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BACnet MS/TP Server

Mitsubishi Heavy Industries Air Conditioning

Compatible with RAC and VRF air conditioner lines commercialized by Mitsubishi Heavy Industries

HMS Connecting Devices™

Important User Information

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Gateway for the integration of Mitsubishi Heavy Industries air conditioning units in BACnet enabled monitoring and control systems.

Compatible with RAC and VRF air conditioners lines commercialized by Mitsubishi Heavy Industries.

ORDER CODE	LEGACY ORDER CODE
INBACMHI001R100	MH-RC-BAC-1L

URL   https://www.intesis.com

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1 Description

1.1 *Introduction*

This document describes the integration of Mitsubishi Heavy Industries air conditioning systems into BACnet compatible devices and systems using gateway *INBACMHI001R100.*

The aim of this integration is to monitor and control your Mitsubishi Heavy Industries air conditioning system, remotely, from your Control Center using any commercial SCADA or monitoring software that includes a BACnet driver or connect it to other BACnet devices to do any automation. To do it so, Intesis allows BACnet communication allowing polling or subscription requests (COV).

Intesis makes available the Mitsubishi Heavy Industries air conditioning system indoor units through independent BACnet objects.

Abstraction of Mitsubishi Heavy Industries air conditioning system properties and functionalities as fixed BACnet Objects. Intesis allows fixed BACnet object IDs mapping. Simple configuration is needed: just select the appropriate communication parameters (MAC address, baud rate…).

This document assumes that the user is familiar with BACnet and Mitsubishi Heavy Industries technologies and their technical terms.
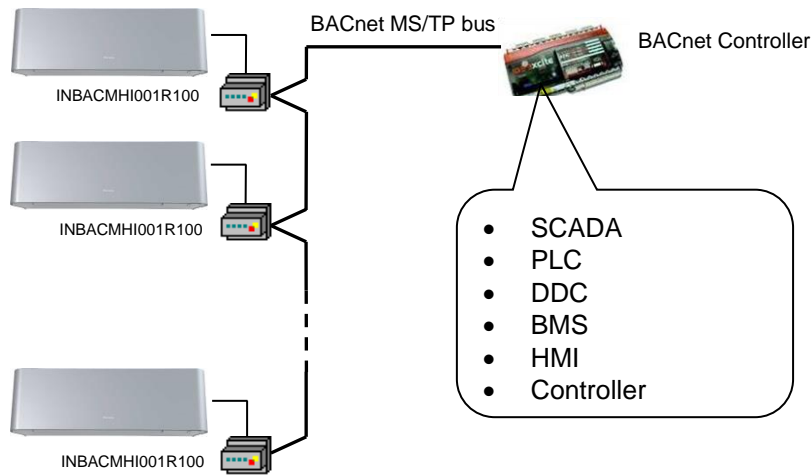
BACnet MS/TP installation sketch

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1.2   *Functionality*

Intesis continuously read the Mitsubishi Heavy Industries AC unit and keeps the updated status of all objects in its memory, ready to be served when requested from the BACnet side.

The role of Intesis consists in associate the elements of the Mitsubishi Heavy Industries AC unit with BACnet objects.

The control of the indoor units through the INBACMHI001R100 is permitted, so commands toward the Mitsubishi Heavy Industries AC unit are permitted too.

The indoor unit is offered in a set of BACnet objects and extra functionality.

1.3   *Capacity of Intesis*

Intesis can integrate one single Mitsubishi Heavy Industries AC unit and its associated elements.

Element	Max.	Notes
Number of indoor units	1	Number of indoor units that can be controlled through Intesis
Number of Objects	34	Number of Mitsubishi Heavy Industries AC signals available as objects into Intesis.

1.4   *Quick Setup*

1.   Install Intesis in the desired installation site (DIN rail mounting inside a metallic industrial cabinet connected to ground is recommended).

2.   Connect the communication cables. Connection details in **5.3.30 OUTDOORTEMP_STATUS (**Analog Input Object Type)

It indicates the current outdoor temperature, obtained from the outdoor unit sensor.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 8)	R	R
Object_Name	CharacterString	"OutdoorTemp_status"	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value *	REAL	-	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units *	BACnetEngineeringUnits	-	R	R
Min_Pres_Value *	REAL	-	O	R
Max_Pres_Value *	REAL	-	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W

Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

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1.4.1 CenterRemote (Multistate Input Object Type)

It indicates the current status of the center and remote control.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Multi-state Input, 9)	R	R
Object_Name	CharacterString	"CenterRemote"	R	R
Object_Type	BACnetObjectType	MULTISTATE_INPUT(13)	R	R
Present_Value	Unsigned	1 ~ 5	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE/TRUE	R	R
Number_Of_States	Unsigned	5	R	R
State_Text	BACnetArray[N] of CharacterString	*Check **Center Remote table** below.*	O	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Values	List of Unsigned	-	O	-
Fault_Values	List of Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Center Remote values table

Check possible Occupancy values in the following correspondence table.

Pesent_Value	Contents displayed in State_Text
1	Center I
2	Remote I
3	Center/Remote I
4	Center II
5	Remote II
6	Center/Remote II

1.4.2 DIP_SW_S1_status (Analog Input Object Type)

It indicates the status of the DIP switch 1 in decimal value. To get the micro-switch position, just translate the value into binary. It is only read after booting the device.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 9)	R	R
Object_Name	CharacterString	"DIP_SW_S1_status"	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value *	REAL	-	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units *	BACnetEngineeringUnits	-	R	R
Min_Pres_Value *	REAL	-	O	R
Max_Pres_Value *	REAL	-	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

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1.4.3 DIP_SW_S2_status (Analog Input Object Type)

It indicates the status of the DIP switch 2 in decimal value. To get the micro-switch position, just translate the value into binary. It is only read after booting the device.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 10)	R	R
Object_Name	CharacterString	"DIP_SW_S2_status"	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value *	REAL	-	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units *	BACnetEngineeringUnits	-	R	R
Min_Pres_Value *	REAL	-	O	R
Max_Pres_Value *	REAL	-	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

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1.4.4 SerialNumber (Analog Input Object Type)

It indicates the serial number of the device. Serial number follows the next rule 000KXXXXX, where:
- 000K is constant and no included in Present Value property.
- XXXXX is the unique serial number of the device. It is the information provided through the Present Value.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 11)	R	R
Object_Name	CharacterString	"SerialNumber"	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value *	REAL	-	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units *	BACnetEngineeringUnits	-	R	R
Min_Pres_Value *	REAL	-	O	R
Max_Pres_Value *	REAL	-	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

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3. Connections and switches.

4. Connect to the Intesis.

5. (Optional) Configure the Intesis using the configuration tool.

6. Check the BACnet objects list for its integration to your BACnet project. Details in **5.3 OBJECTS AND PROPERTIES**.

7. Check if there is communication between BACnet and AC system.

8. The Intesis is ready to be used in your system.

2   Protocol Implementation Conformance Statement

BACnet Protocol Implementation Conformance Statement (PICS)

Date: *2015-04-01*
Vendor Name: *HMS Industrial Networks S.L.U*
Product Name: *INBACMHI001R100*
Product Model Number: *INBACMHI001R100*
Application Software Version: *1.0*
Firmware Revision: *1.0.0.0*
BACnet Protocol Revision: *12*

Product Description:

Mitsubishi Heavy Industries air conditioning system – BACnet MS/TP Gateway

Abstraction of Mitsubishi Heavy Industries air conditioning system properties and functionalities as BACnet Objects.

2.1   *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)

Additional BACnet Interoperability Building Blocks Supported (Annex K):
Reference of BIBBs List

2.2   *Segmentation Capability:*

Segmented request supported   ☐ No   ☒ Yes   Window Size · *16* ·
Segmented responses supported   ☐ No   ☒ Yes   Window Size · *16* ·

2.3   *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): 9600, 19200, 38400, 76800
☐   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:

2.4   *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

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2.5   *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

2.6   *Character Sets Supported*

Indicating support for multiple character sets does not imply that they can all be supported simultaneously.

☒   ANSI X3.4
☐   IBM™/Microsoft™ DBCS
☐   JIS C 6226
☐   ISO 10646 (UCS-4)
☐   ISO 10646 (UCS-2)
☐   ISO 8859-1

2.7   *Gateway*

If this product is a communication gateway, describe the types of non-BACnet equipment/network(s) that the gateway supports:

Mitsubishi Heavy Industries air conditioning units belonging to RAC and VRF lines.

