
Out_Of_Service	BOOLEAN	R	■	R	Always FALSE
Update_Interval	Unsigned	O	□	—	
Units	BACnetEngineeringUnits	R	■	R	Refer **to 7.2 Individual Object Specifications**
Min_Pres_Value	REAL	O	□	—	
Max_Pres_Value	REAL	O	□	—	
Resolution	REAL	O	□	—	
COV_Increment	REAL	O2	■	R	Fixed to 1.0 *There is no support for objects which are unsupported by COV. For objects covered by COV, Refer to **8. Report Functions**
Time_Delay	Unsigned	O3	□	—	
Notification_Class	Unsigned	O3	□	—	
High_Limit	REAL	O3	□	—	
Low_Limit	REAL	O3	□	—	
Deadband	REAL	O3	□	—	
Limit_Enable	BACnetLimitEnable	O3	□	—	
Event_Enable	BACnetEventTransitionBits	O3	□	—	
Acked_Transitions	BACnetEventTransitionBits	O3	□	—	
Notify_Type	BACnetNotifyType	O3	□	—	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O3	□	—	
Profile_Name	CharacterString	O	□	—	

5.5 Analog Value Object Type

Property Identifier	Property Datatype	Compatible Class	Support ■ = Yes, □ = No	R: Readable W: Writable	Remarks
Object_Identifier	BACnetObjectIdentifier	R	■	R	
Object_Name	CharacterString	R	■	R	
Object_Type	BACnetObjectType	R	■	R	ANALOG_VALUE
Present_Value	REAL	W	■	W	
Description	CharacterString	O	□	—	
Status_Flags	BACnetStatusFlags	R	■	R	IN_ALARM (Always FALSE) FAULT (TRUE: Communication error) OVERRIDDEN (Always FALSE) OUT_OF_SERVICE (Always FALSE)
Event_State	BACnetEventState	R	■	R	Fixed to NORMAL
Reliability	BACnetReliability	O	■	R	NO_FAULT_DETECTED: Normal communication UNRELIABLE_OTHER: Communication error
Out_Of_Service	Boolean	R	■	R (*)	("Unocc Cooling Setpoint“ "Unocc Heating Setpoint" "Max Cooling Setpoint“ "Min Cooling Setpoint" "Max Heating Setpoint“ "Min Heating Setpoint") TRUE: Disabled FALSE: Enabled [Other] Always FALSE
Units	BACnetEngineeringUnits	R	■	R	Follows the setting on *iTM*
PriorityArray	BACnetPriorityArray	O1	■	R	
RelinquishDefault	REAL	O1	■	R	Fixed
COV_Increment	REAL	O2	■	R	Fixed to 1.0
Time_Delay	Unsigned	O2	□	—	
Notification_Class	Unsigned	O3	□	—	
High_Limit	REAL	O3	□	—	
Low_Limit	REAL	O3	□	—	
Deadband	REAL	O3	□	—	
Limit_Enable	BACnetLimitEnable	O3	□	—	
Event_Enable	BACnetEventTransitionBits	O3	□	—	
Acked_Transitions	BACnetEventTransitionBits	O3	□	—	
Notify_Type	BACnetNotifyType	O3	□	—	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O3	□	—	
Profile_Name	CharacterString	O	□	—	

(*) Writing is possible only to objects that can change between TRUE and FALSE.
(See Chapter 6 for details.)

5.6 Binary Input Object Type

Property Identifier	Property Datatype	Compatible Class	Support ■ = Yes, □ = No	R: Readable W: Writable	Remarks
Object_Identifier	BACnetObjectIdentifier	R	■	R	
Object_Name	CharacterString	R	■	R	
Object_Type	BACnetObjectType	R	■	R	BINARY_INPUT
Present_Value	BACnetBinaryPV	R1	■	R	
Description	CharacterString	O	■	R	[Alarm Status] Sets an error code [Other] Sets the string corresponding to the current value
Device_Type	CharacterString	O	□	—	
Status_Flags	BACnetStatusFlags	R	■	R	IN_ALARM (Always FALSE) FAULT (TRUE: Communication error) OVERRIDDEN (Always FALSE) OUT_OF_SERVICE (Always FALSE)
Event_State	BACnetEventState	R	■	R	Fixed to NORMAL
Reliability	BACnetReliability	O	■	R	NO_FAULT_ DETECTED: Normal communication NO_SENSOR: Sensor error UNRELIABLE_ OTHER: Communication error
Out_Of_Service	Boolean	R	■	R	Always FALSE
Polarity	BACnetPolarity	R	■	R	Fixed to NORMAL
Inactive_Text	CharacterString	O2	■	R	Sets the string corresponding to Inactive
Active_Text	CharacterString	O2	■	R	Sets the string corresponding to Active
Change_Of_State_Time	BACnetDateTime	O3	□	—	
Change_Of_State_Count	Unsigned	O3	□	—	
Time_Of_State_Count_Reset	BACnetDateTime	O3	□	—	
Elapsed_Active_Time	Unsigned32	O4	□	—	
Time_Of_Active_Time_Reset	BACnetDateTime	O4	□	—	
Time_Delay	Unsigned	O5	□	—	
Notification_Class	Unsigned	O5	□	—	
Alarm_Value	BACnetBinaryPV	O5	□	—	
Event_Enable	BACnetEventTransitionBits	O5	□	—	
Acked_Transitions	BACnetEventTransitionBits	O5	□	—	
Notify_Type	BACnetNotifyType	O5	□	—	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O5	□	—	
Profile_Name	CharacterString	O	□	—	

5.7 Binary Output Object Type

Property Identifier	Property Datatype	Compatible Class	Support ■ = Yes, □ = No	R: Readable W: Writable	Remarks
Object_Identifier	BACnetObjectIdentifier	R	■	R	
Object_Name	CharacterString	R	■	R	
Object_Type	BACnetObjectType	R	■	R	BINARY_OUTPUT
Present_Value	BACnetBinaryPV	R	■	W	
Description	CharacterString	O	■	R	Sets the string corresponding to the current value
Device_Type	CharacterString	O	□	—	
Status_Flags	BACnetStatusFlags	R	■	R	IN_ALARM (Always FALSE) FAULT (TRUE: Communication error) OVERRIDDEN (Always FALSE) OUT_OF_SERVICE (Always FALSE)
Event_State	BACnetEventState	R	■	R	Fixed to NORMAL
Reliability	BACnetReliability	O	■	R	Always NO_FAULT_ DETECTED
Out_Of_Service	Boolean	R	■	R	Always FALSE
Polarity	BACnetPolarity	R	■	R	Fixed to NORMAL
Inactive_Text	CharacterString	O1	■	R	Sets the string corresponding to Inactive
Active_Text	CharacterString	O1	■	R	Sets the string corresponding to Active
Change_Of_State_Time	BACnetDateTime	O2	□	—	
Change_Of_State_Count	Unsigned	O2	□	—	
Time_Of_State_Count_ Reset	BACnetDateTime	O2	□	—	
Elapsed_Active_Time	Unsigned32	O3	□	—	
Time_Of_Active_Time_ Reset	BACnetDateTime	O3	□	—	
Minimum_Off_Time	Unsigned32	O	□	—	
Minimum_On_Time	Unsigned32	O	□	—	
Priority_Array	BACnetPriorityArray	R	■	R	
Relinquish_Default	BACnetBinaryPV	R	■	R	
Time_Delay	Unsigned	O4	□	—	
Notification_Class	Unsigned	O4	□	—	
Feedback_Value	BACnetBinaryPV	O4	□	—	
Event_Enable	BACnetEventTransitionBits	O4	□	—	
Acked_Transitions	BACnetEventTransitionBits	O4	□	—	
Notify_Type	BACnetNotifyType	O4	□	—	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O4	□	—	
Profile_Name	CharacterString	O	□	—	

5.8 Binary Value Object Type

Property Identifier	Property Datatype	Compatible Class	Support ■ = Yes, □ = No	R: Readable W: Writable	Remarks
Object_Identifier	BACnetObjectIdentifier	R	■	R	
Object_Name	CharacterString	R	■	R	
Object_Type	BACnetObjectType	R	■	R	BINARY_VALUE
Present_Value	BACnetBinaryPV	R1	■	W	
Description	CharacterString	O	■	R	Sets the string corresponding to the current value
Status_Flags	BACnetStatusFlags	R	■	R	IN_ALARM (Always FALSE) FAULT (TRUE: Communication error) OVERRIDDEN (Always FALSE) OUT_OF_SERVICE (Always FALSE)
Event_State	BACnetEventState	R	■	R	Fixed to NORMAL
Reliability	BACnetReliability	O	■	R	NO_FAULT_DETECTED: Normal communication UNRELIABLE_OTHER: Communication error
Out_Of_Service	Boolean	R	■	R	Always FALSE
Inactive_Text	CharacterString	O2	■	R	Sets the string corresponding to Inactive
Active_Text	CharacterString	O2	■	R	Sets the string corresponding to Active
Change_Of_State_Time	BACnetDateTime	O3	□	—	
Change_Of_State_Count	Unsigned	O3	□	—	
Time_Of_State_Count_Reset	BACnetDateTime	O3	□	—	
Elapsed_Active_Time	Unsigned32	O4	□	—	
Time_Of_Active_Time_Reset	BACnetDateTime	O4	□	—	
Minimum_Off_Time	Unsigned32	O	□	—	
Minimum_On_Time	Unsigned32	O	□	—	
Priority_Array	BACnetPriorityArray	R5	■	R	
Relinquish_Default	BACnetBinaryPV	R5	■	R	
Time_Delay	Unsigned	O6	□	—	
Notification_Class	Unsigned	O6	□	—	
Alarm_Value	BACnetBinaryPV	O6	□	—	
Event_Enable	BACnetEventTransitionBits	O6	□	—	
Acked_Transitions	BACnetEventTransitionBits	O6	□	—	
Notify_Type	BACnetNotifyType	O6	□	—	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O6	□	—	
Profile_Name	CharacterString	O	□	—	

5.9 Multi-State Input Object Type

Property Identifier	Property Datatype	Compatible Class	Support ■ = Yes, □ = No	R: Readable W: Writable	Remarks
Object_Identifier	BACnetObjectIdentifier	R	■	R	
Object_Name	CharacterString	R	■	R	
Object_Type	BACnetObjectType	R	■	R	MULTI-STATE_INPUT
Present_Value	Unsigned	R1	■	R	
Description	CharacterString	O	■	R	Sets the string corresponding to the current value
Device_Type	CharacterString	O	□	—	
Status_Flags	BACnetStatusFlags	R	■	R	IN_ALARM (Always FALSE) FAULT (TRUE: Communication error) OVERRIDDEN (Always FALSE) OUT_OF_SERVICE (Always FALSE)
Event_State	BACnetEventState	R	■	R	Fixed to NORMAL
Reliability	BACnetReliability	O2	■	R	NO_FAULT_ DETECTED: Normal communication UNRELIABLE_OTHER: Communication error
Out_Of_Service	Boolean	R	■	R	Always FALSE
Number_Of_States	Unsigned	R	■	R	Sets the number of states
State_Text	BACnetARRAY[N] of CharacterString	O	■	R	Sets the string corresponding to Present_Value
Time_Delay	Unsigned	O3	□	—	
Notification_Class	Unsigned	O3	□	—	
Alarm_Values	List of Unsigned	O3	□	—	
Fault_Values	List of Unsigned	O3	□	—	
Event_Enable	BACnetEventTransitionBits	O3	□	—	
Acked_Transitions	BACnetEventTransitionBits	O3	□	—	
Notify_Type	BACnetNotifyType	O3	□	—	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O3	□	—	
Profile_Name	CharacterString	O	□	—	

5.10 Multi-State Output Object Type

Property Identifier	Property Datatype	Compatible Class	Support ■ = Yes, □ = No	R: Readable W: Writable	Remarks
Object_Identifier	BACnetObjectIdentifier	R	■	R	
Object_Name	CharacterString	R	■	R	
Object_Type	BACnetObjectType	R	■	R	MULTI-STATE_OUTPUT
Present_Value	Unsigned	W	■	W	
Description	CharacterString	O	■	R	Sets the string corresponding to the current value
Device_Type	CharacterString	O	□	—	
Status_Flags	BACnetStatusFlags	R	■	R	IN_ALARM (Always FALSE) FAULT (TRUE: Communication error) OVERRIDDEN (Always FALSE) OUT_OF_SERVICE (Always FALSE)
Event_State	BACnetEventState	R	■	R	Fixed to NORMAL
Reliability	BACnetReliability	O	■	R	NO_FAULT_DETECTED: Normal communication UNRELIABLE_OTHER: Communication error
Out_Of_Service	Boolean	R	■	R	Always FALSE
Number_Of_States	Unsigned	R	■	R	Sets the number of states
State_Text	BACnetARRAY[N] of CharacterString	O	■	R	Sets the string corresponding to Present_Value
Priority_Array	BACnetPriorityArray	R	■	R	
Relinquish_Default	Unsigned	R	■	R	
Time_Delay	Unsigned	O1	□	—	
Notification_Class	Unsigned	O1	□	—	
Feedback_Value	Unsigned	O1	□	—	
Event_Enable	BACnetEventTransitionBits	O1	□	—	
Acked_Transitions	BACnetEventTransitionBits	O1	□	—	
Notify_Type	BACnetNotifyType	O1	□	—	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O1	□	—	
Profile_Name	CharacterString	O	□	—	

5.11 Multi-State Value Object Type

Property Identifier	Property Datatype	Compatible Class	Support ■ = Yes, □ = No	R: Readable W: Writable	Remarks
Object_Identifier	BACnetObjectIdentifier	R	■	R	
Object_Name	CharacterString	R	■	R	
Object_Type	BACnetObjectType	R	■	R	MULTI-STATE_VALUE
Present_Value	Unsigned	R1	■	W	
Description	CharacterString	O	■	R	Sets the string corresponding to the current value
Status_Flags	BACnetStatusFlags	R	■	R	IN_ALARM (Always FALSE) FAULT (TRUE: Communication error) OVERRIDDEN (Always FALSE) OUT_OF_SERVICE (Always FALSE)
Event_State	BACnetEventState	R	■	R	Fixed to NORMAL
Reliability	BACnetReliability	O2	■	R	NO_FAULT_DETECTED: Normal communication UNRELIABLE_OTHER: Communication error
Out_Of_Service	Boolean	R	■	R	Always FALSE
Number_Of_States	Unsigned	R	■	R	Sets the number of states
State_Text	BACnetARRAY[N] of CharacterString	O	■	R	Sets the string corresponding to Present_Value
Priority_Array	BACnetPriorityArray	O3	■	R	
Relinquish_Default	Unsigned	O3	■	R	
Time_Delay	Unsigned	O4	□	—	
Notification_Class	Unsigned	O4	□	—	
Alarm_Values	List of Unsigned	O4	□	—	
Fault_Values	List of Unsigned	O4	□	—	
Event_Enable	BACnetEventTransitionBits	O4	□	—	
Acked_Transitions	BACnetEventTransitionBits	O4	□	—	
Notify_Type	BACnetNotifyType	O4	□	—	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O4	□	—	
Profile_Name	CharacterString	O	□	—	

6. Error Response in BACnet® Communication

When a request from a *BACnet* Client cannot be processed, one of the Protocol Data Unit (PDU)'s listed below is returned.

Error PDU	Error Class	Error Code
Request for accessing an unimplemented object	OBJECT (1)	UNKNOWN_OBJECT (31)
Request for accessing an unimplemented property	PROPERTY (2)	UNKNOWN_PROPERTY (32)
Request for writing a write-protected property	PROPERTY (2)	WRITE_ACCESS_DENIED (40)
Request for writing a property with a wrong type of value	PROPERTY (2)	INVALID_DATATYPE (9)
Request for accessing an array-type property by specifying an out-of-range index	PROPERTY (2)	INVALID_ARRAY_INDEX (42)
Request for accessing a non-array-type property by specifying an index	PROPERTY (2)	PROPERTY_IS_NOT_AN_ARRAY (50)
Request for writing an out-of-range value	PROPERTY (2)	VALUE_OUT_OF_RANGE (37)
COV subscription for an object not supporting COV notification	SERVICES (5)	OTHER (0)
Request for registering a total of 6 or more COV notification recipients	SERVICES (5)	COV_SUBSCRIPTION_FAILED (43)

Reject PDU	Reject Reason
Excessive or missing PropertyID or value for WritePropertyMultiple	INCONSISTENT_PARAMETER (2)
Different argument type for the service	INVALID_PARAMETER_DATA_TYPE (3)
Error detected during tag decoding	INVALID_TAG (4)
Missing parameter during service execution	MISSING_REQUIRED_PARAMETER (5)
Excessive arguments for the service	TOO_MANY_ARGUMENTS (7)
Execution of unsupported service with confirmation	UNRECOGNIZED_SERVICE (9)

Abort PDU	Abort Reason
• Process overflow due to massive requests	BUFFER_OVERFLOW (1)
• Response message size is larger than the maximum transmittable size (100 segments)	
Segment processing aborted because an unexpected APDU has been received during processing	INVALID_APDU_IN_THIS_STATE (2)
Respondent does not support segment in segment response	SEGMENTATION_NOT_SUPPORTED (4)

7. Detailed Description of Objects

7.1 Specifications Common to All Objects

For each communication status of an indoor unit, objects related to that indoor unit and system control device are treated in *BACnet* as follows:

1. **Indoor unit communicating normally**
   Other *BACnet* devices can access all objects for the indoor unit.
   The value of the following properties of each object at this point is as follows:
   Reliability: NOFAULT_DETECTED
   FAULT flag of the Status_Flags property: FALSE
2. **Indoor unit communication in error**
   Although other *BACnet* devices can access objects for the indoor unit, requests for Present_Value readout returns values immediately before the communication error.
   If the aforementioned value is undetermined, 0 is returned for AI, Inactive for BI, and 1 for MI.
   Objects of type Output and Value follow the value of Relinquish_Default property.
   Furthermore, the value of the following properties for objects other than the communication status object at this point is as follows:
   Reliability: UNRELIABLE_OTHER
   FAULT flag of the Status_Flags property: TRUE
   When issued during a communication error, commands are not sent out to the *VRV* communication line (DIII network).

   Note 1: In the indoor unit, the setpoints, start/stop status, mode, airflow direction, and fan speed are written to the non-volatile memory each time they are changed so the settings are not lost in the event of a power failure.
   The number of times this non-volatile memory can be written is limited, and writing beyond that limit may cause failure to the indoor unit EEPROM. This will not cause the indoor unit to stop functioning; however, the volatile memory will not retain the last settings received.
   Consequently, when the setpoints, start/stop status, dependent mode, airflow direction, and fan speed are frequently changed by automatic control from the BMS, the number of times each setting for each indoor unit is limited to 70,000 – 80,000 times per year (dependent on the indoor unit manufacturing date).
3. **Outdoor unit communicating normally**
   Other *BACnet* devices can access to all objects for the outdoor unit.
   The values of the following properties of each object at this point are as follows.
   Reliability: NOFAULT_DETECTED
   FAULT flag of the Status_Flags perperty: FALSE
4. **Outdoor unit communicating in error**
   Although other *BACnet* devices can access objects for the outdoor unit, requests for Present_Value readout return values immediately before the communication error.
   If the aforementioned value is undetermined, 0 is returned for AI, Inactive for BI, and 1 for MI.
   Furthermore, the value of the following properties of objects other than communication status object at this point is as follows.
   Reliability : UNRELIABLE_OTHER
   FAULT flag of the Status_Flags property: TRUE

Warning: Command priority control on objects of type Value.
During a WriteProperty (Multiple) service execution, the command priority control is applied according to the *BACnet* specifications.
Commands/setting changes can be issued to each indoor unit from the *iTM* Setup screen and the Remote Controller (remote controller operation) (hereinafter collectively called "local operation").
When a local operation is performed on objects of type Value, the Present_Value is changed without changing the value of Priority_Array to allow status monitoring.
While the indoor unit control co-exists between both the *BACnet* operation and local operation, the latest occurrence has priority (i.e., the last command wins). Since there is no priority on the DIII network, and command priority control only applies to operations at the BMS, the highest priority is not always Priority_Array value = Present_Value value.

Out_Of_Service property
Objects able to change the value (TRUE/FALSE) of the Out_Of_Service property determine its value in accordance with the *iTM* settings.
However, the value is TRUE if communication has never been established with the indoor units since the *iTM* was started up.
Executing a command on the Out_Of_Service property when there is a communication error or during maintenance* returns error (WRITE_ACCESS_DENIED).
* Maintenance is a status in which the indoor unit is temporarily removed from the targets of monitoring and control by the *iTM*.

About this Property
The Units property of the indoor and outdoor unit device AI and AV objects are as follows:

BACnet® Engineering List	
Value	Unit
3	A (Amperes)
48	kW (Kilowatts)
51	HP (Horse Power)
56	psi (Pounds force per square inch)
62	°C (Degrees Celsius)
64	°F (Degrees Fahrenheit)
95	None (No units)

7.2 Individual Object Specifications

1. Individual indoor unit object specifications

a. Occupancy Mode

Member number: 1
Object name: Occupancy Mode
Object type: Multistate Output
Description: Controls the indoor unit based on the occupancy status.
Present_Value property:
1: Unocc
2: Occ
3: Standby

Notes:

1. Controls the indoor unit in accordance with the command also when the same value is written to Present_Value.
2. Present_Value is set to "1" at *iTM* start-up.
3. Relinquish_Default property is fixed to "1".
   When the BMS changes the present value property of the Occupancy Mode object, the *iTM* sends the operation command to the indoor unit and enables/disables the Timer Extension of the indoor unit management point on the *iTM* as follows:

iTM Action[*1] / Occupancy Mode	Sends On/Off Command to Indoor Unit	Sends Energy saving command to Indoor Unit	Enable/Disable Timer Extension of Indoor Unit management point on iTM
Occ	On	Disable	Disable
Standby	On	Enable[*2]	Disable
Unocc	Off	Disable	Enable

*1 *iTM* sends the on/off operation command to indoor unit, even if the indoor unit has the same on/off state.

*2 If the BMS sets 'Standby' to the present value property of Occupancy Mode Object, Remote Controller displays "Central Control" on its screen. When enabled, the indoor unit setpoint is offset (increased in cool mode or decreased in heat mode) by a fixed internal value of 3.6°F (2°C). This value (offset) is not displayed on the local controller, *iTM* or *BACnet* Server's setpoint present value as the actual setpoint is unchanged.

2. Unit On_Off Status

Member number: 2
Object name: Unit On_Off Status
Object type: Binary Input
Description: Monitors the indoor unit on/off status.
Present_Value property:
ACTIVE: On
INACTIVE: Off
Notes:

1. The IN_ALARM flag of the Status_Flags property of this object for an indoor unit in error is not TRUE. To detect the occurrence of an error, always refer to the value of the Alarm Status object.
2. Even when the indoor unit is in error, the operating status remains at Operating (the value of the Present_Value property remains ACTIVE).

3. Alarm Status

Member number: 3
Object name: Alarm Status
Object type: Binary Input
Description: Monitors the indoor unit alarm status.
Present_Value property:
ACTIVE: Alarm
INACTIVE: Normal
Notes:
"Alarm" means the indoor unit is "stopped" due to error.
The contents of the Description property are as follows:
Error: Error code (2 or 5 characters)
Normal: 00

4. Operation Mode

Member number: 4
Object name: Operation Mode
Object type: Multistate Value
Description: Monitors/configures the indoor unit operation mode.
Present_Value property:
1: Cool
2: Heat
3: Fan
4: Dry
Notes:

1. Relinquish_Default property is fixed to "1".
2. When a command that cannot be executed is issued to an indoor unit without the changeover option, the command is delivered, and the operation determined by the indoor unit.

5. Room Temperature

Member number: 5
Object name: Room Temperature
Object type: Analog Input
Description: Monitors the room temperature received from the indoor unit.
Present_Value property:
Room temperature detected by the indoor unit (or remote controller).
Notes:

1. The unit is degrees Celsius (°C) or degrees Fahrenheit (°F), depending on the *iTM* system settings.
2. The number of significant digits is up to one decimal place for both degrees Celsius and degrees Fahrenheit.
3. If the indoor unit is not equipped with a room temperature sensor, the Present_Value property is 0.0°C or 0.0°F.
4. If the room temperature sensor is disconnected, the Reliability property changes to NO_SENSOR while the FAULT flag of the Status_Flags property changes to TRUE.
   The Present_Value property retains the last value.
5. When subscribed to COV notification, the COV_Increment property is fixed to 1.0 and cannot be changed.
   COV notification is issued when a change of 1°C/1°F or more is detected.
   The next COV notification is issued when the temperature changes 1°C/1°F or more from the value of the Present_Value property that triggered the previous COV notification.

6. Occ Cooling Setpoint

Member number: 6
Object name: Occ Cooling Setpoint
Object type: Analog Value
Description: Monitors/configures the indoor unit setpoint (cool).
Present_Value property:
Setpoint (cool) used by the indoor unit.
Notes:

1. The unit is degrees Celsius (°C) or degrees Fahrenheit (°F), depending on the *iTM* system settings.
2. The number of significant digits is up to one decimal place for degrees Celsius and zero decimal places for degrees Fahrenheit.
3. A setpoint has an upper/lower limit value. If a value outside that range is specified, it is corrected to the upper/lower limit value 16–32°C/60–90°F.
4. Relinquish_Default property is fixed to 22.2°C/72°F.
5. When subscribed to COV notification, the COV_Increment property is fixed to 1.0 and cannot be changed.
   COV notification is issued when a change of 1°C/1°F or more is detected.
   The next COV notification is issued when the temperature further changes for 1°C/1°F or more from the value of the Present_Value property that triggered the previous COV notification.

7. Occ Heating Setpoint

Member number: 7
Object name: Occ Heating Setpoint
Object type: Analog Value
Description: Monitors/configures the indoor unit setpoint (heat).
Present_Value property:
Setpoint (heat) used by the indoor unit.

Notes:

1. The unit is degrees Celsius (°C) or degrees Fahrenheit (°F), depending on the *iTM* system settings.
2. The number of significant digits is up to one decimal place for degrees Celsius and zero decimal places for degrees Fahrenheit.
3. A setpoint has an upper/lower limit value. If a value outside that range is specified, it is corrected to the upper/lower limit value 16–32°C/60–90°F.
4. Relinquish_Default property is fixed to 22.2°C/72°F.
5. When subscribed to COV notification, the COV_Increment property is fixed to 1.0 and cannot be changed.
   COV notification is issued when a change of 1°C/1°F or more is detected.
   The next COV notification is issued when the temperature further changes for 1°C/1°F or more from the value of the Present_Value property that triggered the previous COV notification.

