



IntesisBox[®]

BACnet MS/TP Server & BACnet IP Server

Toshiba Air Conditioning

Compatible with VRF air conditioner lines commercialized by Toshiba

User Manual

r1.0 eng

Intesis The Intesis logo icon consists of three overlapping squares: a yellow one on top, a red one on the bottom left, and a white one on the bottom right.

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

Compatible with the Digital Inverter & VRF air conditioner lines commercialized by Toshiba.

Order Code:

TO-RC-BAC-1

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1 Description

1.1 Introduction

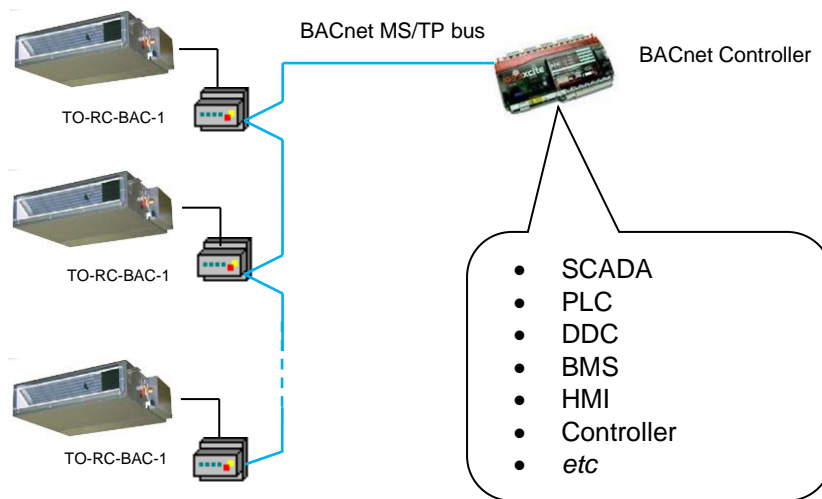
This document describes the integration of Toshiba air conditioning systems into BACnet compatible devices and systems using the *TO-RC-BAC-1* gateway.

The aim of this integration is to monitor and control your Toshiba 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).

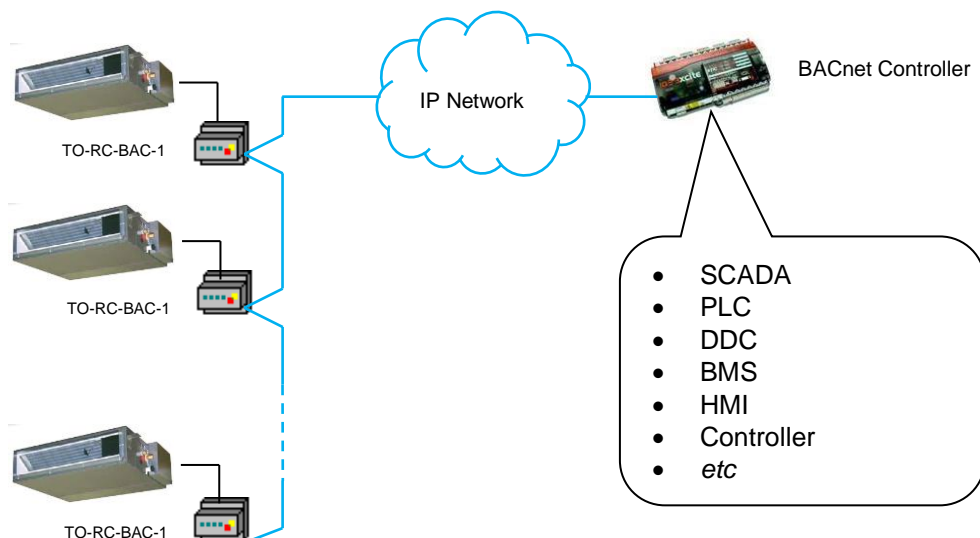
IntesisBox makes available the Toshiba air conditioning system indoor units through independent BACnet objects.

Abstraction of Toshiba 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 Toshiba technologies and their technical terms.



BACnet MS/TP installation sketch



BACnet IP installation sketch

1.2 Functionality

IntesisBox continuously reads the Toshiba AC system 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 Toshiba AC system with BACnet objects.

The control of the indoor units through the TO-RC-BAC-1 is permitted, so commands towards the Toshiba AC units are permitted too.

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

1.3 Capacity of IntesisBox

IntesisBox is capable of integrating one or more Toshiba AC units 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	29	Number of Toshiba AC signals available as objects into IntesisBox.

* **NOTE:** Keep in mind that more than one unit can be connected to the same TO-RC-BAC-1 gateway. You can control then more than one AC unit, but it will be actuated as a single unit. Different commands to different AC units connected to the same TO-RC-BAC-1 will not be allowed.

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 0.
3. Connect to the IntesisBox. Details in section 7.5.
4. (Optional) Configure the IntesisBox using the configuration tool. Details in section 7.5.2.
5. Check the BACnet objects list for its integration to your BACnet project. Details in section 5.2.
6. Check if there is communication between BACnet and AC system. Details in section 7.5.3.
7. The IntesisBox is ready to be used in your system.

