



IntesisBox[®]

BACnet MS/TP Server

Mitsubishi Electric Air Conditioning

Compatible with Domestic, Mr Slim and City Multi line air conditioners
commercialized by Mitsubishi Electric

User Manual

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Gateway for the integration of a Mitsubishi Electric air conditioning unit in BACnet MSTP enabled monitoring and control systems.

Compatible with Domestic, Mr. Slim and City Multi line air conditioners commercialized by Mitsubishi Electric.

Order Code:
IBBACMIT001I100

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1 Description

1.1 Introduction

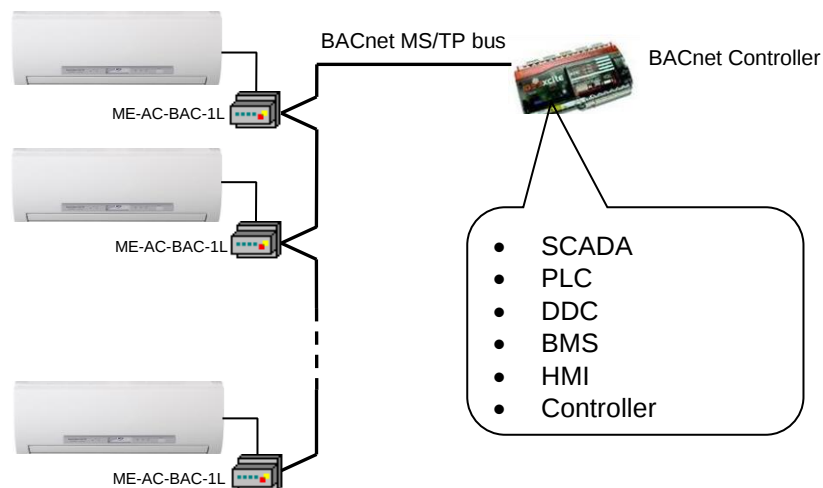
This document describes the integration of Mitsubishi Electric air conditioning systems into BACnet MS/TP compatible devices and systems using gateway *ME-AC-BAC-1L*.

The aim of this integration is to monitor and control your Mitsubishi Electric 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, IntesisBox allows BACnet communication allowing polling or subscription requests (COV).

IntesisBox makes available the Mitsubishi Electric air conditioning system indoor units through independent BACnet objects.

Abstraction of Mitsubishi Electric air conditioning system properties and functionalities as fixed BACnet Objects. IntesisBox 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 Electric technologies and their technical terms.



BACnet MS/TP installation sketch

1.2 Functionality

IntesisBox continuously read the Mitsubishi Electric 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 IntesisBox consists in associate the elements of the Mitsubishi Electric AC unit with BACnet objects.

The control of the indoor units through the ME-AC-BAC-1L is permitted, so commands toward the Mitsubishi Electric AC unit are permitted too.

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

1.3 Capacity of IntesisBox

IntesisBox is capable of integrate one single Mitsubishi Electric AC unit and its associated elements.

Element	Max.	Notes
Number of indoor units	1	Number of indoor units that can be controlled through IntesisBox
Number of Objects	28	Number of Mitsubishi Electric AC signals available as objects into IntesisBox.

1.4 Quick Setup

1. Install IntesisBox in the desired installation site (DIN rail mounting inside a metallic industrial cabinet connected to ground is recommended).
2. Connect the communication cables. Details in section [6 CONNECTIONS AND SWITCHES](#).
3. Check the BACnet objects list for its integration to your BACnet project. Details in section [5.3 OBJECTS AND PROPERTIES](#).
4. Check if there is communication between BACnet and AC system through device LED. Details in section [7.3 LED STATUS](#).
5. The IntesisBox 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: Intesis Software SLU

Product Name: ME-AC-BAC-1L

Product Model Number: ME-AC-BAC-1L

Application Software Version: 1.0

Firmware Revision: 1.0.0.0

BACnet Protocol Revision: 12

Product Description:

Mitsubishi Electric air conditioning system – BACnet MS/TP

Abstraction of Mitsubishi Electric 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 <u>16</u>
Segmented responses supported	☐ No	☒ Yes	Window Size <u>16</u>

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

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 Electric Air Conditioning Units compatible with Domestic & Mr. Slim line air conditioners.