8. Unocc Cooling Setpoint

Member number: 8
Object name: Unocc Cooling Setpoint
Object type: Analog Value
Description: Monitors/configures the indoor unit setback temperature (cool).
Present_Value property:
Setback temperature (cool) used to prevent space over heating during the unoccupied period.

Notes:

1. The unit is degrees Celsius (°C) or degrees Fahrenheit (°F), depending on the system settings.
2. The number of significant digits is up to one decimal place for degrees Celsius and zero decimal places for degrees Fahrenheit.
3. The settable values are fixed by the system (16.7 to 35.0 [°C] / 62 to 95 [°F]). If a value outside the range is written, it is corrected to the upper/lower limit value.
4. Value is associated with the cooling setback setpoint of the *iTM*.
5. Out_Of_Service property
   If TRUE: The setback temperature (cool) is disabled.
   If FALSE: The setback temperature (cool) is enabled.
   - The following table shows the corresponding difference between the Out_Of_Service property status and the response of the Present_Value and setback temperature (cool) on the indoor unit to a command from the BMS.

Response to command from BMS / Out_of_Service property	Present_Value	Setback temperature (cool)
TRUE	Error ErrorClass=PROPERTY ErrorCode=WRITE_ACCESS_DENIED	No change
FALSE	Change	←

When the Out_Of_Service property changes from TRUE to FALSE, the Present_Value changes to the value set on the *iTM*.
If the unoccupied cooling setpoint point is set by the *iTM*, the BMS does not need to change the Out_Of_Service property unless a value change is needed.

- The following table shows the corresponding difference between the current status of the Out_Of_Service property and Present_Value when a command for Out_Of_Service property is sent from the *iTM* or BMS.

Command value / Current status	*iTM* (Command sent by operating the unit)		BMS	
	TRUE (Disable)	FALSE (Enable)	TRUE	FALSE
TRUE	—	—	—	—
FALSE	○	—	—	—

○: Present_Value changed to that of Relinquish_Default.
– : Present_Value remains unchanged.

6. Relinquish_Default property is fixed to 26.7°C/80°F.
7. When subscribed to COV notification, the COV_Increment property is fixed to 1.0 and cannot be changed.
   COV notification is issued when a change of 1°C/1°F or more is detected.
   The next COV notification is issued when the temperature further changes for 1°C/1°F or more from the value of the Present_Value property that triggered the previous COV notification.

9. Unocc Heating Setpoint

Member number: 9
Object name: Unocc Heating Setpoint
Object type: Analog Value
Description: Configures/Monitors the indoor unit setback temperature (heat).
Present_Value property:
Setback temperature (heat) for the indoor unit.
Notes:

1. The unit is degrees Celsius (°C) or degrees Fahrenheit (°F), depending on the system settings.

2. The number of significant digits is up to one decimal place for degrees Celsius and zero decimal places for degrees Fahrenheit.
3. The settable values are fixed by the system (10.0 to 31.1 [°C] / 50 to 88 [°F]).
   If a value outside the range is written, it is corrected to the upper/lower limit value.
4. Out_Of_Service property
   If TRUE: The setback temperature (heat) is disabled.
   If FALSE: The setback temperature (heat) is enabled.
   The following table shows the correspondence between the Out_Of_Service property status and the response of the Present_Value and setback temperature (heat) on the indoor unit to the command from the BMS.

Response to command from BMS / Out_of_Service property	Present_Value	Setback temperature (heat)
TRUE	Error ErrorClass=PROPERTY ErrorCode=WRITE_ACCESS_DENIED	No change
FALSE	Change	←

When the Out_Of_Service property changes from TRUE to FALSE, the Present_Value changes to the value set on the *iTM*.

If the unoccupied heating setpoint point is set by the *iTM*, the BMS does not need to change the Out_Of_Service property unless a value change is needed.

The table below shows the correspondence between the current status of the Out_Of_Service property and the Present_Value when a command for Out_Of_Service property is sent from the *iTM* or BMS.

Command value / Current status	*iTM* (Command sent by operating the unit)		BMS	
	TRUE (Disable)	FALSE (Enable)	TRUE	FALSE
TRUE	—	—	—	—
FALSE	O	—	—	—

o: Present_Value changed to that of Relinquish_Default.
–: Present_Value remains unchanged.

5. Relinquish_Default property is fixed to 17.8°C/64°F.
6. When subscribed to COV notification, the COV_Increment property is fixed to 1.0 and cannot be changed.
   COV notification is issued when a change of 1°C/1°F or more is detected.
   The next COV notification is issued when the temperature further changes for 1°C/1°F or more from the value of the Present_Value property that triggered the previous COV notification.
7. Value is associated with the heating setback setpoint of the *iTM*.

10. Max Cooling Setpoint

Member number: 10
Object name: Max Cooling Setpoint
Object type: Analog Value
Description: Monitors/configures the upper limit for the indoor unit setpoint range (cool).
Present_Value property:
Upper limit for the setpoint range (cool) on the indoor unit.
Notes:

1. The unit is degrees Celsius (°C) or degrees Fahrenheit (°F), depending on the system settings.
2. The number of significant digits is up to one decimal place for degrees Celsius and zero decimal places for degrees Fahrenheit.
3. The settable values are between the upper and lower limits of the indoor unit cooling setpoint.
   If a value outside the range is written, it is corrected to the upper/lower limit value.
4. Out_Of_Service property
   If TRUE: The Setpoint Restriction (cool) is disabled.
   If FALSE: The Setpoint Restriction (cool) is enabled.

   <u>If value is changed from the BACnet®:</u>
   The Out_Of_Service property of the Setpoint Restriction lower limit (cool) (Min Cooling Setpoint) also changes to the same value along with Min Cooling Setpoint.

   If the Max Cooling Setpoint point is set by the *iTM*, the BMS does not need to change the Out_Of_Service property unless a value change is needed.

   The following table shows the correspondence between the Out_Of_Service property status and the response of Present_Value and setback temperature (cool) on the indoor unit to the command from BMS.

Response to command from BMS / **Out_of_Service property**	**Present_Value**	**Setpoint Restriction upper limit (cool)**
TRUE	Error ErrorClass=PROPERTY ErrorCode=WRITE_ACCESS_DENIED	No change
FALSE	Change	←

   When the Out_Of_Service property changes from TRUE to FALSE, the Present_Value changes to the value set on the *iTM*.

5. Relinquish_Default property is fixed to 32°C/90°F.
6. When subscribed to COV notification, the COV_Increment property is fixed to 1.0 and cannot be changed.
   COV notification is issued when a change of 1°C/1°F or more is detected.

The next COV notification is issued when the temperature further changes for 1°C/1°F or more from the value of the Present_Value property that triggered the previous COV notification.

11. Min Cooling Setpoint

Member number: 11
Object name: Min Cooling Setpoint
Object type: Analog Value
Description: Monitors/configures the lower limit for the indoor unit setpoint range (cool).
Present_Value property:
Lower limit for the setpoint range (cool) on the indoor unit
Notes:

1. The unit is degrees Celsius (°C) or degrees Fahrenheit (°F), depending on the system settings.
2. The number of significant digits is up to one decimal place for degrees Celsius and zero decimal places for degrees Fahrenheit.
3. The settable values are between the upper and lower limits of the indoor unit cooling setpoint.
   If a value outside the range is written, it is corrected to the upper/lower limit value.
4. Out_Of_Service property
   If TRUE: The Setpoint Restriction (cool) is disabled.
   If FALSE: The Setpoint Restriction (cool) is enabled.
   If value is changed from the *BACnet*:
   The Out_Of_Service property of the Setpoint Restriction upper limit (cool).
   (Max Cooling Setpoint) also changes to the same value along with Max Cooling Setpoint.

   If the Min Cooling Setpoint point is set by the *iTM*, the BMS does not need to change the Out_Of_Service property unless a value change is needed.

   The following table shows the correspondence between the Out_Of_Service property status and the response of the Present_Value and Setpoint Restriction lower limit (cool) on the indoor unit to the command from the BMS.

Response to command from BMS / Out_Of_Service property	Present_Value	Setpoint Restriction lower limit (cool)
TRUE	Error ErrorClass=PROPERTY ErrorCode=WRITE_ACCESS_DENIED	No change
FALSE	Change	←

   When the Out_Of_Service property changes from TRUE to FALSE, the Present_Value changes to the value set on the *iTM*.
5. Relinquish_Default property is fixed to 16°C/60°F.
6. When subscribed to COV notification, the COV_Increment property is fixed to 1.0 and cannot be changed.

COV notification is issued when a change of 1°C/1°F or more is detected.
The next COV notification is issued when the temperature further changes for 1°C/1°F or more from the value of the Present_Value property that triggered the previous COV notification.

12. Max Heating Setpoint

Member number: 12
Object name: Max Heating Setpoint
Object type: Analog Value
Description: Monitors/configures the upper limit for the indoor unit setpoint range (heat).
Present_Value property:
Upper limit for the setpoint range (heat) on the indoor unit.
Notes:

1. The unit is degrees Celsius (°C) or degrees Fahrenheit (°F), depending on the system settings.
2. The number of significant digits is up to one decimal place for degrees Celsius and zero decimal places for degrees Fahrenheit.
3. The settable values are between the upper and lower limits of the indoor unit heating setpoint.
   If a value outside the range is written, it is corrected to the upper/lower limit value.
4. Out_Of_Service property:
   If TRUE: The Setpoint Restriction (heat) is disabled.
   If FALSE: The Setpoint Restriction (heat) is enabled.

   <u>If value is changed from the BACnet®:</u>
   The Out_Of_Service property of the Setpoint Restriction lower limit (heat) (Min Heating Setpoint) also changes to the same value along with Min Heating Setpoint.

   If the Max Heating Setpoint point is set by the *iTM*, the BMS does not need to change the Out_Of_Service property unless a value change is needed.

   The following table shows the correspondence between the Out_Of_Service property status and the response of Present_Value and Setpoint Restriction upper limit (heat) on the indoor unit to the command from BMS.

Response to command from BMS / **Out_Of_Service property**	**Present_Value**	**Setpoint Restriction upper limit (heat)**
TRUE	Error ErrorClass=PROPERTY ErrorCode=WRITE_ACCESS_DENIED	No change
FALSE	Change	←

   When the Out_Of_Service property changes from TRUE to FALSE, the Present_Value changes to the value set on the *iTM*.

5. Relinquish_Default property is fixed to 32°C/90°F.

6. When subscribed to COV notification, the COV_Increment property is fixed to 1.0 and cannot be changed.
   COV notification is issued when a change of 1°C/1°F or more is detected.
   The next COV notification is issued when the temperature further changes for 1°C/1°F or more from the value of the Present_Value property that triggered the previous COV notification.

13. Min Heating Setpoint

Member number: 13
Object name: Min Heating Setpoint
Object type: Analog Value
Description: Monitors/configures the lower limit for the indoor unit setpoint range (heat).
Present_Value property:
Lower limit for the setpoint range (heat) on the indoor unit.
Notes:

1. The unit is degrees Celsius (°C) or degrees Fahrenheit (°F), depending on the system settings.
2. The number of significant digits is up to one decimal place for degrees Celsius and zero decimal places for degrees Fahrenheit.
3. The settable values are between the upper and lower limits of the indoor unit heating setpoint.
   If a value outside the range is written, it is corrected to the upper/lower limit value.
4. Out_Of_Service property:
   If TRUE: The Setpoint Restriction (heat) is disabled.
   If FALSE: The Setpoint Restriction (heat) is enabled.

   <u>If value is changed from the BACnet®:</u>
   The Out_Of_Service property of the Setpoint Restriction upper limit (heat) (Max Heating Setpoint) also changes to the same value along with Max Heating Setpoint.

   If the Min Heating Setpoint point is set by the *iTM*, the BMS does not need to change the Out_Of_Service property unless a value change is needed.

   The table below shows the correspondence between the Out_Of_Service property status and the response of Present_Value and Setpoint Restriction lower limit (heat) on the indoor unit to the command from BMS.

Response to command from BMS / **Out_Of_Service property**	**Present_Value**	**Setpoint Restriction lower limit (heat)**
TRUE	Error ErrorClass=PROPERTY ErrorCode=WRITE_ACCESS_DENIED	No change
FALSE	Change	←

When the Out_Of_Service property changes from TRUE to FALSE, the Present_Value changes to the value set on the iTM.

5. Relinquish_Default property is fixed to 16°C/60°F.
6. When subscribed to COV notification, the COV_Increment property is fixed to 1.0 and cannot be changed.
   COV notification is issued when a change of 1°C/1°F or more is detected.
   The next COV notification is issued when the temperature further changes for 1°C/1°F or more from the value of the Present_Value property that triggered the previous COV notification.

14. Min Setpoint Differential (Cooling & Heating)

Member number: 14
Object name: Min Setpoint Differential (Cooling & Heating)
Object type: Analog Value
Description: Monitors/configures the minimum heating and cooling setpoint difference for the indoor unit.
Present_Value property:
Minimum heating and cooling setpoint difference on the indoor unit

Notes:

1. The unit is degrees Celsius (°C) or degrees Fahrenheit (°F), depending on the system settings.
2. The number of significant digits is up to one decimal place for degrees Celsius and zero decimal places for degrees Fahrenheit.
3. The settable values are fixed by the system (0 to 4[°C] /0 to 7 [°F]).
   If a value outside the range is written, it is corrected to the upper/lower limit value.
4. Relinquish_Default property is fixed to 0°C/0°F.
5. When subscribed to COV notification, the COV_Increment property is fixed to 1.0 and cannot be changed.
   COV notification is issued when a change of 1°C/1°F or more is detected.
   The next COV notification is issued when the temperature further changes for 1°C/1°F or more from the value of the Present_Value property that triggered the previous COV notification.

15. Cooling & Heating Setpoint Tracking Mode

Member number: 15
Object name: Cooling & Heating Setpoint Tracking Mode
Object type: Binary Value
Description: Monitors/configures the status of the tracking mode for the indoor unit.
Present_Value property:
ACTIVE: Enable
INACTIVE: Disable

Note:

1. Relinquish_Default property is fixed to "INACTIVE".

16. Fan Speed

Member number: 16
Object name: Fan Speed
Object type: Multistate Value
Description: Monitors/configures the indoor unit fan speed level.
Present_Value property (Description property string):

1: Low
2: Reserved
3: Medium
4: Reserved
5: High
6: Reserved
7: Reserved
8: Auto

Notes:

1. The indoor unit has separate fan speed settings for "cool mode" and "heat mode". This object configures and reads the fan speed for the current operation mode.
2. If an Auto-command is sent to an indoor unit without the “auto” fan speed function, the command is sent but ignored by the indoor unit. The value of the Present_Value is changed to the current fan speed value returned by the indoor unit.
3. 5-speed indoor unit will be supported in the future; therefore, Present_Value = 2 and 4 are Not Available values.
4. For commands to 2-speed and 3-speed indoor units, use the Present_Values below:
   2-speed indoor unit: 1: "Low" 5: "High"
   3-speed indoor unit: 1: "Low" 3: "Medium" 5: "High"

Values other than those indicated above are unsupported. If a value other than those indicated above is sent to the Present_Value in a command in error, it is changed to a settable value and reflected as follows in the indoor unit.

Present_Value in the command	1	2	3	4	5	6	7	8
2-speed	1	5	5	5	5	5	5	8
3-speed	1	3	3	5	5	5	5	8

5. When a 5-speed indoor unit is connected to the *iTM*, the *iTM* identifies it as a 3-speed indoor unit.
   The following table shows the corresponding values in commands from the remote controller to the 5-speed indoor unit, fan speed indications on the *iTM*, and values of the Present_Value.

Value in command from the remote controller	1	2	3	4	5	6	7	8
Fan speed indication on the iTM	1	1	3	3	5	5	5	8
Present_Value	1	1	3	3	5	5	5	8

6. Relinquish_Default property is fixed to "1".

17. Airflow Direction

Member number: 17
Object name: Airflow Direction
Object type: Multistate Value
Description: Monitors/configures the airflow direction for the indoor unit.
Present_Value property:
1 to 5: P0 to P4
8: P7
Note:
1. The indoor unit has separate airflow direction settings for "cool mode" and "heat mode". This object configures and reads the airflow direction for the current operation mode.
2. Relinquish_Default property is fixed to "1".
3. When airflow direction for an indoor unit is set to "Auto", the value of Present_Value is "8".
4. When 6 or 7 are specified, the value is corrected to 5.

18. Timed Override Operation

Member number: 18
Object name: Timed Override Operation
Object type: Binary Value
Description: Monitors the status of/configures Timer Extension for the indoor unit. When the timed override function is enabled for an indoor unit group, the units are turned off automatically when the preset timer has expired if the unit is turned on during the unoccupied period.
Present_Value property:
ACTIVE: Enable
INACTIVE: Disable
Note:
1. Relinquish_Default property is fixed to "INACTIVE".

19. Current Unit Operation

Member number: 19
Object name: Current Unit Operation
Object type: Multistate Input
Description: Monitors the indoor unit operating status against the indoor unit status managed by the *iTM* as a result of the execution of a command on the indoor unit from the *BACnet*, or setback control in the *iTM*.
Present_Value property:
1: Off
2: Normal
3: Override
4: Setback
Note:
1. Present_Value is set to "1" at *iTM* start-up.

2. The present value property of the “Current Unit Operation” object is determined by the combination of present value property of the “Occupancy Mode” object and the state of the indoor unit management point on *iTM* as indicated in the following table:

		Occupancy Mode		
		Occ	**Standby**	**Unocc**
States of Indoor unit management point on iTM	On	**Normal**		**Override**
	Setback On	**Setback**		
	Setback Off	**Off**		
	Off			

3. Setback On: space temperature has met or exceeded the setback setpoint and the indoor unit is turned On to lower (cooling) or raise (heating) the room temperature to an adequate temperature below or above the setback setpoint.
4. Setback Off: Indoor unit remains Off and the room temperature is allowed to float between the cooling and heating setback setpoints.

20. Remote Controller Prohibit (On_Off)

Member number 20
Object name: Remote Controller Prohibit (On_Off)
Object type: Multistate Value
Description: Permits/Prohibits on/off operation from the remote controller connected to the indoor unit.
Present_Value property:
1: Permit
2: Prohibit
3: Stop Only

Notes:

1. When more than one indoor unit is connected to a single remote controller group, the BMS should only send commands to the indoor unit that is designated to receive the command for the remote controller group (unit #0). The BMS should not send commands to other indoor units in the remote control group. If this object is sent to the other indoor units in the remote controller group, the indoor unit will not execute the command.
2. Relinquish_Default property is fixed to "1".

21. Remote Controller Prohibit (Operation Mode)

Member number: 21
Object name: Remote Controller Prohibit (Operation Mode)
Object type: Binary Value
Description: Permits/Prohibits change of operation mode from the remote controller connected to the indoor unit.
Present_Value property:
ACTIVE: Prohibit
INACTIVE: Permit

Notes:

1. When more than one indoor unit is connected to a single remote controller group, the BMS should only send commands to the indoor unit that is designated to receive the command for the remote controller group (unit #0). BMS should not send commands to other indoor units in the remote control group. If this object is sent to the other indoor units in the remote controller group, the indoor unit will not execute the command.
2. Relinquish_Default property is fixed to "INACTIVE".

22. Remote Controller Prohibit (Setpoint)

Member number: 22
Object name: Remote Controller Prohibit (Setpoint)
Object type: Binary Value
Description: Permits/Prohibits change of setpoints from the remote controller connected to the indoor unit.
Present_Value property:
ACTIVE: Prohibit
INACTIVE: Permit

Notes:

1. When more than one indoor unit is connected to a single remote controller group, the BMS should only send commands to the indoor unit that is designated to receive the command for the remote controller group (unit #0). BMS should not send commands to other indoor units in the remote control group. If this object is sent to the other indoor units in the remote controller group, the indoor unit will not execute the command.
2. Relinquish_Default property is fixed to "INACTIVE".

23. Filter Sign Status

Member number: 23
Object name: Filter Sign Status
Object type: Binary Input
Description: Monitors the filter sign status for the indoor unit filter.
Present_Value property:
ACTIVE: Alarm
INACTIVE: Normal

24. Filter Sign Reset

Member number: 24
Object name: Filter Sign Reset
Object type: Binary Value
Description: Resets the filter sign status for the indoor unit filter.
Present_Value property:
ACTIVE: Alarm
INACTIVE: Reset

Notes:

1. Present_Value readout
   This object becomes ACTIVE when "Filter Sign Status" becomes ACTIVE.

2. Present_Value writing
   The following table shows how the object will work depending on the combination of the current value in Present_Value and value in the command.

Value in command / Current value	INACTIVE	ACTIVE
INACTIVE	Remains as-is	Changes to ACTIVE. However, after 10 minutes, the object becomes INACTIVE again to match the indoor unit status.
ACTIVE	Changes to INACTIVE (Clears the filter sign information)	Remains as-is.

3. Relinquish_Default property is fixed to "INACTIVE".

25. Indoor Fan Status

Member number: 25
Object name: Indoor Fan Status
Object type: Binary Input
Description: Monitors whether or not the indoor unit fan is operating.
Present_Value property:
ACTIVE: On
INACTIVE: Off

26. Communication Status

Member number: 26
Object name: Communication Status
Object type: Binary Input
Description: Monitors the communication status of the indoor unit.
Present_Value property:
ACTIVE: Alarm
INACTIVE: Normal
Notes:
1. When the indoor unit communication is in error, the Reliability property does not change to UNRELIABLE_OTHER, and remains NO_FAULT_DETECTED. Therefore, the Fault flag of the Status_Flags property also remains FALSE.

27. Thermo-on Status

Member number: 27
Object name: Thermo-on Status
Object type: Binary Input
Description: Monitors whether or not the indoor unit is in thermo-on mode (i.e., requesting for cool or heat).
Present_Value property:
ACTIVE: On (Thermo-on)

INACTIVE: Off (Thermo-off)

28. Compressor Status

Member number: 28
Object name: Compressor Status
Object type: Multistate Input
Description: Monitors the operating status of the outdoor unit compressor connected to the indoor unit.
Present_Value property:
1: The outdoor unit compressor connected to the indoor unit is stopped (**Off**).
2: The outdoor unit compressor connected to the indoor unit is operating (Oil-return operation included) (**On**).
3: In heat mode, the outdoor unit compressor connected to the indoor unit is defrosting, in oil return operating, or the indoor unit is in hot start operation (**Defrost/Hot Start**).

29. Aux Heater Status

Member number: 29
Object name: Aux Heater Status
Object type: Binary Input
Description: Monitors whether or not the auxiliary heater connected to the indoor unit is operating.
Present_Value property:
ACTIVE: On
INACTIVE: Off

30. Forced Thermo-off

Member number: 30
Object name: Forced Thermo-off
Object type: Binary Value
Description: Forcibly restrict the indoor unit thermo-on
Present_Value property:
ACTIVE: Enable (Forcibly restrict the indoor unit thermo-on).
INACTIVE: Disable (Cancel the restriction).
Notes:
1. The command is sent to the indoor unit independently regardless if the indoor unit is operating or stopped.
2. Relinquish_Default property is fixed to "INACTIVE".

31. Indoor Unit Changeover Option

Member number: 31
Object name: Indoor Unit Changeover Option
Object type: Binary Input
Description: Monitors the availability of the Changeover option for an indoor unit.
Present_Value property:
ACTIVE: Available
INACTIVE: Not Available (In selecting included)

32. Return Air Temperature

Member number: 32
Object name: Return Air Temperature
Object type: Analog Input
Description: Monitors the return air temperature of the indoor unit.
Present_Value property:
Return air temperature of the indoor unit.
Remarks:
(1) Units are set to ℃/°F depending on the system settings.
(2) The number of valid digits is to one decimal place for both Celsius and Fahrenheit.
(3) The value range is (-50.0 to 120.0[℃] / -58.0 to 248.0[° F]).

33. Discharge Air Temperature

Member number: 33
Object name: Discharge Air Temperature
Object type: Analog Input
Description: Monitors the discharge air temperature of the indoor unit.
Present_Value property:
Discharge air temperature of the indoor unit
Remarks:
(1) Units are set to ℃/°F depending on the system settings.
(2) The number of valid digits is to one decimal place for both Celsius and Fahrenheit.
(3) The value range is (-50.0 to 120.0[℃] / -58.0 to 248.0[° F]).

34. Liquid Pipe Temperature

Member number: 34
Object name: Liquid Pipe Temperature
Object type: Analog Input
Description: Monitors the liquid pipe temperature of the indoor unit.
Present_Value property:
Liquid pipe temperature of the indoor unit
Remarks:
(1) Units are set to ℃/°F depending on the system settings.
(2) The number of valid digits is to one decimal place for both Celsius and Fahrenheit.
(3) The value range is (-50.0 to 120.0[℃] / -58.0 to 248.0[° F]).

35. Gas Pipe Temperature

Member number: 35
Object name: Gas Pipe Temperature
Object type: Analog Input
Description: Monitors the gas pipe temperature of the indoor unit.
Present_Value property:
Gas pipe temperature of the indoor unit
Remarks:
(1) Units are set to ℃/°F depending on the system settings.
(2) The number of valid digits is to one decimal place for both Celsius and Fahrenheit.

(3) The value range is (-50.0 to 120.0[℃] / -58.0 to 248.0[˚ F]).

36. EV Position

Member number: 36
Object name: EV Position
Object type: Analog Input
Description: Monitors the EV position of the indoor unit.
Present_Value property:
EV position of the indoor unit.
Remarks:
(1) There are no units of measurement.
(2) The number of valid digits is an integer.
(3) The value range is (0 to 2000).

37. Freeze Protection

Member number: 37
Object name: Freeze Protection
Object type: Binary Input
Description: Monitors whether freeze-up protection operation is being carried out by the indoor unit.
Present_Value property:
ACTIVE : Freeze-up protection operation is being carried out by the indoor unit.
INACTIVE : Freeze-up protection operation is not being carried out by the indoor unit.

7.3 Individual System Control Object Specifications

1. Enable *iTM* Schedule Operation

Member number: 1
Object name: Enable *iTM* Schedule Operation
Object type: Binary Output
Description: Changes the enable/disable status of all schedule control programs created in the *iTM* at the same time.
Present_Value property:
ACTIVE: Enable
INACTIVE: Disable
Note:
Relinquish_Default property is fixed to "INACTIVE".

2. Enable *iTM* Auto-Changeover Operation

Member number: 2
Object name: Enable *iTM* Auto-Changeover Operation
Object type: Binary Output
Description: Changes the enable/disable status of all Auto-Changeover groups created in the *iTM* at the same time.
Present_Value property:

ACTIVE: Enable
INACTIVE: Disable

Note:
1. Relinquish_Default property is fixed to "INACTIVE".