2 Protocol Implementation Conformance Statement

BACnet Protocol Implementation Conformance Statement (PICS)

Date: 2014-12-05

Vendor Name: Intesis Software SL

Product Name: TO-RC-BAC-1

Product Model Number: TO-RC-BAC-1

Application Software Version: 1.0

Firmware Revision: 1.0.0.0

BACnet Protocol Revision: 12

Product Description:

Toshiba air conditioning system – BACnet MS/TP & BACnet IP Gateway

Abstraction of Toshiba 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

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:

Toshiba Air Conditioning Units compatible with Digital Inverter & VRF air conditioner 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	<input type="checkbox"/>	ReadProperty	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DS-RP-B	Data Sharing-ReadProperty-B	<input checked="" type="checkbox"/>	ReadProperty	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DS-RPM-A	Data Sharing-ReadPropertyMultiple-A	<input type="checkbox"/>	ReadPropertyMultiple	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DS-RPM-B	Data Sharing-ReadPropertyMultiple-B	<input checked="" type="checkbox"/>	ReadPropertyMultiple	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DS-RPC-A	Data Sharing-ReadPropertyConditional-A	<input type="checkbox"/>	ReadPropertyConditional	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DS-RPC-B	Data Sharing-ReadPropertyConditional-B	<input type="checkbox"/>	ReadPropertyConditional	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DS-WP-A	Data Sharing-WriteProperty-A	<input type="checkbox"/>	WriteProperty	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DS-WP-B	Data Sharing-WriteProperty-B	<input checked="" type="checkbox"/>	WriteProperty	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DS-WPM-A	Data Sharing-WritePropertyMultiple-A	<input type="checkbox"/>	WritePropertyMultiple	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DS-WPM-B	Data Sharing-WritePropertyMultiple-B	<input checked="" type="checkbox"/>	WritePropertyMultiple	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DS-COV-A	Data Sharing-COV-A	<input type="checkbox"/>	SubscribeCOV	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	ConfirmedCOVNotification	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	UnconfirmedCOVNotification	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DS-COV-B	Data Sharing-COV-B	<input checked="" type="checkbox"/>	SubscribeCOV	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input checked="" type="checkbox"/>	ConfirmedCOVNotification	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input checked="" type="checkbox"/>	UnconfirmedCOVNotification	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DS-COVP-A	Data Sharing-COVP-A	<input type="checkbox"/>	SubscribeCOV	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	ConfirmedCOVNotification	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	UnconfirmedCOVNotification	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DS-COVP-B	Data Sharing-COVP-B	<input type="checkbox"/>	SubscribeCOV	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	ConfirmedCOVNotification	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	UnconfirmedCOVNotification	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DS-COVU-A	Data Sharing-COV-Unsolicited-A	<input type="checkbox"/>	UnconfirmedCOVNotification	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DS-COVU-B	Data Sharing-COV-Unsolicited-B	<input type="checkbox"/>	UnconfirmedCOVNotification	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.2 Alarm and Event Management BIBBs

BIBB Type		Active	BACnet Service	Initiate	Execute
AE-N-A	Alarm and Event-Notification-A	<input type="checkbox"/>	ConfirmedEventNotification	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	UnconfirmedEventNotification	<input type="checkbox"/>	<input checked="" type="checkbox"/>
AE-N-I-B	Alarm and Event-Notification Internal-B	<input type="checkbox"/>	ConfirmedEventNotification	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	UnconfirmedEventNotification	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AE-N-E-B	Alarm and Event-Notification External-B	<input type="checkbox"/>	ConfirmedEventNotification	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	UnconfirmedEventNotification	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AE-ACK-A	Alarm and Event-ACK-A	<input type="checkbox"/>	AcknowledgeAlarm	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AE-ACK-B	Alarm and Event-ACK-B	<input type="checkbox"/>	AcknowledgeAlarm	<input type="checkbox"/>	<input checked="" type="checkbox"/>
AE-ASUM-A	Alarm and Event-Summary-A	<input type="checkbox"/>	GetAlarmSummary	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AE-ASUM-B	Alarm and Event-Summary-B	<input type="checkbox"/>	GetAlarmSummary	<input type="checkbox"/>	<input checked="" type="checkbox"/>
AE-ESUM-A	Event-Summary-A	<input type="checkbox"/>	GetEnrollmentSummary	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AE-ESUM-B	Event-Summary-B	<input type="checkbox"/>	GetEnrollmentSummary	<input type="checkbox"/>	<input checked="" type="checkbox"/>
AE-INFO-A	Alarm and Event-Information-A	<input type="checkbox"/>	GetEventInformation	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AE-INFO-B	Alarm and Event-Information-B	<input type="checkbox"/>	GetEventInformation	<input type="checkbox"/>	<input checked="" type="checkbox"/>
AE-LS-A	Alarm and Event-LifeSafety-A	<input type="checkbox"/>	LifeSafetyOperation	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AE-LS-B	Alarm and Event-LifeSafety-B	<input type="checkbox"/>	LifeSafetyOperation	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.3 Scheduling BIBBs