3 BACnet Interoperability Building Blocks Supported (BIBBs)

3.1 Data Sharing BIBBs

BIBB Type		Active	BACnet Service	Initiate	Execute
DS-RP-A	Data Sharing-ReadProperty–A	☐	ReadProperty	☒	☐
DS-RP-B	Data Sharing-ReadProperty–B	☒	ReadProperty	☐	☒
DS-RPM-A	Data Sharing-ReadPropertyMultiple–A	☐	ReadPropertyMultiple	☒	☐
DS-RPM-B	Data Sharing-ReadPropertyMultiple–B	☒	ReadPropertyMultiple	☐	☒
DS-RPC-A	Data Sharing-ReadPropertyConditiona–A	☐	ReadPropertyConditional	☒	☐
DS-RPC-B	Data Sharing-ReadPropertyConditional–B	☐	ReadPropertyConditional	☐	☒
DS-WP-A	Data Sharing-WriteProperty–A	☐	WriteProperty	☒	☐
DS-WP-B	Data Sharing-WriteProperty–B	☒	WriteProperty	☐	☒
DS-WPM-A	Data Sharing-WritePropertyMultiple–A	☐	WritePropertyMultiple	☒	☐
DS-WPM-B	Data Sharing-WritePropertyMultiple–B	☒	WritePropertyMultiple	☐	☒
DS-COV-A	Data Sharing-COV–A	☐	SubscribeCOV	☒	☐
		☐	ConfirmedCOVNotification	☐	☒
		☐	UnconfirmedCOVNotification	☐	☒
DS-COV-B	Data Sharing-COV–B	☒	SubscribeCOV	☐	☒
		☒	ConfirmedCOVNotification	☒	☐
		☒	UnconfirmedCOVNotification	☒	☐
DS-COVP-A	Data Sharing-COVP–A	☐	SubscribeCOV	☒	☐
		☐	ConfirmedCOVNotification	☐	☒
		☐	UnconfirmedCOVNotification	☐	☒
DS-COVP-B	Data Sharing-COVP–B	☐	SubscribeCOV	☐	☒
		☐	ConfirmedCOVNotification	☒	☐
		☐	UnconfirmedCOVNotification	☒	☐
DS-COVU-A	Data Sharing-COV-Unsolicited–A	☐	UncofirmedCOVNotification	☐	☒
DS-COVU-B	Data Sharing-COV-Unsolicited-B	☐	UncofirmedCOVNotification	☒	☐

3.2 Alarm and Event Management BIBBs

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

3.3 Scheduling BIBBs

BIBB Type		Active	BACnet Service	Initiate	Execute
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)*	☐ ☐			
T-VMT-A	Trending - Viewing and Modifying Trends–A	☐	ReadRange	☐	☒
T-VMT-I-B	Trending - Viewing and Modifying Trends Inernal–B	☐	ReadRange	☐	☒
T-VMT-E-B	Trending - Viewing and Modifying Trends External–B	☐	ReadRange	☐	☒
T-ATR-A	Trending - Automated Trend Retrieval–A	☐	ConfirmedEventNotification	☐	☒
		☐	ReadRange	☒	☐
T-ATR-B	Trending - Automated Trend Retrieval–B	☐	ConfirmedEventNotification	☒	☐
		☐	ReadRange	☐	☒

3.4 Trending BIBBs

BIBB Type		Active	BACnet Service	Initiate	Execute
T-VMT-A	Trending - Viewing and Modifying Trends–A	☐	ReadRange	☒	☐
T-VMT-I-B	Trending - Viewing and Modifying Trends Inernal–B	☐	ReadRange	☐	☒
T-VMT-E-B	Trending - Viewing and Modifying Trends External–B	☐	ReadRange	☐	☒
T-ATR-A	Trending - Automated Trend Retrieval–A	☐	ConfirmedEventNotification	☐	☒
		☐	ReadRange	☒	☐
T-ATR-B	Trending - Automated Trend Retrieval–B	☐	ConfirmedEventNotification	☒	☐
		☐	ReadRange	☐	☒

3.5 Network Management BIBBs

BIBB Type		Active	BACnet Service	Initiate	Execute
NM-CE-A	Network Management - Connection Establishment–A	☐	Establish-Connection-To-Network	☒	☐
		☐	Disconnect-Connection-To-Network	☒	☐
NM-CE-B	Network Management - Connection Establishment– B	☐	Establish-Connection-To-Network	☐	☒
		☐	Disconnect-Connection-To-Network	☐	☒
NM-RC-A	Network Management - Router Configuration–A	☐	Who-Is-Router-To-Network	☒	☐
		☐	I-Am-Router-To-Network	☐	☒
		☐	I-Could-Be-Router-To-Network	☐	☒
		☐	Initialize-Routing-Table	☒	☐
		☐	Initialize-Routing-Table-Ack	☐	☒
NM-RC-B	Network Management - Router Configuration–B	☐	Who-Is-Router-To-Network	☒	☒
		☐	I-Am-Router-To-Network	☒	☒
		☐	Initialize-Routing-Table	☐	☒
		☐	Initialize-Routing-Table-Ack	☒	☐

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3.6 *Device Management BIBBs*

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

4   Service Types

Service type	Service name	Supported	Remarks
Alarm and Event Services	AcknowledgeAlarm	☐	
	ConfirmedCOVNotification	☐	
	ConfirmedEventNotification	☐	
	GetAlarmSummary	☐	
	GetEnrollmentSummary	☐	
	SubscribeCOV	☒	
File Access Services	AtomicReadFile	☐	
	AtomicWriteFile	☐	
Object Access Services	AddListElement	☐	
	RemoveListElement	☐	
	CreateObject	☐	
	DeleteObject	☐	
	ReadProperty	☒	
	ReadPropertyConditional	☐	
	ReadPropertyMultiple	☒	
	ReadRange	☐	
	WriteProperty	☒	
	WritePropertyMultiple	☒	
Remote Device Management Services	DeviceComminicationControl	☐	
	ConfirmedPrivateTransfer	☐	
	ConfirmedTextMessage	☐	
	ReinitializeDevice	☒	
Virtual Terminal Services	VtOpen	☐	
	VtClose	☐	
	VtData	☐	
Security Services	Authenticate	☐	
	RequestKey	☐	
Unconfirmed Services	I-Am	☒	
	I-Have	☒	
	UnconfirmedCOVNotification	☐	
	UnconfirmedEventNotification	☐	
	UnconfirmedPrivateTransfer	☐	
	UnconfirmedTextMessage	☐	
	TimeSynchronization	☐	
	UtcTimeSynchronization	☐	
	Who-Has	☒	
	Who-Is	☒	
	LifeSafetyOperation	☐	
	SubscribeCOVProperty	☒	
	GetEventInformation	☐	

5 Objects

5.1 *Supported Object Types*

The objects supported are shown in the table below.

Object Type	ID	Supported	Management Point
Analog-Input	0	☒	SetPoint_status RoomTemperature_status ErrorCode ErrorAddress OutdoorTemp_status DIP_SW_S1_status DIP_SW_S2_status SerialNumber
Analog-Output	1	☒	SetPoint_command RoomTemperature_command
Analog-Value	2	☒	OnTimeCounter OccupiedCoolSetPoint OccupiedHeatSetPoint UnoccupiedCoolSetPoint UnoccupiedHeatSetPoint
Averaging	18	☐	
Binary-Input	3	☒	OnOff_status ErrorActive FilterSign
Binary-Output	4	☒	OnOff_command ErrorReset FilterReset
Binary-Value	5	☒	OccupancyContinuousCheck UnoccupiedDeadbandAction LockRemoteControl
Calendar	6	☐	
Command	7	☐	
Device	8	☒	INBACMHI001R100
Event-Enrollment	9	☐	
File	10	☐	
Group	11	☐	
Life-Safety-Point	21	☐	
Life-Safety-Zone	22	☐	
Loop	12	☐	
Multistate-Input	13	☒	Mode_status FanSpeed_status AirDirectionUD_status ErrorCodeM CenterRemote
Multistate-Output	14	☒	Mode_command FanSpeed_command AirDirectionUD_command
Multistate-Value	19	☒	Occupancy
Notification-Class	15	☐	
Program	16	☐	
Schedule	17	☐	
Trend-Log	20	☐	

5.2 Member objects

5.2.1 Type: Gateway

Object-name	Description	Object-type	Object-instance
INBACMHI001R100	Mitsubishi Heavy Industries RC Interface	Device	246000*

5.2.2 Type: Indoor Unit

Object-name	Description	Object-type	Object-instance
OnOff_status		BI	0
OnOff_command		BO	0
Mode_status		MI	0
Mode_command		MO	0
SetPoint_status		AI	0
SetPoint_command		AO	0
FanSpeed_status		MI	1
FanSpeed_command		MO	1
AirDirectionUD_status		MI	2
AirDirectionUD_command		MO	2
RoomTemperature_status		AI	1
RoomTemperature_command		AO	1
ErrorCode		AI	2
ErrorCodeM		MI	4
ErrorActive		BI	1
ErrorAddress		AI	4
ErrorReset		BO	5
OnTimeCounter		AV	0
FilterSign		BI	6
FilterReset		BO	4
Occupancy		MV	0
OccupancyCoolSetpoint		AV	1
OccupancyHeatSetpoint		AV	2
UnoccupiedCoolSetPoint		AV	3
UnoccupiedHeatSetPoint		AV	4
OccupancyContinuousCheck		BV	0
UnoccupiedDeadbandAction		BV	1
LockRemoteControl		BV	2
OutdoorTemp_status		AI	8
CenterRemote		MI	9
DIP_SW_S1_status		AI	9
DIP_SW_S2_status		AI	10
SerialNumber		AI	11

* This is the default value. Check section 0 (below) for more information.

5.3 *Objects and properties*

Below you can find relevant information for the objects and properties.

Object_Identifier: In the **Device Object**, is configurable writing directly on the property. either from BACnet or through our configuration tools and can be set automatically or manually. When set automatically, it is set using a base address and the address selected in SW2 P1...P7. The base address can be selected using the configuration tool. When set manually, the address is directly the one configured on the configuration tool. See ¡ERROR! NO SE ENCUENTRA EL ORIGEN DE LA REFERENCIA. ¡ERROR! NO SE ENCUENTRA EL ORIGEN DE LA REFERENCIA. for more information

Object_Name: In the **Device Object**, is configurable writing directly on this property. This can be done using the configuration tools too.