3. Timed Override Minutes

Member number: 3
Object name: Timed Override Minutes
Object type: Multistate Value
Description: Monitors/sets the time for the Timer Extension in *iTM*.
Present_Value property:
1: 30 minutes
2: 60 minutes
3: 90 minutes
4: 120 minutes
5: 150 minutes
6: 180 minutes

Note:
1. Relinquish_Default property is fixed to "1".

4. System Forced Off

Member number: 4
Object name: System Forced off
Object type: Binary Output
Description: Executes all emergency stop programs (including the default program) registered and enabled with the *iTM*.
Present_Value property:
ACTIVE: Active
INACTIVE: Inactive

Note:
1. Cancelling the emergency stop programs does not start the indoor units (they remain stopped). Indoor unit will require a manual restart after the emergency stop switches from Active to Inactive.
2. Writing INACTIVE does not cancel the emergency stop if the input conditions for emergency stop are satisfied in the *iTM*.
3. Relinquish_Default property is fixed to "INACTIVE".
4. After an *iTM* reboot, "System Forced Off" is Inactive.

7.4. Individual Outdoor Unit Object Specifications

Outdoor unit common objects

1. Communication Status

Member number: 1
Object name: Communication Status
Object type: Binary Input

Description: Monitors the communication status of the outdoor unit.
Present_Value property:
ACTIVE : Outdoor unit communicating in error
INACTIVE : Outdoor unit communicating normally
Remarks:
(1) Even if the outdoor unit is communicating in error, the Reliability property will not change to UNRELIABLE_OTHER, but will remain as NO_FAULT_DETECTED. Accordingly, the Fault flag of the Status_Flags property will remain FALSE.

2. Operation Mode

Member number: 2
Object name: Operation Mode
Object type: Multistate Input
Description: Monitors the operation mode of the outdoor unit.
Present_Value property:
1: Cooling
2: Heating
3: Fan
4: Simultaneous cooling and heating

3. Outdoor Unit Alarm Status

Member number: 3
Object name: Outdoor Unit Alarm Status
Object type: Binary Input
Description: Monitors the normal / abnormal status of the outdoor unit.
Present_Value property:
ACTIVE : Abnormal
INACTIVE : Normal
Remarks:
(1) "Abnormal" means that the outdoor unit has stopped operating due to some trouble.
(2) The Description property is as follows:
Abnormal: Error code (2 or 5 characters)
Normal: "00"

4. Defrost Mode

Member number: 4
Object name: Defrost Mode
Object type: Binary Input
Description: Monitors whether the outdoor unit is in defrost operation.
Present_Value property:
ACTIVE : The outdoor unit is in defrost operation.
INACTIVE : The outdoor unit is not in defrost operation.

5. Oil Return Mode

Member number: 5
Object name: Oil Return Mode
Object type: Binary Input
Description: Monitors whether the outdoor unit is in oil return operation.
Present_Value property:
ACTIVE: The outdoor unit is in oil return operation.
INACTIVE: The outdoor unit is not in oil return operation.

6. Electric Power

Member number: 6
Object name: Electric Power
Object type: Analog Input
Description: Monitors the power consumption of the outdoor unit. Calculated value
Present_Value property:
Outdoor unit power consumption
Remarks:
(1) The units are in kw.
(2) The number of valid digits is to one decimal place.
(3) The value range is (0.0 to 1000.0).

7. Electric Current

Member number: 7
Object name: Electric Current
Object type: Analog Input
Description: Monitors the operating current of the outdoor unit.
Present_Value property:
The operating current of the outdoor unit
Remarks:
(1) The units are in A.
(2) The number of valid digits is to one decimal place.
(3) The value range is (0.0 to 300.0).

8. System Capacity Code

Member number: 8
Object name: System Capacity Code
Object type: Analog Input
Description: Monitors the system horsepower of the outdoor unit.
Present_Value property:
System horsepower of the outdoor unit
Remarks:
(1) The units are in HP.
(2) The number of valid digits is an integer.
(3) The value range is (0 to 64).

9. Outdoor Air Temperature

Member number: 9
Object name: Outdoor Air Temperature
Object type: Analog Input
Description: Monitors the outdoor air temperature around the outdoor unit.
Present_Value property:
The outdoor air temperature around the outdoor unit
Remarks:
(1) Units are set to ℃/°F depending on the system settings.
(2) The number of valid digits is an integer for both Celsius and Fahrenheit.
(3) The value range is (-50 to 120[℃] / -58 to 248[° F]).

Outdoor unit individual objects
The names of the outdoor unit individual objects vary depending upon the outdoor unit (1 to 3) as follows:

Outdoor unit 1 (main) = M_XXXXXXXX
Outdoor unit 2 (sub 1) = S1_XXXXXXXX
Outdoor unit 3 (sub 2) = S2_XXXXXXXX

10. M_Condensing Pressure
S1_Condensing Pressure
S2_Condensing Pressure

Member number: 100 （M_Condensing Pressure）
200 （S1_Condensing Pressure)
300 （S2_Condensing Pressure ）
Object name: M_Condensing Pressure
S1_Condensing Pressure
S2_Condensing Pressure
Object type: Analog Input
Description: Monitors the condensing pressure of the outdoor unit.
Present_Value property:
Condensing pressure of the outdoor unit
Remarks:
(1) Units are in psi.
(2) The number of valid digits is to two decimal places.
(3) The value range is (-14.22 to 711.17 [psi]) (-1.0 to 50.0 [kgf/cm2]).

11. M_Evaporating Pressure
S1_Evaporating Pressure
S2_Evaporating Pressure

Member number: 101 （M_Evaporating Pressure）
201 （S1_Evaporating Pressure)
301 （S2_Evaporating Pressure ）
Object name: M_Evaporating Pressure
S1_Evaporating Pressure
S2_Evaporating Pressure
Object type: Analog Input

Description: Monitors the evaporating pressure of the outdoor unit.
Present_Value property:
Evaporating pressure of the outdoor unit
Remarks:
(1) Units are in psi.
(2) The number of valid digits is to two decimal places.
(3) The value range is (-28.45 to 284.47[psi]) (-2.0 to 20.0 [kgf/cm2]

12. M_Condensing Temperature
S1_Condensing Temperature
S2_Condensing Temperature

Member number 102 （M_Condensing Temperature）
202 （S1_Condensing Temperature)
302 （S2_Condensing Temperature）
Object name: M_Condensing Temperature
S1_Condensing Temperature
S2_Condensing Temperature
Object type: Analog Input
Description: Monitors the condensing temperature (measured value) of the outdoor unit.
Present_Value property:
Condensing temperature of the outdoor unit (measured value)
Remarks:
(1) Units are set to ℃/˚ F depending on the system settings.
(2) The number of valid digits is an integer for both Celsius and Fahrenheit.
(3) The value range is (-65 to 74 [℃] / -85 to 165[˚ F]).

13. M_Evaporating Temperature
S1_Evaporating Temperature
S2_Evaporating Temperature

Member number: 103 （M_Evaporating Temperature）
203 （S1_Evaporating Temperature)
303 （S2_Evaporating Temperature）
Object name: M_Evaporating Temperature
S1_Evaporating Temperature
S2_Evaporating Temperature
Object type: Analog Input
Description: Monitors the evaporating temperature (measured value) of the outdoor unit.
Present_Value property:
Evaporating temperature of the outdoor unit (measured value)
Remarks:
(1) Units are set to ℃/˚ F depending on the system settings.
(2) The number of valid digits is an integer for both Celsius and Fahrenheit.
(3) The value range is (-79 to 33[℃] / -110 to 91[˚ F]).

14. M_Inverter Compressor 1 Speed
S1_Inverter Compressor 1 Speed
S2_Inverter Compressor 1 Speed

Member number: 104 （M_Inverter Compressor 1 Speed）
204 （S1_Inverter Compressor 1 Speed)
304 （S2_Inverter Compressor 1 Speed）
Object name: M_Inverter Compressor 1 Speed
S1_Inverter Compressor 1 Speed
S2_Inverter Compressor 1 Speed
Object type: Analog Input
Description: Monitors the Inverter 1 speed of the outdoor unit.
Present_Value property:
Inverter 1 speed of the outdoor unit
Remarks:
(1) There are no units of measurement.
(2) The number of valid digits is an integer.
(3) The value range is (0 to 255).

15. M_Inverter Compressor 2 Speed
S1_Inverter Compressor 2 Speed
S2_Inverter Compressor 2 Speed

Member number: 105 （M_Inverter Compressor 2 Speed）
205 （S1_Inverter Compressor 2 Speed)
305 （S2_Inverter Compressor 2 Speed）
Object name: M_Inverter Compressor 2 Speed
S1_Inverter Compressor 2 Speed
S2_Inverter Compressor 2 Speed
Object type: Analog Input
Description: Monitors the Inverter 2 speed of the outdoor unit
Present_Value property:
Inverter 2 speed of the outdoor unit
Remarks:
(1) There are no units of measurement.
(2) The number of valid digits is an integer.
(3) The value range is (0 to 255).

16. M_Fan Step
S1_Fan Step
S2_Fan Step

Member number: 106 （M_Fan Step）
206 （S1_Fan Step)
306 （S2_Fan Step）
Object name: M_Fan Step
S1_Fan Step
S2_Fan Step
Object type: Analog Input

Description: Monitors the fan step of the outdoor unit.
Present_Value property:
Fan step of the outdoor unit
Remarks:
(1) There are no units of measurement.
(2) The number of valid digits is an integer.
(3) The value range is (0 to 8) for *VRV* IV, and (0 to 255) for *VRV* IV R.

17. M_EV Position 1
S1_EV Position 1
S2_EV Position 1
Member number: 107（M_EV Position 1）
207（S1_EV Position 1)
307（S2_EV Position 1）
Object name: M_EV Position 1
S1_EV Position 1
S2_EV Position 1
Object type: Analog Input
Description: Monitors the EV position of the outdoor unit (upper side).
Present_Value property:
EV position of the outdoor unit (upper side)
Remarks:
(1) There are no units of measurement.
(2) The number of valid digits is an integer.
(3) The value range is (0 to 3000).

18. M_EV Position 2
S1_EV Position 2
S2_EV Position 2
Member number: 108（M_EV Position 2）
208（S1_EV Position 2)
308（S2_EV Position 2）
Object name: M_EV Position 2
S1_EV Position 2
S2_EV Position 2
Object type: Analog Input
Description: Monitors the EV position of the outdoor unit (lower side).
Present_Value property:
EV position of the outdoor unit (lower side)
Remarks:
(1) There are no units of measurement.
(2) The number of valid digits is an integer.
(3) The value range is (0 to 3000).

19. M_Hot Gas Temperature (Compressor 1)
S1_Hot Gas Temperature (Compressor 1)
S2_Hot Gas Temperature (Compressor 1)

Member number: 109 （M_Hot Gas Temperature (Compressor 1)
209 （S1_Hot Gas Temperature (Compressor 1))
309 （S2_Hot Gas Temperature (Compressor 1)
Object name: M_Hot Gas Temperature (Compressor 1)
S1_Hot Gas Temperature (Compressor 1)
S2_Hot Gas Temperature (Compressor 1)
Object type: Analog Input
Description: Monitors the temperature 1 of outdoor unit discharge pipe.
Present_Value property:
Outdoor unit discharge pipe temperature 1
Remarks:
(1) Units are set to ℃/˚ F depending on the system settings.
(2) The number of valid digits is an integer for both Celsius and Fahrenheit.
(3) The value range is (0 to 255[℃] / 32 to 491[˚ F]).

20. M_Hot Gas Temperature (Compressor 2)
S1_Hot Gas Temperature (Compressor 2)
S2_Hot Gas Temperature (Compressor 2)

Member number: 110 （M_Hot Gas Temperature (Compressor 2）
210 （S1_Hot Gas Temperature (Compressor 2))
310 （S2_Hot Gas Temperature (Compressor 2)
Object name: M_Hot Gas Temperature (Compressor 2)
S1_Hot Gas Temperature (Compressor 2)
S2_Hot Gas Temperature (Compressor 2)
Object type: Analog Input
Description: Monitors the temperature 2 of outdoor unit discharge pipe.
Present_Value property:
Outdoor unit discharge pipe temperature 2
Remarks:
(1) Units are set to ℃/˚ F depending on the system settings.
(2) The number of valid digits is an integer for both Celsius and Fahrenheit.
(3) The value range is (0 to 255[℃] / 32 to 491[˚ F]).

21. M_Liquid Pipe Temperature
S1_Liquid Pipe Temperature
S2_Liquid Pipe Temperature

Member number: 111 （M_Liquid Pipe Temperature）
211 （S1_Liquid Pipe Temperature)
311 （S2_Liquid Pipe Temperature）
Object name: M_Liquid Pipe Temperature
S1_Liquid Pipe Temperature
S2_Liquid Pipe Temperature
Object type: Analog Input

Description: Monitors the temperature of the outdoor unit liquid pipe heat exchanger.

Present_Value property:
Temperature of the outdoor unit liquid pipe heat exchanger

Remarks:
(1) Units are set to ℃/˚F depending on the system settings.
(2) The number of valid digits is an integer for both Celsius and Fahrenheit.
(3) The value range is (-50 to 120[℃] / -58 to 248[˚F]).

22. M_Liquid Pipe Temperature (HX Upper)
S1_Liquid Pipe Temperature (HX Upper)
S2_Liquid Pipe Temperature (HX Upper)

Member number: 112 （M_Liquid Pipe Temperature (HX Upper)）
212 （S1_Liquid Pipe Temperature (HX Upper)）
312 （S2_Liquid Pipe Temperature (HX Upper)）

Object name: M_Liquid Pipe Temperature (HX Upper)
S1_Liquid Pipe Temperature (HX Upper)
S2_Liquid Pipe Temperature (HX Upper)

Object type: Analog Input

Description: Monitors the temperature of the outdoor unit liquid pipe heat exchanger (upper side).

Present_Value property:
Temperature of the outdoor unit liquid pipe heat exchanger (upper side)

Remarks:
(1) Units are set to ℃/˚F depending on the system settings.
(2) The number of valid digits is an integer for both Celsius and Fahrenheit.
(3) The value range is (-50 to 120[℃] / -58 to 248[˚F])

23. M_Liquid Pipe Temperature (HX Lower)
S1_Liquid Pipe Temperature (HX Lower)
S2_Liquid Pipe Temperature (HX Lower)

Member number: 113 （M_Liquid Pipe Temperature (HX Lower)）
213 （S1_Liquid Pipe Temperature (HX Lower)）
313 （S2_Liquid Pipe Temperature (HX Lower)）

Object name: M_Liquid Pipe Temperature (HX Lower)
S1_Liquid Pipe Temperature (HX Lower)
S2_Liquid Pipe Temperature (HX Lower)

Object type: Analog Input

Description: Monitors the temperature of the outdoor unit liquid pipe heat exchanger (lower side).

Present_Value property:
Temperature of the outdoor unit liquid pipe heat exchanger (lower side)

Remarks:
(1) Units are set to ℃/˚F depending on the system settings.

(2) The number of valid digits is an integer for both Celsius and Fahrenheit.
(3) The value range is (-50 to 120[℃] / -58 to 248[˚F]).

24. M_Liquid Pipe Temperature (Deicer)
S1_Liquid Pipe Temperature (Deicer)
S2_Liquid Pipe Temperature (Deicer)

Member number: 114 （M_Liquid Pipe Temperature (Deicer)
214 （S1_Liquid Pipe Temperature (Deicer))
314 （S2_Liquid Pipe Temperature (Deicer)
Object name: M_Liquid Pipe Temperature (Deicer)
S1_Liquid Pipe Temperature (Deicer)
S2_Liquid Pipe Temperature (Deicer)
Object type: Analog Input
Description: Monitors the temperature of the outdoor unit liquid pipe heat exchanger (for de-icing).
Present_Value property:
Temperature of the outdoor unit liquid pipe heat exchanger (for de-icing)
Remarks:
(1) Units are set to ℃/˚F depending on the system settings.
(2) The number of valid digits is an integer for both Celsius and Fahrenheit.
(3) The value range is (-50 to 120[℃] / -58 to 248[˚F]).

25. M_Gas Pipe Temperature (HX Upper)
S1_Gas Pipe Temperature (HX Upper)
S2_Gas Pipe Temperature (HX Upper)

Member number: 115 （M_Gas Pipe Temperature (HX Upper)
215 （S1_Gas Pipe Temperature (HX Upper))
315 （S2_Gas Pipe Temperature (HX Upper)
Object name: M_Gas Pipe Temperature (HX Upper)
S1_Gas Pipe Temperature (HX Upper)
S2_Gas Pipe Temperature (HX Upper)
Object type: Analog Input
Description: Monitors the temperature of the outdoor unit gas pipe heat exchanger (upper side).
Present_Value property:
Temperature of the outdoor unit gas pipe heat exchanger (upper side)
Remarks:
(1) Units are set to ℃/˚F depending on the system settings.
(2) The number of valid digits is an integer for both Celsius and Fahrenheit.
(3) The value range is (-50 to 120[℃] / -58 to 248[˚F]).

26. M_Gas Pipe Temperature (HX Lower)
S1_Gas Pipe Temperature (HX Lower)
S2_Gas Pipe Temperature (HX Lower)

Member number: 116 （M_Gas Pipe Temperature (HX Lower)
216 （S1_Gas Pipe Temperature (HX Lower))
316 （S2_Gas Pipe Temperature (HX Lower)
Object name: M_Gas Pipe Temperature (HX Lower)
S1_Gas Pipe Temperature (HX Lower)
S2_Gas Pipe Temperature (HX Lower)
Object type: Analog Input
Description: Monitors the temperature of the outdoor unit gas pipe heat exchanger (lower side).
Present_Value property:
Temperature of the outdoor unit gas pipe heat exchanger (lower side)
Remarks:
(1) Units are set to ℃/˚ F depending on the system settings.
(2) The number of valid digits is an integer for both Celsius and Fahrenheit.
(3) The value range is (-50 to 120[℃] / -58 to 248[˚ F]).

27. M_Suction Temperature
S1_Suction Temperature
S2_Suction Temperature

Member number: 117 （M_Suction Temperature）
217 （S1_Suction Temperature)
317 （S2_Suction Temperature）
Object name: M_Suction Temperature
S1_Suction Temperature
S2_Suction Temperature
Object type: Analog Input
Description: Monitors the temperature of the outdoor unit accumulator inlet.
Present_Value property:
Temperature of the outdoor unit accumulator inlet
Remarks:
(1) Units are set to ℃/˚ F depending on the system settings.
(2) The number of valid digits is an integer for both Celsius and Fahrenheit.
(3) The value range is (-50 to 120[℃] / -58 to 248[˚ F]).

28. M_Compressor Suction Temperature
S1_Compressor Suction Temperature
S2_Compressor Suction Temperature

Member number: 118 （M_Compressor Suction Temperature)
218 （S1_Compressor Suction Temperature)
318 （S2_Compressor Suction Temperature)
Object name: M_Compressor Suction Temperature
S1_Compressor Suction Temperature
S2_Compressor Suction Temperature

Object type: Analog Input
Description: Monitors the compressor suction temperature of the outdoor unit.
Present_Value property:
Compressor suction temperature of the outdoor unit
Remarks:
(1) Units are set to ℃/˚F depending on the system settings.
(2) The number of valid digits is an integer for both Celsius and Fahrenheit.
(3) The value range is (-50 to 120[℃] / -58 to 248[˚F]).

29. M_Subcool Inlet Temperature
S1_Subcool Inlet Temperature
S2_Subcool Inlet Temperature

Member number: 119 （M_Subcool Inlet Temperature）
219 （S1_Subcool Inlet Temperature)
319 （S2_Subcool Inlet Temperature）
Object name: M_Subcool Inlet Temperature
S1_Subcool Inlet Temperature
S2_Subcool Inlet Temperature
Object type: Analog Input
Description: Monitors the temperature of the outdoor unit sub cool heat exchanger inlet.
Present_Value property:
Temperature of the outdoor unit sub cool heat exchanger inlet
Remarks:
(1) Units are set to ℃/˚F depending on the system settings.
(2) The number of valid digits is an integer for both Celsius and Fahrenheit.
(3) The value range is (-50 to 120[℃] / -58 to 248[˚F]).

30. M_Subcool Outlet Temperature
S1_Subcool Outlet Temperature
S2_Subcool Outlet Temperature

Member number: 120 （M_Subcool Outlet Temperature）
220 （S1_Subcool Outlet Temperature)
320 （S2_Subcool Outlet Temperature）
Object name: M_Subcool Outlet Temperature
S1_Subcool Outlet Temperature
S2_Subcool Outlet Temperature
Object type: Analog Input
Description: Monitors the temperature of the outdoor unit sub cool heat exchanger outlet.
Present_Value property:
Temperature of the outdoor unit sub cool heat exchanger outlet
Remarks:
(1) Units are set to ℃/˚F depending on the system settings.
(2) The number of valid digits is an integer for both Celsius and Fahrenheit.
(3) The value range is (-50 to 120[℃] / -58 to 248[˚F]).

31. M_Subcool EV Position
S1_Subcool EV Position
S2_Subcool EV Position

Member number: 121 （M_Subcool EV Position）
221 （S1_Subcool EV Position)
321 （S2_Subcool EV Position）

Object name: M_Subcool EV Position
S1_Subcool EV Position
S2_Subcool EV Position

Object type: Analog Input

Description: Monitors the EV position of the outdoor unit (sub cool heat exchanger)

Present_Value property:
EV position of the outdoor unit (sub cool heat exchanger)

Remarks:
(1) There are no units of measurement.
(2) The number of valid digits is an integer.
(3) The value range is (0 to 3000).

8. Report Function

8.1 COV Notification

The subscribed COV notification (DS-COV-B) is supported.

1. Subscribed COV Notification

Requests for COV subscription are received by the SubscribeCOV service.

a. Setting Confirmed/Unconfirmed COV notification with/without confirmation.
   Supported as defined in the BACnet® specifications.
b. Setting validity period of notifications.
   Supported as defined in the *BACnet* specifications whether or not the validity period has expired is judged when executing the COV notification at a status change. If the calculated difference between the current time and subscription time is larger than the defined validity period, the notification is cancelled. Therefore, if the clock was changed, the actual validity period may differ from the defined validity period.
c. Retention of subscription information at power off.
   Not supported.
   The subscription information is not written to memory; therefore, it disappears at power off.
   The retention of subscription information during power off is not required by the *BACnet* specifications.
d. Notification recipient information.
   It is included in the Active_COV_Subscriptions property of the device object mapped to the indoor unit and system control device object.
e. Number of notification recipients.
   The number of notification recipient registrations per object is limited to 5 clients.
   An attempt to register beyond 5 clients returns Error Class = SERVICES,
   Error Code = COV_SUBSCRIPTION_FAILED.

The COV notification support for each object is as follows:

Indoor unit device

Instance Number	Object_Name	Type
1	Occupancy Mode	MO
2	Unit On_Off Status	BI
3	Alarm Status	BI
4	Operation Mode	MV
5	Room Temperature	AI
6	Occ Cooling Setpoint	AV
7	Occ Heating Setpoint	AV
8	Unocc Cooling Setpoint	AV
9	Unocc Heating Setpoint	AV
10	Max Cooling Setpoint	AV
11	Min Cooling Setpoint	AV
12	Max Heating Setpoint	AV
13	Min Heating Setpoint	AV
14	Min Setpoint Differential (Cooling & Heating)	AV
15	Cooling & Heating Setpoint Tracking Mode	BV
16	Fan Speed	MV
17	Airflow Direction	MV
18	Timed Override Operation	BV
19	Current Unit Operation	MI
20	Remote Controller Prohibit (On_Off)	MV
21	Remote Controller Prohibit (Operation Mode)	BV
22	Remote Controller Prohibit (Setpoint)	BV
23	Filter Sign Status	BI
24	Filter Sign Reset	BV
25	Indoor Fan Status	BI
26	Communication Status	BI
27	Thermo-on Status	BI
28	Compressor Status	MI
29	Aux Heater Status	BI
30	Forced Thermo-off	BV
31	Indoor Unit Changeover Option	BI

System control device

Instance Number	Object_Name	Type
1	Enable *ITM* Schedule Operation	BO
2	Enable *ITM* Auto Changeover Operation	BO
3	Timed Override Minutes	MV
4	System Forced Off	BO

*Objects other than those listed above, as well as, outdoor unit devices objects, are not supported by COV.