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-ReadPropertyConditional-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	☐	UnconfirmedCOVNotification	☐	☒
DS-COVU-B	Data Sharing-COV-Unsolicited-B	☐	UnconfirmedCOVNotification	☒	☐

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 Internal–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 Internal–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	☒	☐

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	☐	UnconfirmedCOVNotification	☐	☒
DM-R-B	Device Management - Restart–B	☐	UnconfirmedCOVNotification	☒	☐
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	DeviceCommunicationControl	☐	
	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 Room Temperature ErrorCode 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
Binary-Output	4	☒	OnOff_command
Binary-Value	5	☒	OccupancyContinousCheck UnnoccupiedDeadBandAction LockRemoteControl
Calendar	6	☐	
Command	7	☐	
Device	8	☒	ME-AC-BAC-1L
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
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
ME-AC-BAC-1L	Mitsubishi Electric AC Interface	Device	246000*

* This is the default value.

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
OnTimeCounter		AV	0
Occupancy		MV	0
OccupiedCoolSetPoint		AV	1
OccupiedHeatSetPoint		AV	2
UnoccupiedCoolSetPoint		AV	3
UnoccupiedHeatSetPoint		AV	4
OccupancyContinuousCheck		BV	0
UnoccupiedDeadbandAction		BV	1
LockRemoteControl		BV	2
DIP_SW_S1_status		AI	9
DIP_SW_S2_status		AI	10
SerialNumber		AI	11

5.3 Objects and properties

5.3.1 Mitsubishi Electric AC Gateway (Device Object Type)

Below you can find relevant information about the properties of the object type.

Object_Identifier: identifying the device in the BACnet MSTP network can be done automatically or manually:

- Automatic addressing. This is the device factory mode. Automatic addressing is based on using a base address of 246000 and adding to this number the address selected in SW2 P1..P7.
- Manual addressing. Device will switch into manual addressing mode once a value is received from BACnet side in this property. During manual addressing mode, SW2 P1..P7 address is not considered.

⚠ Important: If **Object_Identifier** is overwritten from BACnet, SW2 configuration will not be considered for device instance calculation until a **Restore factory Settings** reset is performed.

Object_Name: In the **Device Object**, is configurable writing directly on this property.

Description: In the **Device Object**, is configurable writing directly on the property, length maximum 63 chars.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Device, 246000*)	R	W
Object_Name	CharacterString	"ME-AC-BAC-1L"	R	W
Object_Type	BACnetObjectType	DEVICE (8) (Device Object Type)	R	R
System_Status	BACnetDeviceStatus	OPERATIONAL (0)	R	R
Vendor_Name	CharacterString	"Intesis Software SL"	R	R
Vendor_Identifier	Unsigned16	246	R	R
Model_Name	CharacterString	"ME-AC-BAC-1L"	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 Electric AC interface"	O	W
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	BACnetObjectTypesSupported	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	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	-

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Local_Date	Date	-	O	-
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	32	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	-

* This is the default value.

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	-

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 ~ 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	R	R
Number_Of_States	Unsigned	5	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.

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

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	16...31 °C // 61...89 °F	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	16 // 61	O	R
Max_Pres_Value *	REAL	31 // 89	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 Fahrenheit units can be selected through the switch configuration. Check section 6.1 for more information.

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	16...31 °C // 61...89 °F	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	16 // 61	O	R
Max_Pres_Value	REAL	31 // 89	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 Fahrenheit units can be selected through the switch configuration. Check section 6.1 for more information.

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	<i>Check Fan Speed status setting table below.</i>	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.

Present_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	<i>Check Fan Speed command setting table below</i>	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
5	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 ~ 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/TRUE	R	R
Number_Of_States	Unsigned	7	R	R
State_Text	BACnetArray[N] of CharacterString	<i>Check Air Direction Status setting table below.</i>	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	Auto
2	Up
3	Mid-1
4	Mid-2
5	Mid-3
6	Down
7	Swing

5.3.11 RoomTemperature_status (Analog Input Object Type)

It indicates the room temperature from the sensor 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	10...38°C // 50...100°F	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
Update_Interval	Unsigned	-	O	-
Units	BACnetEngineeringUnits	Degrees Celsius (62) Degrees Fahrenheit (64)	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	-

5.3.12 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, 3)	R	R
Object_Name	CharacterString	"AirDirectionUD_command"	R	R
Object_Type	BACnetObjectType	MULTISTATE_OUTPUT (14)	R	R
Present_Value	Unsigned	1 ~ 7	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	7	R	R
State_Text	BACnetArray[N] of CharacterString	<i>Check Air Direction Command setting table below</i>	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	Auto
2	Up
3	Mid-1
4	Mid-2
5	Mid-3
6	Down
7	Swing

5.3.13 ErrorCode (Analog Input Object Type)

It indicates the current error present in the AC system.