Description: In the **Device Object**, is configurable writing directly on the property, length maximum 63 chars. This string is configurable using the configuration tool.

5.3.1 Mitsubishi Heavy Industries AC Gateway (Device Object Type)

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Device, 246000)	R	R
Object_Name	CharacterString	"INBACMHI001R100"	R	R
Object_Type	BACnetObjectType	DEVICE (8) (Device Object Type)	R	R
System_Status	BACnetDeviceStatus	OPERATIONAL (0)	R	R
Vendor_Name	CharacterString	"HMS Industrial Networks S.L.U."	R	R
Vendor_Identifier	Unsigned16	246	R	R
Model_Name	CharacterString	"INBACMHI001R100"	R	R
Firmware_Revision	CharacterString	"1.0.0.0"	R	R
Application_Software_ Version	CharacterString	"1.0.0.0"	R	R
Location	CharacterString	""	O	-
Description	CharacterString	"Mitsubishi Heavy Industries AC interface"	O	R
Protocol_Version	Unsigned	1	R	R
Protocol_Revision	Unsigned	12	R	R
Protocol_Services_ Supported	BACnetServiceSupported	Refer to section 4 [Service Types]	R	R
Protocol_Object_Types_ Supported	BACnetObjectTypes Supported	Refer to section 5.1 [Object Types]	R	R
Object_List	BACnetArray[N] of BACnetObjectIdentifier	BACnetARRAY[N]	R	R
Structured_Object_List	BACnetArray[N] of BACnetObjectIdentifier	-	O	-
Max_APDU_Length_ Accepted	Unsigned	480 when MSTP / 1476 when BACnet/IP	R	R
Segmentation_Supported	BACnetSegmentation	SEGMENTED-BOTH (0)	R	R
Max_Segments_accepted	Unsigned	16	O	R
VT_Classes_Supported	List of BACnetVTClass	-	O	-
Active_VT_Sessions	List of BACnetVTSession	-	O	-
Local_Date	Date	-	O	-

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Local_Time	Time	-	O	-
UTC_Offset	INTEGER	-	O	-
Daylight_Savings_Status	BOOLEAN	-	O	-
APDU_Segment_Timeout	Unsigned	3000	R	R
APDU_Timeout	Unsigned	3000	R	R
Number_of_APDU_Retries	Unsigned	3	R	R
List_Of_Session_Keys	List of BACnetSessionKey	-	O	-
Time_Synchronization_Recipients	List of BACnetRecipient	-	O	-
Max_Master * **	Unsigned	127	R	W
Max_Info_Frames *	Unsigned	1	O	R
Device_Address_Binding	List of BACnetAddressBinding	NULL (empty)	R	R
Database_Revision	Unsigned	0	R	R
Configuration_Files	BACnetArray[N] of BACnetObjectIdentifier	-	O	-
Last_Restore_Time	BACnetTimeStamp	-	O	-
Backup_Failure_Timeout	Unsigned16	-	O	-
Active_COV_Subscriptions	List of BACnetCOVSubscription	List of BACnetCOVSubscription	O	R
Slave_Proxy_Enable	BACnetArray[N] of BOOLEAN	-	O	-
Manual_Slave_Address_Binding	List of BACnetAddressBinding	-	O	-
Auto_Slave_Discovery	BACnetArray[N] of BOOLEAN	-	O	-
Slave_Address_Binding	BACnetAddressBinding	-	O	-
Last_Restart_Reason	BACnetRestartReason	-	O	-
Time_Of_Device_Restart	BACnetTimeStamp	-	O	-
Restart_Notification_Recipients	List of BACnetRecipient	-	O	-
UTC_Time_Synchronization_Recipients	List of BACnetRecipient	-	O	-
Time_Synchronization_Interval	Unsigned	-	O	-
Align_Intervals	BOOLEAN	-	O	-
Interval_Offset	Unsigned	-	O	-
Profile_Name	CharacterString	-	O	-

* Only available when MSTP is used

** Configurable through the configuration tool. See section 7.4 for more information.

5.3.2 OnOff_status (Binary Input Object Type)

It indicates if the indoor unit is in On or Off status.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Binary Input, 0)	R	R
Object_Name	CharacterString	"OnOff_status"	R	R
Object_Type	BACnetObjectType	BINARY_INPUT (3)	R	R
Present_Value	BACnetBinaryPV	INACTIVE (0) / ACTIVE (1)	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Polarity	BACnetPolarity	NORMAL (0)	R	R
Inactive_Text	CharacterString	"Off"	O	R
Active_Text	CharacterString	"On"	O	R
Change_Of_State_Time	BACnetDatetime	-	O	-
Change_Of_State_Count	Unsigned	-	O	-
Time_Of_State_Count_Reset	BACnetDatetime	-	O	-
Elapsed_Active_Time	Unsigned	-	O	-
Time_Of_Active_Time_Reset	BACnetDatetime	-	O	-
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Value	BACnetBinaryPV	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

5.3.3 OnOff_command (Binary Output Object Type)

It sets the indoor unit to On or Off.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Binary Output, 0)	R	R
Object_Name	CharacterString	"OnOff_command"	R	R
Object_Type	BACnetObjectType	BINARY_OUTPUT (4)	R	R
Present_Value	BACnetBinaryPV	INACTIVE (0) / ACTIVE (1)	W	W
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Polarity	BACnetPolarity	NORMAL (0)	R	R
Inactive_Text	CharacterString	"Off"	O	R
Active_Text	CharacterString	"On"	O	R
Change_Of_State_Time	BACnetDatetime	-	O	-
Change_Of_State_Count	Unsigned	-	O	-
Time_Of_State_Count_Reset	BACnetDatetime	-	O	-
Elapsed_Active_Time	Unsigned	-	O	-
Time_Of_Active_Time_Reset	BACnetDatetime	-	O	-
Minimum_Off_Time	Unsigned32	-	O	-
Minimum_On_Time	Unsigned32	-	O	-
Priority_Array	BACnetPriorityArray	BACnetPriorityArray	R	R
Relinquish_Default	BACnetBinaryPV	INACTIVE (0)	R	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Feedback_Value	BACnetBinaryPV	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

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5.3.4 Mode_status (Multistate Input Object Type)

It indicates the active mode for the indoor unit.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Multi-state Input, 0)	R	R
Object_Name	CharacterString	"Mode_status"	R	R
Object_Type	BACnetObjectType	MULTISTATE_INPUT (13)	R	R
Present_Value	Unsigned	1 ~ 7	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Number_Of_States	Unsigned	7	R	R
State_Text	BACnetArray[N] of CharacterString	*Check **Mode Status setting table** below.*	O	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Values	List of Unsigned	-	O	-
Fault_Values	List of Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Mode status setting table

Mode status interpretation is possible using the value in the following correspondence table.

Pesent_Value	Contents displayed in State_Text
1	Heat
2	Cool
3	Fan
4	Dry
5	Auto
6	AutoHeat
7	AutoCool

5.3.5 Mode_command (Multistate Output Object Type)

It allows control over the indoor unit's mode.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Multi-state Output, 0)	R	R
Object_Name	CharacterString	"Mode_command"	R	R
Object_Type	BACnetObjectType	MULTISTATE_OUTPUT (14)	R	R
Present_Value	Unsigned	1 ~ 5	W	W
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Number_Of_States	Unsigned	5	R	R
State_Text	BACnetArray[N] of CharacterString	*Check **Mode Command setting table** below*	O	R
Priority_Array	BACnetPriorityArray	BACnetPriorityArray	R	R
Relinquish_Default	Unsigned	1	R	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Feedback_Value	Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Mode Command setting table

Mode commands can be set using the values in the following correspondence table.

Pesent_Value	Contents displayed in State_Text
1	Heat
2	Cool
3	Fan
4	Dry
5	Auto

5.3.6 Setpoint_status (Analog Input Object Type)

It indicates the current setpoint temperature in the indoor unit.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 0)	R	R
Object_Name	CharacterString	"SetPoint_status"	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value *	REAL	10…32 ºC // 50…89,6 ºF	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units *	BACnetEngineeringUnits	Degrees Celsius (62), Degrees Fahrenheit (64)	R	R
Min_Pres_Value *	REAL	10 ºC 50 ºF	O	R
Max_Pres_Value *	REAL	32 ºC 89,6 ºF	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

* Use of Celsius or Fahrenheits units can be selected throught the switch configuration. Check section 6.1 for more information.

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5.3.7 Setpoint_command (Analog Output Object Type)

It sets the desired temperature in the indoor unit.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Analog Output, 0)	R	R
Object_Name	CharacterString	"SetPoint_command"	R	R
Object_Type	BACnetObjectType	ANALOG_OUTPUT (1)	R	R
Present_Value *	REAL	10…32 ºC // 50…89,6 ºF	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units *	BACnetEngineeringUnits	Degrees Celsius (62), Degrees Fahrenheit (64)	R	R
Min_Pres_Value *	REAL	10 ºC 50 ºF	O	R
Max_Pres_Value *	REAL	32 ºC 89,6 ºF	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Priority_Array	BACnetPriorityArray	BACnetPriorityArray	R	R
Relinquish_Default	Unsigned	22	R	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

* Use of Celsius or Fahrenheits units can be selected throught the switch configuration.