The following error is returned to a SubscribeCOV request for an object that does not support COV:

Outdoor device: ErrorPDU (Class = OBJECT, Code = OPTIONAL_FUNCTIONALITY_NOT_SUPPORTED)

Indoor device: RejectPDU (UNRECOGNIZED_SERVICE)

9. Error Codes

#	Indoor Unit Type	Error Code	Description
1	DK_SkyAir | DK_VRV	A0	"External protection device activated"
2	DK_SkyAir | DK_VRV | DK_RA	A1	"Malfunction of ID unit PCB"
3	DK_SkyAir | DK_VRV | DK_RA	A3	"Malfunction of drain level control system"
4	DK_RA	A5	"High pressure control in heating freeze-up protection control in cooling"
5	DK_SkyAir | DK_VRV | DK_RA	A6	"Fan motor locked overload overcurrent"
6	DK_SkyAir | DK_VRV	A7	"Malfunction of swing flap motor"
7	DK_SkyAir | DK_VRV	A8	"Malfunction of power supply"
8	DK_VRV	A9	"Malfunction of electronic expansion valve drive"
9	DK_SkyAir | DK_VRV | DK_RA	AH	"Malfunction of dust collector of air cleaner"
10	DK_SkyAir | DK_VRV	AJ	"Malfunction of capacity setting (ID unit PCB)"
11	DK_SkyAir | DK_VRV	AF	"Malfunction of a humidifier system"
12	DK_SkyAir | DK_VRV	C1	"Failure of transmission (between ID unit PCB and fan PCB)"
13	DK_SkyAir | DK_VRV | DK_RA	C4	"Malfunction of liquid pipe thermistor for heat exchanger"
14	DK_VRV | DK_RA	C5	"Malfunction of gas pipe thermistor for heat exchanger"
15	DK_SkyAir | DK_VRV	C6	"Malfunction of fan motor control driver"
16	DK_RA	C7	"Front panel driving motor fault"
17	DK_SkyAir | DK_VRV | DK_RA	C9	"Malfunction of suction air thermistor"
18	DK_VRV	CA	"Malfunction of discharge air thermistor"
19	DK_SkyAir | DK_RA	CC	"Malfunction of humidity sensor system"
20	DK_SkyAir | DK_VRV	CJ	"Malfunction of thermostat sensor in remote controller"
21	DK_SkyAir | DK_VRV	E0	"Protection devices actuated (unified)"
22	DK_SkyAir | DK_VRV | DK_RA	E1	"Defect of OD unit PCB"
23	DK_VRV	E2	"Earth Leakage detected by the ELB PCB"
24	DK_SkyAir | DK_VRV | DK_RA	E3	"Actuation of high pressure switch (HPS)"
25	DK_SkyAir | DK_VRV	E4	"Actuation of low pressure switch (LPS)"
26	DK_SkyAir | DK_VRV | DK_RA	E5	"Overheat of inverter compressor motor"
27	DK_SkyAir | DK_VRV | DK_RA	E6	"STD compressor motor overcurrent/lock"
28	DK_SkyAir | DK_VRV | DK_RA	E7	"Malfunction of OD unit fan motor"
29	DK_RA	E8	"Overcurrent of inverter compressor"
30	DK_SkyAir | DK_VRV	E9	"Malfunction of electronic expansion valve coil"
31	DK_RA	EA	"Malfunction of four way valve"
32	DK_VRV	EC	"Malfunction of entering water temperature"
33	DK_VRV	EF	"Malfunction of thermal storage unit"
34	DK_RA	H0	"Malfunction of sensor system of compressor"
35	DK_RA	H1	"Malfunction of humidifier unit damper"
36	DK_SkyAir | DK_VRV | DK_RA	H3	"Malfunction of high pressure switch (HPS)"
37	DK_SkyAir | DK_VRV	H4	"Malfunction of low pressure switch (LPS)"
38	DK_RA	H5	"Malfunction of compressor motor overload thermistor"
39	DK_RA	H6	"Malfunction of position detection sensor"
40	DK_SkyAir | DK_VRV	H7	"Malfunction of OD fan motor signal"
41	DK_RA	H8	"Malfunction of compressor input (CT) system"
42	DK_SkyAir | DK_VRV | DK_RA	H9	"Malfunction of OD air thermistor"
43	DK_SkyAir | DK_VRV	HC	"Malfunction of (hot) water temperature thermistor"
44	DK_VRV	HJ	"Malfunction of water system"
45	DK_SkyAir | DK_VRV | DK_RA	F3	"Malfunction of discharge pipe temperature"
46	DK_SkyAir | DK_VRV | DK_RA	F4	“Malfunction of low discharge super heat across the compressor”
47	DK_RA	F6	"Abnormal high pressure in cooling"
48	DK_VRV	F6	"Refrigerant overcharged"
49	DK_VRV	F9	"Defect of EEV in BS box"
50	DK_SkyAir | DK_VRV	J1	"Malfunction of pressure sensor"
51	DK_SkyAir | DK_VRV	J2	"Malfunction of current sensor of compressor"
52	DK_SkyAir | DK_VRV | DK_RA	J3	"Malfunction of discharge pipe thermistor"
53	DK_RA	J4	"Malfunction of low pressure equivalent saturated temperature sensor system"
54	DK_SkyAir | DK_VRV | DK_RA	J5	"Malfunction of suction pipe thermistor"
55	DK_SkyAir | DK_VRV | DK_RA	J6	"Malfunction of heat exchanger thermistor"
56	DK_SkyAir | DK_VRV	J7	"Malfunction of liquid pipe thermistor (Refrigerant circuit and others)"

Continued form previous page.

#	Indoor Unit Type	Error Code	Description
57	DK_SkyAir	J8	"Malfunction of liquid pipe thermistor (Refrigerant circuit and others)"
58	DK_SkyAir | DK_VRV | DK_RA	J9	"Malfunction of gas pipe thermistor (Refrigerant circuit and others)"
59	DK_SkyAir | DK_VRV	Ja	"Malfunction of high pressure sensor"
60	DK_VRV	JH	"Malfunction of oil temperature thermistor"
61	DK_SkyAir | DK_VRV	JC	"Malfunction of low pressure sensor"
62	DK_VRV	JF	"Malfunction of heating thermistor for heat exchanger"
63	DK_VRV	L0	"Malfunction of inverter system"
64	DK_SkyAir | DK_VRV	L1	"Malfunction of inverter PCB"
65	DK_RA	L3	"Electrical box temperature rise"
66	DK_SkyAir | DK_VRV | DK_RA	L4	"Malfunction of inverter radiating fin temperature rise"
67	DK_SkyAir | DK_VRV | DK_RA	L5	"Inverter instantaneous overcurrent (DC)"
68	DK_VRV	L6	"Inverter instantaneous overcurrent (AC)"
69	DK_SkyAir | DK_VRV	L8	"Overcurrent of inverter compressor"
70	DK_SkyAir | DK_VRV	L9	"Malfunction of inverter compressor startup"
71	DK_VRV	LA	"Malfunction of power transistor"
72	DK_RA	LC	"Malfunction of transmission between OD unit PCB and micro-computer"
73	DK_SkyAir | DK_VRV	LC	"Malfunction of transmission between control and inverter PCB"
74	DK_VRV	P0	"Shortage of refrigerant amount (thermal storage unit)"
75	DK_SkyAir | DK_VRV	P1	"Power voltage imbalance open phase"
76	DK_VRV	P2	"Automatic refrigerant charge operation stop"
77	DK_SkyAir | DK_RA	P3	"Malfunction of thermistor in electrical box"
78	DK_SkyAir | DK_VRV | DK_RA	P4	"Malfunction of radiating fin temperature sensor"
79	DK_VRV	P8	"Heat exchanger freezing protection during automatic refrigerant charging"
80	DK_RA	P9	"Malfunction of fan motor (humidifier unit)"
81	DK_VRV	P9	"Automatic refrigerant charge operation completed"
82	DK_RA	PA	"Broken wire of heater (humidifier unit)"
83	DK_VRV	PA	"Empty refrigerant cylinder during automatic refrigerant charging"
84	DK_RA	PH	"Malfunction of temperature (humidifier unit)"
85	DK_VRV	PH	"Empty refrigerant cylinder during automatic refrigerant charging"
86	DK_VRV	PC	"Empty refrigerant cylinder during automatic refrigerant charging"
87	DK_SkyAir	PJ	"Malfunction of capacity setting (OD unit PCB)"
88	DK_VRV	PJ	"Improper combination between inverter and fan driver"
89	DK_VRV	PE	"Automatic refrigerant charge operation nearly completed"
90	DK_SkyAir | DK_VRV | DK_RA	U0	"Shortage of refrigerant"
91	DK_SkyAir | DK_VRV | DK_RA	U1	"Reverse phase open phase"
92	DK_SkyAir | DK_VRV | DK_RA	U2	"Defect of power supply voltage or instantaneous power failure"
93	DK_VRV	U3	"Check operation not executed"
94	DK_SkyAir | DK_VRV | DK_RA	U4	"Malfunction of transmission between ID and OD unit"
95	DK_SkyAir | DK_VRV | DK_RA	U5	"Malfunction of transmission between ID unit and remote controller"
96	DK_VRV	U6	"Malfunction of transmission between ID units"
97	DK_RA	U7	"Malfunction of transmission between main body micro-computer - INV micro-computer"
98	DK_VRV	U7	"Malfunction of transmission between OD units"
99	DK_SkyAir | DK_VRV	U8	"Malfunction of transmission between remote controllers"
100	DK_VRV	U9	"Malfunction of transmission (other system)"
101	DK_RA	UA	"Defect of ID/OD power supply"
102	DK_SkyAir	UA	"Malfunction of field setting"
103	DK_VRV	UA	"Improper combination of ID and OD units"
104	DK_VRV | DK_RA	UH	"Malfunction of system"
105	DK_SkyAir | DK_VRV	UC	"Malfunction of setting of centralized controller address"
106	DK_VRV	UJ	"Malfunction of transmission (Accessory devices)"
107	DK_SkyAir | DK_VRV	UE	"Malfunction of transmission between ID unit and centralized controller"
108	DK_SkyAir | DK_VRV	UF	"Wiring and piping mismatch"
109	DK_SkyAir | DK_VRV | DK_RA	M1	"Malfunction of centralized remote controller PCB"
110	DK_SkyAir | DK_VRV | DK_RA	M8	"Malfunction of transmission between optional controllers for centralized control"
111	DK_SkyAir | DK_VRV | DK_RA	MA	"Improper combination of optional controllers for centralized control"
112	DK_SkyAir | DK_VRV | DK_RA	MC	"Address duplication improper setting"

10. PICS

BACnet® Protocol Implementation Conformance Statement

Date: Feb. 5, 2016
Vendor Name: DAIKIN INDUSTRIES, Ltd.
Product Name: intelligent Touch Manager™
Product Model Number: DCM601A71
Applications Software Version: 2.06.00* Firmware Revision: 000.001
BACnet® Protocol Revision: 4

Product Description:
This product provides the function of monitoring and operating the air-conditioner.
The supported Data Link Layer Options are *BACnet*/IP.

BACnet Standardized Device Profile (Annex L):
☐ *BACnet* Operator Workstation (B-OWS)
☐ *BACnet* Building Controller (B-BC)
☐ *BACnet* Advanced Application Controller (B-AAC)
■ *BACnet* Application Specific Controller (B-ASC)
☐ *BACnet* Smart Sensor (B-SS)
☐ *BACnet* Smart Actuator (B-SA)

BACnet Interoperability Building Blocks Supported (Annex K):

	Supported BIBBs	BIBB Name	Supported	
			Standard support	Optional support
Data Sharing	DS-RP-B	Data Sharing-ReadProperty-B	■	☐
	DS-RPM-B	Data Sharing-ReadProperyMultiple-B	■	☐
	DS-WP-B	Data Sharing-WriteProperty-B	■	☐
	DS-WPM-B	Data Sharing-WriteProperyMultiple-B	■	☐
	DS-COV-B	Data Sharing-COV-B	■	☐
Device Management	DM-DDB-B	Device Management-Dynamic Device Binding-B	■	☐
	DM-DOB-B	Device Management-Dynamic Object Binding-B	■	☐
	DM-TS-B	Device Management-Time Synchronization-B	■	☐
	DM-UTC-B	Device Management-UTCTimeSynchronization-B	■	☐
Network Management	NM-RC-B	Network Management - Router Configuration–B	■	☐

*Follows the *iTM* software version.

Standard Object Types Supported:

1. Analog Input
   a. Return Air Temperature, Discharge Air Temperature, Liquid Pipe Temperature, Gas Pipe Temperature, EV position, All Outdoor Unit's AI Object

Dynamically Creatable:	No
Dynamically Deletable:	No
Optional Properties Supported:	Reliability
Writable Properties:	N/A
Proprietary Properties:	N/A
Property Range Restrictions:	N/A

   b. Other

Dynamically Creatable:	No
Dynamically Deletable:	No
Optional Properties Supported:	Reliability, COV_Increment
Writable Properties:	N/A
Proprietary Properties:	N/A
Property Range Restrictions:	N/A

2. Analog Value

Dynamically Creatable:	No
Dynamically Deletable:	No
Optional Properties Supported:	Reliability, Priority_Array, Relinquish_Default, COV_Increment
Writable Properties:	Present_Value
Proprietary Properties:	N/A
Property Range Restrictions:	N/A

3. Binary Input

Dynamically Creatable:	No
Dynamically Deletable:	No
Optional Properties Supported:	Description, Reliability, Inactive_Text, Active_Text,
Writable Properties:	N/A
Proprietary Properties:	N/A
Property Range Restrictions:	N/A

4. Binary Output

Dynamically Creatable:	No
Dynamically Deletable:	No
Optional Properties Supported:	Description, Reliability, Inactive_Text, Active_Text,
Writable Properties:	Present_Value
Proprietary Properties:	N/A
Property Range Restrictions:	N/A

5. Binary Value

Dynamically Creatable:	No
Dynamically Deletable:	No
Optional Properties Supported:	Description, Reliability, Inactive_Text, Active_Text
Writable Properties:	Present_Value
Proprietary Properties:	N/A
Property Range Restrictions:	N/A

6. Device

a. Outdoor Unit Object

Dynamically Creatable:	No
Dynamically Deletable:	No
Optional Properties Supported:	Max_Segment_Accepted, Local_Time, Local_Date, UTC_Offset, Daylight_Saving_Status, APDU_Segment_Timeout, Description
Writable Properties:	N/A
Proprietary Properties:	N/A
Property Range Restrictions:	N/A

b. Other

Dynamically Creatable:	No
Dynamically Deletable:	No
Optional Properties Supported:	Max_Segment_Accepted, Local_Time, Local_Date, UTC_Offset, Daylight_Saving_Status, APDU_Segment_Timeout, Active_COV_Subscriptions, Description
Writable Properties:	N/A
Proprietary Properties:	N/A
Property Range Restrictions:	N/A

7. Multi-state Input

Dynamically Creatable:	No
Dynamically Deletable:	No
Optional Properties Supported:	Reliability, Description, State_Text
Writable Properties:	N/A
Proprietary Properties:	N/A
Property Range Restrictions:	N/A

8. Multi-state Output

Dynamically Creatable:	No
Dynamically Deletable:	No
Optional Properties Supported:	Reliability, Description, State_Text
Writable Properties:	Present_Value
Proprietary Properties:	N/A
Property Range Restrictions:	N/A

9. Multi-state Value

Dynamically Creatable:	No
Dynamically Deletable:	No
Optional Properties Supported:	Reliability, Description, State_Text, Priority_Array, Relinquish_Default
Writable Properties:	Present_Value
Proprietary Properties:	N/A
Property Range Restrictions:	N/A

Data Link Layer Options:

■ *BACnet* IP, (Annex J)
■ *BACnet* IP, (Annex J), Foreign Device
☐ ISO 8802-3, Ethernet (Clause 7)
☐ ANSI/ATA 878.1, 2.5 Mb. ARCNET (Clause 8)
☐ ANSI/ATA 878.1, RS-485 ARCNET (Clause 8), baud rate(s) _____
☐ MS/TP master (Clause 9), baud rate(s): _____
☐ MS/TP slave (Clause 9), baud rate(s): _____
☐ Point-To-Point, EIA 232 (Clause 10), baud rate(s):_____
☐ Point-To-Point, modem, (Clause 10), baud rate(s): _____
☐ LonTalk, (Clause 11), medium: _____
☐ Other: _____

Device Address Binding:
Is static device binding supported? (This is currently necessary for two-way communication with MS/TP slaves and certain other devices.) ☐ Yes ■ No

Networking Options:
☐ Router, Clause 6 - List all routing configurations, e.g., ARCNET-Ethernet, Ethernet-MS/TP, etc.
☐ Annex H, *BACnet* Tunneling Router over IP
☐ *BACnet*/IP Broadcast Management Device (BBMD)
Does the BBMD support registrations by Foreign Devices? ☐ Yes ☐ No

Character Sets Supported:
Indicating support for multiple character sets does not imply that can all be supported simultaneously.
■ ANSI X3.4 ☐ IBM™/Microsoft™ DBCS ☐ ISO 8859-1
☐ ISO 10646 (UCS-2) ☐ ISO 10646 (UCS-4) ☐ JIS C 6226

If this product is a communication gateway, describe the types of non-*BACnet* equipment/networks(s) that the gateway supports:
Not applicable.

11. BACnet® Interoperability Building Blocks Supported (BIBBs)

11.1 Data Sharing BIBBs

BIBB Type		Supported	BACnet® Service	Initiate	Execute
DS-RP-A	Data Sharing-ReadProperty–A	□	ReadProperty	X	
DS-RP-B	Data Sharing-ReadProperty–B	■	ReadProperty		X
DS-RPM-A	Data Sharing-ReadPropertyMultiple–A	□	ReadPropertyMultiple	X	
DS-RPM-B	Data Sharing-ReadPropertyMultiple–B	■	ReadPropertyMultiple		X
DS-RPC-A	Data Sharing-ReadPropertyConditional–A	□	ReadPropertyConditional	X	
DS-RPC-B	Data Sharing-ReadPropertyConditional–B	□	ReadPropertyConditional		X
DS-WP-A	Data Sharing-WriteProperty–A	□	WriteProperty	X	
DS-WP-B	Data Sharing-WriteProperty–B	■	WriteProperty		X
DS-WPM-A	Data Sharing-WritePropertyMultiple–A	□	WritePropertyMultiple	X	
DS-WPM-B	Data Sharing-WritePropertyMultiple–B	■	WritePropertyMultiple		X
DS-COV-A	Data Sharing-COV–A	□	SubscribeCOV	X	
			ConfirmedCOVNotification		X
			UnconfirmedCOVNotification		X
DS-COV-B	Data Sharing-COV–B	■*	SubscribeCOV		X
			ConfirmedCOVNotification	X	
			UnconfirmedCOVNotification	X	
DS-COVP-A	Data Sharing-COVP–A	□	SubscribeCOV	X	
			ConfirmedCOVNotification		X
			UnconfirmedCOVNotification		X
DS-COVP-B	Data Sharing-COVP–B	□	SubscribeCOV		X
			ConfirmedCOVNotification	X	
			UnconfirmedCOVNotification	X	
DS-COVU-A	Data Sharing-COV-Unsolicited–A	□	UncofirmedCOVNotification		X
DS-COVU-B	Data Sharing-COV-Unsolicited-B	□	UncofirmedCOVNotification	X	

* Not applicable to outdoor unit devices.

11.2 Alarm and Event Management BIBBs

BIBB Type		Supported	BACnet® Service	Initiate	Execute
AE-N-A	Alarm and Event-Notification–A	☐	ConfirmedEventNotification		X
			UnconfirmedEventNotification		X
AE-N-I-B	Alarm and Event-Notification Internal–B	☐	ConfirmedEventNotification	X	
			UnconfirmedEventNotification	X	
AE-N-E-B	Alarm and Event-Notification External–B	☐	ConfirmedEventNotification	X	
			UnconfirmedEventNotification	X	
AE-ACK-A	Alarm and Event-ACK–A	☐	AcknowledgeAlarm	X	
AE-ACK-B	Alarm and Event-ACK–B	☐	AcknowledgeAlarm		X
AE-ASUM-A	Alarm and Event-Summary–A	☐	GetAlarmSummary	X	
AE-ASUM-B	Alarm and Event-Summary–B	☐	GetAlarmSummary		X
AE-ESUM-A	Event-Summary–A	☐	GetEnrollmentSummary	X	
AE-ESUM-B	Event-Summary–B	☐	GetEnrollmentSummary		X
AE-INFO-A	Alarm and Event-Information–A	☐	GetEventInformation	X	
AE-INFO-B	Alarm and Event-Information–B	☐	GetEventInformation		X
AE-LS-A	Alarm and Event-LifeSafety–A	☐	LifeSafetyOperation	X	
AE-LS-B	Alarm and Event-LifeSafety–B	☐	LifeSafetyOperation		X

11.3 Scheduling BIBBs

BIBB Type		Supported
SCHED-A	Scheduling–A (must support DS-RP-A and DS-WP-A)	☐
SCHED-I-B	Scheduling-Internal–B (shall support DS-RP-B and DS-WP-B) (shall also support ether DM-TS-B or DS-UTC-B)	☐
SCHED-E-B	Scheduling-External–B (shall support SCHED-I-B and DS-WP-A)	☐

11.4 Trending BIBBs

BIBB Type		Supported	BACnet® Service	Initiate	Execute
T-VMT-A	Trending - Viewing and Modifying Trends–A	☐	ReadRange	X	
T-VMT-I-B	Trending - Viewing and Modifying Trends Internal–B	☐	ReadRange		X
T-VMT-E-B	Trending - Viewing and Modifying Trends External–B	☐	ReadRange		X
T-ATR-A	Trending - Automated Trend Retrieval–A	☐	ConfirmedEventNotification		X
			ReadRange	X	
T-ATR-B	Trending - Automated Trend Retrieval–B	☐	ConfirmedEventNotification	X	
			ReadRange		X

11.5 Device Management BIBBs

BIBB Type		Supported	BACnet® Service	Initiate	Execute
DM-DDB-A	Device Management - Dynamic Device Binding–A	□	Who-Is	X	
			I-Am		X
DM-DDB-B	Device Management - Dynamic Device Binding–B	■	Who-Is		X
			I-Am	X	
DM-DOB-A	Device Management - Dynamic Object Binding–A	□	Who-Has	X	
			I-Have		X
DM-DOB-B	Device Management - Dynamic Object Binding–B	■	Who-Has		X
			I-Have	X	
DM-DCC-A	Device Management - DeviceCommunicationControl–A	□	DeviceCommunicationControl	X	
DM-DCC-B	Device Management - DeviceCommunicationControl–B	□	DeviceCommunicationControl		X
DM-PT-A	Device Management - PrivateTransfer–A	□	ConfirmedPrivateTransfer	X	
			UnconfirmedPrivateTransfer	X	
DM-PT-B	Device Management - PrivateTransfer–B	□	ConfirmedPrivateTransfer		X
			UnconfirmedPrivateTransfer		X
DM-TM-A	Device Management - Text Message–A	□	ConfirmedTextMessage	X	
			UnconfirmedTextMessage	X	
DM-TM-B	Device Management - Text Message–B	□	ConfirmedTextMessage		X
			UnconfirmedTextMessage		X
DM-TS-A	Device Management - TimeSynchronization–A	□	TimeSynchronization	X	
DM-TS-B	Device Management - TimeSynchronization–B	■	TimeSynchronization		X
DM-UTC-A	Device Management - UTCTimeSynchronization–A	□	UTCTimeSynchronization	X	
DM-UTC-B	Device Management - UTCTimeSynchronization–B	■	UTCTimeSynchronization		X
DM-RD-A	Device Management - ReinitializeDevice–A	□	ReinitializeDevice	X	
DM-RD-B	Device Management - ReinitializeDevice–B	□	ReinitializeDevice		X
DM-BR-A	Device Management - Backup and Restore–A	□	AtomicReadFile	X	
			AtomicWriteFile	X	
			CreateObject	X	
			ReinitializeDevice	X	
DM-BR-B	Device Management - Backup and Restore–B	□	AtomicReadFile		X
			AtomicWriteFile		X
			ReinitializeDevice		X
DM-R-A	Device Management - Restart–A	□	UnconfimedCOVNotification		X
DM-R-B	Device Management - Restart–B	□	UnconfimedCOVNotification	X	
DM-LM-A	Device Management - List Manipulation–A	□	AddListElement	X	
			RemoveListElement	X	
DM-LM-B	Device Management - List Manipulation–B	□	AddListElement		X
			RemoveListElement		X
DM-OCD-A	Device Management - Object Creation and Deletion–A	□	CreateObject	X	
			DeleteObject	X	
DM-OCD-B	Device Management - Object Creation and Deletion–B	□	CreateObject		X
			DeleteObject		X
DM-VT-A	Device Management - Virtual Terminal–A	□	VT-Open	X	
			VT-Close	X	X
			VT-Data	X	X
DM-VT-B	Device Management - Virtual Terminal–B	□	VT-Open		X
			VT-Close	X	X
			VT-Data	X	X

11.6 Network Management BIBBs

BIBB Type		Supported	BACnet® Network Layer Message	Initiate	Execute
NM-CE-A	Network Management - Connection Establishment–A	□	Establish-Connection-To-Network	X	
			Disconnect-Connection-To-Network	X	
NM-CE-B	Network Management - Connection Establishment– B	□	Establish-Connection-To-Network		X
			Disconnect-Connection-To-Network		X
NM-RC-A	Network Management - Router Configuration–A	□	Who-Is-Router-To-Network	X	
			I-Am-Router-To-Network		X
			I-Could-Be-Router-To-Network		X
			Initialize-Routing-Table	X	
			Initialize-Routing-Table-Ack		X
NM-RC-B	Network Management - Router Configuration–B	■	Who-Is-Router-To-Network		X
			I-Am-Router-To-Network	X	
			Initialize-Routing-Table		X
			Initialize-Routing-Table-Ack	X	

12. BACnet™ Gateway (BACnetGW) and iTM Protocol Comparison

This section describes the following differences between BACnetGW (Ver. 6.34.00) and iTM:
1. Functions removed from BACnetGW
2. Functions changed from BACnetGW

Note that "Additions from BACnetGW" are omitted from this section as they are described in the main body of these specifications.

Furthermore, differences described in this section are limited to the following:
- Properties
- Services
- PICS

12.1. Functions removed from the BACnetGW

1. Properties
   The following properties are not supported because Event is not supported:
   a. Common (Analog Input, Binary Input, Binary Value)
      ・Time_Delay
      ・Notification_Class
      ・Event_Enable
      ・Acked_Transitions
      ・Notify_Type
      ・Event_Time_Stamps

   b. Analog Input (Room Temperature)
      ・High_Limit
      ・Low_Limit
      ・Deadband
      ・Limit_Enable

   c. Binary Input (Unit On_Off Status)
      ・Change_Of_State_Time
      ・Change_Of_State_Count
      ・Time_Of_State_Count_Reset
      ・Elapsed_Active_Time
      ・Time_Of_Active_Time_Reset

2. Services
   The following services are removed because Unsolicited COV and Event are not supported:
   ・Device Management-DeviceCommunicationControl-B
   ・Data Sharing-COV-Unsolicited-B
   ・Alarm and Event-Notification Internal–B
   ・Device Management - List Manipulation–B

12.2. Functions changed from BACnetGW

Services changed because COV and Event are not supported.