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... 6846	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	-

5.3.14 ErrorCodeM (Multistate Input Object Type)

It indicates the current error present in the AC system.

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Multi-state Input, 2)	R	R
Object_Name	CharacterString	"ErrorCodeM"	R	R
Object_Type	BACnetObjectType	MULTISTATE_INPUT(13)	R	R
Present_Value	Unsigned	1 ~ 39	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	Contents displayed in State_Text	Pesent_Value	Contents displayed in State_Text
1	-	25	4230
2	CommError	26	5101
3	1102	27	5102
4	1108	28	5104
5	1110	29	5105
6	1300	30	5106
7	1302	31	5107
8	1503	32	5110
9	1504	33	5202
10	1509	34	5300
11	1520	35	6600
12	2500	36	6602
13	2502	37	6603
14	2503	38	6606
15	4030	39	6607
16	4100	40	6608
17	4101	41	6831
18	4102	42	6832
19	4103	43	6840
20	4108	44	6841
21	4118	45	6844
22	4124	46	6845
23	4210	47	6846
24	4220	48	UNKOWN

5.3.15 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	-

5.3.16 OnTimeCounter (Analog Value Object Type)

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

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	-

5.3.17 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	(Multi-state Output, 0)	R	R
Object_Name	CharacterString	"Occupancy"	R	R
Object_Type	BACnetObjectType	MULTISTATE_VALUE (19)	R	R
Present_Value	Unsigned	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	R	R
State_Text	BACnetArray[N] of CharacterString	<i>Check Occupancy setting table below</i>	O	R
Priority_Array	BACnetPriorityArray	-	R	-
Relinquish_Default	Unsigned	-	R	-
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Value	Unsigned	-	O	-
Fault_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	-

Occupancy values table

Check possible Occupancy values in the following correspondence table.

Present_Value	Contents displayed in State_Text
1	Occupied
2	Unoccupied
3	Disabled

5.3.18 OccupiedCoolSetPoint (Analog Value Object Type)

It indicates the current Setpoint when Cool mode is selected and 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	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	-

5.3.19 OccupiedHeatSetPoint (Analog Value Object Type)

It indicates the current Setpoint when Heat mode is selected and 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	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 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	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	-

5.3.21 UnoccupiedHeatSetPoint (Analog Value Object Type)

It indicates the current Setpoint when Heat mode is selected and 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	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	-

5.3.22 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	"Disable"	O	R
Active_Text	CharacterString	"Enable"	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	-

5.3.23 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	-

5.3.24 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	-

5.3.25 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	BACnetBinaryPV	0...255*	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 / TRUE	R	R
Polarity	BACnetPolarity	NORMAL (0)	R	R
Inactive_Text	CharacterString		O	R
Active_Text	CharacterString		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	-
Units	BACnetEngineeringUnits	No units (95)	R	R
COV_Increment	REAL	0	O	W

5.3.26 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	BACnetBinaryPV	0...255*	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		O	R
Active_Text	CharacterString		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	-
Units	BACnetEngineeringUnits	No units (95)	R	R
COV_Increment	REAL	0	O	W

5.3.27 SerialNumber (Analog Input Object Type)

It indicates the serial number of the device. Serial number follows the next rule **000KXXXXXX**, where:

- **000K** is constant and no included in Present Value property.
- **XXXXXX** 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	BACnetBinaryPV	00000...99999	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		O	R
Active_Text	CharacterString		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	-
Units	BACnetEngineeringUnits	No units (95)	R	R
COV_Increment	REAL	0	O	W

5.4 Considerations on Temperature Objects

- **Setpoint_command (Analog Output Object Type)**

This is the adjustable temperature setpoint value that must be required by the user.

Present value can be read or written.

A remote controller connected to the Mitsubishi Electric indoor unit will report the same temperature setpoint value set in this object.