5.3.8 FanSpeed_status (Multistate Input Object Type)

It indicates the fan speed status of the indoor unit.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Multi-state Input, 1)	R	R
Object_Name	CharacterString	"FanSpeed_status"	R	R
Object_Type	BACnetObjectType	MULTISTATE_INPUT(13)	R	R
Present_Value	Unsigned	1 ~ 5	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE/TRUE	R	R
Number_Of_States	Unsigned	5	R	R
State_Text	BACnetArray[N] of CharacterString	*Check **Fan Speed status setting table** below.*	O	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Values	List of Unsigned	-	O	-
Fault_Values	List of Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Fan Speed status setting table

Fan speed interpretation is possible using the value in the following correspondence table.

Pesent_Value	Contents displayed in State_Text
1	Auto
2	Fan Speed 1
3	Fan Speed 2
4	Fan Speed 3
5	Fan Speed 4

5.3.9 FanSpeed_command (Multistate Output Object Type)

It allows control over the fan speed for the indoor unit.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Multi-state Output, 1)	R	R
Object_Name	CharacterString	"FanSpeed_command"	R	R
Object_Type	BACnetObjectType	MULTISTATE_OUTPUT (14)	R	R
Present_Value	Unsigned	1 ~ 5	W	W
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Number_Of_States	Unsigned	5	R	R
State_Text	BACnetArray[N] of CharacterString	*Check **Fan Speed command setting table** below*	O	R
Priority_Array	BACnetPriorityArray	BACnetPriorityArray	R	R
Relinquish_Default	Unsigned	1	R	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Feedback_Value	Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Fan Speed command setting table

Fan speed interpretation is possible using the value in the following correspondence table.

Pesent_Value	Contents displayed in State_Text
1	Auto
2	Fan Speed 1
3	Fan Speed 2
4	Fan Speed 3
4	Fan Speed 4

5.3.10 AirDirectionUD_status (Multistate Input Object Type)

It indicates the status of the vertical vane (Up/Down) for the indoor unit.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Multi-state Input, 2)	R	R
Object_Name	CharacterString	"AirDirectionUD_status"	R	R
Object_Type	BACnetObjectType	MULTISTATE_INPUT(13)	R	R
Present_Value	Unsigned	1 ~ 5	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE/TRUE	R	R
Number_Of_States	Unsigned	5	R	R
State_Text	BACnetArray[N] of CharacterString	*Check **Air Direction Status setting table** below.*	O	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Values	List of Unsigned	-	O	-
Fault_Values	List of Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Air direction Up/Down status setting table

Air direction interpretation is possible using the value in the following correspondence table.

Pesent_Value	Contents displayed in State_Text
1	Pos1
2	Pos2
3	Pos3
4	Pos4
5	Swing

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5.3.11 AirDirectionUD_command (Multistate Output Object Type)

It allows control over the vertical air direction (Up/Down) for the indoor unit.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Multi-state Output, 2)	R	R
Object_Name	CharacterString	"AirDirectionUD_command"	R	R
Object_Type	BACnetObjectType	MULTISTATE_OUTPUT (14)	R	R
Present_Value	Unsigned	1 ~ 5	W	W
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Number_Of_States	Unsigned	5	R	R
State_Text	BACnetArray[N] of CharacterString	*Check **Air Direction Command setting table** below*	O	R
Priority_Array	BACnetPriorityArray	-	R	R
Relinquish_Default	Unsigned	-	R	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Feedback_Value	Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Air direction Up/Down Command setting table

Air direction commands can be set using the values in the following correspondence table.

Pesent_Value	Contents displayed in State_Text
1	Pos1
2	Pos2
3	Pos3
4	Pos4
5	Swing

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5.3.12 RoomTemperature_status (Analog Input Object Type)

It indicates the current return temperature in the indoor unit.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 1)	R	R
Object_Name	CharacterString	"RoomTemperature_status"	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value *	REAL	- ºC/ºF	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units *	BACnetEngineeringUnits	Degrees Celsius (62), Degrees Fahrenheit (64)	R	R
Min_Pres_Value *	REAL	-	O	R
Max_Pres_Value *	REAL	-	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

5.3.13 RoomTemperature_command (Analog Output Object Type)

It sets the desired temperature in the indoor unit.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Analog Output, 1)	R	R
Object_Name	CharacterString	"RoomTemperature_command"	R	R
Object_Type	BACnetObjectType	ANALOG_OUTPUT (1)	R	R
Present_Value *	REAL	- ºC/ºF	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units *	BACnetEngineeringUnits	Degrees Celsius (62), Degrees Fahrenheit (64)	R	R
Min_Pres_Value *	REAL	-	O	R
Max_Pres_Value *	REAL	-	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Priority_Array	BACnetPriorityArray	BACnetPriorityArray	R	R
Relinquish_Default	Unsigned	22	R	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

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5.3.14 ErrorCode (Analog Input Object Type)

It indicates the current error present in the AC system. Check

Error codes for more information on error codes.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 2)	R	R
Object_Name	CharacterString	"ErrorCode"	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value	REAL	-1… 349	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	300	O	-
Units	BACnetEngineeringUnits	NO_UNITS (95)	R	R
Min_Pres_Value	REAL	-	O	-
Max_Pres_Value	REAL	-	O	-
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

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5.3.15 ErrorCodeM (Multistate Input Object Type)

It indicates the current error present in the AC system. Check **11 ERROR CODES** for more information.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Multi-state Input, 4)	R	R
Object_Name	CharacterString	"ErrorCodeM"	R	R
Object_Type	BACnetObjectType	MULTISTATE_INPUT(13)	R	R
Present_Value	Unsigned	1 ~ 156	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Number_Of_States	Unsigned	39	R	R
State_Text	BACnetArray[N] of CharacterString	*Check **Error Code table** below.*	O	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Values	List of Unsigned	-	O	-
Fault_Values	List of Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Error Code table

In the table below you will find the error correspondence value.

Pesent_Value	State_Text		Pesent_Value	State_Text
1	–		55	E52
2	CommError		56	E53
3	AddressingProcess		57	E54
4	E1		58	E55
5	E2		59	E56
6	E3		60	E57
7	E4		61	E58
8	E5		62	E59
9	E6		63	E60
10	E7		64	E61
11	E8		65	E62
12	E9		66	E63
13	E10		67	E64
14	E11		68	E65
15	E12		69	E66
16	E13		70	E67
17	E14		71	E68
18	E15		72	E69
19	E16		73	E70
20	E17		74	E71
21	E18		75	E72
22	E19		76	E73
23	E20		77	E74
24	E21		78	E75
25	E22		79	E76
26	E23		80	E77
27	E24		81	E78
28	E25		82	E79
29	E26		83	E80
30	E27		84	E81
31	E28		85	E82
32	E29		86	E83
33	E30		87	E84
34	E31		88	E85
35	E32		89	E86
36	E33		90	E87
37	E34		91	E88
38	E35		92	E89
39	E36		93	E90
40	E37			
41	E38			
42	E39			
43	E40			
44	E41			
45	E42			
46	E43			
47	E44			
48	E45			
49	E46			
50	E47			
51	E48			
52	E49			
53	E50			
54	E51			

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5.3.16 ErrorActive (Binary Input Object Type)

It indicates if there is an error active in the indoor unit.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Binary Input, 1)	R	R
Object_Name	CharacterString	"ErrorActive"	R	R
Object_Type	BACnetObjectType	BINARY_INPUT (3)	R	R
Present_Value	BACnetBinaryPV	INACTIVE (0) / ACTIVE (1)	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Polarity	BACnetPolarity	NORMAL (0)	R	R
Inactive_Text	CharacterString	"No"	O	R
Active_Text	CharacterString	"Error"	O	R
Change_Of_State_Time	BACnetDatetime	-	O	-
Change_Of_State_Count	Unsigned	-	O	-
Time_Of_State_Count_Reset	BACnetDatetime	-	O	-
Elapsed_Active_Time	Unsigned	-	O	-
Time_Of_Active_Time_Reset	BACnetDatetime	-	O	-
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Value	BACnetBinaryPV	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

5.3.17 ErrorAddress (Analog Input Object Type)

It indicates the indoor unit address where the error is active.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 4)	R	R
Object_Name	CharacterString	"ErrorAddress"	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value *	REAL	-	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units *	BACnetEngineeringUnits	-	R	R
Min_Pres_Value *	REAL	-	O	R
Max_Pres_Value *	REAL	-	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

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5.3.18 ErrorReset (Binary Output Object Type)

It resets the error signal.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Binary Output, 5)	R	R
Object_Name	CharacterString	"ErrorReset"	R	R
Object_Type	BACnetObjectType	BINARY_OUTPUT (4)	R	R
Present_Value	BACnetBinaryPV	INACTIVE (0) / ACTIVE (1)	W	W
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Polarity	BACnetPolarity	NORMAL (0)	R	R
Inactive_Text	CharacterString	"Normal"	O	R
Active_Text	CharacterString	"Reset"	O	R
Change_Of_State_Time	BACnetDatetime	-	O	-
Change_Of_State_Count	Unsigned	-	O	-
Time_Of_State_Count_Reset	BACnetDatetime	-	O	-
Elapsed_Active_Time	Unsigned	-	O	-
Time_Of_Active_Time_Reset	BACnetDatetime	-	O	-
Minimum_Off_Time	Unsigned32	-	O	-
Minimum_On_Time	Unsigned32	-	O	-
Priority_Array	BACnetPriorityArray	BACnetPriorityArray	R	R
Relinquish_Default	BACnetBinaryPV	INACTIVE (0)	R	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Feedback_Value	BACnetBinaryPV	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

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5.3.19 OnTimeCounter (Analog Value Object Type)

It indicates the amount of time the units have been running.