	Object Type	Property Identifier	Before (BACnetGW (Ver6.34.00))	After (*iTM* for North America)
Property	Device (for indoor unit)	Object_Name	DAIKIN MasterStation III	Indoor unit name
		System_Status	During D3 initialization: DOWNLOAD_IN_PROGRESS	Fixed to OPERATIONAL
		Model_Name	Fixed to "D-BACS *BACnet* Gateway"	Fixed to "Indoor Unit"
		Firmware_Revision	3000	Ver.000.001
		Application_Software_Version	3000	*
		Protocol_Services_Supported	SubCOV, RP, RPM, WP, WPM, I-Am, I-Have, TimeSync, Who-Is, Who-Has, UTCTimeSync (DeviceCommunicationControl *ver6.20 to) (AddList, RemoveList *When Event notification is supported)	SubCOV, RP, RPM, WP, WPM, I-Am, TimeSync, Who-Is, Who-Has, UTCTimeSync
		Protocol_Object_Types_Supported	AI, AO, AV, BI, BO, BV, MI, MO, Device,NotificationClass	AI, AV, BI,BV, MI, MO, MV, Device
		Daylight_Saving_Status	Fixed to FALSE	Follows the iTM clock settings
	Device (for system control)	Object_Name	DAIKIN MasterStation III	Fixed to “Daikin ITM Server Control”
		System_Status	During D3 initialization: DOWNLOAD_IN_PROGRESS Normal: OPERATIONAL	Fixed to OPERATIONAL
		Model_Name	Fixed to “D-BACS *BACnet* Gateway”	Fixed to “Daikin ITM Server Control”
		Firmware_Revision	3000	Ver.000.001
		Application_Software_Version	3000	*
		Protocol_Services_Supported	SubCOV, RP, RPM, WP, WPM, I-Am, I-Have, TimeSync, Who-Is, Who-Has, UTCTimeSync (DeviceCommunicationControl *ver6.20 to) (AddList, RemoveList *When Event notification is supported)	SubCOV, RP, RPM, WP, WPM, I-Am, TimeSync, Who-Is, Who-Has, UTCTimeSync
		Protocol_Object_Types_Supported	AI, AO, AV, BI, BO, BV, MI, MO, Device,NotificationClass	BO, MV, Device
		Daylight_Saving_Status	Fixed to FALSE	Follows the iTM clock settings

Continued from previous page

	Object Type	Property Identifier	Before (BACnetGW (Ver6.34.00))	After (*iTM* for North America)
Property	Device (for outdoor unit)	Object_Name	DAIKIN MasterStation III	Outdoor unit name
		System_Status	During D3 initialization: DOWNLOAD_IN_PROGRESS	Fixed to OPERATIONAL
			Normal: OPERATIONAL	
		Model_Name	Fixed to “D-BACS *BACnet* Gateway”	Fixed to “Outdoor Unit”
		Firmware_Revision	3000	Ver.000.001
		Application_Software_Version	3000	*
		Protocol_Services_Supported	SubCOV, RP, RPM, WP, WPM, I-Am, I-Have, TimeSync, Who-Is, Who-Has, UTCTimeSync (DeviceCommunicationControl *ver6.20 to) (AddList, RemoveList *When Event notification is supported	RP, RPM, I-Am, TimeSync, Who-Is, Who-Has, UTCTimeSync
		Protocol_Object_Types_Supported	AI, AO, AV, BI, BO, BV, MI, MO, Device,NotificationClass	AI, BI,MI, Device
		Daylight_Saving_Status	Fixed to FALSE	Follows the iTM clock settings

* Follows the *iTM* software version.

Continued from previous page

	Object Type	Property Identifier	Before (BACnetGW (Ver6.34.00))	After (*iTM* for North America)
Property	Analog Input (Room Temperature)	Status_Flags	IN_ALARM (TRUE: Analog maximum/minimum error)	IN_ALARM (Always FALSE)
			FAULT (TRUE: Communication error or Sensor error)	FAULT (TRUE: Communication error or Sensor error)
			OVERRIDDEN (Always FALSE)	OVERRIDDEN (Always FALSE)
			OUT_OF_SERVICE (Always FALSE)	OUT_OF_SERVICE (Always FALSE)
		Event_State	NORMAL: Normal	Fixed to NORMAL
			FAULT: Communication error/Sensor error	
			LOW_LIMIT: Analog minimum error	
			HIGH_LIMIT: Analog maximum error	
	Analog Value (Occ Cooling Setpoint, Occ Heating Setpoint, Unocc Cooling Setpoint, Unocc Heating Setpoint, Max Cooling Setpoint, Min Cooling Setpoint, Max Heating Setpoint, Min Heating Setpoint, Min Setpoint Differential (Cooling & Heating))	Out_Of_Service	Always FALSE	["Unocc Cooling Setpoint“, "Unocc Heating Setpoint", "Max Cooling Setpoint“, "Min Cooling Setpoint", "Max Setpoint“, "Min Setpoint"] TRUE: Disabled FALSE: Enabled [Other] Always FALSE

Continued from previous page

	Object Type	Property Identifier	Before (BACnetGW (Ver6.34.00))	After (*iTM* for North America)
Property	Binary Input (Alarm Status)	Description	2-character error codes	2 or 5-character error codes
		Status_Flags	IN_ALARM (TRUE: Alarm is present) FAULT (TRUE: Communication error) OVERRIDDEN (Always FALSE) (Exception: Communication status object is fixed to FALSE) OUT_OF_SERVICE (Always FALSE)	IN_ALARM (TRUE: Alarm is present) FAULT (TRUE: Communication error) (Exception: Communication status object is fixed to FALSE) OVERRIDDEN (Always FALSE) OUT_OF_SERVICE (Always FALSE)
		Event_State	NORMAL No alarm is present OFF_NORMAL Alarm is present	Fixed to NORMAL
	Binary Output	Reliability	NO_FAULT_DETECTED: Normal communication UNRELIABLE_OTHER: Communication error	Always NO_FAULT_DETECTED
	Binary Value	Status_Flags	IN_ALARM (TRUE: Filter Sign ON) FAULT (TRUE: Communication error) OVERRIDDEN (Always FALSE) OUT_OF_SERVICE (Always FALSE)	IN_ALARM (Always FALSE) FAULT (TRUE: Communication error) OVERRIDDEN (Always FALSE) OUT_OF_SERVICE (Always FALSE)
		Event_State	NORMAL Other OFF_NORMAL Filter sign ON	Fixed to NORMAL
Service	No changes from BACnetGW			
PICS	No changes from BACnetGW			

Part 3. Commissioning Procedure

1. Site Visit

1.1 Obtaining Object Information

Initializing the configure BACnet® Server Gateway CSV file is required before the test operation. **Gather the object information listed below ([1] - [6])** before visiting the site. Obtain this information from **the Daikin sales person or Sales Representative for the object**. (Fill in the information related to the object in the blank space of [1] - [6].)

1. Confirmation of communication method between the *iTM* and the BMS front end:

   Communication method between the *iTM* and the BMS front end.

No.	Communication Method	Communication method for the objects
1	*BACnet*/ IP communication	

2. BACnet® communication port number:

   Note: The factory setting is 47808. The available setting range is 1 - 65535.

BACnet communication port number	

3. Device ID (instance number) for each *VRV* indoor unit:

   Note: The available setting range is 0 - 4194303 there is no factory setting assigned.

DIII-Net Group Address	Device ID (Instance #)	DIII-Net Group Address	Device ID (Instance #)	DIII-Net Group Address	Device ID (Instance #)	DIII-Net Group Address	Device ID (Instance #)
1:1-00		1:2-00		1:3-00		1:4-00	
1:1-01		1:2-01		1:3-01		1:4-01	
1:1-02		1:2-02		1:3-02		1:4-02	
1:1-03		1:2-03		1:3-03		1:4-03	
1:1-04		1:2-04		1:3-04		1:4-04	
1:1-05		1:2-05		1:3-05		1:4-05	
1:1-06		1:2-06		1:3-06		1:4-06	
1:1-07		1:2-07		1:3-07		1:4-07	
1:1-08		1:2-08		1:3-08		1:4-08	
1:1-09		1:2-09		1:3-09		1:4-09	
1:1-10		1:2-10		1:3-10		1:4-10	
1:1-11		1:2-11		1:3-11		1:4-11	
1:1-12		1:2-12		1:3-12		1:4-12	
1:1-13		1:2-13		1:3-13		1:4-13	
1:1-14		1:2-14		1:3-14		1:4-14	
1:1-15		1:2-15		1:3-15		1:4-15	

DIII-Net Group Address	Device ID (Instance #)	DIII-Net Group Address	Device ID (Instance #)	DIII-Net Group Address	Device ID (Instance #)	DIII-Net Group Address	Device ID (Instance #)
2:1-00		2:2-00		2:3-00		2:4-00	
2:1-01		2:2-01		2:3-01		2:4-01	
2:1-02		2:2-02		2:3-02		2:4-02	
2:1-03		2:2-03		2:3-03		2:4-03	
2:1-04		2:2-04		2:3-04		2:4-04	
2:1-05		2:2-05		2:3-05		2:4-05	
2:1-06		2:2-06		2:3-06		2:4-06	
2:1-07		2:2-07		2:3-07		2:4-07	
2:1-08		2:2-08		2:3-08		2:4-08	
2:1-09		2:2-09		2:3-09		2:4-09	
2:1-10		2:2-10		2:3-10		2:4-10	
2:1-11		2:2-11		2:3-11		2:4-11	
2:1-12		2:2-12		2:3-12		2:4-12	
2:1-13		2:2-13		2:3-13		2:4-13	
2:1-14		2:2-14		2:3-14		2:4-14	
2:1-15		2:2-15		2:3-15		2:4-15	

Notes:
Up to 7 *iTM* Plus Adaptor can be used.
Port assignments (2 to 8) and DIII-Net group addresses may vary with system configuration.

Device ID for System Control Device– one device ID needed for all 4 points:

Instance #	Object Name	Device ID
1	Enable *iTM* Schedule	
2	Enable Auto-Changeover Operation	
3	Timed Override Minutes	
4	System Forced Off	

4. Working drawings
    1. Cable routing diagram (provides the following information):
        a. The number and locations of the *iTM*.
        b. The number and locations of the *iTM* Plus Adaptors.
        c. Material (e.g., drawings) identifying the number of indoor units and mapping between the addresses and locations of indoor units.

5. Items monitored/controlled from the BMS for all indoor units.

Indoor unit points	**Point name in CSV file**	**Monitor/control from BMS for each indoor unit (yes/no)**
Occupancy Mode	Occupancy_Mode	
Unit On_Off Status	On_Off_Status	
Alarm Status	Alarm_Status	
Operation Mode	Operation_Mode	
Room Temperature	Room_Temperature	
Occ Cooling Setpoint	Occ_Cooling_Setpoint	
Occ Heating Setpoint	Occ_Heating_Setpoint	
Unocc Cooling Setpoint	Unocc_Cooling_Setpoint	
Unocc Heating Setpoint	Unocc_Heating_Setpoint	
Max Cooling Setpoint	Max_Cooling_Setpoint	
Min Cooling Setpoint	Min_Cooling_Setpoint	
Max Heating Setpoint	Max_Heating_Setpoint	
Min Heating Setpoint	Min_Heating_Setpoint	
Min Setpoint Differential (Cooling & Heating)	Min_Setpoint_Differential	
Cooling & Heating Setpoint Tracking Mode	Setpoint_Tracking_Mode	
Fan Speed	Fan_Speed	
Airflow Direction	Airflow_Direction	
Timed Override Operation	Timed_Override_Operation	
Current Unit Operation	Current_Unit_Operation	
Remote Controller Prohibit (On_Off)	RC_On_Off	
Remote Controller Prohibit (Operation Mode)	RC_Operation_Mode	
Remote Controller Prohibit (Setpoint)	RC_Setpoint	
Filter Sign Status	Filter_Sign_Status	
Filter Sign Reset	Filter_Sign_Reset	
Indoor Fan Status	Indoor_Fan_Status	
Communication Status	Communication_Status	
Thermo-on Status	Thermo_On_Status	
Compressor Status	Compressor_Status	
Aux Heater Status	Aux_Heater_Status	
Forced Thermo-off	Forced_Thermo_Off	
Indoor Unit Changeover Option	Changeover_Option	
Return Air Temperature	Return_Air_Temperature	
Discharge Air Temperature	Discharge_Air_Temperature	
Liquid Pipe Temperature	Liquid_Pipe_Temperature	
Gas Pipe Temperature	Gas_Pipe_Temperature	
EV Position	EV_Position	
Freeze Protection	Freeze_Protection	

System Points	Monitor/control from BMS for each indoor unit
Enable *iTM* Schedule	
Enable Auto-Changeover Operation	
Timed Override Minutes	
System Forced Off	

Note: All system points are enabled cannot be disabled.

6. Items monitored from the BMS for all outdoor units.

Outdoor unit point name in CSV File (General/Main)	Monitor from BMS for each indoor unit (yes/no)
Communication Status	
Operation Mode	
Outdoor Unit Alarm Status	
Defrost Mode	
Oil Return	
Electric Power	
Electric Current	
System Capacity Code	
Outdoor Air Temperature	
M_Condensing Pressure	
M_Evaporating Pressure	
M_Condensing Temperature	
M_Evaporating Temperature	
M_Inverter Compressor 1 Speed	
M_Inverter Compressor 2 Speed	
M_Fan Step	
M_EV Position 1	
M_EV Position 2	
M_Hot Gas Temperature (Compressor 1)	
M_Hot Gas Temperature (Compressor 2)	
M_Liquid Pipe Temperature	
M_Liquid Pipe Temperature (HX Upper)	
M_Liquid Pipe Temperature (HX Lower)	
M_Liquid Pipe Temperature (Deicer)	
M_Gas Pipe Temperature (HX Upper)	
M_Gas Pipe Temperature (HX Lower)	
M_Suction Temperature	
M_Compressor Suction Temperature	
M_Subcool Inlet Temperature	
M_Subcool Outlet Temperature	
M_Subcool EV Position	

Outdoor unit point name in CSV File (Sub_1)	Monitor from BMS for each indoor unit (yes/no)
S1_Condensing Pressure	
S1_Evaporating Pressure	
S1_Condensing Temperature	
S1_Evaporating Temperature	
S1_Inverter Compressor 1 Speed	
S1_Inverter Compressor 2 Speed	
S1_Fan Step	
S1_EV Position 1	
S1_EV Position 2	
S1_Hot Gas Temperature (Compressor 1)	
S1_Hot Gas Temperature (Compressor 2)	
S1_Liquid Pipe Temperature	
S1_Liquid Pipe Temperature (HX Upper)	
S1_Liquid Pipe Temperature (HX Lower)	
S1_Liquid Pipe Temperature (Deicer)	
S1_Gas Pipe Temperature (HX Upper)	
S1_Gas Pipe Temperature (HX Lower)	
S1_Suction Temperature	
S1_Compressor Suction Temperature	
S1_Subcool Inlet Temperature	
S1_Subcool Outlet Temperature	
S1_Subcool EV Position	

Outdoor unit point name in CSV File (Sub_2)	Monitor from BMS for each indoor unit (yes/no)
S2_Condensing Pressure	
S2_Evaporating Pressure	
S2_Condensing Temperature	
S2_Evaporating Temperature	
S2_Inverter Compressor 1 Speed	
S2_Inverter Compressor 2 Speed	
S2_Fan Step	
S2_EV Position 1	
S2_EV Position 2	
S2_Hot Gas Temperature (Compressor 1)	
S2_Hot Gas Temperature (Compressor 2)	
S2_Liquid Pipe Temperature	
S2_Liquid Pipe Temperature (HX Upper)	
S2_Liquid Pipe Temperature (HX Lower)	
S2_Liquid Pipe Temperature (Deicer)	
S2_Gas Pipe Temperature (HX Upper)	
S2_Gas Pipe Temperature (HX Lower)	
S2_Suction Temperature	
S2_Compressor Suction Temperature	
S2_Subcool Inlet Temperature	
S2_Subcool Outlet Temperature	
S2_Subcool EV Position	

7. IPv4 address (IP address):
   Use a private address as the IP address.
   Set the Address and Subnet Mask to arbitrary values from the PC.
   Default: Address = 192.168.0.1, Subnet Mask = 255.255.255.0
   (Also write an additional IP address for temporary use during the test service operation. The additional IP address will not be used after the test operation.)

1. IP address for the *iTM*

IP Address		Ex. 192.168.0.1
Subnet mask		Ex. 255.255.255.0
Default gateway address		Ex. 192.168.0.100

2. IP address temporarily used for the test service operation (but will not be used after the test operation).

IP address		Ex. 192.168.0.2
Subnet mask		Ex. 255.255.255.0
Default gateway address		Ex. 192.168.0.100

Restriction on IPv4 address (The following addresses cannot be used.)
One of the following invalid addresses is used as the IP address: • An address outside the range of the Class A - C addresses (1.0.0.0 - 223.255.255.255) • A loop-back address (127.0.0.0 - 127.255.255.255) • An address of which the host portion (hexadecimal "0" portion of subnet mask) contains all "0"s or "1"s • An address of which the network portion (hexadecimal "1" portion of subnet mask) contains all "0"s or "1"s [Example] • 244.1.1.1 -> NG (outside the range of Class A - C addresses) • 127.0.0.1 -> NG (Loop-back address) • IP: 198.168.1.0/Subnet: 255.255.255.0 -> NG (host portion contains all "0"s.) • IP: 192.168.0.1/Subnet: 192.0.0.0 -> NG (network portion contains all "1"s.)
One of the following invalid addresses is used as the default gateway address: • An address outside the range of the Class A - C addresses (1.0.0.0 - 223.255.255.255) • A loop-back address (127.0.0.0 - 127.255.255.255)
An invalid address is used for the subnet mask (outside the range 128.0.0.0 - 255.255.255.255, hexadecimal "1" portion contain non-sequential value or blank). [Example] • 255.255.255.244 -> NG (hexadecimal "1" portion contain non-sequential value.)
A Class C network is required for reliable operation

2. Foreign Device

2.1 Foreign Device Setting

1. When the *iTM* BACnet® Server Gateway is on a different subnet from the BMS, a *BACnet* Broadcast Management Device (BBMD) is required and the *iTM BACnet* Server Gateway should be registered as a Foreign Device.
2. The *iTM BACnet* Server Gateway should also be configured with a BBMD IP address and Port No.

2.2 Typically not changed unless requested by the BMS

1. The Foreign Device setting is only set if the BMS notifies that a *BACnet* Broadcast Management Device (BBMD) is used on the network.
2. The *iTM BACnet* Server Gateway must be configured to communicate with the BBMD. This is done by enabling the BBMD function, and adding the IP address of the BBMD and BBMD port number to the CSV file (see section 4.2.1.8).

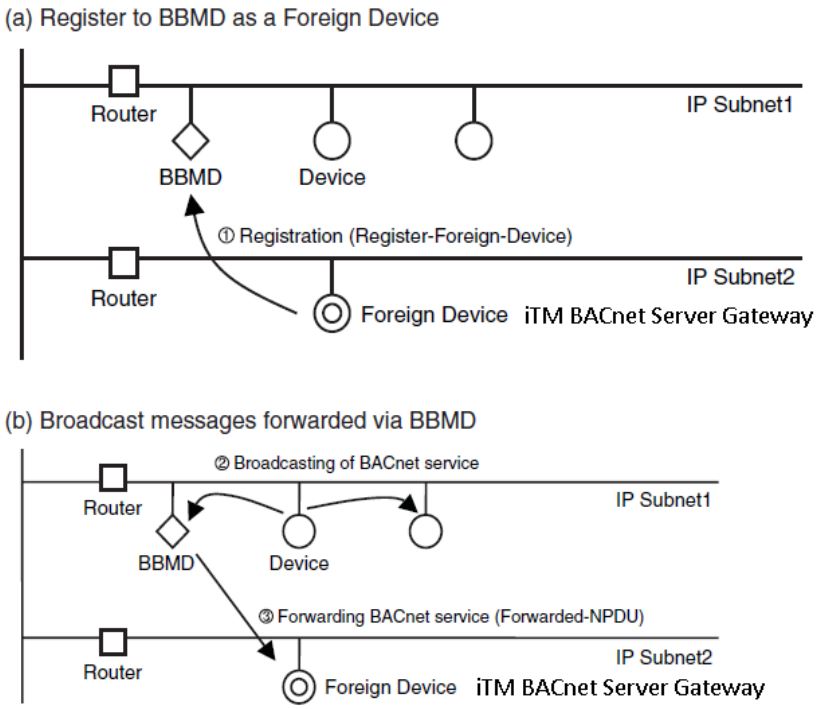


Figure 20. Enabling the BBMD

3. BACnet® Point List

What is a point list?

If connecting the indoor units to the BMS using the *iTM BACnet* Server Gateway, it is necessary for the sales engineer to create a **"points list"** and submit it to the BMS integrator. The point list includes the *BACnet* object information required when monitoring/controlling the indoor unit from the BMS via *iTM BACnet* Server Gateway. The BMS creates an indoor unit monitoring/control program items appearing in the points list.

Parameter 1. Port assignment, DIII-NET address and room name of the indoor unit connected to the iTM.

Parameter 2. Indoor unit monitoring and/or control points executed by the BMS.

For objects where multiple *iTM BACnet* Server Gateway will be used, a points list should be created for each *iTM BACnet* Server Gateway.

How to create a point list.

The point list creation methods for the following monitoring / control objects are provided as examples.

Port assignment, DIII-NET address and room name of the indoor unit connected to the iTM

- Address of indoor unit connected to DIII port 1: 1-01 (name: 1F_Lobby)
- Address of indoor unit connected to DIII port 2: 4-15 (name: 4F_Tenant2)

3.1 System Control (one per system)

Instance No	Object Name	Type
1	Enable *iTM* Schedule Operation	BO
2	Enable *iTM* Auto-Changeover Operation	BO
3	Timed Override Minutes	MV
4	System Forced Off	BO

3.2 Indoor Unit Points (for each indoor unit)

Instance Number	Object Name	Type
1	Occupancy Mode	MO
2	Unit On_Off Status	BI
3	Alarm Status	BI
4	Operation Mode	MV
5	Room Temperature	AI
6	Occ Cooling Setpoint	AV
7	Occ Heating Setpoint	AV
8	Unocc Cooling Setpoint	AV
9	Unocc Heating Setpoint	AV
10	Max Cooling Setpoint	AV
11	Min Cooling Setpoint	AV
12	Max Heating Setpoint	AV
13	Min Heating Setpoint	AV
14	Min Setpoint Differential (Cooling & Heating)	AV
15	Setpoint Tracking Mode	BV
16	Fan Speed	MV
17	Airflow Direction	MV
18	Timed Override Operation	BV
19	Current Unit Operation	MI
20	RC On Off	MV
21	RC Operation Mode	BV
22	RC Setpoint	BV
23	Filter Sign Status	BI
24	Filter Sign Reset	BV
25	Indoor Fan Status	BI
26	Communication Status	BI
27	Thermo On Status	BI
28	Compressor Status	MI
29	Aux Heater Status	BI
30	Forced Thermo-off	BV
31	Indoor Unit Changeover Option	BI
32	Return Air Temperature	AI
33	Discharge Air Temperature	AI
34	Liquid Pipe Temperature	AI
35	Gas Pipe Temperature	AI
36	EV Position	AI
37	Freeze Protection	BI

Note: Shaded points are not available by default and will need to be enabled during the *iTM* BACnet® Server Gateway commissioning.

3.3. Outdoor Unit Points (for each outdoor unit)

Instance #	Object Name (Common)	Type
1	Communication Status	BI
2	Operation Mode	MI
3	Outdoor Unit Alarm Status	BI
4	Defrost Mode	BI
5	Oil Return	BI
6	Electric Power	AI
7	Electric Current	AI
8	System Capacity Code	AI
9	Outdoor Air Temperature	AI

Instance #	Object Name (Main)	Type
100	M_Condensing Pressure	AI
101	M_Evaporating Pressure	AI
102	M_Condensing Temperature	AI
103	M_Evaporating Temperature	AI
104	M_Inverter Compressor 1 Speed	AI
105	M_Inverter Compressor 2 Speed	AI
106	M_Fan Step	AI
107	M_EV Position 1	AI
108	M_EV Position 2	AI
109	M_Hot Gas Temperature (Compressor 1)	AI
110	M_Hot Gas Temperature (Compressor 2)	AI
111	M_Liquid Pipe Temperature	AI
112	M_Liquid Pipe Temperature (HX Upper)	AI
113	M_Liquid Pipe Temperature (HX Lower)	AI
114	M_Liquid Pipe Temperature (Deicer)	AI
115	M_Gas Pipe Temperature (HX Upper)	AI
116	M_Gas Pipe Temperature (HX Lower)	AI
117	M_Suction Temperature	AI
118	M_Compressor Suction Temperature	AI
119	M_Subcool Inlet Temperature	AI
120	M_Subcool Outlet Temperature	AI
121	M_Subcool EV Position	AI

Note: Shaded points are not available by default and will need to be enabled during the *iTM* BACnet® Server Gateway commissioning.

Instance #	Object Name (Sub_1)	Type
200	S1_Condensing Pressure	AI
201	S1_Evaporating Pressure	AI
202	S1_Condensing Temperature	AI
203	S1_Evaporating Temperature	AI
204	S1_Inverter Compressor 1 Speed	AI
205	S1_Inverter Compressor 2 Speed	AI
206	S1_Fan Step	AI
207	S1_EV Position 1	AI
208	S1_EV Position 2	AI
209	S1_Hot Gas Temperature (Compressor 1)	AI
210	S1_Hot Gas Temperature (Compressor 2)	AI
211	S1_Liquid Pipe Temperature	AI
212	S1_Liquid Pipe Temperature (HX Upper)	AI
213	S1_Liquid Pipe Temperature (HX Lower)	AI
214	S1_Liquid Pipe Temperature (Deicer)	AI
215	S1_Gas Pipe Temperature (HX Upper)	AI
216	S1_Gas Pipe Temperature (HX Lower)	AI
217	S1_Suction Temperature	AI
218	S1_Compressor Suction Temperature	AI
219	S1_Subcool Inlet Temperature	AI
220	S1_Subcool Outlet Temperature	AI
221	S1_Subcool EV Position	AI

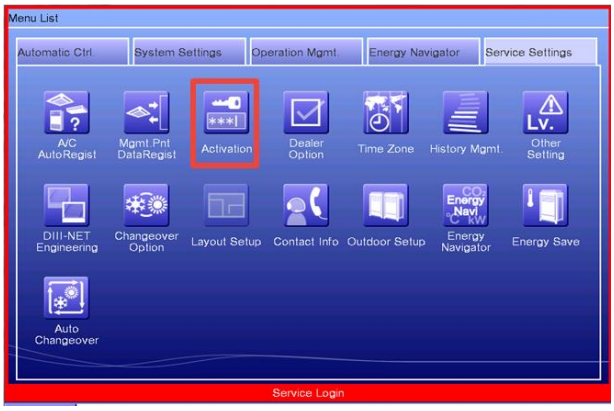
Instance #	Object Name (Sub_2)	Type
300	S2_Condensing Pressure	AI
301	S2_Evaporating Pressure	AI
302	S2_Condensing Temperature	AI
303	S2_Evaporating Temperature	AI
304	S2_Inverter Compressor 1 Speed	AI
305	S2_Inverter Compressor 2 Speed	AI
306	S2_Fan Step	AI
307	S2_EV Position 1	AI
308	S2_EV Position 2	AI
309	S2_Hot Gas Temperature (Compressor 1)	AI
310	S2_Hot Gas Temperature (Compressor 2)	AI
311	S2_Liquid Pipe Temperature	AI
312	S2_Liquid Pipe Temperature (HX Upper)	AI
313	S2_Liquid Pipe Temperature (HX Lower)	AI
314	S2_Liquid Pipe Temperature (Deicer)	AI
315	S2_Gas Pipe Temperature (HX Upper)	AI
316	S2_Gas Pipe Temperature (HX Lower)	AI
317	S2_Suction Temperature	AI
318	S2_Compressor Suction Temperature	AI
319	S2_Subcool Inlet Temperature	AI
320	S2_Subcool Outlet Temperature	AI
321	S2_Subcool EV Position	AI

Note: Shaded points are not available by default and will need to be enabled during the *iTM* BACnet® Server Gateway commissioning.