BIBB Type		Active	BACnet Service	Initiate	Execute
SCHEd-A	Scheduling–A (must support DS-RP-A and DS-WP-A)	<input type="checkbox"/>			
		<input type="checkbox"/>			
SCHEd-I-B	Scheduling-Internal–B (shall support DS-RP-B and DS-WP-B) (shall also support either DM-TS-B or DS-UTC-B)	<input type="checkbox"/>			
		<input type="checkbox"/>			
SCHEd-E-B	Scheduling-External–B (shall support SCHEd-I-B and DS-WP-A)	<input type="checkbox"/>			
		<input type="checkbox"/>			
T-VMT-A	Trending - Viewing and Modifying Trends–A	<input type="checkbox"/>	ReadRange	<input type="checkbox"/>	<input checked="" type="checkbox"/>
T-VMT-I-B	Trending - Viewing and Modifying Trends Internal–B	<input type="checkbox"/>	ReadRange	<input type="checkbox"/>	<input checked="" type="checkbox"/>
T-VMT-E-B	Trending - Viewing and Modifying Trends External–B	<input type="checkbox"/>	ReadRange	<input type="checkbox"/>	<input checked="" type="checkbox"/>
T-ATR-A	Trending - Automated Trend Retrieval–A	<input type="checkbox"/>	ConfirmedEventNotification	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	ReadRange	<input checked="" type="checkbox"/>	<input type="checkbox"/>
T-ATR-B	Trending - Automated Trend Retrieval–B	<input type="checkbox"/>	ConfirmedEventNotification	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	ReadRange	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.4 Trending BIBBs

BIBB Type		Active	BACnet Service	Initiate	Execute
T-VMT-A	Trending - Viewing and Modifying Trends–A	<input type="checkbox"/>	ReadRange	<input checked="" type="checkbox"/>	<input type="checkbox"/>
T-VMT-I-B	Trending - Viewing and Modifying Trends Internal–B	<input type="checkbox"/>	ReadRange	<input type="checkbox"/>	<input checked="" type="checkbox"/>
T-VMT-E-B	Trending - Viewing and Modifying Trends External–B	<input type="checkbox"/>	ReadRange	<input type="checkbox"/>	<input checked="" type="checkbox"/>
T-ATR-A	Trending - Automated Trend Retrieval–A	<input type="checkbox"/>	ConfirmedEventNotification	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	ReadRange	<input checked="" type="checkbox"/>	<input type="checkbox"/>
T-ATR-B	Trending - Automated Trend Retrieval–B	<input type="checkbox"/>	ConfirmedEventNotification	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	ReadRange	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.5 Network Management BIBBs

BIBB Type		Active	BACnet Service	Initiate	Execute
NM-CE-A	Network Management - Connection Establishment–A	<input type="checkbox"/>	Establish-Connection-To-Network	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	Disconnect-Connection-To-Network	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NM-CE-B	Network Management - Connection Establishment– B	<input type="checkbox"/>	Establish-Connection-To-Network	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	Disconnect-Connection-To-Network	<input type="checkbox"/>	<input checked="" type="checkbox"/>
NM-RC-A	Network Management - Router Configuration–A	<input type="checkbox"/>	Who-Is-Router-To-Network	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	I-Am-Router-To-Network	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	I-Could-Be-Router-To-Network	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	Initialize-Routing-Table	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NM-RC-B	Network Management - Router Configuration–B	<input type="checkbox"/>	Initialize-Routing-Table-Ack	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	Who-Is-Router-To-Network	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	I-Am-Router-To-Network	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	Initialize-Routing-Table	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	Initialize-Routing-Table-Ack	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.6 Device Management BIBBs