Property Identifier	Property Datatype	Value		ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Analog Value, 0)		R	R
Object_Name	CharacterString	"OnTimeCounter"		R	R
Object_Type	BACnetObjectType	ANALOG_VALUE (2)		R	R
Present_Value	REAL	0 .. 65535		R	R
Description	CharacterString	-		O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}		R	R
Event_State	BACnetEventState	STATE_NORMAL (0)		R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)		O	R
Out_Of_Service	BOOLEAN	FALSE		R	R
Update_Interval	Unsigned	-		O	-
Units	BACnetEngineeringUnits	Hours (71)		R	R
Min_Pres_Value	REAL	-		O	-
Max_Pres_Value	REAL	-		O	-
Resolution	REAL	-		O	-
COV_Increment	REAL	0		O	W
Time_Delay	Unsigned	-		O	-
Notification_Class	Unsigned	-		O	-
High_Limit	REAL	-		O	-
Low_Limit	REAL	-		O	-
Deadband	REAL	-		O	-
Limit_Enable	BACnetLimitEnable	-		O	-
Event_Enable	BACnetEventTransitionBits	-		O	-
Acked_Transitions	BACnetEventTransitionBits	-		O	-
Notify_Type	BACnetNotifyType	-		O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-		O	-
Profile_Name	CharacterString	-		O	-

5.3.20 FilterSign (Binary Input Object Type)
It indicates if the filter signal is active.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Binary Input, 6)	R	R
Object_Name	CharacterString	"FilterSign"	R	R
Object_Type	BACnetObjectType	BINARY_INPUT (3)	R	R
Present_Value	BACnetBinaryPV	INACTIVE (0) / ACTIVE (1)	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Polarity	BACnetPolarity	NORMAL (0)	R	R
Inactive_Text	CharacterString	"No"	O	R
Active_Text	CharacterString	"Yes"	O	R
Change_Of_State_Time	BACnetDatetime	-	O	-
Change_Of_State_Count	Unsigned	-	O	-
Time_Of_State_Count_Reset	BACnetDatetime	-	O	-
Elapsed_Active_Time	Unsigned	-	O	-
Time_Of_Active_Time_Reset	BACnetDatetime	-	O	-
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Value	BACnetBinaryPV	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

5.3.21 FilterReset (Binary Output Object Type)

It resets the filter signal.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Binary Output, 4)	R	R
Object_Name	CharacterString	"FilterReset"	R	R
Object_Type	BACnetObjectType	BINARY_OUTPUT (4)	R	R
Present_Value	BACnetBinaryPV	INACTIVE (0) / ACTIVE (1)	W	W
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Polarity	BACnetPolarity	NORMAL (0)	R	R
Inactive_Text	CharacterString	"Normal"	O	R
Active_Text	CharacterString	"Reset"	O	R
Change_Of_State_Time	BACnetDatetime	-	O	-
Change_Of_State_Count	Unsigned	-	O	-
Time_Of_State_Count_Reset	BACnetDatetime	-	O	-
Elapsed_Active_Time	Unsigned	-	O	-
Time_Of_Active_Time_Reset	BACnetDatetime	-	O	-
Minimum_Off_Time	Unsigned32	-	O	-
Minimum_On_Time	Unsigned32	-	O	-
Priority_Array	BACnetPriorityArray	BACnetPriorityArray	R	R
Relinquish_Default	BACnetBinaryPV	INACTIVE (0)	R	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Feedback_Value	BACnetBinaryPV	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

5.3.22 Occupancy (Multistate Value Object Type)

It indicates the use or not of the occupancy function.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Multistate Output, 0)	R	R
Object_Name	CharacterString	"Occupancy"	R	R
Object_Type	BACnetObjectType	MULTISTATE_VALUE (19)	R	R
Present_Value	BACnetBinaryPV	1 ~ 3	W	W
Description	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Number_of_states	Unsigned	3	O	R
State_Text	BACnetArray[N] of CharacterString	Check *Occupancy setting Table below*	O	R
Priority_Array	BACnetPriorityArray	BACnetPriorityArray	R	-
Relinquish_Default	BACnetBinaryPV	-	R	-
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Value	BACnetBinaryPV	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Occupancy values table

Check possible Occupancy values in the following table:

Present_Value	Contents displayed in State_Text
1	Occupied
2	Unoccupied
3	Disabled

5.3.23 OccupiedCoolSetpoint (Analog Value Object Type)

It indicates the current Setpoint when Cool mode is selected, Occupancy is enabled and the room is occupied.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Analog Value, 1)	R	R
Object_Name	CharacterString	"OccupiedCoolSetpoint"	R	R
Object_Type	BACnetObjectType	ANALOG_VALUE (2)	R	R
Present_Value	REAL	0 .. 65535	R	R
Description	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units	BACnetEngineeringUnits	Degrees Celsius (62)	R	R
Min_Pres_Value	REAL	-	O	-
Max_Pres_Value	REAL	-	O	-
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

5.3.24 OccupiedHeatSetpoint (Analog Value Object Type)

It indicates the current Setpoint when Heat mode is selected, Occupancy is enabled and the room is occupied.

Property Identifier	Property Datatype	Value		ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Analog Value, 2)		R	R
Object_Name	CharacterString	"OccupiedHeatSetpoint"		R	R
Object_Type	BACnetObjectType	ANALOG_VALUE (2)		R	R
Present_Value	REAL	0 .. 65535		R	R
Description	CharacterString	-		O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}		R	R
Event_State	BACnetEventState	STATE_NORMAL (0)		R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)		O	R
Out_Of_Service	BOOLEAN	FALSE		R	R
Update_Interval	Unsigned	-		O	-
Units	BACnetEngineeringUnits	Degrees Celsius (62)		R	R
Min_Pres_Value	REAL	-		O	-
Max_Pres_Value	REAL	-		O	-
Resolution	REAL	-		O	-
COV_Increment	REAL	0		O	W
Time_Delay	Unsigned	-		O	-
Notification_Class	Unsigned	-		O	-
High_Limit	REAL	-		O	-
Low_Limit	REAL	-		O	-
Deadband	REAL	-		O	-
Limit_Enable	BACnetLimitEnable	-		O	-
Event_Enable	BACnetEventTransitionBits	-		O	-
Acked_Transitions	BACnetEventTransitionBits	-		O	-
Notify_Type	BACnetNotifyType	-		O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-		O	-
Profile_Name	CharacterString	-		O	-

5.3.25 UnoccupiedCoolSetpoint (Analog Value Object Type)

It indicates the current Setpoint when Cool mode is selected, Occupancy is enabled and the room is unoccupied.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Analog Value, 3)	R	R
Object_Name	CharacterString	"UnoccupiedCoolSetpoint"	R	R
Object_Type	BACnetObjectType	ANALOG_VALUE (2)	R	R
Present_Value	REAL	0 .. 65535	R	R
Description	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units	BACnetEngineeringUnits	Degrees Celsius (62)	R	R
Min_Pres_Value	REAL	-	O	-
Max_Pres_Value	REAL	-	O	-
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

5.3.26 UnoccupiedHeatSetpoint (Analog Value Object Type)

It indicates the current Setpoint when Heat mode is selected, Occupancy is enabled and the room is unoccupied.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Analog Value, 4)	R	R
Object_Name	CharacterString	"UnoccupiedHeatSetpoint"	R	R
Object_Type	BACnetObjectType	ANALOG_VALUE (2)	R	R
Present_Value	REAL	0 .. 65535	R	R
Description	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units	BACnetEngineeringUnits	Degrees Celsius (62)	R	R
Min_Pres_Value	REAL	-	O	-
Max_Pres_Value	REAL	-	O	-
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

5.3.27 OccupancyContinuousCheck (Binary Value Object Type)

It indicates if the system is continuously checking the setpoint and occupancy conditions.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Binary Value, 0)	R	R
Object_Name	CharacterString	"OccupancyContinuousCheck"	R	R
Object_Type	BACnetObjectType	BINARY_VALUE (5)	R	R
Present_Value	BACnetBinaryPV	INACTIVE (0) / ACTIVE (1)	W	W
Description	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Inactive_Text	CharacterString	"Disabled"	O	R
Active_Text	CharacterString	"Enabled"	O	R
Change_Of_State_Time	BACnetDatetime	-	O	-
Change_Of_State_Count	Unsigned	-	O	-
Time_Of_State_Count_Reset	BACnetDatetime	-	O	-
Elapsed_Active_Time	Unsigned	-	O	-
Time_Of_Active_Time_Reset	BACnetDatetime	-	O	-
Minimum_Off_Time	Unsigned32	-	O	-
Minimum_On_Time	Unsigned32	-	O	-
Priority_Array	BACnetPriorityArray	BACnetPriorityArray	R	-
Relinquish_Default	BACnetBinaryPV	INACTIVE (0)	R	-
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Value	BACnetBinaryPV	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