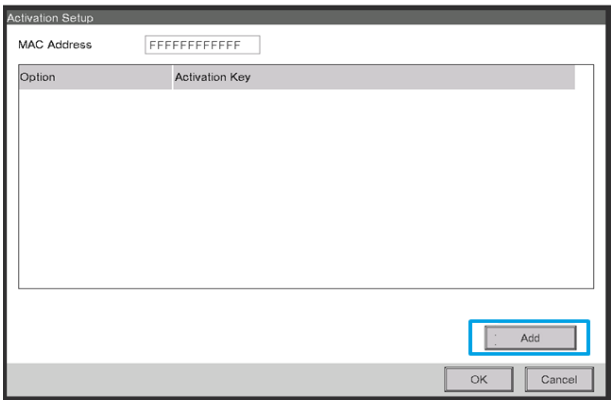
4. Commissioning the BACnet® Server Gateway on the *iTM*

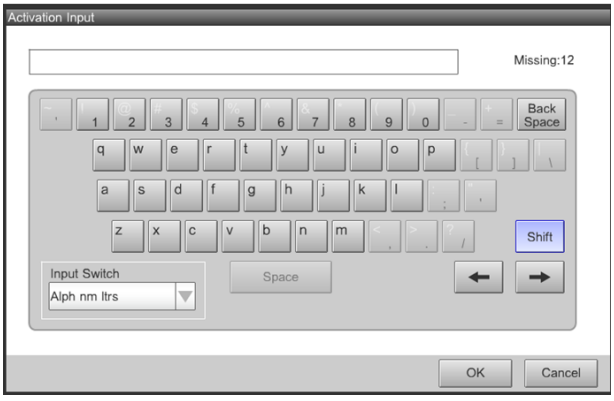
4.1 *iTM BACnet* Server Gateway Activation

1. From the Service Settings tab of the *iTM*, click on the Activation icon.



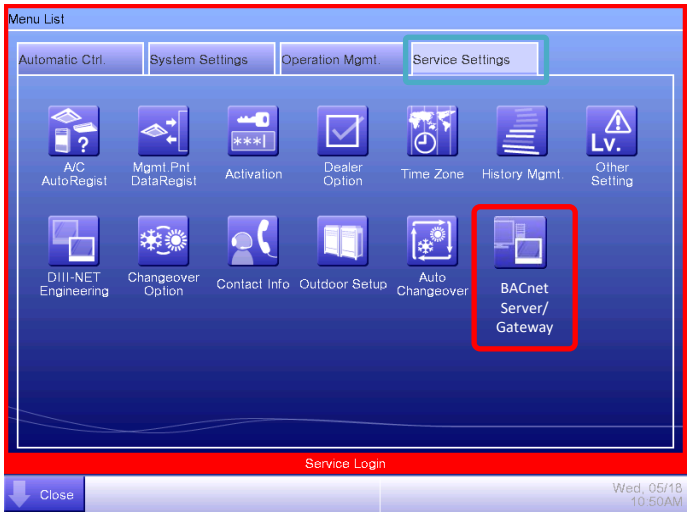
2. On the Activation Setup page, click the Add button to open the keyboard dialog box, and enter the activation key for the *iTM BACnet* Server Gateway option.



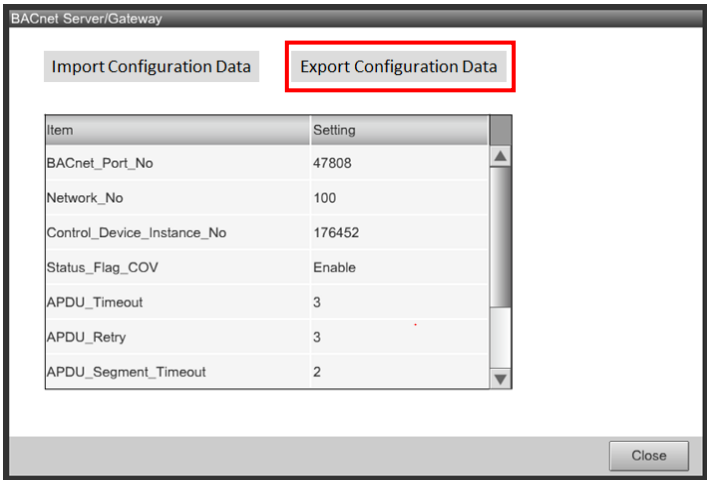


4.2 CSV Configuration

1. How to export the CSV file.
   a. Insure that all indoor units have been added/recognized before exporting the CSV file — set indoor unit name (ex. Room 101), enable Unocc Setpoints, Setpoint Range Limitation and configure Auto-changeover in the *iTM*.
   b. Click the Service Settings tab for the *iTM*.
   c. Click the [BACnet® Server/Gateway] icon (only appears when the *BACnet* Server Gateway option is activated).

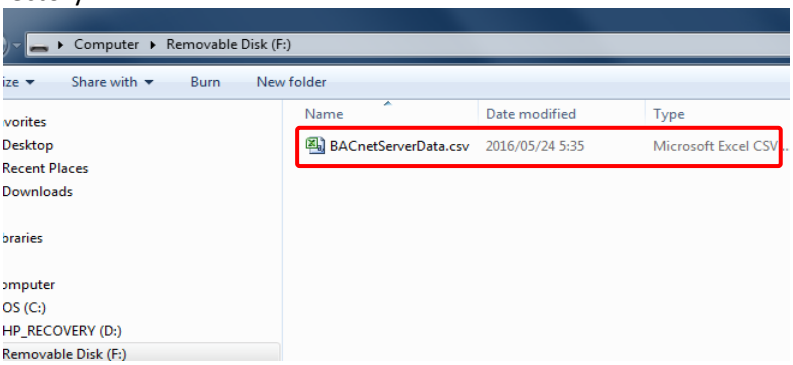


   d. Insert the USB memory device into the *iTM* USB port.

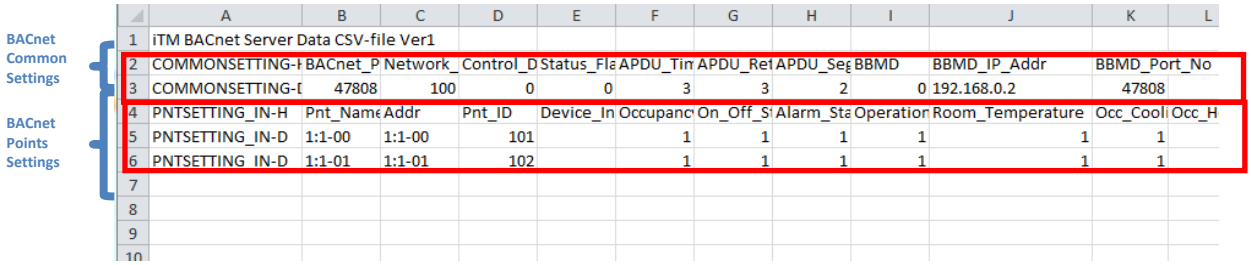


   e. Click the [Export Configuration Data] button to download *iTM* BACnet® Server Gateway CVS file to the USB drive.

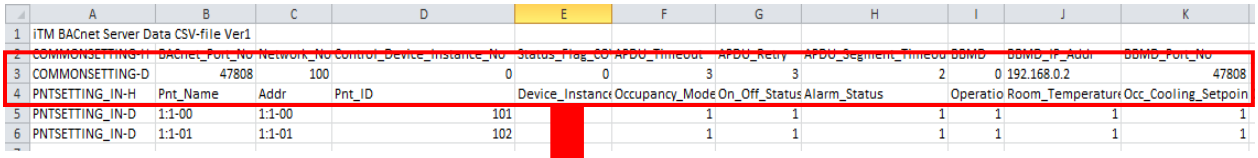
f. Remove the USB drive from the *iTM* and insert into PC. The CSV file is displayed in the root directory.



g. Open the CSV file.

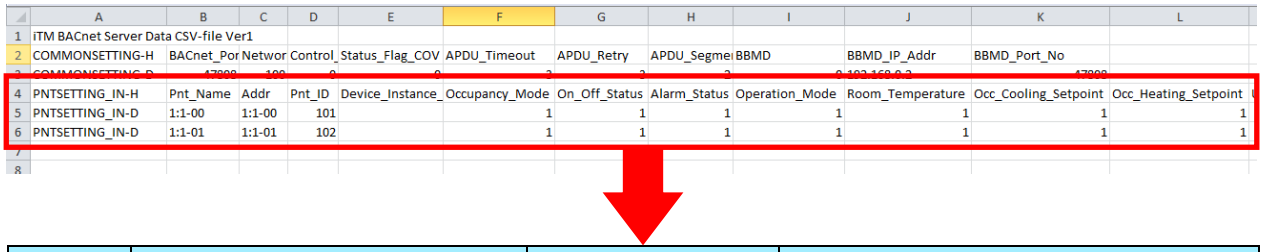


h. BACnet® communication settings “COMMONSETTING”.



Column #	COMMONSETTING-H (Title)	COMMONSETTING-D (Default Value)	Comments
A	CSV Header		
B	BACnet_Port_No	47808	BACnet Communication Port (47808 is default and rarely changes)
C	Network_No	100	BACnet Network Number (1 to 65534). Configurable , no preference
D	Control_Device_Instance_No	0	All objects under the System Control Device are visible as default.
E	Status_Flag_COV	0	0 = COV enabled , 1 = COV disabled. Using COV is recommended.
F	APDU_Timeout	3 (1~120 sec)	Amount of time the iTM waits for a response message from BMS. (APDU = Application Layer Protocol Data Units)
G	APDU_Retry	3 (0~7 times)	Number of iTM retries sending the same request message after APDU timeout.
H	APDU_Segment_Timeout	2 (1~10 sec)	Amount of time between retransmission of an APDU segment.
I	BBMD	0	1:Register , 0:Not Register
J	BBMD_IP_Addr	192.168.0.2	If BBMD is exist on the network
K	BBMD_Port_No	47808	If BBMD is exist on the network

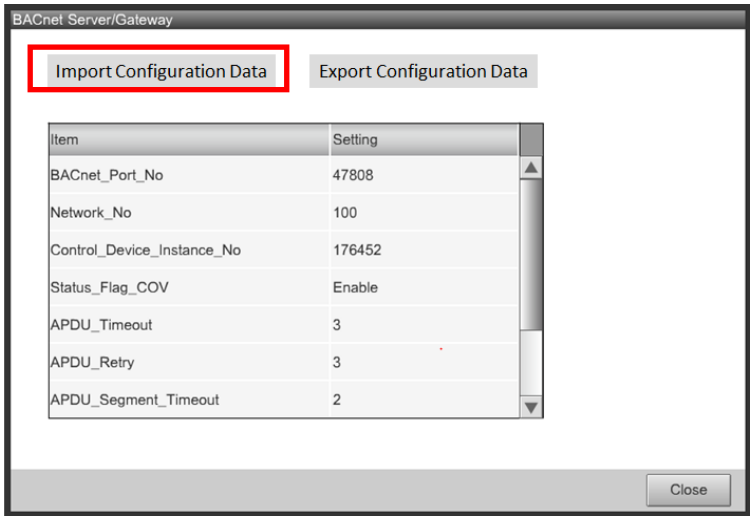
i. BACnet® point setting “PNTSETTING”.
   1. Enable or disable each point as required to meet the controls specification.

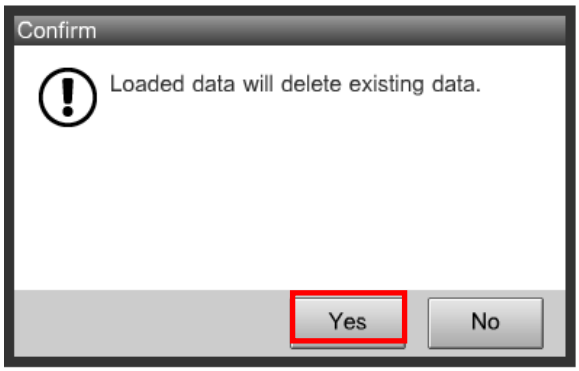


A	B	C	D	E	F	G	H	I	J	K	L
1 iTM BACnet Server Data CSV-file Ver1											
2 COMMONSETTING-H	BACnet_Por	Networ	Control_	Status_Flag_COV	APDU_Timeout	APDU_Retry	APDU_Segme	BBMD	BBMD_IP_Addr	BBMD_Port_No	
3 COMMONSETTING-D	47808	100	0	0	3	3	3	0	192.168.0.2	47808	
4 PNTSETTING_IN-H	Pnt_Name	Addr	Pnt_ID	Device_Instance_	Occupancy_Mode	On_Off_Status	Alarm_Status	Operation_Mode	Room_Temperature	Occ_Cooling_Setpoint	Occ_Heating_Setpoint
5 PNTSETTING_IN-D	1:1-00	1:1-00	101		1	1	1	1	1	1	1
6 PNTSETTING_IN-D	1:1-01	1:1-01	102		1	1	1	1	1	1	1
7											
8											

Column #	PNTSETTING_IN-H (Title)	PNTSETTING_IN-D (Default Value)	Comments
B	Pnt_Name	1:1-00	Indoor unit name - **DO NOT CHANGE**
C	Addr	1:1-00	Group Address - **DO NOT CHANGE**
D	Pny_ID	101	Assigned by iTM – **DO NOT CHANGE**
E	Device_Instance	“Empty”	Assign unique device ID
F	Occupancy_Mode	1	1: Enable, 0: Disable
G	On_Off_Status	1	1: Enable, 0: Disable
H	Alarm_Status	1	1: Enable, 0: Disable
I	Operation_Mode	1	1: Enable, 0: Disable
J	Room_Temperature	1	1: Enable, 0: Disable
K	Occ_Cooling_Setpoint	1	1: Enable, 0: Disable
L	Occ_Heating_Setpoint	1	1: Enable, 0: Disable
M	Unocc_Cooling_Setpoint	1	1: Enable, 0: Disable
N	Unocc_Heating_Setpoint	1	1: Enable, 0: Disable
O	Max_Cooling_Setpoint	1	1: Enable, 0: Disable
P	Min_Cooling_Setpoint	1	1: Enable, 0: Disable
Q	Max_Heating_Setpoint	1	1: Enable, 0: Disable
R	Min_Heating_Setpoint	1	1: Enable, 0: Disable
S	Min_Setpoint_Differential	0	1: Enable, 0: Disable
T	Setpoint_Tracking_Mode	0	1: Enable, 0: Disable
U	Fan_Speed	0	1: Enable, 0: Disable
V	Airflow_Direction	0	1: Enable, 0: Disable
W	Timed_Override_Operation	0	1: Enable, 0: Disable
X	Current_Unit_Operation	0	1: Enable, 0: Disable
Y	RC_On_Off	1	1: Enable, 0: Disable
Z	RC_Operation_Mode	1	1: Enable, 0: Disable
AA	RC_Setpoint	1	1: Enable, 0: Disable
AB	Filter_Sign_Status	0	1: Enable, 0: Disable
AC	Filter_Sign_Reset	0	1: Enable, 0: Disable
AD	Indoor_Fan_Status	0	1: Enable, 0: Disable
AE	Communication_Status	0	1: Enable, 0: Disable
AF	Thermo_On_Status	0	1: Enable, 0: Disable
AG	Compressor_Status	0	1: Enable, 0: Disable
AH	Aux_Heater_Status	0	1: Enable, 0: Disable
AI	Forced_Thermo_Off	0	1: Enable, 0: Disable
AJ	Changeover_Option	0	1: Enable, 0: Disable

2. How to import the CSV File.
   a. Save the CSV file on the USB drive – **Do not change the file name.**
   b. Insert the USB drive in the *iTM* USB port.
   c. Login to the “Service Mode” from the *iTM* [List Screen].
   d. Select the [*BACnet* Server/Gateway] button under the “Service Setting” tab.
   e. Select the [Import Configuration Data] button and select [Yes] to start the import process.

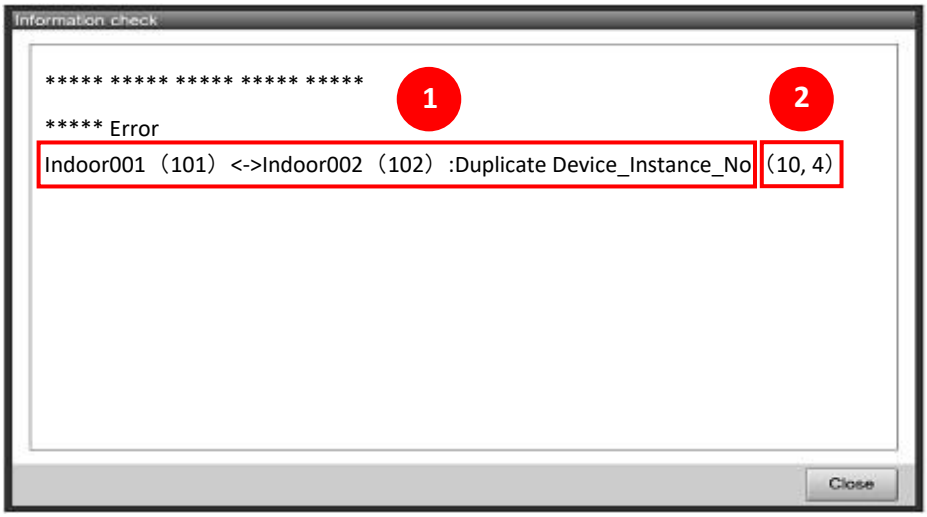




f. If the data in the CSV file imports successfully, the “Information Check” screen will display “**No error**”. However, this does not ensure the data is correct.

g. Press “**Close**” to reboot the *iTM*.

h. If the data did not input correctly into the CSV file, iTM displays “**Error**” on the “Information Check” screen. Confirm the details of the error, and modify the data in the CSV file.



1 CSV file import error message.

2 Target cell(s) with the error in the CSV file (10, 4):

(**10** = Row, **4** = Column) on CSV file.

i. Import error message details.

Type of Error	Error message	Detail of Error
Common setting	CSV File Version does not match.	There is no description of a file version in CSV file. There is an incorrect file version in the CSV file.
	No more than one common setting entry allowed.	There are multiple lines for Common setting.
	[Item]:File Error(line, column)	There is no numeric string.
	[Item]:Out of Range(line, column)	There is out of range value.
Target Device ID and Object setting (Management Point individual setting)	[Mgmt. Point ID]:Designated Management Point does not exist(line, Column)	There is no-exist Management point ID.
	[Mgmt. Point name] ([Mgmt. Point ID]) :[Item]: File Error (line, column)	There is no numeric string.
	[Mgmt. Point name] ([Mgmt. Point ID]) :[Item]: Out of Range (line, column)	There is out of range value.
	[Mgmt. Point name] ([Mgmt. Point ID]): Duplicate Management Points (line, column)	There is the same Management point ID.
	[Mgmt. Point name] ([Mgmt. Point ID]) <-> [Mgmt. Point name] ([Mgmt. Point ID]) : Duplicate Device_Instance_No (line, column)	There is same Device Instance Number which is set to the other indoor unit.
	[Mgmt. Point name] ([Mgmt. Point ID]) <-> Control_Device_Instance_No: Duplicate Device_Instance_No (line,)	The same Device Instance Number is used for System Control device.

5. Connecting the test operation PC and *iTM* via the cross cable or the hub/switch using 100BASE-TX straight cable.

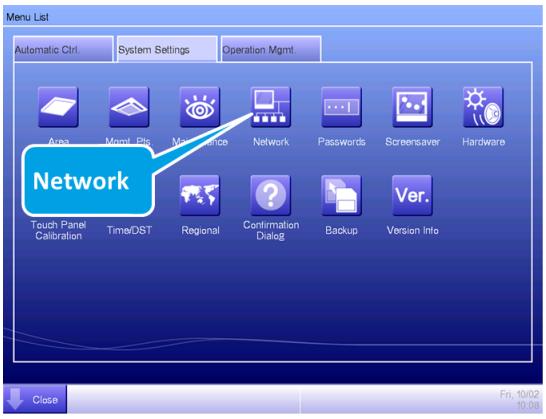
5.1 Connecting a Test PC to the *iTM*.

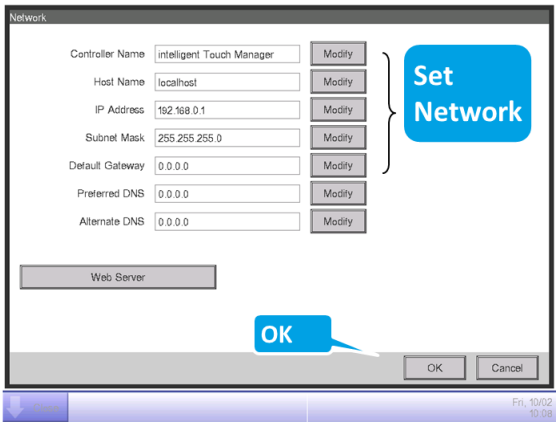
Verify that the CSV file is commissioned correctly and the required points are visible to the BMS by using a BACnet® discovery tool/software (ex. Yabe or Cimetrics).

1. Configure network setting of your laptop to communicate to *iTM* on the same subnet.
   - *iTM* Network Settings example:
     IP:192.168.0.1 (default)
     Subnet Mask: 255.255.255.0 (default)
   - PC Network Settings example:
     IP:192.168.0.2
     Subnet Mask: 255.255.255.0
2. Connect laptop to *iTM* using one of the following methods:
   - Ethernet crossover cable.
   - Straight Ethernet cables and a network hub/switch.

5.2 Configuring *iTM* Network Settings

1. From the [Menu List] of the *iTM* select the [System Settings].
2. Select the [Network] button.
   a. Modify the *iTM* IP address, Subnet Mask, and Default Gateway.

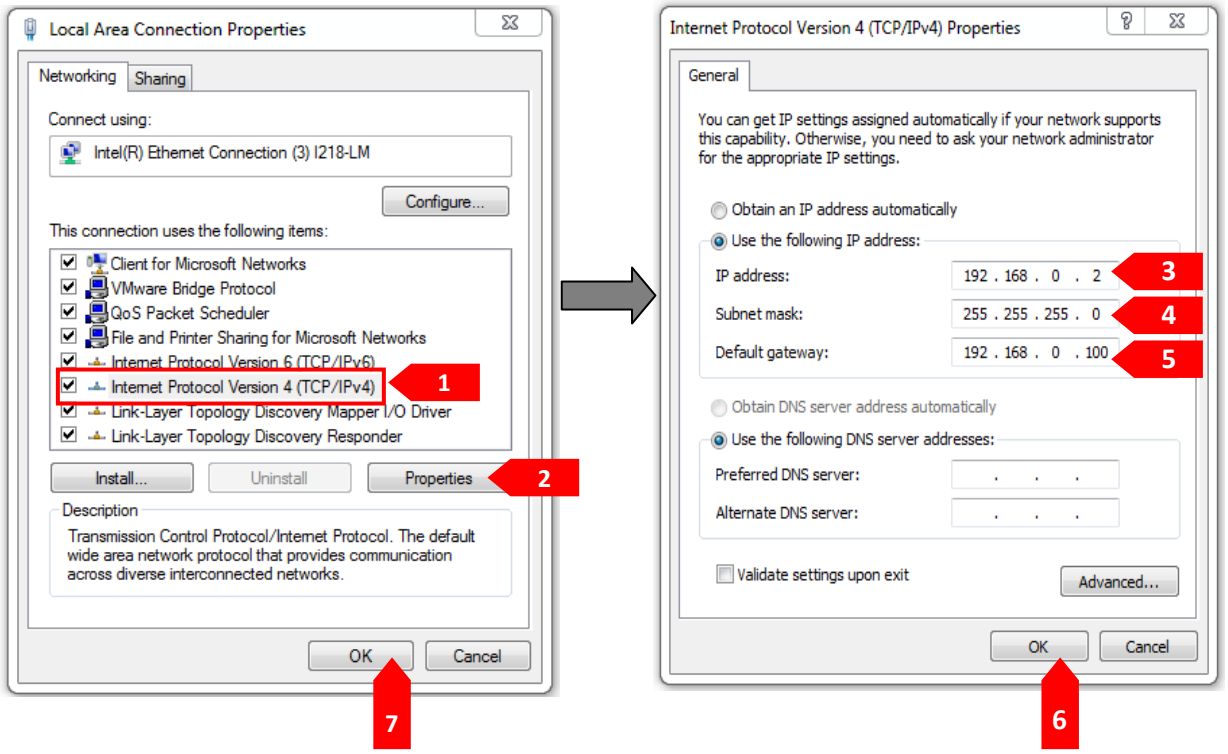




5.3 Configuring PC Network Settings

1. From the PC **Control Panel**, double-click on **Network and Sharing Center**.
2. Click on **Local Area Connection** or on the top left corner **Change Adopter Settings**, then double-click on **Local Area Connection**.

3. Select "Internet Protocol (TCP / IPv4)" [1] and click the Properties button [2]. The "Internet Protocol (TCP / IPv4) Properties" dialog box opens. This dialog box shows the test operation PC's current IP address [3], subnet mask [4], and default gateway address [5].



4. Change the test operation PC's IP address.
   Note: Use one of the following IP address depending on the current status of the *iTM*.
   1. If the *iTM's* IP address has not been changed from the factory setting, use the following for the test PC:
      - **IP address: 192.168.0.2**
      - **Subnet mask: 255.255.255.0**
      - **Default gateway address: 192.168.0.100**
   2. If the iTM's IP address **has been changed from the factory setting at the site**, use the following:
      - IP address shown in the table in **"[6]-2 IP address temporarily used for the test service operation"** on P.87.
5. Enter the information above in "IP address" [3], "subnet mask" [4], and "default gateway" [5] in the dialog box 2 of Step 1-3, and press the OK button [6]. The dialog box 1 reappears. Click the OK button [7].
6. Reboot the PC. (Reboot may not be necessary depending on the Windows version. Reboot the PC only when requested.)

5.4 Return the IP address of the test PC to the original address after the test operation.

(Be sure to return the test operation PC's IP address to the original setting.)