BIBB Type	Active	BACnet Service	Initiate	Execute
DM-DDB-A	<input type="checkbox"/>	Who-Is	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	I-Am	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DM-DDB-B	<input checked="" type="checkbox"/>	Who-Is	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/>	I-Am	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DM-DOB-A	<input type="checkbox"/>	Who-Has	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	I-Have	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DM-DOB-B	<input checked="" type="checkbox"/>	Who-Has	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/>	I-Have	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DM-DCC-A	<input type="checkbox"/>	DeviceCommunicationControl	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DM-DCC-B	<input checked="" type="checkbox"/>	DeviceCommunicationControl	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DM-PT-A	<input type="checkbox"/>	ConfirmedPrivateTransfer	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	UnconfirmedPrivateTransfer	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DM-PT-B	<input type="checkbox"/>	ConfirmedPrivateTransfer	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	UnconfirmedPrivateTransfer	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DM-TM-A	<input type="checkbox"/>	ConfirmedTextMessage	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	UnconfirmedTextMessage	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DM-TM-B	<input type="checkbox"/>	ConfirmedTextMessage	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	UnconfirmedTextMessage	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DM-TS-A	<input type="checkbox"/>	TimeSynchronization	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DM-TS-B	<input type="checkbox"/>	TimeSynchronization	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DM-UTC-A	<input type="checkbox"/>	UTCTimeSynchronization	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DM-UTC-B	<input type="checkbox"/>	UTCTimeSynchronization	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DM-RD-A	<input type="checkbox"/>	ReinitializeDevice	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DM-RD-B	<input checked="" type="checkbox"/>	ReinitializeDevice	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DM-BR-A	<input type="checkbox"/>	AtomicReadFile	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	AtomicWriteFile	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	CreateObject	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	ReinitializeDevice	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DM-BR-B	<input type="checkbox"/>	AtomicReadFile	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	AtomicWriteFile	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	ReinitializeDevice	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DM-R-A	<input type="checkbox"/>	UnconfirmedCOVNotification	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DM-R-B	<input type="checkbox"/>	UnconfirmedCOVNotification	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DM-LM-A	<input type="checkbox"/>	AddListElement	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	RemoveListElement	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DM-LM-B	<input type="checkbox"/>	AddListElement	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	RemoveListElement	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DM-OCD-A	<input type="checkbox"/>	CreateObject	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	DeleteObject	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DM-OCD-B	<input type="checkbox"/>	CreateObject	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	DeleteObject	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DM-VT-A	<input type="checkbox"/>	VT-Open	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	VT-Close	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	VT-Data	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
DM-VT-B	<input type="checkbox"/>	VT-Open	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	VT-Close	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	VT-Data	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

4 Service Types

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

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	<input checked="" type="checkbox"/>	SetPoint_status RoomTemperature ErrorCode ErrorAddress
Analog-Output	1	<input checked="" type="checkbox"/>	SetPoint_command
Analog-Value	2	<input checked="" type="checkbox"/>	OnTimeCounter OccupiedCoolSetPoint OccupiedHeatSetPoint UnoccupiedCoolSetPoint UnoccupiedHeatSetPoint
Averaging	18	<input type="checkbox"/>	
Binary-Input	3	<input checked="" type="checkbox"/>	OnOff_status ErrorActive FilterSign
Binary-Output	4	<input checked="" type="checkbox"/>	OnOff_command FilterReset
Binary-Value	5	<input checked="" type="checkbox"/>	OccupancyContinuousCheck UnoccupiedDeadBandAction
Calendar	6	<input type="checkbox"/>	
Command	7	<input type="checkbox"/>	
Device	8	<input checked="" type="checkbox"/>	TO-RC-BAC-1
Event-Enrollment	9	<input type="checkbox"/>	
File	10	<input type="checkbox"/>	
Group	11	<input type="checkbox"/>	
Life-Safety-Point	21	<input type="checkbox"/>	
Life-Safety-Zone	22	<input type="checkbox"/>	
Loop	12	<input type="checkbox"/>	
Multistate-Input	13	<input checked="" type="checkbox"/>	Mode_status FanSpeed_status AirDirectionUD_status ErrorCodeM RemoteControllerProhibit_status RuntimeModeRestriction
Multistate-Output	14	<input checked="" type="checkbox"/>	Mode_command FanSpeed_command AirDirectionUD_command RemoteControllerProhibit_command
Multistate-Value	19	<input checked="" type="checkbox"/>	Occupancy
Notification-Class	15	<input type="checkbox"/>	
Program	16	<input type="checkbox"/>	
Schedule	17	<input type="checkbox"/>	
Trend-Log	20	<input type="checkbox"/>	

5.2 Member objects

5.2.1 Type: Gateway

Object-name	Description	Object-type	Object-instance
TO-RC-BAC-1	Toshiba AC 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		AI	1
ErrorCode		AI	2
ErrorCodeM		MI	4
ErrorActive		BI	1
OnTimeCounter		AV	0
FilterSign		AI	6
FilterReset		MI	4
Occupancy		MV	0
OccupiedCoolSetPoint		AV	1
OccupiedHeatSetPoint		AV	2
UnoccupiedCoolSetPoint		AV	3
UnoccupiedHeatSetPoint		AV	4
OccupancyContinuousCheck		BV	0
UnoccupiedDeadbandAction		BV	1
RemoteControlProhibit_status		MI	6
RemoteControlProhibit_command		MO	5
RuntimeModeRestriction		MI	7

* This is the default value. Check section 5.3 (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 section 7.4 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. See section 7.4 for more information.

Description: In the **Device Object**, is configurable writing directly on the property, length maximum 63 chars. This string is configurable using the configuration tool. See section 7.4 for more information.

5.3.1 Toshiba AC Gateway (Device Object Type)

Property Identifier	Property Datatype	Value	ASHRAE	IBOX
Object_Identifier	BACnetObjectIdentifier	(Device, 246000)	R	R
Object_Name	CharacterString	" TO-RC-BAC-1"	R	R
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	"TO-RC-BAC-1"	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	"Toshiba RC2 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	-

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	-

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 ~ 6	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	6	R	R
State_Text	BACnetArray[N] of CharacterString	<i>Check Mode 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	-

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	AutoHeat
6	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	<i>Check Mode 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	-

Mode Command setting table

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

Present_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...30 °C 60...86 °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	Depends on IU	O	R
Max_Pres_Value	REAL	Depends on IU	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.