5.3.28 UnoccupiedDeadbandAction (Binary Value Object Type)

It indicates the action to be performed by the system when Unoccupancy is enabled and Room Temperature is within the deadband.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Binary Value, 1)	R	R
Object_Name	CharacterString	"UnoccupiedDeadbandAction"	R	R
Object_Type	BACnetObjectType	BINARY_VALUE (5)	R	R
Present_Value	BACnetBinaryPV	INACTIVE (0) / ACTIVE (1)	W	W
Description	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Inactive_Text	CharacterString	"Off"	O	R
Active_Text	CharacterString	"CurrentMode"	O	R
Change_Of_State_Time	BACnetDatetime	-	O	-
Change_Of_State_Count	Unsigned	-	O	-
Time_Of_State_Count_Reset	BACnetDatetime	-	O	-
Elapsed_Active_Time	Unsigned	-	O	-
Time_Of_Active_Time_Reset	BACnetDatetime	-	O	-
Minimum_Off_Time	Unsigned32	-	O	-
Minimum_On_Time	Unsigned32	-	O	-
Priority_Array	BACnetPriorityArray	BACnetPriorityArray	R	-
Relinquish_Default	BACnetBinaryPV	INACTIVE (0)	R	-
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Value	BACnetBinaryPV	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

5.3.29 LockRemoteControl(Binary Value Object Type)

It indicates if control from the remote controller is locked or not.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Binary Value, 2)	R	R
Object_Name	CharacterString	"LockRemoteControl"	R	R
Object_Type	BACnetObjectType	BINARY_VALUE (5)	R	R
Present_Value	BACnetBinaryPV	INACTIVE (0) / ACTIVE (1)	W	W
Description	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Inactive_Text	CharacterString	"Locked"	O	R
Active_Text	CharacterString	"Unlocked"	O	R
Change_Of_State_Time	BACnetDatetime	-	O	-
Change_Of_State_Count	Unsigned	-	O	-
Time_Of_State_Count_Reset	BACnetDatetime	-	O	-
Elapsed_Active_Time	Unsigned	-	O	-
Time_Of_Active_Time_Reset	BACnetDatetime	-	O	-
Minimum_Off_Time	Unsigned32	-	O	-
Minimum_On_Time	Unsigned32	-	O	-
Priority_Array	BACnetPriorityArray	BACnetPriorityArray	R	-
Relinquish_Default	BACnetBinaryPV	INACTIVE (0)	R	-
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Value	BACnetBinaryPV	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

5.3.30 OutdoorTemp_status (Analog Input Object Type)

It indicates the current outdoor temperature, obtained from the outdoor unit sensor.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 8)	R	R
Object_Name	CharacterString	"OutdoorTemp_status"	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value *	REAL	-	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units *	BACnetEngineeringUnits	-	R	R
Min_Pres_Value *	REAL	-	O	R
Max_Pres_Value *	REAL	-	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

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5.3.31 CenterRemote (Multistate Input Object Type)

It indicates the current status of the center and remote control.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Multi-state Input, 9)	R	R
Object_Name	CharacterString	"CenterRemote"	R	R
Object_Type	BACnetObjectType	MULTISTATE_INPUT(13)	R	R
Present_Value	Unsigned	1 ~ 5	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE/TRUE	R	R
Number_Of_States	Unsigned	5	R	R
State_Text	BACnetArray[N] of CharacterString	*Check **Center Remote table** below.*	O	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Values	List of Unsigned	-	O	-
Fault_Values	List of Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Center Remote values table

Check possible Occupancy values in the following correspondence table.

Pesent_Value	Contents displayed in State_Text
1	Center I
2	Remote I
3	Center/Remote I
4	Center II
5	Remote II
6	Center/Remote II

5.3.32 DIP_SW_S1_status (Analog Input Object Type)

It indicates the status of the DIP switch 1 in decimal value. To get the micro-switch position, just translate the value into binary. It is only read after booting the device.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 9)	R	R
Object_Name	CharacterString	"DIP_SW_S1_status"	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value *	REAL	-	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units *	BACnetEngineeringUnits	-	R	R
Min_Pres_Value *	REAL	-	O	R
Max_Pres_Value *	REAL	-	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

5.3.33 DIP_SW_S2_status (Analog Input Object Type)

It indicates the status of the DIP switch 2 in decimal value. To get the micro-switch position, just translate the value into binary. It is only read after booting the device.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 10)	R	R
Object_Name	CharacterString	"DIP_SW_S2_status"	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value *	REAL	-	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units *	BACnetEngineeringUnits	-	R	R
Min_Pres_Value *	REAL	-	O	R
Max_Pres_Value *	REAL	-	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

5.3.34 SerialNumber (Analog Input Object Type)

It indicates the serial number of the device. Serial number follows the next rule 000KXXXXX, where:
- 000K is constant and no included in Present Value property.
- XXXXX is the unique serial number of the device. It is the information provided through the Present Value.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 11)	R	R
Object_Name	CharacterString	"SerialNumber"	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value *	REAL	-	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units *	BACnetEngineeringUnits	-	R	R
Min_Pres_Value *	REAL	-	O	R
Max_Pres_Value *	REAL	-	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

6 Connections and switches

6.1 *Connecting diagram*

Disconnect the Mitsubishi Heavy Industries system from Mains Power.

Connect the interface to XY bus in any point of the bus. The XY bus is the bus that connects the AC indoor unit and the wired remote controller, is a two-wire bus connecting terminals XY of both. This XY connection has no specific polarity.

⚠ *Important*: Do not modify the length of the cable supplied with the interface, it may affect to the correct operation of the interface.

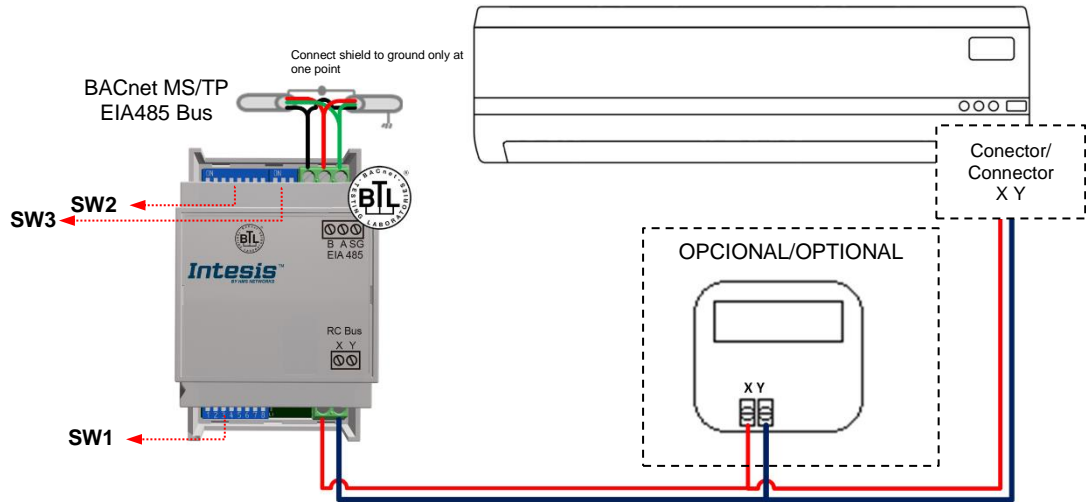⚠ *Important*: Remember that switch changes only apply after an Intesis power cycle

Figure 2.2 Connection diagram

SW1 – Settings for the remote controller bus

Binary value $b_1...b_5$	Switches 1 2 3 4 5 6 7 8	Description
0xxxxxxx	↓ x x x x x x x	Slave in bus XY
1xxxxxxx	↑ x x x x x x x	Master in bus XY (valor por defecto - default value)
x0xxxxxx	x ↓ x x x x x x	Not used
x0xxxxxx	x ↑ x x x x x x	Not used
xx0xxxxx	x x ↓ x x x x x	Not used
xx1xxxxx	x x ↑ x x x x x	Not used
xxx0xxxx	x x x ↓ x x x x	Not used
xxx1xxxx	x x x ↑ x x x x	Not used
xxxx0xxx	x x x x ↓ x x x	Low Power mode
xxxx1xxx	x x x x ↑ x x x	High Performance mode (Default value)

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6.2   *Connect to BACnet MS/TP*

Connect the EIA485 bus wires to the plug-in terminal block (EIA485) of INBACMHI001R100; respect the polarity on this connection (A+ and B-). Connect the ground signal to the plug-in terminal block (SG).

Respect the maximum distance of 1.200 meters for the bus, no loop or star topologies are allowed for EIA485 bus.

Remember that a terminator resistor of 120 Ω must be present at each end of the bus to avoid signal reflections and also a polarization mechanism. Please, use switch **SW3** in order to configure these parameters.

Check configuration on **SW1, SW2** and **SW3** before connecting to BACnet MS/TP.

⚠ *Important*: Remember that switch changes only apply after an Intesis power cycle

SW1 – BACnet MS/TP baudrate

Select the right baudrate for BACnet MS/TP communication using switch **SW1**.