- **RoomTemperature_status (Analog Input Object Type)**

This object reports the temperature that is currently used by the Mitsubishi Electric indoor unit as the reference of its own control loop. Depending on the configuration of the indoor unit, this value can be the temperature reported by the sensor on the return path of the Mitsubishi Electric indoor unit or the sensor of its remote controller.

Present value can be read only.

- **RoomTemperature_command (Analog Output Object Type)**

This object allows us to provide an external temperature's sensor from the BACnet side.

- After receiving **RoomTemperature_command** and **Setpoint_command**, ME-AC-BAC-1L is going to estimate the appropriate temperature setpoint.

Example. If a **Setpoint_command** = 22°C, and **RoomTemperature_command** = 20°C are received, ME-AC-BAC-1-L will assume that the user is demanding a +2°C increase in temperature.

- By knowing at any time, the reference temperature currently used by the indoor unit (the return temperature), ME-AC-BAC-1L can calculate the required temperature setpoint needed to apply the decrease/increase on the real temperature and reach the temperature chosen by the user.

Following the example above, if ME-AC-BAC-1-L reads an **RoomTemperature_command** = 24°C in the indoor unit, it will apply a final setpoint of **24°C + 2°C = 26°C**.

- At this moment, every time that ME-AC-BAC-1L detects a change on the ambient temperature reported by the indoor unit, it will also change the required setpoint to keep the temperature required by the user at any time.

If we follow the example, if ME-AC-BAC-1-L receives a new temperature value coming from the indoor unit of **25°C**, ME-AC-BAC-1-L will automatically adjust the temperature setpoint required of the AC indoor unit to **25°C + 2°C = 27°C**.

- In general, ME-AC-BAC-1L is constantly applying the "Virtual Temperature" formula:

$$S_{AC} = S_u - (T_u - T_{AC})$$

Where:

S_{AC} - setpoint value currently applied to the indoor unit

S_u - setpoint value

T_u - external temperature reference written at BACnet side

T_{AC} - ambient temperature that the indoor unit is using as the reference of its own control loop

When ME-AC-BAC-1L detects a change in any of the values of $\{S_u, T_u, T_{AC}\}$, it will send the new setpoint (S_{AC}) to the indoor unit.

- After a device booting, Present value for **RoomTemperature_command** has a value 0 and the property "Realibility" is displayed as *Unreliable Other (7)*. This "Realibility" status means that no external temperature reference has being provided to the object, so the system is not applying the Virtual temperature function. However, after receiving the first value, "Realibility" wil change into *Nofault Detected (0)*. After that, any value can be used in the temperature range, including 0.

- **Setpoint_status (Analog Input Object Type)**

This register will show the same value as **Setpoint_command**. The reference temperature from the remote controller is sent directly to the AC unit to be applied in the control loop.

Present value can be read only.

Moreover, notice that temperature's values of all these four objects are expressed according to the temperature's format configured through its onboard DIP-Switches (See 6 Connections and switches). The following formats are possible:

- **Celsius value:** Value in BACnet object is the temperature value in Celsius (i.e. a value "22" in the BACnet object must be interpreted as 22°C).
- **Fahrenheit value:** Value in BACnet object is the temperature value in Fahrenheit (i.e. a value "72" in the BACnet object must be interpreted as 72°F (~22°C)).

6 Connections and switches

6.1 Connect to the AC indoor unit interface

The interface includes a 1,9 meters cable for direct connection to the internal control board of the AC indoor unit.

Disconnect mains power from the AC unit. Open the front cover of the indoor unit to have access to the internal control board. In the control board locate the socket connector marked as **CN105** (**CN92** in some units).

Using the cable that comes with the interface, insert one of its connectors, the one installed in the shortest uncovered part, into the socket of the ME-AC-BAC-1L marked as **AC Unit**, and the other connector, the one in the largest uncovered part, into the socket **CN105** of the AC unit's control board. Fix the ME-AC-BAC-1L outside the AC indoor; remember that ME-AC-BAC-1L must be also connected to the BACnet network. Close the AC indoor unit's front cover again.