1. Return the test operation PC's IP address to the original setting.

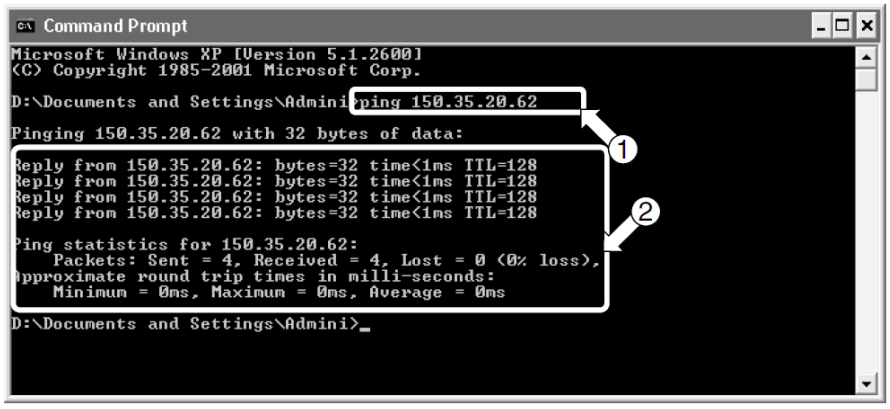
6. Reference

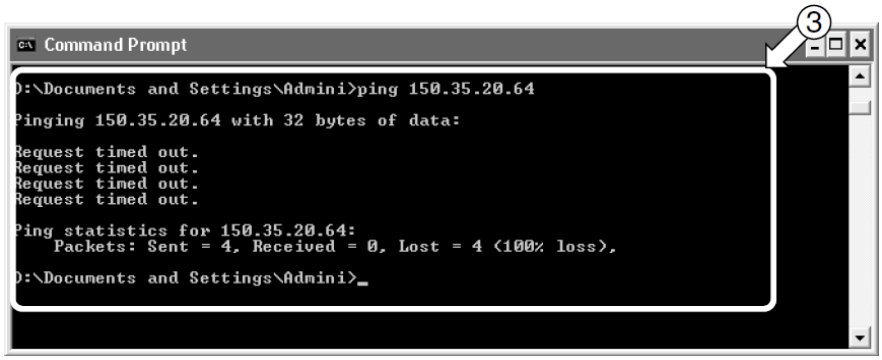
6.1 Possible Causes for Unconnected *iTM* and Test Operation PC

1. When using the Ethernet (LAN):
   Is the correct IP address set for the PC?
   Is the cable type correct?
   [1] When connecting via the hub/switch: Straight cable.
   [2] When connecting the *iTM* and test operation PC directly: Cross cable.
   Is the PC's LAN communication port functioning?
   When using the hub/switch, is the hub powered On?
   Can PING be executed from the test operation PC? (See below.)

6.2 How to Execute PING

1. From the PC's desktop, select **Start > Program > Accessories > Command Prompt**. The dialog box opens (see figure below).
2. Using the PC's keyboard, enter the *iTM's* IP address in [1].
   Ex. When the *iTM's* IP address is "150.35.20.62", enter "ping 150.35.20.62" and press the Return key.
3. If you can see information as shown in [2], the LAN connection is established. Start the test operation program and retry connection.
   If you see information as shown in [3], the LAN connection is not established. Check the PC's settings, and retry steps 1-3.





Handover to BMS

7.1 CSV File

1. Keep a copy of the CSV file with the proper configurations for record.

7.2 Network Settings

1. To allow the BMS to access the indoor unit information, change the *iTM* network settings according to network administrator requirements. .

7.3 Ask the BMS integrator to discover the BACnet® points from the *iTM*.

7.4 Unable to auto discover *BACnet* points.

1. If the BMS cannot auto-discover the *iTM BACnet* points, the points must be manually entered in the BMS system. The *iTM BACnet* Server Gateway Design Guide should be used as a source for point information.

7.5 Final Review

1. Review points list with the BMS integrator to answer questions on how to use the *BACnet* points.

Part 4. Programming Guide

1. Typical Requirements

1.1 Typical Indoor Unit Schedule Set by BMS Master Schedule

Mode	Time	Setpoint	Occupant	Note
Occupied Mode	8:00am to 6:00pm weekdays	Cool 72°F Heat 68°F	Can **adjust setpoint +/-2°F** from a zone controller.	• BMS to create **Optimum Start** • Unoccupied for more than 30 minutes (detected by occupancy sensor)→go to **Standby Mode** *Cool 74°F* *Heat 66°F (Setback)*
Unoccupied Mode	*The remainder of the day from above and weekend.*	Cool 80°F Heat 65°F (**setback** recovery of 4°F)	Can **override for 120 minutes** from a zone controller.	

1. If the BMS sets the schedule from their master schedule, the schedule set in the *iTM* should be disabled. See section 7.2 (1.) in Part 2.

2. How to Program

- BMS to set Setpoint Range Limitation to materialize +/-2°F from the occupied setpoints.
- BMS to set Occupied Setpoints and Unoccupied Setpoints.

- BMS to set Timed Override Time (override is handled by *iTM* with the Timed Override Minutes).
- BMS to set the occupancy status based on the Master Schedule. The BMS may send the occupied setpoints if the BMS wants to reset the occupied setpoints when the occupancy status is changed.

2.1 Setpoints

1. Refer to sections 7.2 (6.) – 7.2 (9.), 7.2 (14.), and 7.2 (15.) in Part 2.
2. The Occupied Setpoint can be set via the *iTM* or BMS schedule, or manually from the *iTM* or BMS remote controller. The setpoint stored in the indoor unit is based on the last command (last setpoint) received as the indoor unit does not recognize priority arrays.
3. The Unoccupied Setpoints can be set via the schedule (*iTM* or BMS) or manually from the *iTM* or BMS. Enable the setback at the *iTM* during its commissioning. The BMS can monitor and adjust the unoccupied setpoint if set at the *iTM*.

2.2 Setpoint Range Limitation

Mode	Min Setpoint	Max Setpoint	Occupant	Note
Cool Mode	70°F	74°F	Can **adjust setpoint from 70°F to 74°F** from a zone controller.	• Allows ± 2°F adjustment from 72°F in Cooling and 68°F in heating set in schedule. • BMS can set range limit according to controls specifications.
Heat Mode	66°F	70°F	Can **adjust setpoint from 66°F to 70°F** from a zone controller.	

1. Refer to sections 7.2 (10.) – 7.2 (13.) in Part 2.
2. The Min and Max cool and heat setpoints should be enabled and set in the *iTM* during commissioning. Values set in the *iTM* can be monitored and adjusted from the BMS.

2.3 Auto-Changeover Configuration

1. Auto-changeover should be configured at the *iTM* prior to the BMS integration. This will prevent the need for the BMS to program the auto-changeover for each indoor unit group from the master workstation. See section 3.2 (3.) in Part 1, and 7.3 (2.) in Part 2.

2.4 Schedule

1. The BMS should set the Occupied, Unoccupied, and Standby modes from the BMS Master Schedule (if the *iTM* Schedule is not used). See section 7.2 (1.) in Part 2 for details on Standby mode.
2. If the BMS Master schedule is used the Optimum Start should be configured from the Master Schedule.

2.5 Timed Override

1. During the unoccupied period (while Occupancy Mode is Unocc), the timed override is automatically allowed utilizing the Timer Extension function for the *iTM* Indoor Unit Management Point. While the Occupancy Mode is Occ, the occupied period is automatically disabled. See section 7.2 (1.) in Part 2. The timed override time can be set by the BMS with the Timed Override Minutes point. The typical setting is 120 minutes (2 hours). See section 7.3 (3.) in Part 2.
2. The timed override can be enabled/disabled by the BMS with the Timed Override Operation if necessary. See section 7.2 (18.) in Part 2.
3. Override status can be determined with the Current Unit Operation point. See section 7.2 (19.) in Part 2.

2.6 Remote Controller Prohibits

1. Remote controller prohibits (On/Off, Mode and Setpoint) must be enabled/disabled by the objects provided to the BMS. See sections 7.2 (20.) – 7.2 (22.) in Part 2.
2. The Remote Controller prohibits can also be set from the *iTM* touch screen or web browser.
3. Prohibiting the remote controller setpoint adjustment should not be enabled if the BMS sets the Setpoint Range Limitation (see section 7.2 (22.)).

4. The Remote Controller On/Off and Mode adjustment can be prohibited during the occupied hours. However, On/Off may need to be permitted during the unoccupied period for the Timed Override operation.

3. Notes

3.1 Indoor Unit EEPROM

1. Every change made is sent to the respective indoor unit. When the same data value is resent from the BMS, it is not counted as change to the indoor unit.
2. The indoor unit stores the latest setting in the EEPROM. The maximum writable entries are limited to 1,000,000 (depending upon indoor unit model) for each data item. This allows the indoor unit to resume using the previous setting after a power failure.
3. Changes should be kept at a minimum of 70,000-80,000 times per year.
   a. Rule of thumb:
      Do not change settings frequently. Keep below 200 change settings per day for each data item.

3.2 Priority Array

1. An object in the *iTM* BACnet® Server Gateway has a priority array, so that the highest priority value is sent to the indoor unit.
2. The indoor unit does not have priority. The last change will be valid for the indoor unit either from the *iTM BACnet* Server Gateway, *iTM* or Remote Controller.

Part 5. Installation Manual

1. Installation

Before *iTM* installation begins, perform the following preparatory checks.

- Confim the *iTM* includes all accessories.
- Confirm the location of *iTM* terminals and switches.
- Check that appropriate space for installing the *iTM* is available.

1.1 Understanding the Location of Terminals and Switches

- Understand the arrangement of terminals and the location of openings on the unit. Plan the cable route and the order for connecting wires to facilitate the installation procedure. For connection details, including the cable type and terminal size, refer to “Electric Wiring”.

1.2 Rear Panel

- Most terminals are located on the rear panel of the *iTM*, behind a terminal cover for safety. Remove two screws to detach the cover and view the ports (terminals).

  Rear face of *iTM*:

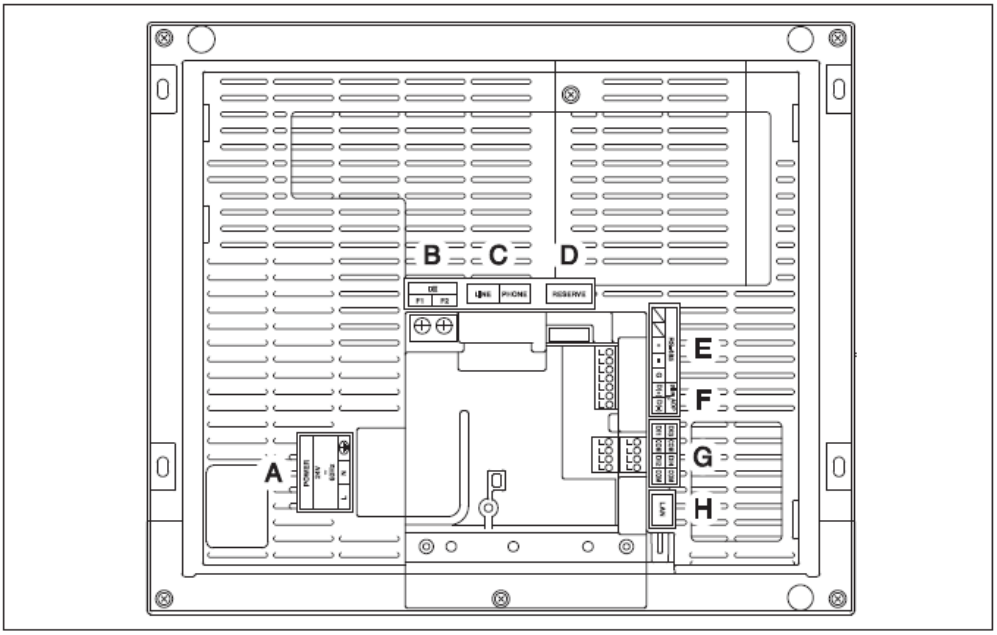


Figure 21. Rear Face of intelligent Touch Manager™

A. [POWER] The power line connection terminals. A power supply voltage of 24 VAC (at 60 Hz) is required. Near the terminal block, there is a blue resin cable mount for securing the power supply cable with the clamp.

B. [DIII] The communication line connection terminals for “DIII-NET” enable communications with DAIKIN’s air conditioning equipment.

C. [LINE, PHONE] The port used when subscribing to the DAIKIN “Air Conditioning Network Service System” online monitoring service for air-conditioning systems. A separate maintenance contact is necessary for “Air Conditioning Network Service System” service.

D. **[RESERVE]** No Use.
E. **[RS-485]** The terminals for connecting serial equipment.
F. **[plus ADP IF]** The terminals for connecting one or more *iTM* plus adaptors when the *iTM* is used to control additional air conditioning devices.
G. **[Di (1-4), COM]** The terminals for stopping air conditioners when wired to emergency devices, connecting a power meter to calculate the electricity usage of individual air conditioners, or other operations.
H. **[LAN]** The port for connecting the *iTM* to an Ethernet network.

1.3 Front Panel

- Four LEDs are located below the monitor display on the front panel, and indicate the operating status of the *iTM*. Sliding the front slide cover down and removing the cover reveals terminals used during installation or maintenance work.

Front face of *iTM*:

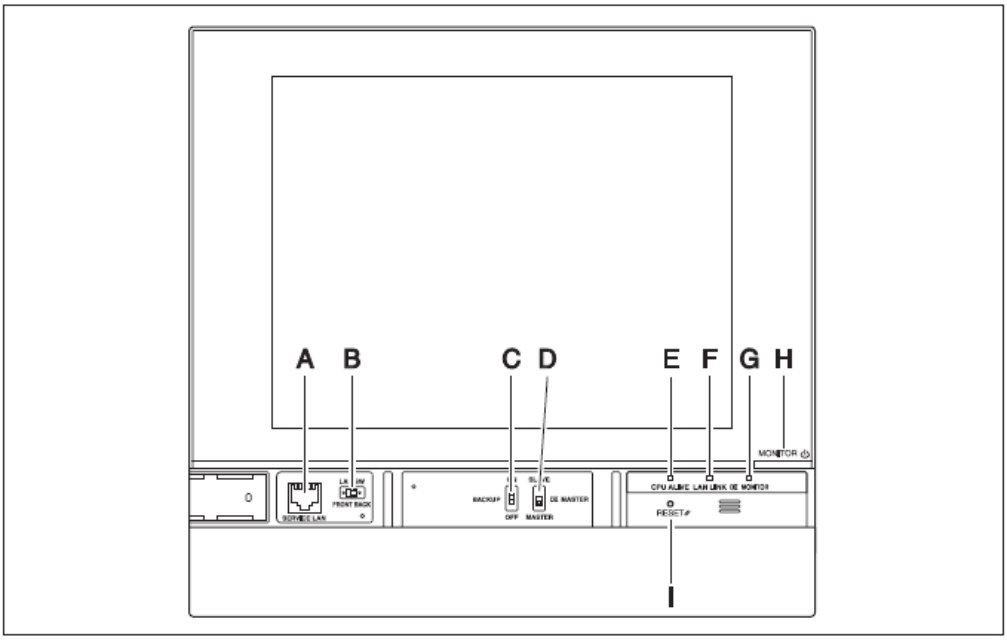


Figure 22. Front Face of intelligent Touch Manager™

A. **[SERVICE LAN]** The port for temporarily connecting the *iTM* to a LAN from its front panel (instead of the rear panel), during installation or maintenance operations.
B. **[LAN SW]** Switch for setting the LAN port on the back and the SERVICE LAN port on the front. The cover cannot close when the switch set to “FRONT”. To close the cover, select “BACK”.
C. **[BACKUP]** The switch for turning On/Off the backup power supply for retaining the current settings.
D. **[DIII MASTER]** The switch for setting “MASTER” or “SLAVE” when there are multiple DIII-Net centralized controllers such as iTM.
E. **[CPU ALIVE]** LED (Green): The LED that indicates the CPU is operating normally. The CPU is operating normally when this LED is blinking, and malfunctioning when it is On or Off. (It takes about 10 seconds for detection of the abnormality.)
Solid On: Software error

Off: Hardware error or power Off

F. [LAN LINK] LED (Green): The LED that indicates the hardware connection is established normally between the *iTM* and the equipment connected to the LAN port. It is lit when there is no error.

G. [DIII MONITOR] LED (Yellow): This LED blinks when data is sent or received via DIII-Net communication line.

H. [MONITOR] Key and LED (Orange/Green): By pressing this key, the monitor display turns On/Off. The color of the LED also changes simultaneously. Off: The monitor is powered off.
On (Orange): The monitor display is off.
On (Green): The monitor display is on.

I. [RESET] The switch for restarting the *iTM*.

1.4 Side Panel

A USB port is located on the left side of the *iTM*. The USB port is used for connecting devices for making settings, performing maintenance, or other operations after *iTM* installation. The left side also contains the product label identifying product name, weight, power supply, and serial number.

Side panel of *iTM*:

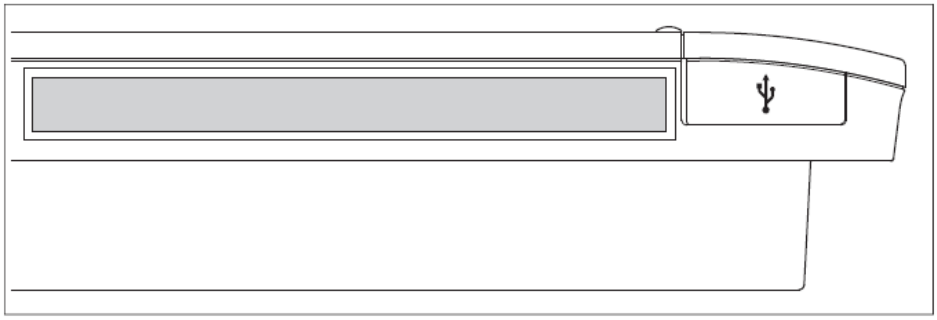


Figure 23. Side Panel of intelligent Touch Manager™

[ψ] Open this cover to expose and connect to the USB port. This port can be turned 90 degrees to the front direction. Connect to this port from the front direction if there is not enough space on the side.

1.5 Environmental Conditions

Check that the installation environment meets the following conditions:

- The ambient temperature is 32 – 104°F.
- The ambient humidity is 85% RH or less (without condensation).
- The electromagnetic wave does not affect the operation of the iTM.

2. Electrical Wiring

This section describes the procedure for connecting the *iTM* with Daikin air conditioning devices and other equipment.

In addition to the indoor units, the *iTM* can monitor and control a wide variety of equipment. However, the required connection procedures vary depending on the equipment connected.

Do not connect more than two wires to the same terminal.

- 2.2 Connecting the DIII-NET-compatible air conditioning equipment
- 2.3(2.) Connecting a LAN cable
- 2.3.(4.) Connecting an emergency stop input device or power meter
- 2.3.(7.) Connecting an *iTM* Plus Adaptors
- 2.3.(9.) Connecting the power supply

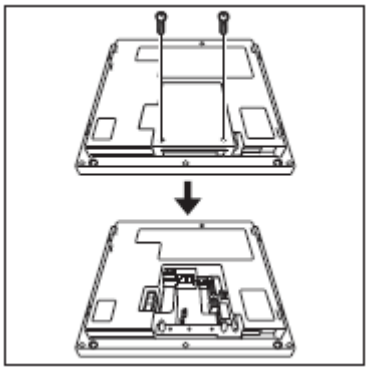
⚠ WARNING

- **Do not turn on the power supply before all wire connections are completed. When there is an earth leakage breaker or a local switch installed on the circuit, make sure that the circuit is securely interrupted. Otherwise, an electric shock may result.**
- **After the wiring is completed, double-check that all wires are connected correctly before turning on the power supply.**
- **All field supplied parts and materials, electric works must conform to local codes.**
- **All wiring must be performed by an authorized electrician.**

2.1 Removing Wiring Cover from Rear Face

1. Remove the wiring cover from the rear face by removing two screws using a Phillips screwdriver.

<Removing wiring cover>



2.2 Connecting DIII-Net-Compatible Air Conditioning Equipment

The DIII-Net is Daikin's proprietary communication method used between indoor units. Using the DIII-Net, multiple Daikin DIII-Net-compatible indoor units can be centrally control by connecting them to the *iTM*.

⚠ WARNING

- Be sure to perform the operation during power-off conditions. Not doing so may cause an electric shock.
- The maximum length of adhered wiring of high current electrical line of power wires and weak current line of communication wires must be kept to 65 ft. or less.

2.3 Wiring Specifications

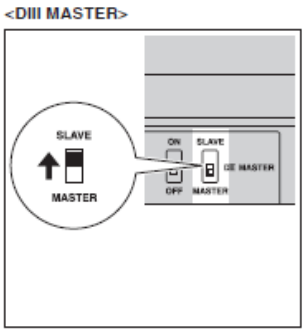
- Cable type: 2-core, vinyl-insulated, vinyl-sheathed cable/vinyl cable (non-shielded).
- Core thickness: AWG 18-16
- Terminal treatment: Use a round crimp-type terminal (M3.5) with insulating sleeve.

⚠ CAUTION

- Do not use multicore cables with three or more cores.
- When using a shielded cable, connect only one end of the cable to the ground.
- The maximum wiring length is 3280 ft. and total wiring length is 6561 ft. or less. When using a shielded wire, the total wiring length is limited to 4921 ft. or less.

1. Precautions for using multiple centralized controllers.
   a. The “centralized controller” refers to the equipment (e.g. the *iTM*) that controls multiple indoor units. In addition to the *iTM*, the Daikin product portfolio includes a wide range of centralized controllers suitable for different applications or building sizes. These controllers can be used in combination to construct an optimal air conditioning control system.
   b. If multiple centralized controllers are connected on the DIII-Net network, set a MASTER and SLAVE relationship for those controllers.
   c. Assign only one of the controllers to MASTER, and other controllers to SLAVE.
   d. The iTM is set to MASTER by default. Change the setting to SLAVE in the following cases:
      - Interface for use in BACnet® is installed in parallel.
      - Interface for use in LONWORKS is installed in parallel.
      - If another *iTM* or *iTM* Plus Adaptor is assigned to MASTER.

e. To change the setting of the *iTM* to SLAVE, flip the DIII MASTER switch located under the front slide cover to the up position (see figure below).



When installing multiple centralized controllers, only set the highest-priority controller to MASTER, and set all other controllers to SLAVE according to the following order of priority.

High	↑	(1) Interface for use in BACnet.
		(2) Interface for use in LONWORKS.
		(3) **intelligent Touch Manager™ (iTM) (Main),** *iTM* plus adaptor (Main).
		(4) Central Remote Controller (Main).
Priority		(5) ***intelligent Touch Manager* (Sub),** *iTM* plus adaptor (Sub).
		(6) Central Remote Controller (Sub).
		(7) ON/OFF Controller (Main).
Low	↓	(8) ON/OFF Controller (Sub).

Centralized controllers that cannot be connected to the same network as the *iTM*:

- Parallel Interface
- intelligent Touch Controller™ (iTC)
- DIII-Net Plus Adaptor
- Residential Central Remote Controller
- Schedule Timer
- Wiring Adaptor for Electrical Appendices (1) (KRP4A)

2. Connecting a LAN cable
   By connecting the *iTM* with a PC via Ethernet, remote operations such as setup and maintenance of air conditioning system can be performed.

⚠ WARNING

Do not clamp the LAN cable with high current cables.

NOTE

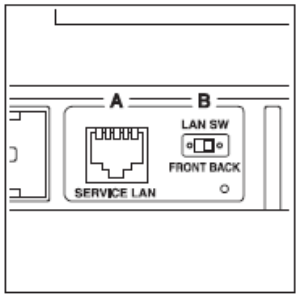
For how to connect the intelligent Touch Manager to a PC network, contact your network administrator.

3. Wiring specifications
   Applicable cable standard: 100Base-TX or 10Base-T
   Connector standard: RJ-45

NOTE

- When you connect the intelligent Touch Manager to the LAN temporarily during installation or maintenance, use the SERVICE LAN port located on the front face.
  The SERVICE LAN port is enabled by changing the position of the LAN SW switch beside the SERVICE LAN to the FRONT position.
- You cannot close the cover when the switch set to "FRONT". To close the cover, select "BACK".

<SERVICE LAN socket and LAN SW switch>



A. SERVICE LAN
B. LAN SW

4. Connecting an emergency stop input device or power meter.
   The *iTM* can perform operations such as an emergency stop of indoor units according to the external signal input device, and an electricity usage calculation for each indoor unit (for power proportional distribution) according to the pulse inputs from a power meter.

WARNING

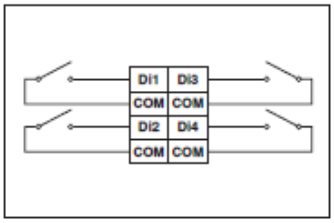
- Be sure to perform the operation during power-off conditions. Not doing so may cause an electric shock.
- Do not clamp high-current cables together with low-current cables.

5. Terminal location and schematic connection diagram.
   Connect the contact input signal wire or pulse signal wire to Di1, Di2, Di3, Di4, or COM terminal to the orange connector on the rear face. Each of these terminals has different function.

NOTE

The COM terminals are all connected internally. So, you can use either of them. However, you can connect up to two wires simultaneously to each COM terminal. When using an open collector type output, connect the COM terminal to the negative side.

<Schematic drawing of Di connection>

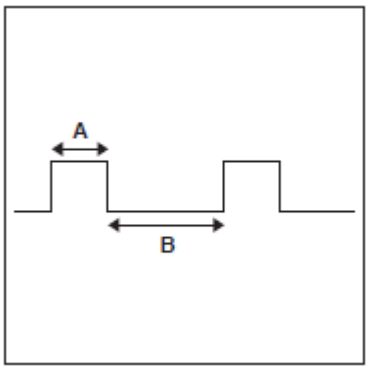


[Di1] Emergency stop input
[Di2] [Di3] [Di4] Pulse input, contact signal input (digital input)
[COM] Common

Note: The function settings for these terminals can be changed later. To change the function settings, refer to the “Commissioning Manual (EM11A022)”.

6. Wiring specifications
   - Cable type: CPEV cable
   - Core thickness: AWG 22-19
   - Cable length: 656 ft. or less

   Pulse width



   A. Pulse width: 20 to 400 ms
   B. Pulse interval: 100 ms or more

> **CAUTION**
> - The contact connected to the contact input terminal must be capable of handling 10 mA at 16 VDC.
> - If an instantaneous contact is used for triggering an emergency stop, use one that has an energization time of 200 ms or more.

> **NOTE**
> Once the emergency stop input signal is turned on, all air conditioners stop and do not restart until the emergency stop input is cleared. When the manual reset is specified for the resetting method, you need to clear the emergency stop using the intelligent Touch Manager.

7. Connecting the *iTM* Plus Adaptors
   When networking several indoor units, use *iTM* Plus Adaptors. A single *iTM* is limited to controlling 64 indoor groups. By installing *iTM* Plus Adaptors, an additional 64 indoor unit groups per adaptor is possible. Additionally, as the *iTM* can be connected with a maximum of seven *iTM* Plus Adaptors, a total of 512 groups of indoor units can be controlled with a single iTM.