Binary value $b_6...b_8$	Switches 1 2 3 4 5 6 7 8	Description
xxxxx000	x x x x x ↓ ↓ ↓	Autobaudrate (default value)
xxxxx100	x x x x x ↑ ↓ ↓	9600 bps
xxxxx010	x x x x x ↓ ↑ ↓	19200 bps
xxxxx110	x x x x x ↑ ↑ ↓	38400 bps
xxxxx001	x x x x x ↓ ↓ ↑	57600 bps
xxxxx101	x x x x x ↑ ↓ ↑	76800 bps
xxxxx011	x x x x x ↓ ↑ ↑	115200 bps
xxxxx111	x x x x x ↑ ↑ ↑	Autobaudrate

* Note: If Autobaudrate is selected, the INBACMHI001R100 will look for another BACnet MS/TP device with a fixed baudrate in order to match this value. Once detected, the baudrate will not be modified until a device reset is produced.

SW2 – BACnet MS/TP MAC address and temperature magnitude (ºC/ºF)

Binary value $b_1...b_8$	Switches 1 2 3 4 5 6 7 8	MAC address	Description
0000000x	↓ ↓ ↓ ↓ ↓ ↓ ↓ x	0	
1000000x	↑ ↓ ↓ ↓ ↓ ↓ ↓ x	1	
0100000x	↓ ↑ ↓ ↓ ↓ ↓ ↓ x	2	
1100000x	↑ ↑ ↓ ↓ ↓ ↓ ↓ x	3	
….	....	…	
1011111x	↑ ↓ ↑ ↑ ↑ ↑ ↑ x	125	
0111111x	↓ ↑ ↑ ↑ ↑ ↑ ↑ x	126	
1111111x	↑ ↑ ↑ ↑ ↑ ↑ ↑ x	127	
xxxxxxx0	x x x x x x x ↓		Temperature values in Bacnet are represented in Celsius degrees (default value)
xxxxxxx1	x x x x x x x ↑		Temperature values in Bacnet are represented in Fahrenheit degrees

The MAC address selected my affect on the Device Instance. If the "Auto Device Instance" is used, keep in mind that the Device Instance will be build using the "Device Instance Base" + the address selected in SWP2 P1-P7.

SW3 – BACnet polarization and termination resistor

Binary value $b_1...b_3$	Switches 1 2 3	Description
0xx	↓ x x	EIA485 bus without termination resistor. The gateway is not at one end of the EIA485 bus (default value)
1xx	↑ x x	120 Ω termination resistor active. The gateway is at one end of the EIA485 bus
x00	x ↓ ↓	No bus polarization (valor por defecto - default value)
x11	x ↑ ↑	Bus polarization active

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7   Set-up process and troubleshooting

7.1   Pre-requisites

In a BACnet MS/TP integration, it is necessary to have the BACnet MS/TP Master device operative and well connected to the BACnet MS/TP port of the INBACMHI001R100.

In a BACnet IP integration, it is necessary to have the BACnet IP client operative and well connected to the IP network and the INBACMHI001R100 connected to this same IP network through the ETH port.

Items supplied by HMS Networks for this integration are:

- Intesis INBACMHI001R100 interface with Mitsubishi Heavy Industries AC external protocol firmware loaded.
- Specific connection cable to connect Mitsubishi Heavy Industries AC unit with INBACMHI001R100 gateway.
- MiniUSB cable for console communication.
- Product documentation.

7.2   Physical checking

First point to look at to make sure that gateway is working properly is to check physical connections:

1.- Make sure that the supplied cable is correctly connected between the AC unit and the gateway. INBACMHI001R100 needs to be connected to the AC unit or externaly powered before starting the device configuration. Contact Intesis if you need to power your device without connecting it to the AC unit.

2.- Check that the AC unit is connected to mains.

3.- If using BACnet MS/TP, check the EIA485 connection from the gateway to the BACnet MS/TP. Remember to verify polarity and terminal resistors configuration. If using BACnet IP, check the IP network connections.

7.3   LED status

On start up, all leds blink once and then turn off. After that, depending on the type of connection (MS/TP or IP) and the processes carried out, LED status may change.

Please, check the table below for more information:

LED	Status	Description
L1 (red)	ON Steady	BACnet MS/TP link
	Blinking	Activity on the BACnet MS/TP bus
	OFF	BACnet MS/TP link not performed
L2 (green)	ON Steady	Communication error
	Blinking	AC Error
	Flashing	Communication OK
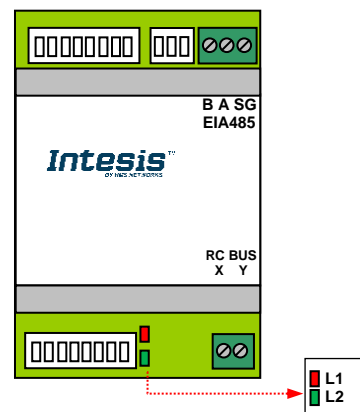
7.4   Occupancy

Each indoor unit has its own occupancy signal. Remember that this signals needs to be feed by an external sensor which indicates if there is presense or not (occupancy). This signal is processed directly in the INBACMHI001R100.

When occupancy mode is active, according to current room temperature it will set the mode, setpoint and on/off, for example:

- Room Temperature > OCS: Setpoint = OCS, Mode = Cool, On/Off = On
- Room Temperature < OHS: Setpoint = OHS, Mode = Heat, On/Off = On

- OCS < Room Temperature > OHS: Setpoint = OCS/OHS depending on current mode (if Fan or Dry mode is active => no setpoint is sent), On/Off = On

When unoccupancy mode is active, according to current room temperature it will set the mode, setpoint and on/off, for example:

- Room Temperature > UCS: Setpoint = UCS, Mode = Cool, On/Off = On
- Room Temperature < UHS: Setpoint = UHS, Mode = Heat, On/Off = On
- UCS < Room Temperature > UHS: Setpoint = UCS/UHS depending on current mode (if Fan or Dry mode is active => no setpoint is sent), On/Off = On (if Unoccupancy Deadband Action is = 1)

These checks will be done each time the indoor unit occupancy status is changed, and if *check continuously* checkbox is checked, also each time the room temperature changes.

The configuration set on the occupany signals is applied from the very first moment the occupancy signal is enabled until the user changes the setpoint, mode or the On/Off signal, which disables occupancy functionality.

The minimum difference between Cool and Heat SetPoints must be 2ºC/4ºF.

Occupancy Cool SetPoint (OCS)   Unoccupancy Cool SetPoint (UCS)

Occupancy Heat SetPoint (OHS)   Unoccupancy Heat SetPoint (UHS)
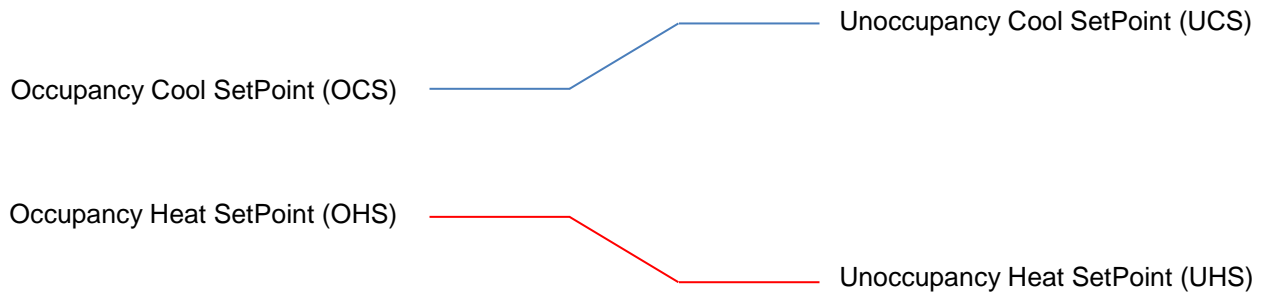
8 AC Unit Types compatibility

Please, check compatibility list at to know which Mitsubishi Heavy Industries units are compatible with our gateway.
https://www.intesis.com/docs/compatibilities/inxxxmhi001rx00_compatibility

9   Mechanical & electrical characteristics

Enclosure	Plastic, type PC (UL 94 V-0). Dimensions: 93mm x 53mm x 58mm. Light Grey. RAL 7035	Operational temperature	0°C to +70°C
Weight	85g.	Stock Temperature	-20ºC to +85ºC
Mounting	Wall. DIN rail EN60715 TH35.	Operational humidity	5% to 95%, with no condensation
Terminal wiring (for low-voltage signals)	Per terminal: solid wires or stranded wires (twisted or with ferrule) • 1 core: 0.5…2.5mm^2 • 2 cores: 0.5…1.5mm^2 • 3 cores: not permitted	Stock Humidity	<95% RH, with no condensation
BACnet MS/TP port	1 x Serial EIA485 Plug-in screw terminal block (3 poles + GND): • A, B, SG • SELV	Isolation Voltage	*1500 VDC*
AC unit port	1 x RC bus Plug-in screw trminal block (2 poles): • XY	Isolation resistance	1000 MΩ
Switch 1 (SW1)	1 x DIP-Switch for AC features and bus baud rate	Protection	IP20 (IEC60529)
Switch 2 (SW2)	1 x DIP-Switch for bus MAC address + temperature magnitude (ºC/ºF).	Bus Power Supply	15VDC, 0.1A PSU shall provide ES1 / PS2 energy source to equipment
Switch 3 (SW3)	1 x DIP-Switch for EIA bus configuration	External power supply (optional)	12VDC 0,1A NEC Class 2 or Limited Power Source (LPS) and SELV rated Power supply
LED indicators	2 x Gateway/Communication status		

10 Dimensions

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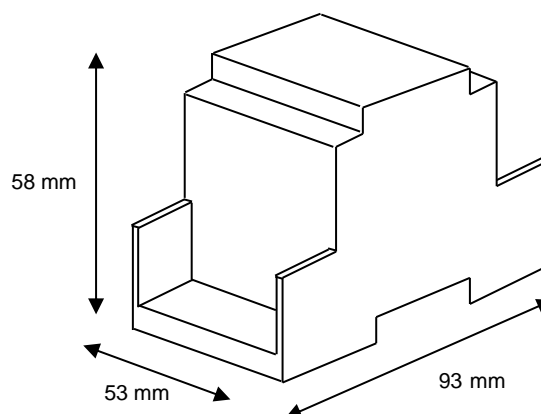
11 Error codes

Below you can find a list of error codes from Mitsubishi Heavy Industries air conditioning system.