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...30 °C 60...86 °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	Depends on IU	O	R
Max_Pres_Value	REAL	Depends on IU	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. 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 ~ 4	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	4	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	Low
3	Mid-1
4	High

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 ~ 4	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	4	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.

Present_Value	Contents displayed in State_Text
1	Auto
2	Low
3	Mid-1
4	High

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.

Present_Value	Contents displayed in State_Text
1	Stop
2	Up
3	Mid-1
4	Mid-2
5	Mid-3
6	Down
7	Swing

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 ~ 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.

Present_Value	Contents displayed in State_Text
1	Stop
2	Up
3	Mid-1
4	Mid-2
5	Mid-3
6	Down
7	Swing

5.3.12 RoomTemperature (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”	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value	REAL	-10...50	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	-

5.3.13 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... 2099*	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	-

* Check section 11 for more information about each error code.

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, 4)	R	R
Object_Name	CharacterString	"ErrorCodeM"	R	R
Object_Type	BACnetObjectType	MULTISTATE_INPUT(13)	R	R
Present_Value	Unsigned	1 ~ 251	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	251	R	R
State_Text	BACnetArray[N] of CharacterString	<i>Check Error Code 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	-

Error Code table

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

Pesent Value	State Text	Pesent Value	State Text	Pesent Value	State Text	Pesent Value	State Text
1		66	E02	132	H06	198	L10
2	CommError	67	E03	133	H07	199	L11
3	A01	68	E04	134	H08	200	L12
4	A02	69	E05	135	H09	201	L13
5	A03	70	E06	136	H10	202	L14
6	A04	71	E07	137	H11	203	L15
7	A05	72	E08	138	H12	204	L16
8	A06	73	E09	139	H13	205	L17
9	A07	74	E10	140	H14	206	L18
10	A08	75	E11	141	H15	207	L19
11	A09	76	E12	142	H16	208	L20
12	A10	77	E13	143	H17	209	L21

13	A11	78	E14	144	H18	210	L22
14	A12	79	E15	145	H19	211	L23
15	A13	80	E16	146	H20	212	L24
16	A14	81	E17	147	H21	213	L25
17	A15	82	E18	148	H22	214	L26
18	A16	83	E19	149	H23	215	L27
19	A17	84	E20	150	H24	216	L28
20	A18	85	E21	151	H25	217	L29
21	A19	86	E22	152	H26	218	L30
22	A20	87	E23	153	H27	219	L31
23	A21	88	E24	154	H28	220	P01
24	A22	89	E25	155	H29	221	P02
25	A23	90	E26	156	H30	222	P03
26	A24	91	E27	157	H31	223	P04
27	A25	92	E28	158	J01	224	P05
28	A26	93	E29	159	J02	225	P06
29	A27	94	E30	160	J03	226	P07
30	A28	95	E31	161	J04	227	P08
31	A29	96	F01	162	J05	228	P09
32	A30	97	F02	163	J06	229	P10
33	A31	98	F03	164	J07	230	P11
34	C01	99	F04	165	J08	231	P12
35	C02	100	F05	166	J09	232	P13
36	C03	101	F06	167	J10	233	P14
37	C04	102	F07	168	J11	234	P15
38	C05	103	F08	169	J12	235	P16
39	C06	104	F09	170	J13	236	P17
40	C07	105	F10	171	J14	237	P18
41	C08	106	F11	172	J15	238	P19
42	C09	107	F12	173	J16	239	P20
43	C10	108	F13	174	J17	240	P21
44	C11	109	F14	175	J18	241	P22
45	C12	110	F15	176	J19	242	P23
46	C13	111	F16	177	J20	243	P24
47	C14	112	F17	178	J21	244	P25
48	C15	113	F18	179	J22	245	P26
49	C16	114	F19	180	J23	246	P27
50	C17	115	F20	181	J24	247	P28
51	C18	116	F21	182	J25	248	P29
52	C19	117	F22	183	J26	249	P30
53	C20	118	F23	184	J27	250	P31
54	C21	119	F24	185	J28	251	UNKNOWN
55	C22	120	F25	186	J29		
56	C23	121	F26	187	J30		
57	C24	122	F27	188	J31		
58	C25	123	F28	189	L01		
59	C26	124	F29	190	L02		
60	C27	125	F30	191	L03		
61	C28	126	F31	192	L04		
62	C29	127	H01	193	L05		
63	C30	128	H02	194	L06		
64	C31	129	H03	195	L07		
65	E01	130	H04	196	L08		
66	E02	131	H05	197	L09		

Check section 11 for more information about each error code.