⚠ 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 IntesisBox power cycle

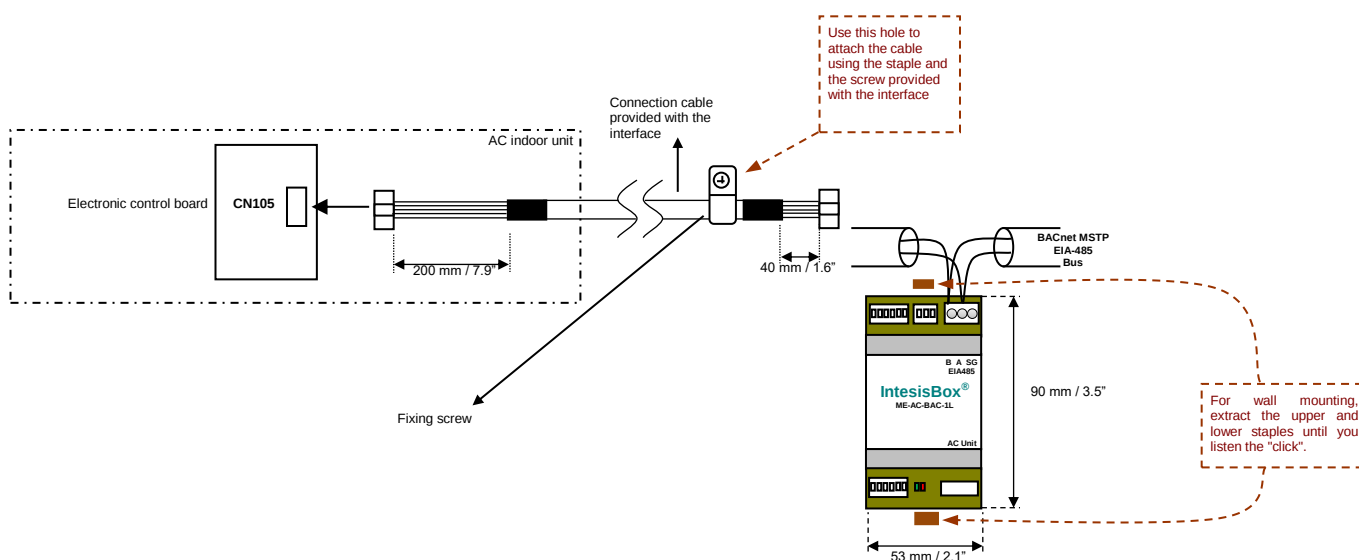


Figure 2.2 Connection diagram

SW1 – Device settings

Binary value b ₅ ...b ₄	Switches 1 2 3 4 5 6 7 8	Description
xxxx0xxx	x x x x ↓ x x x	Low Power Mode
xxxx1xxx	x x x x ↑ x x x	High Performance mode (Default value)

⚠ Important: This switch determines the performance and consumption of the device. Running in **High Performance Mode** means maximum consumption and maximum device performance. However, in very specific installations (AC bus shared with a wired remote controller together with wiring distances from AC to devices and low supply allowed by some AC in connection port) AC port consumption may be exceeded. In this case, it is possible to decrease device consumption by changing into **Low Power Mode**.

SW2 – Temperature magnitude (°C/°F)

Binary value b ₀ ...b ₁	Switches 1 2 3 4 5 6 7 8	Description
xxxxxxx0	x x x x x x ↓	Temperature values in Bacnet are represented in Celsius degrees (Default value)
xxxxxxx1	x x x x x x ↑	Temperature values in Bacnet are represented in Fahrenheit degrees

6.2 Connect to BACnet MS/TP

Connect the EIA485 bus wires to the plug-in terminal block (EIA485) of ME-AC-BAC-1L; 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 a polarization mechanism. Please, use switch **SW3** to configure these parameters.

Binary value $b_2...b_0$	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 (Default value)
x11	x ↑ ↑	Bus polarization active

Please, check configuration on **SW2** and **SW3** before connecting to BACnet MS/TP.

6.2.1 MS/TP MAC address switch configuration

MAC address can be configured using switch **SW2**

Binary value $b_0...b_7$	Switches 1 2 3 4 5 6 7 8	MAC address
0000000x	↓ ↓ ↓ ↓ ↓ ↓ ↓ x	0 (Default value)
1000000x	↑ ↓ ↓ ↓ ↓ ↓ ↓ x	1
0100000x	↓ ↑ ↓ ↓ ↓ ↓ ↓ x	2
1100000x	↑ ↑ ↓ ↓ ↓ ↓ ↓ x	3
....		...
1011111x	↑ ↓ ↑ ↑ ↑ ↑ ↑ x	125
0111111x	↓ ↑ ↑ ↑ ↑ ↑ ↑ x	126
1111111x	↑ ↑ ↑ ↑ ↑ ↑ ↑ x	127

6.2.2 BACnet MS/TP baudrate

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

Binary value $b_5...b_4$	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 ↓ ↑ ↓	192000 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 ME-AC-BAC-1L will look for another BACnet MS/TP device with a fixed baudrate to match this value. Once detected, the baudrate will not be modified until a device reset is produced.