Error Code	Error CodeM	Error in RC	Error Category	Error Description
0	01	N/A	INBACMHI001R100	No active error
-1	02	N/A		Communication Error between AC unit and INBACMHI001R100
17	03	A0	Indoor unit	External protection devices activated
18	04	A1		Indoor unit PCB assembly failure
19	05	A2		Interlock error for fan
20	06	A3		Drain level system error
21	07	A4		Temperature of heat exchanger (1) error
22	08	A5		Temperature of heat exchanger (2) error
23	09	A6		Fan motor locked, overload, over current
24	10	A7		Swing flap motor error
25	11	A8		Overcurrent of AC input
26	12	A9		Electronic expansion valve drive error
27	13	AA		Heater overheat
28	14	AH		Dust collector error / No-maintenance filter error
30	15	AJ		Capacity setting error (indoor)
31	16	AE		Shortage of water supply
32	17	AF		Malfunctions of a humidifier system (water leaking)
33	18	C0		Malfunctions in a sensor system
36	19	C3		Sensor system of drain water error
37	20	C4		Heat exchanger (1) (Liquid pipe) thermistor system error
38	21	C5		Heat exchanger (1) (Gas pipe) thermistor system error
39	22	C6		Sensor system error of fan motor locked, overload
40	23	C7		Sensor system of swing flag motor error
41	24	C8		Sensor system of over-current of AC input
42	25	C9		Suction air thermistor error
43	26	CA		Discharge air thermistor system error
44	27	CH		Contamination sensor error
45	28	CC		Humidity sensor error
46	29	CJ		Remote control thermistor error
47	30	CE		Radiation sensor error
48	31	CF		High pressure switch sensor
49	32	E0	Outdoor Unit	Protection devices activated
50	33	E1		Outdoor uni9t PCB assembly failure
52	34	E3		High pressure switch (HPS) activated
53	35	E4		Low pressure switch (LPS) activated
54	36	E5		Overload of inverter compressor motor
55	37	E6		Over current of STD compressor motor
56	38	E7		Overload of fan motor / Over current of fan motor
57	39	E8		Over current of AC input
58	40	E9		Electronic expansion valve drive error
59	41	EA		Four-way valve error
60	42	EH		Pump motor over current
61	43	EC		Water temperature abnormal
62	44	EJ		(Site installed) Protection device activated

63	45	EE	Malfunctions in a drain water
64	46	EF	Ice thermal storage unit error
65	47	H0	Malfunctions in a sensor system
66	48	H1	Air temperature thermistor error
67	49	H2	Sensor system of power supply error
68	50	H3	High Pressure switch is faulty
69	51	H4	Low pressure switch is faulty
70	52	H5	Compressor motor overload sensor is abnormal
71	53	H6	Compressor motor over current sensor is abnormal
72	54	H7	Overload or over current sensor of fan motor is abnormal
73	55	H8	Sensor system of over-current of AC input
74	56	H9	Outdoor air thermistor system error
75	57	HA	Discharge air thermistor system error
76	58	HH	Pump motor sensor system of over current is abnormal
77	59	HC	Water temperature sensor system error
79	60	HE	Sensor system of drain water is abnormal
80	61	HF	Ice thermal storage unit error (alarm)
81	62	F0	No.1 and No.2 common protection device operates.
82	63	F1	No.1 protection device operates.
83	64	F2	No.2 protection device operates
84	65	F3	Discharge pipe temperature is abnormal
87	66	F6	Temperature of heat exchanger(1) abnormal
91	67	FA	Discharge pressure abnormal
92	68	FH	Oil temperature is abnormally high
93	69	FC	Suction pressure abnormal
95	70	FE	Oil pressure abnormal
96	71	FF	Oil level abnormal
97	72	J0	Sensor system error of refrigerant temperature
98	73	J1	Pressure sensor error
99	74	J2	Current sensor error
100	75	J3	Discharge pipe thermistor system error
101	76	J4	Low pressure equivalent saturated temperature sensor system error
102	77	J5	Suction pipe thermistor system error
103	78	J6	Heat exchanger(1) thermistor system error
104	79	J7	Heat exchanger(2) thermistor system error
105	80	J8	Oil equalizer pipe or liquid pipe thermistor system error
106	81	J9	Double tube heat exchanger outlet or gas pipe thermistor system error
107	82	JA	Discharge pipe pressure sensor error
108	83	JH	Oil temperature sensor error
109	84	JC	Suction pipe pressure sensor error
111	85	JE	Oil pressure sensor error
112	86	JF	Oil level sensor error
113	87	L0	Inverter system error
116	88	L3	Temperature rise in a switch box
117	89	L4	Radiation fin (power transistor) temperature is too high
118	90	L5	Compressor motor grounded or short circuit, inverter PCB fault
119	91	L6	Compressor motor grounded or short circuit, inverter PCB fault
120	92	L7	Over current of all inputs

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121	93	L8		Compressor over current, compressor motor wire cut
122	94	L9		Stall prevention error (start-up error) Compressor locked, etc.
123	95	LA		Power transistor error
125	96	LC		Communication error between inverter and outdoor control unit
129	97	P0		Shortage of refrigerant (thermal storage unit)
130	98	P1		Power voltage imbalance, open phase
132	99	P3		Sensor error of temperature rise in a switch box
133	100	P4		Radiation fin temperature sensor error
134	101	P5		DC current sensor system error
135	102	P6		AC or DC output current sensor system error
136	103	P7		Total input current sensor error
142	104	PJ		Capacity setting error (outdoor)
145	105	U0	System	Low pressure drop due to insufficient refrigerant or electronic expansion valve error, etc.
146	106	U1		Reverse phase, Open phase
147	107	U2		Power voltage failure / Instantaneous power failure
148	108	U3		Failure to carry out check operation, transmission error
149	109	U4		Communication error between indoor unit and outdoor unit, communication error between outdoor unit and BS unit
150	110	U5		Communication error between remote control and indoor unit / Remote control board failure or setting error for remote control
151	111	U6		Communication error between indoor units
152	112	U7		Communication error between outdoor units / Communication error between outdoor unit and ice thermal storage unit
153	113	U8		Communication error between main and sub remote controllers (sub remote control error) / Combination error of other indoor unit / remote control in the same system (model)
154	114	U9		Communication error between other indoor unit and outdoor unit in the same system / Communication error between other BS unit and indoor/outdoor unit
155	115	UA		Combination error of indoor/BS/outdoor unit (model, quantity, etc.), setting error of spare parts PCB when replaced
156	116	UH		Improper connection of transmission wiring between outdoor and outdoor unit outside control adaptor
157	117	UC		Centralized address duplicated
158	118	UJ		Attached equipment transmission error
159	119	UE		Communication error between indoor unit and centralized control device
160	120	UF		Failure to carrey out check operation Indoor-outdoor, outdoor-outdoor communication error, etc.
209	121	60	Others	All system error
210	122	61		PC board error
211	123	62		Ozone density abnormal
212	124	63		Contamination sensor error
213	125	64		Indoor air thermistor system error
214	126	65		Outdoor air thermistor system error
217	127	68		HVU error (Ventiair dust-collecting unit)
219	128	6A		Dumper system error
220	129	6H		Door switch error
221	130	6C		Replace the humidity element
222	131	6J		Replace the high efficiency filter
223	132	6E		Replace the deodorization catalyst
224	133	6F		Simplified remote controller error
226	134	51		Fan motor of supply air over current or overload
227	135	52		Fan motor of return air over current / Fan motor of return air overload

228	136	53		Inverter system error (supply air side)
229	137	54		Inverter system error (return air side)
241	138	40		Humidifying valve error
242	139	41		Chilled water valve error
243	140	42		Hot water valve error
244	141	43		Heat exchanger of chilled water error
245	142	44		Heat exchanger of hot water error
258	143	31		The humidity sensor of return air sensor
259	144	32		Outdoor air humidity sensor error
260	145	33		Supply air temperature sensor error
261	146	34		Return air temperature sensor error
262	147	35		Outdoor air temperature sensor error
263	148	36		Remote controller temperature sensor error
267	149	3A		Water leakage sensor 1 error
268	150	3H		Water leakage sensor 2 error
269	151	3C		Dew condensation error
339	152	M2		Centralized remote controller PCB error
345	153	M8		Communication error between centralized remote control devices
347	154	MA		Centralized remote control devices inappropriate combination
349	155	MC		Centralized remote controller address setting error

In case you detect an error code not listed, contact your nearest Mitsubishi Heavy Industries technical support service for more information on the error meaning.