> **WARNING**
> - Be sure to perform the operation during power-off conditions. Not doing so may cause an electric shock.
> - Do not clamp high-current cables together with low-current cables.

8. Wiring specifications
   - Cable type: CPEV or FCPEV cable
   - Core thickness: AWG 22-19
   - Cable length: The overall cable length between the *iTM* and the terminal *iTM* Plus Adaptor is 164 ft. or less.
   - Wiring connection type: Sequential connections

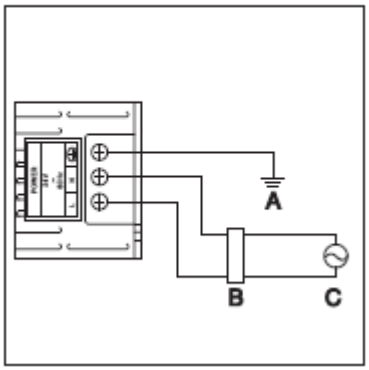
> **NOTE**
> Each air conditioner controlled via an iTM plus adaptor is also assigned a DIII address between "1-00" to "4-15". From the intelligent Touch Manager, it is recognized as "2:1-00", "3:1-02", or the like, with the DIII-NET port number prefixed.

9. Connecting the power supply
   Connect the *iTM* to a power supply.

> **⚠ WARNING**
> **Be sure to perform the operation during power-off conditions. Do not turn the power supply on until all connections are made. Not doing so may cause an electric shock.**

10. Terminal location and schematic connection diagram
    Connect the power supply to the three terminals, L (Live), N (Neutral), and ground in the POWER section.

<Schematic power connection diagram>



A. Earth **B.** Earth leakage breaker **C.** Power supply 24VAC 60 Hz

11. Wiring specifications
    - Cable type: Ordinary tough rubber sheathed cord (60245 IEC 53) equivalent or higher. Ordinary polyvinyl chloride sheathed cord (60227 IEC 53) equivalent or higher.
    - Core thickness: Power wire: AWG 17-14.
      Earth lead: Size must comply with local codes.
    - Terminal treatment: Use a round crimp-type terminal (M4) with insulating sleeve.
    - Power supply voltage: Single phase 24 VAC (at 60 Hz).
    - Voltage fluctuation: ±10% or less.
    - Electric power consumption: 23 W.

CAUTION

- An earth leakage breaker capable of shutting down power supply to the entire system must be installed.
- Turning on/off the earth leakage breaker turns on/off the power supply to the intelligent Touch Manager.
- When using an earth leakage breaker, make sure to select one useful for to protection against overcurrent and short-circuit. When using an earth leakage breaker only for earth device, make sure to use a wiring interrupter together.
- The power supply requires earth leakage breaker installation and earth wire connection. After installing an earth leakage breaker, be sure to connect only the intelligent Touch Manager to it.
- To prevent accidents due to wire breakage or disconnection, secure the power supply cables to the blue resin cable mount with cable ties.
- Be sure to connect the earth wire.
- Do not connect the earth wire to gas or water pipes, lighting rod, or telephone earth wire.
- Replace the unit when the unit cannot be turned on due to the blowing of the electrical fuse.

3. Basic Setup of intelligent Touch Manager™

After checking all connections are correct and secure, begin the *iTM* basic setup. The basic setup refers to the preparative settings for monitoring and controlling the air conditioning system using the *iTM*.

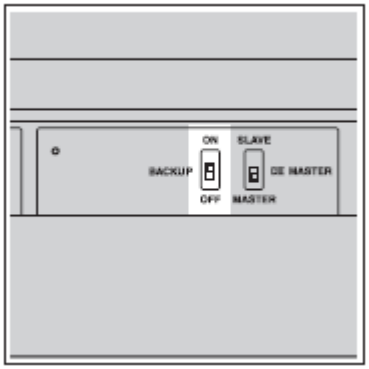
Make each setting by following the guidance displayed on the screen after turning on the *iTM* power supply.

The setting assignment made through this procedure may be changed at a later time.

3.1 Setting Backup Battery to ON

To retain the settings in the event of a power outage, the *iTM* includes a built-in backup battery. The backup battery is disabled by default. Move switch to On position to use backup battery.

< BACKUP switch >



1. Open the front slide cover. Remove screws with a Phillips screwdriver to remove the front switch cover.

2. Move BACKUP switch to ON, and attach the front switch cover back to original position. If the power supply is OFF for a long period of time (six months or more), turn OFF the BACKUP switch.

3.2 Turning on Power Supply to intelligent Touch Manager™ and Air Conditioners

Turn on the power supply for the *iTM* and devices that are connected to the *iTM*.

1. Turn on the power supply to the air conditioners before turning on the *iTM*. After powering the *iTM* and startup, a title screen appears with the message “Ready to set up A/C centralized address”.
   Set the DIII-NET addresses using the remote controller for the indoor units.
2. Click Close.
   The Locale Settings screen appears.

⚠ CAUTION

Before turning on the power supply, double-check that all installations and connections are completed correctly.

NOTE

The message “Turn ON Battery Backup switch” may be displayed instead of the Locale Setting screen. This message is displayed if you do not turn ON the data backup battery switch in the step 3.1. If the message is displayed, make the setting according to section 3.1 Setting backup battery to ON. When done, touch the OK button shown with the message on the screen. Then, the Locale setup screen appears.

Appendix A. BACnet® Gateway (DMS502B71) and *iTM* Protocol Comparison

This appendix describes the following differences between *BACnet* Gateway (Ver. 6.34.00) and *iTM BACnet* Server Gateway (Ver. 2.04.00):

- **Functions removed from *BACnet* Gateway**
- **Functions changed from *BACnet* Gateway**

Note that "Additions from *BACnet* Gateway" are omitted from this appendix as they are described in the main body of these specifications. Furthermore, differences described in this appendix are limited to the following:

- Properties
- Services
- PICS

1. Functions Removed from BACnet® Gateway

Properties

The following properties are not supported as Event Notification is not supported:

- Common (Analog Input, Binary Input, Binary Value）
  - » Time_Delay
  - » Notification_Class
  - » Event_Enable
  - » Acked_Transitions
  - » Notify_Type
  - » Event_Time_Stamps
- Analog Input (Room Temperature）
  - » High_Limit
  - » Low_Limit
  - » Deadband
  - » Limit_Enable
- Binary Input (Unit On_Off Status）
  - » Change_Of_State_Time
  - » Change_Of_State_Count
  - » Time_Of_State_Count_Reset
  - » Elapsed_Active_Time
  - » Time_Of_Active_Time_Reset

Services

The following services are removed as Unsolicited COV and Event are not supported:

- Device Management-DeviceCommunicationControl-B
- Data Sharing-COV-Unsolicited-B
- Alarm and Event-Notification Internal–B
- Device Management - List Manipulation–B

Appendix B. Supported Indoor Unit Models and Monitoring Control Items

The following table includes a list of objects for each of the supported indoor unit models compatible with the *iTM* BACnet® Server Gateway function.

Instance No.	Object Name	*VRV* Indoor Unit	SkyAir Indoor Unit (except FTXS)	Outdoor Air Processing Unit	Mini-Split & SkyAir FTXS Indoor Units (KRP928)	FFQ Indoor Unit for Multi-Split & Super Multi Plus (DTA112BA51 adaptor may be required)
1	Occupancy Mode	✓	✓ (Note4)	✓ (Note4)	✓ (Note4)	✓ (Note4)
2	Unit On_Off Status	✓	✓	✓	✓	✓
3	Alarm Status	✓	✓	✓	✓	✓
4	Operation Mode	✓	✓	✓	✓ (Note3)	✓
5	Room Temperature	✓	✓	✓ (return air temp)	✓	✓
6	Occ Cooling Setpoint	✓	✓	N/A	✓ (Note1,2)	✓
7	Occ Heating Setpoint	✓	✓	N/A	✓ (Note1,2)	✓
8	Unocc Cooling Setpoint	✓	✓	N/A	✓	✓
9	Unocc Heating Setpoint	✓	✓	N/A	✓	✓
10	Max Cooling Setpoint	✓	✓	N/A	✓	✓
11	Min Cooling Setpoint	✓	✓	N/A	✓	✓
12	Max Heating Setpoint	✓	✓	N/A	✓	✓
13	Min Heating Setpoint	✓	✓	N/A	✓	✓
14	Min Setpoint Differential (Cooling & Heating)	✓	✓	N/A	✓	✓
15	Cooling & Heating Setpoint Tracking Mode	✓	✓	N/A	✓	✓
16	Fan Speed	✓	✓	N/A	N/A	✓
17	Airflow Direction	✓	✓	N/A	N/A	✓
18	Timed Override Operation	✓	✓	✓	✓	✓
19	Current Unit Operation	✓	✓	✓	✓	✓
20	Remote Controller Prohibit (On_Off)	✓	✓	✓	✓	✓
21	Remote Controller Prohibit (Operation Mode)	✓	✓	✓	✓	✓
22	Remote Controller Prohibit (Setpoint)	✓	✓	N/A	✓	✓
23	Filter Sign Status	✓	✓	✓	N/A	✓
24	Filter Sign Reset	✓	✓	✓	N/A	✓
25	Indoor Fan Status	✓	✓	✓	N/A	✓
26	Communication Status	✓	✓	✓	✓	✓
27	Thermo-on Status	✓	✓	✓	N/A	✓
28	Compressor Status	✓	✓	✓	N/A	✓
29	Aux Heater Status	✓	✓	✓	N/A	✓
30	Forced Thermo-off	✓	✓	✓	N/A	✓
31	Indoor Unit Changeover Option	✓	✓	✓	✓	✓

Instance No.	Object Name	*VRV* Indoor Unit	SkyAir Indoor Unit (except FTXS)	Outdoor Air Processing Unit	Mini-Split & SkyAir FTXS Indoor Units (KRP928)	FFQ Indoor Unit for Multi-split & Super Multi Plus (DTA112BA51 Adaptor Required)
32	Return Air Temperature	✓	N/A	✓	N/A	N/A
33	Discharge Air Temperature	✓(Note5) (Only FXMQ-PB)	N/A	Invalid	N/A	N/A
34	Liquid Pipe Temperature	✓	N/A	✓	N/A	N/A
35	Gas Pipe Temperature	✓	N/A	✓	N/A	N/A
36	EV Position	✓	N/A	✓	N/A	N/A
37	Freeze Protection	✓(Note6) (Only FXEQ_P, FXFQ_T, FXTQ_TA, FXUQ_P, FXZQ_TA, FXSQ_TA, CXTQ_TA)	N/A	Inactive (Off)	N/A	N/A

N/A: Object not generated
Invalid: Invalid value (0)

Notes:

1. If the operating mode is Auto, the setpoint cannot be changed.
2. The Mini-Splits have varied setpoints ranges (64°F – 90°F in cooling and 50°F – 86°F in heating). In the event that a value outside of the available setpoint range is sent from the BMS via *iTM*, the indoor unit will ignore the out of range setpoint command (however, in the above case, the *iTM* can send the cooling setpoint value and heating setpoint value of only 64°F – 82°F.) Even within the available range of setpoints, for example, if the setpoint value of "61°F" is sent from the BMS, the return value from the indoor unit could be "60°F" due to the Fahrenheit/Celsius conversion. Therefore, when the setpoint is controlled from the BMS, do not continue to send the setpoint until the sent value matches the return value.
3. Fan, Dry, and Auto are not supported.
4. Eco Mode command is also sent to models without the function. Subsequent command processing is processed by the indoor unit.
5. Unit types other than those supported display an invalid value (0)
6. Unit types other than those supported are off

Appendix C. Supported Outdoor Unit Models

Regarding outdoor units models compatible with the BACnet® server, the list is as follows:

***VRV* IV Heat Pump supported ODU**

Model name	
RXYQ72TATJU	RXYQ72TAYDU
RXYQ96TATJU	RXYQ96TAYDU
RXYQ120TATJU	RXYQ120TAYDU
RXYQ144TATJU	RXYQ144TAYDU
RXYQ168TATJU	RXYQ168TAYDU
RXYQ192TATJU	RXYQ192TAYDU
RXYQ216TATJU	RXYQ216TAYDU
RXYQ240TATJU	RXYQ240TAYDU
RXYQ264TATJU	RXYQ264TAYDU
RXYQ288TATJU	RXYQ288TAYDU
RXYQ312TATJU	RXYQ312TAYDU
RXYQ336TATJU	RXYQ336TAYDU
RXYQ360TATJU	RXYQ360TAYDU
RXYQ384TATJU	RXYQ384TAYDU
RXYQ408TATJU	RXYQ408TAYDU

***VRV* IV Heat Recovery supported ODU**

Model name	
REYQ72TATJU	REYQ72TAYDU
REYQ96TATJU	REYQ96TAYDU
REYQ120TATJU	REYQ120TAYDU
REYQ144TATJU	REYQ144TAYDU
REYQ168TATJU	REYQ168TAYDU
REYQ192TATJU	REYQ192TAYDU
REYQ216TATJU	REYQ216TAYDU
REYQ240TATJU	REYQ240TAYDU
REYQ264TATJU	REYQ264TAYDU
REYQ288TATJU	REYQ288TAYDU
REYQ312TATJU	REYQ312TAYDU
REYQ336TATJU	REYQ336TAYDU
REYQ360TATJU	REYQ360TAYDU
REYQ384TATJU	REYQ384TAYDU
REYQ408TATJU	REYQ408TAYDU
REYQ432TATJU	REYQ432TAYDU
REYQ456TATJU	REYQ456TAYDU

***VRV* IV Aurora™ Heat Pump ODU**

Model name	
RXLQ72TATJU	RXLQ144TAYCU
RXLQ96TATJU	RXLQ192TAYCU
RXLQ120TATJU	RXLQ240TAYCU
RXLQ144TATJU	RXLQ72TAYDU
RXLQ192TATJU	RXLQ96TAYDU
RXLQ240TATJU	RXLQ120TAYDU
RXLQ72TAYCU	RXLQ144TAYDU
RXLQ96TAYCU	RXLQ192TAYDU
RXLQ120TAYCU	RXLQ240TAYDU

***VRV* IV Aurora™ Heat Recovery ODU**

Model name	
RELQ72TATJU	RELQ144TAYCU
RELQ96TATJU	RELQ192TAYCU
RELQ120TATJU	RELQ240TAYCU
RELQ144TATJU	RELQ72TAYDU
RELQ192TATJU	RELQ96TAYDU
RELQ240TATJU	RELQ120TAYDU
RELQ72TAYCU	RELQ144TAYDU
RELQ96TAYCU	RELQ192TAYDU
RELQ120TAYCU	RELQ240TAYDU

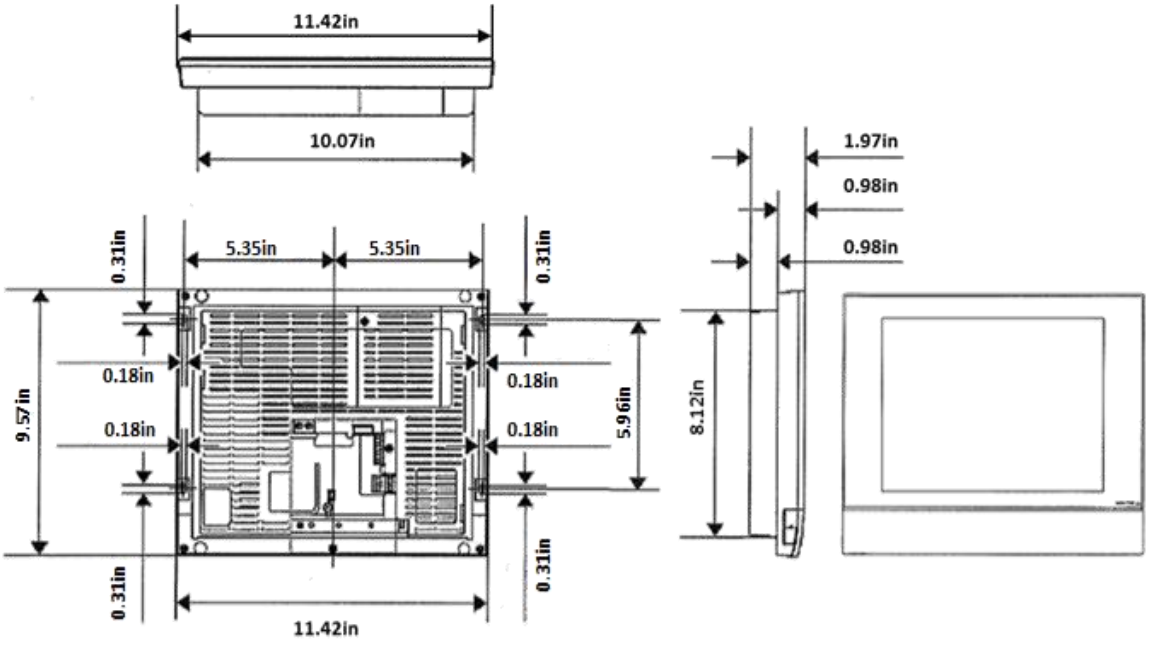
Appendix D. *iTM* Specifications, Dimensions, and System Wiring

1. Specifications

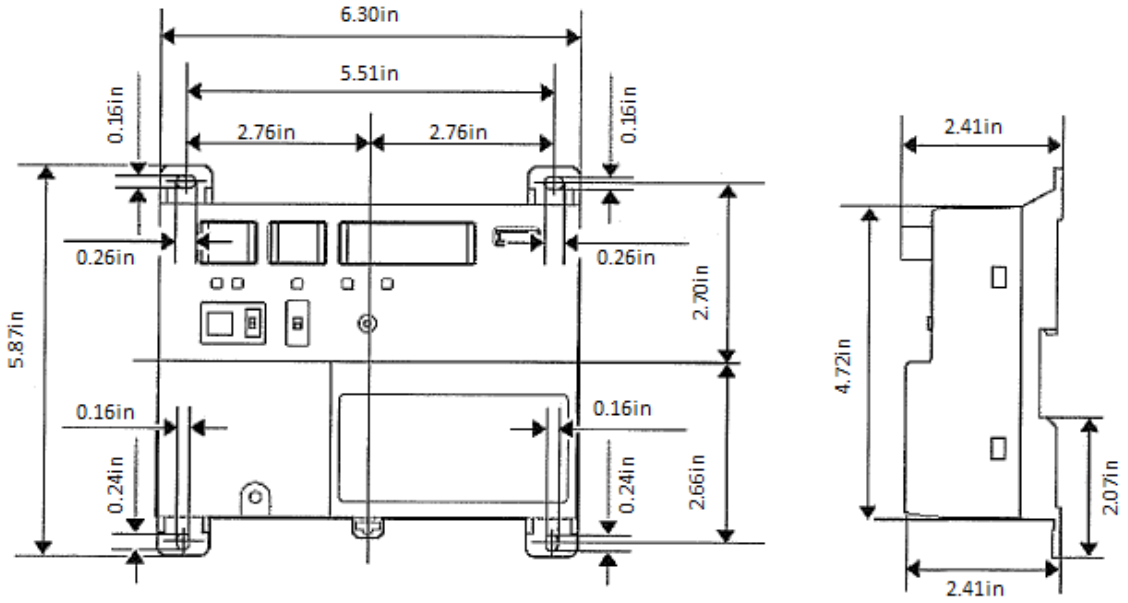
Model No.	intelligent Touch Manager™ DCM601A71	*iTM* Plus Adaptor (option) DCM601A72
Power Supply (Externally supplied)	24 VAC, 60 Hz	24 VAC, 60 Hz
Power Consumption	23 Watts	23 Watts
Operating Temp Range	32-104°F	14 - 122°F
Operating Humidity Range	85% or less (w/o condensation)	85% or less (w/o condensation)
Dimensions (WxHxD)	11.42 x 9.57 x 1.97 in.	6.30 x 5.87 x 2.41 in.
Weight (Mass)	5.3 lbs. (2.4 kg)	1.1 lbs. (0.5 kg)
Certifications	FCC Part 15 Class B	

2. Dimensions

intelligent Touch Manager™ (iTM)
DCM601A71

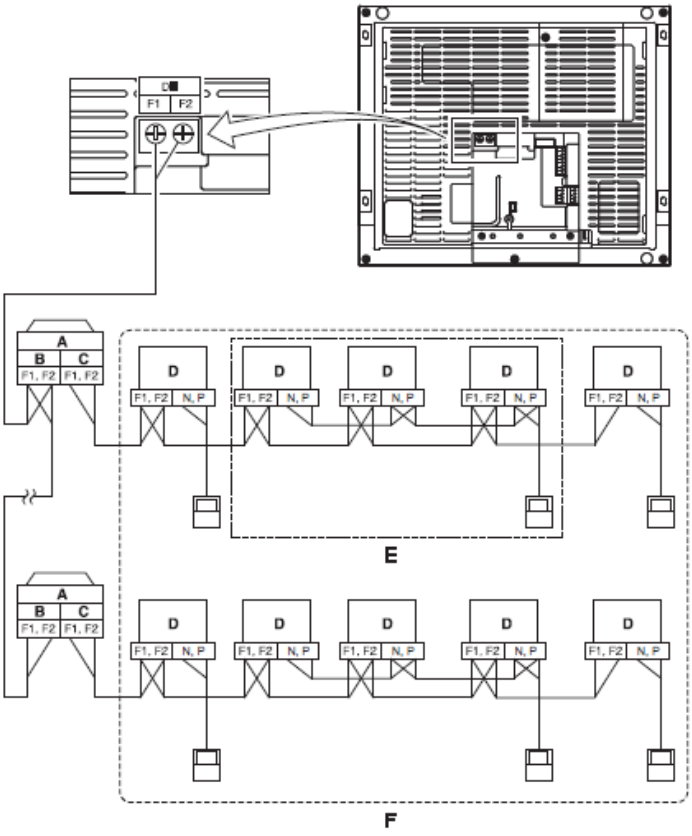


iTM Plus Adaptor
DCM601A72



3. System Configuration and Wiring

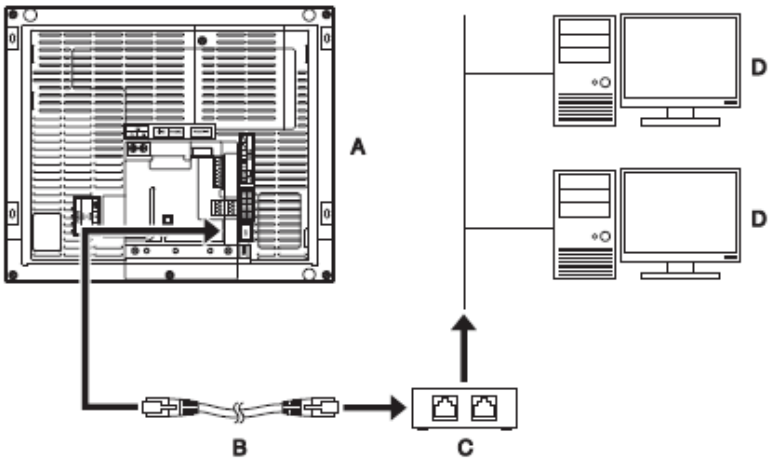
iTM* – DIII-Net Wiring



A. Outdoor unit
B. OUT - OUT communication (terminal)
C. IN - OUT communication (terminal)
D. Indoor unit
E. A maximum of 16 indoor units can be connected per remote controller group.
F. A maximum of 64 indoor unit groups (Up to128 indoor units) can be connected.

* For wire type, refer to the *iTM* Installation Manual.

iTM Ethernet Connection*

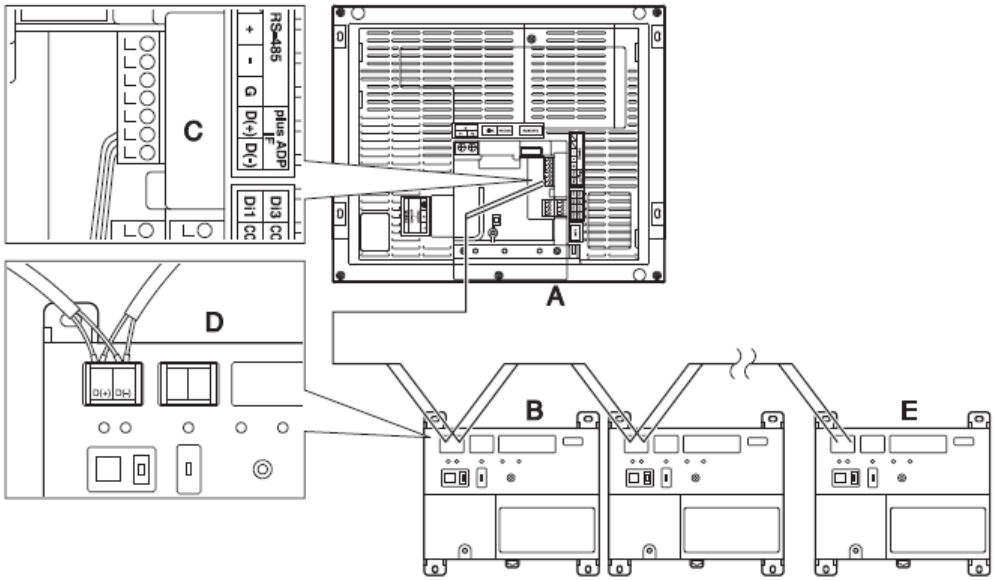


A. Rear face of *iTM*
B. LAN cable
- Applicable cable standard: 100Base-TX or 10Base-T
- Connector standard: RJ-45

C. Hub
D. PC

*Do not use power over Ethernet connection. Only use Ethernet cabling dedicated for communication.

iTM Plus Adaptor Connection



A. *iTM*
B. *iTM* Plus Adaptor
C. Plus ADP IF (*iTM*)
D. Plus ADP IF (*iTM* Plus Adaptor)
E. *iTM* Plus Adaptor where termination resistor must be enabled.
(For details, refer to the "*iTM* Plus Adaptor Installation Manual" (EM11A030).)

WARNING

- Only qualified personnel must complete installation.
- Consult your Daikin contractor regarding relocation and reinstallation of the remote controller. Improper installation may result in electric shock or fire.
- Electrical work must be performed in accordance with relevant local and national regulations, and with the instructions in this installation manual. Improper installation may cause electric shock or fire.
- Only use specified accessories and parts for installation. Failure to use specified parts may result in electric shock, fire, or controller damage.
- Do not disassemble, reconstruct, or repair. Electric shock or fire may occur.
- Only use specified wiring and verify all wiring is secured. Assure no external forces act on the terminal connections or wires. Improper connections or installation may result in electric shock or fire.
- Confirm power to the unit is OFF before touching electrical components.