7 Set-up process and troubleshooting

7.1 Pre-requisites

For 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 ME-AC-BAC-1L.

Items supplied by Intesis Software for this integration are:

- IntesisBox ME-AC-BAC-1L interface with Mitsubishi Electric AC external protocol firmware loaded.
- Specific connection cable to connect Mitsubishi Electric AC unit with ME-AC-BAC-1L gateway.
- Product documentation.

7.2 Physical checking

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

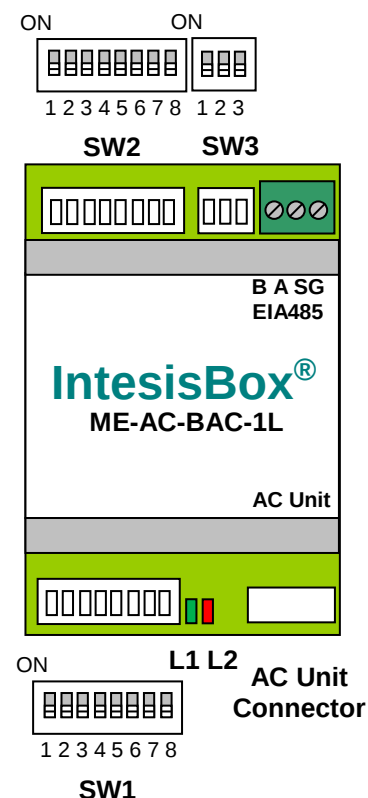
- 1.- Make sure that the supplied cable is correctly connected between the AC unit and the gateway.
- 2.- Check that the AC unit is connected to mains.
- 3.- Check the EIA485 connection from the gateway to the BACnet MS/TP. Remember to verify polarity and terminal resistors configuration.

7.3 LED status

There are two led at the bottom of the device. On start up, all leds blink once and then turn off. After that booting, LED status will be updated.

Please, check the table below for more information:

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



7.4 Occupancy

Each indoor unit has its own occupancy signal. Remember that this signal needs to be feed by an external sensor which indicates if there is presense or not (occupancy). This signal is processed directly in the ME-AC-BAC-1L.

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

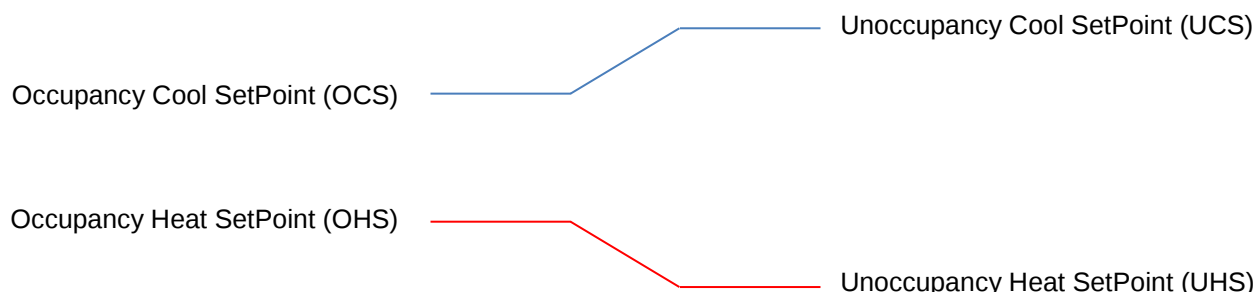
When unoccupancy mode is active, according to current room temperature it will set the mode, setpoint and on/off, for example:

- 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 occupy 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 2°C/4°F.