5.3.15 ErrorActive (Binary Input Object Type)

It indicates if there is an active error 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 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	-

5.3.17 FilterSign (Binary Input Object Type)

It indicates the status for the filter, if in error or not.

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, 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	"OK"	O	R
Active_Text	CharacterString	"Dirty"	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	-

5.3.18 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	-	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	-

5.3.19 Occupancy (Multistate Value Object Type)

It indicates the use or not of the occupancy function. Check section 7.4 for more information.

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

5.3.20 OccupiedCoolSetPoint (Analog Value Object Type)

It indicates the current Setpoint when Cool mode is selected and Occupancy is enabled and the room is occupied. Check section 7.4 for more information.

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	-

5.3.21 OccupiedHeatSetPoint (Analog Value Object Type)

It indicates the current Setpoint when Heat mode is selected and Occupancy is enabled and the room is occupied. Check section 7.4 for more information.

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	-

5.3.22 UnoccupiedCoolSetPoint (Analog Value Object Type)

It indicates the current Setpoint when Cool mode is selected and Occupancy is enabled and the room is unoccupied. Check section 7.4 for more information.

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	-

5.3.23 UnoccupiedHeatSetPoint (Analog Value Object Type)

It indicates the current Setpoint when Heat mode is selected and Occupancy is enabled and the room is unoccupied. Check section 7.4 for more information.

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	-

5.3.24 OccupancyContinuousCheck (Binary Value Object Type)

It indicates if the system is continuously checking the setpoint and occupancy conditions. Check section 7.4 for more information.

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	-

5.3.25 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. Check section 7.4 for more information.

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	-

5.3.26 RemoteControllerProhibit_status (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, 6)	R	R
Object_Name	CharacterString	"RemoteControllerProhibit_status"	R	R
Object_Type	BACnetObjectType	MULTISTATE_INPUT(13)	R	R
Present_Value	Unsigned	1 ~ 8	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	8	R	R
State_Text	BACnetArray[N] of CharacterString	<i>Check Error Code 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	-

Remote Controller Prohibit status

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

Present_Value	Contents displayed in State_Text
1	AllPermitted
2	OnOff
3	Mode
4	Mode, OnOff
5	SetPoint
6	SetPoint, OnOff
7	SetPoint, Mode
8	SetPoint, Mode, OnOff

5.3.27 RemoteControllerProhibit_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, 5)	R	R
Object_Name	CharacterString	"RemoteControllerProhibit_command"	R	R
Object_Type	BACnetObjectType	MULTISTATE_OUTPUT (14)	R	R
Present_Value	Unsigned	1 ~ 8	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	8	R	R
State_Text	BACnetArray[N] of CharacterString	<i>Check Mode 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	-

Remote Controller Prohibit command

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

Present_Value	Contents displayed in State_Text
1	AllPermitted
2	OnOff
3	Mode
4	Mode, OnOff
5	SetPoint
6	SetPoint, OnOff
7	SetPoint, Mode
8	SetPoint, Mode, OnOff

5.3.28 RuntimeModeRestriction (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, 7)	R	R
Object_Name	CharacterString	"RuntimeModeRestriction"	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	<i>Check Error Code 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	-

Runtime Mode Restriction

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

Present_Value	Contents displayed in State_Text
1	None
2	Auto
3	Heat
4	Heat, Auto
5	Cool, Dry
6	Cool, Dry, Auto
7	Cool, Dry, Heat, Auto

6 Connections and switches

6.1 Connect to the Remote Controller bus

Disconnect the Toshiba system from Mains Power

Connect the interface to A B bus in any point of the bus. The A B bus is the bus that connects the AC indoor unit and the wired remote controller, is a two-wire bus connecting terminals A B of both. This A B 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