8 Restore factory Settings

8.1 Restore factory Settings

To restore device factory settings, it is necessary to complete the following process:

1. Set **SW1** and **SW2** DIP switches to ON position.
2. Reset the device performing a POWER OFF and a POWER ON.
3. After booting, both leds (green+red) should be blinking in S.O.S morse sequence.
4. At this moment, a 30 seconds countdown will start to set all SW1 and SW2 switches to OFF position.
5. By completing these previous steps, the device will be restored to Factory Settings.

To continue working with the device, remember to proceed as usual:

1. Set again switches to reach user desired configuration
2. Reset the device (POWER OFF + POWER ON).

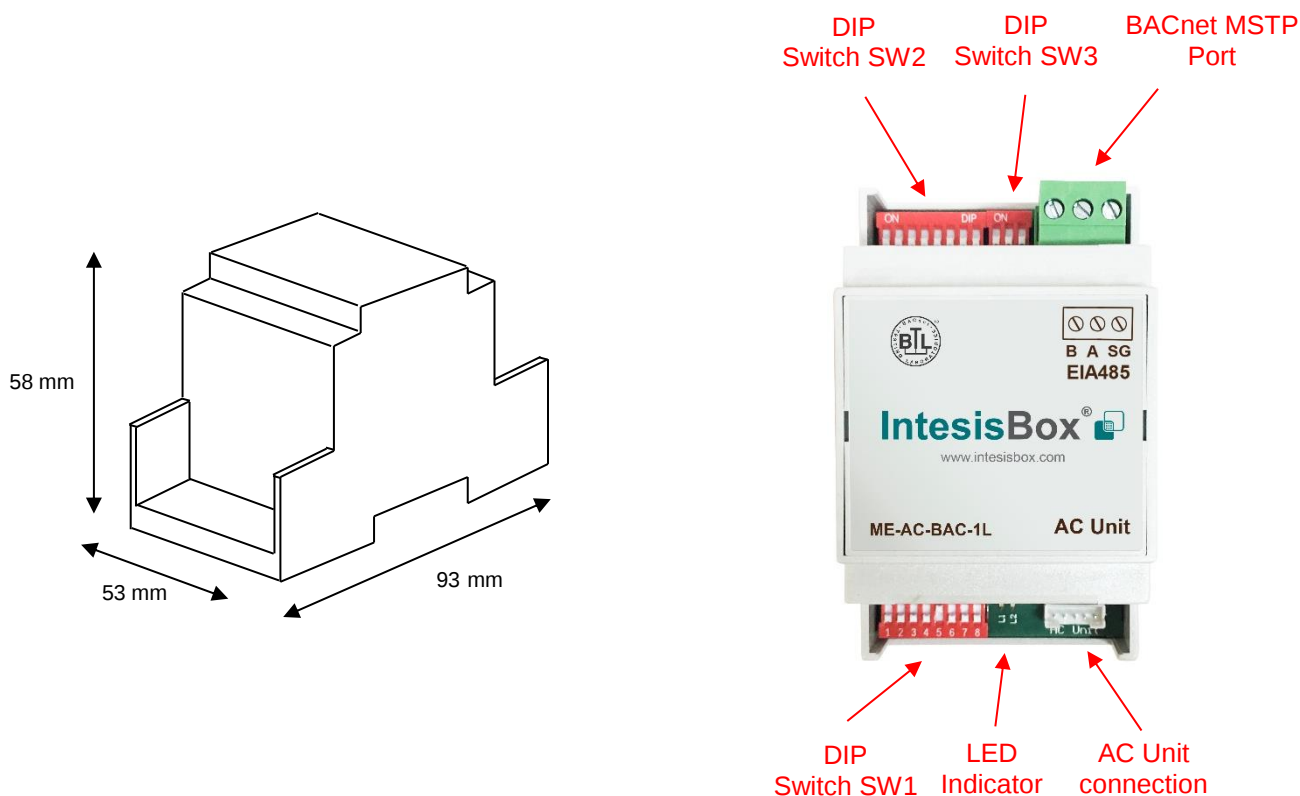
9 AC Unit Types compatibility

Please, check compatibility list at to know which Mitsubishi Electric units are compatible with our gateway.