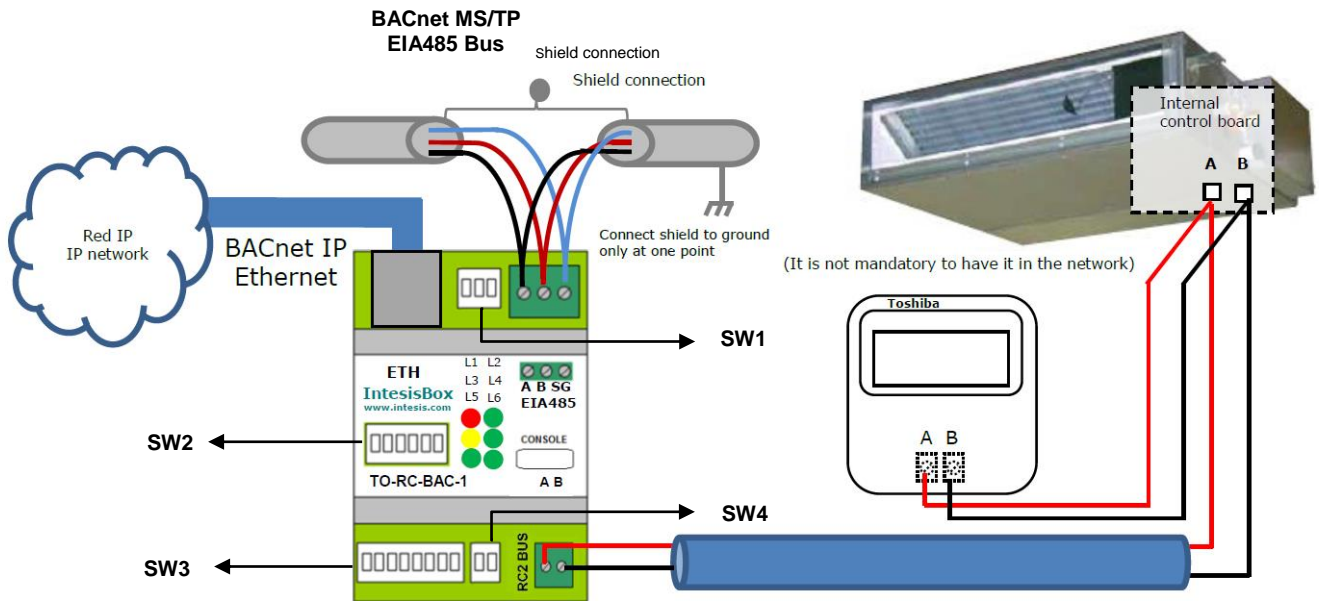



Figure 2.2 Connection diagram

⚠ Important: In case of having a Toshiba's Control Panel (not mandatory), DIP switch of the Toshiba Control Panel should be always set into Follower position.

	<table border="1"> <thead> <tr> <th>Switches</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>1 2</td> <td>Toshiba's remote controller as Follower.</td> </tr> <tr> <td>↑ ↓</td> <td></td> </tr> </tbody> </table>	Switches	Function	1 2	Toshiba's remote controller as Follower.	↑ ↓	
Switches	Function						
1 2	Toshiba's remote controller as Follower.						
↑ ↓							

Please, check the configuration for the AC unit to ensure proper control of the AC unit according to its specifications. Use **SW4** and **SW3** for that purpose.

SW3 - Celsius/Fahrenheit selection

Binary value b ₇ ...b ₀	Decimal value	Switches 1 2 3 4 5 6 7 8	Description
xxxx0xxx	0	x x x x ↓ x x x	Celsius degrees (default value)
xxxx1xxx	1	x x x x ↑ x x x	Fahrenheit degrees

SW4 – Fan/Vanes selection

Binary value b ₁ ...b ₀	Decimal value	Switches 1 2	MAC address
0x	0	↓ x	Fan mode not available
1x	1	↑ x	Fan mode available
x0	0	x ↓	Horizontal vanes not available
x1	1	x ↑	Horizontal vanes available

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

6.2 Connect to BACnet MS/TP

Connect the EIA485 bus wires to the plug-in terminal block (EIA485) of TO-RC-BAC-1; 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 **SW1** in order to configure these parameters.

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

Please, check as well 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 **SW2** DIP-Switch

Binary value b ₇ ...b ₀	Decimal value	Switches 1 2 3 4 5 6 7 8	MAC address
0000000x	0	↓ ↓ ↓ ↓ ↓ ↓ ↓ x	0
1000000x	1	↑ ↓ ↓ ↓ ↓ ↓ ↓ x	1
0100000x	2	↓ ↑ ↓ ↓ ↓ ↓ ↓ x	2
1100000x	3	↑ ↑ ↓ ↓ ↓ ↓ ↓ x	3
....
1011111x	125	↑ ↓ ↑ ↑ ↑ ↑ ↑ x	125
0111111x	126	↓ ↑ ↑ ↑ ↑ ↑ ↑ x	126
1111111x	127	↑ ↑ ↑ ↑ ↑ ↑ ↑ x	127

The MAC address selected may 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. Please, check section 7.4 for more information.

6.2.2 MS/TP activation and baudrate

Select the right baudrate for BACnet MS/TP communication using switch **SW3**.

Binary value b ₇ ...b ₀	Decimal value	Switches 1 2 3 4 5 6 7 8	Description
0xxxxxxx	0	↓ x x x x x x x	BACnet MS/TP active (default value)
1xxxxxxx	1	↑ x x x x x x x	BACnet IP active
x000xxxx	0	x ↓ ↓ ↓ ↓ x x x x	Autobaudrate (default value) *
x100xxxx	1	x ↑ ↓ ↓ ↓ x x x x	9600 bps
x010xxxx	2	x ↓ ↑ ↓ ↓ x x x x	192000 bps
x110xxxx	3	x ↑ ↑ ↓ ↓ x x x x	38400 bps
x001xxxx	4	x ↓ ↓ ↑ ↓ x x x x	57600 bps
x101xxxx	5	x ↑ ↓ ↑ ↓ x x x x	76800 bps
x011xxxx	6	x ↓ ↑ ↑ ↓ x x x x	115200 bps
x111xxxx	7	x ↑ ↑ ↑ ↓ x x x x	Autobaudrate *
xxxx0xxx	0	x x x x ↓ x x x	Celsius degrees (default value)
xxxx1xxx	1	x x x x ↑ x x x	Fahrenheit degrees

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

* Note: If Autobaudrate is selected, the TO-RC-BAC-1 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.