http://www.intesis.com/pdf/IntesisBox_ME-AC-xxx-1_AC_Compatibility.pdf

10 Mechanical & electrical characteristics

Enclosure	Plastic, type PC (UL 94 V-0) Net dimensions (dxwxh): 93 x 53 x 58 mm / 3.7" x 2.1" x 2.3" Color: Light Grey. RAL 7035	Operation Temperature	0°C to +70°C
Weight	85 g.	Stock Temperature	-20°C to +85°C
Mounting	Wall DIN rail EN60715 TH35.	Operational Humidity	<95% RH, non-condensing
Terminal Wiring (for low-voltage signals)	For terminal: solid wires or stranded wires (twisted or with ferrule) 1 core: 0.5mm ² ... 2.5mm ² 2 cores: 0.5mm ² ... 1.5mm ² 3 cores: not permitted	Stock Humidity	<95% RH, non-condensing
BACnet MS/TP port	1 x EIA485 Plug-in screw terminal block (2 poles + GND) with 120 Ω resistor termination and polatization selectable by switch.	Isolation voltage	1500 VDC
AC unit port	1 x Specific connector Specific cable included	Isolation resistance	1000 MΩ
Switch 1 (SW1)	1 x DIP-Switch for Air Conditioner Unit + Bacnet baud rate	Protection	IP20
Switch 3 (SW3)	1 x DIP-Switch for Bacnet MAC address + temperature magnitude (°C/°F).	LED indicators	1 x Onboard LED - Operational status
Switch 4 (SW4)	1 x DIP-Switch for extra functions		



11 Error codes

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

ErrorCode	Error CodeM	Error in RC	Description
0001	CommError	-	Communication error between the ME-AC-BAC-1L and the AC unit
1102	1102	1102	Discharge Temperature high
1108	1108	1108	Internal thermostat detector working (49C)
1110	1110	1110	Outdoor unit fail
1300	1300	1300	Pressure low
1302	1302	1302	Pressure high (High pressure probe working 63H)
1503	1503	1503	Protection against freeze or battery high temperature
1504	1504	1504	Protection against freeze or battery high temperature
1504	1504	1504	Over heating protection
1509	1509	1509	High pressure error (ball valve closed)
1520	1520	1520	Super heating anomaly due to low temp. of discharge. (TH4)
2500	2500	2500	Erroneous operation of drain pump
2502	2502	2502	Erroneous operation of drain pump
2503	2503	2503	Drain sensor anomaly (DS)
4030	4030	4030	Serial transmission error
4100	4100	4100	Compressor pause due to excess of current (initial block)
4101	4101	4101	Compressor pause due to excess of current (overload)
4102	4102	4102	Phase detection opened
4103	4103	4103	Anti-phase detection
4108	4108	4108	Phase opened in phase L2 or connector 51CM opened
4118	4118	4118	Error in the anti-phase detector (electronic board)
4124	4124	4124	Connector 49L opened
4210	4210	4210	Cut due to over-current of compressor
4220	4220	4220	Voltage anomaly
4230	4230	4230	Radiator panel temperature anomaly (TH8)
5101	5101	5101	Ambient temperature probe anomaly (TH1), indoor unit
5102	5102	5102	Liquid probe anomaly (TH2)
5103	5103	5103	Cond/Evap probe anomaly (TH5)
5104	5104	5104	Error detection in discharge temperature

ErrorCode	Error CodeM	Error in RC	Description
5105	5105	5105	Outdoor probe error TH3
5106	5106	5106	Outdoor probe errorTH7
5107	5107	5107	Outdoor probe errorTH6
5110	5110	5110	Outdoor probe errorTH8
5202	5202	5202	Connector 63L opened
5300	5300	5300	Current probe error
6600	6600	6600	MNET duplicated address definition
6602	6602	6602	MNET Line transmission hardware error
6603	6603	6603	MNET BUS busy
6606	6606	6606	MNET Line transmission error
6607	6607	6607	MNET transmission error
6607	6607	6607	MNET without ack
6608	6608	6608	MNET transmission error
6608	6608	6608	MNET without response
6831	6831	6831	IR remote control transmission error (reception error)
6832	6832	6832	IR remote control transmission error (transmission error)
6840	6840	6840	Transmission error with the indoor/outdoor unit (reception error)
6841	6841	6841	Transmission error with the indoor/outdoor unit (transmission error)
6844	6844	6844	Error in inter-connection cable in the indoor/outdoor unit, indoor unit number deactivated (5 min or more)
6845	6845	6845	Error in inter-connection cable in the indoor/outdoor unit (cabling error, disconnection)
6846	6846	6846	Initial timer deactivated

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