6.3 Connect to BACnet IP

Connect the RJ45 connector to the Ethernet connection (ETH) of TO-RC-BAC-1.

Respect same recommendations as per any other Ethernet communication network.

Remember to activate the IP interface through the **SW3** switch.

Binary value b ₇ ...b ₀	Decimal value	Switches								Description	
		1	2	3	4	5	6	7	8		
0xxxxxxx	0	↓	x	x	x	x	x	x	x	x	BACnet MS/TP active (default value)
1xxxxxxx	1	↑	x	x	x	x	x	x	x	x	BACnet IP active

By default, the TO-RC-BAC-1 comes with a static IP address: **192.168.100.246**.

In order to change it, please use the configuration tool and select either DHCP or another static IP (recommended) that suits your integration project requirements. Check section 7.4 for more information.

6.3.1 BACnet 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.

Binary value b ₇ ...b ₀	Decimal value	Switches								MAC address
		1	2	3	4	5	6	7	8	
0000000x	0	↓	↓	↓	↓	↓	↓	↓	x	0
1000000x	1	↑	↓	↓	↓	↓	↓	↓	x	1
0100000x	2	↓	↑	↓	↓	↓	↓	↓	x	2
1100000x	3	↑	↑	↓	↓	↓	↓	↓	x	3
....
1011111x	125	↑	↓	↑	↑	↑	↑	↑	x	125
0111111x	126	↓	↑	↑	↑	↑	↑	↑	x	126
1111111x	127	↑	↑	↑	↑	↑	↑	↑	x	127

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

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 TO-RC-BAC-1.

In a BACnet IP integration, it is necessary to have the BACnet IP client operative and well connected to the IP network and the TO-RC-BAC-1 connected to this same IP network through the ETH port.

Items supplied by Intesis Software for this integration are:

- IntesisBox TO-RC-BAC-1 interface with Toshiba AC external protocol firmware loaded.
- Specific connection cable to connect Toshiba AC unit with TO-RC-BAC-1 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:

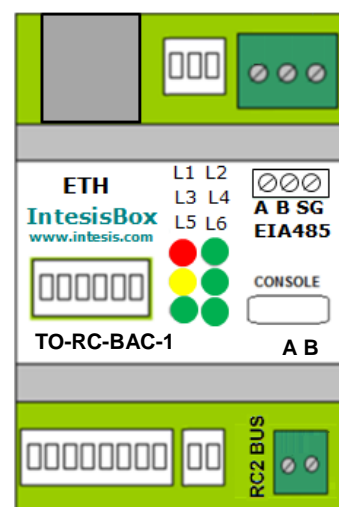
- 1.- Make sure that the supplied cable is correctly connected between the AC unit and the gateway. TO-RC-BAC-1 needs to be connected to the AC unit or externally powered before start the device configuration. Contact Intesis if you need to power your device without connecting it to the AC unit.
- 2.- 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	AC communication error
	Blinking	AC error
	Off	No errors present
L5 (green)	ON Steady	BACnet MS/TP link
	Blinking	Activity on the BACnet MS/TP bus
L6 (green)	ON Steady	Ethernet link
	Blinking	Activity on BACnet IP
L1+L4+L5	Blinking	Device in Bootloader mode
All	Blinking	Fatal Error
All	On Steady 1 sec	On start up (for testing purposes)



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 TO-RC-BAC-1.

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

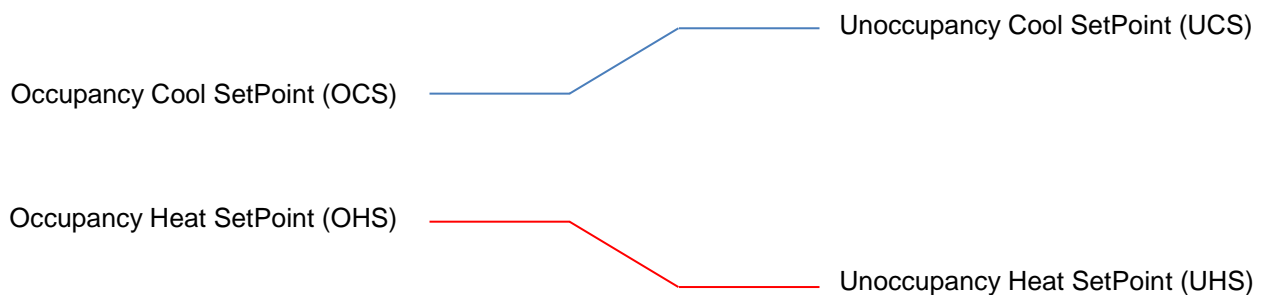
When unoccupancy mode is active, according to current room temperature it will set the mode, setpoint and on/off, for example:

- 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 2°C/4°F.



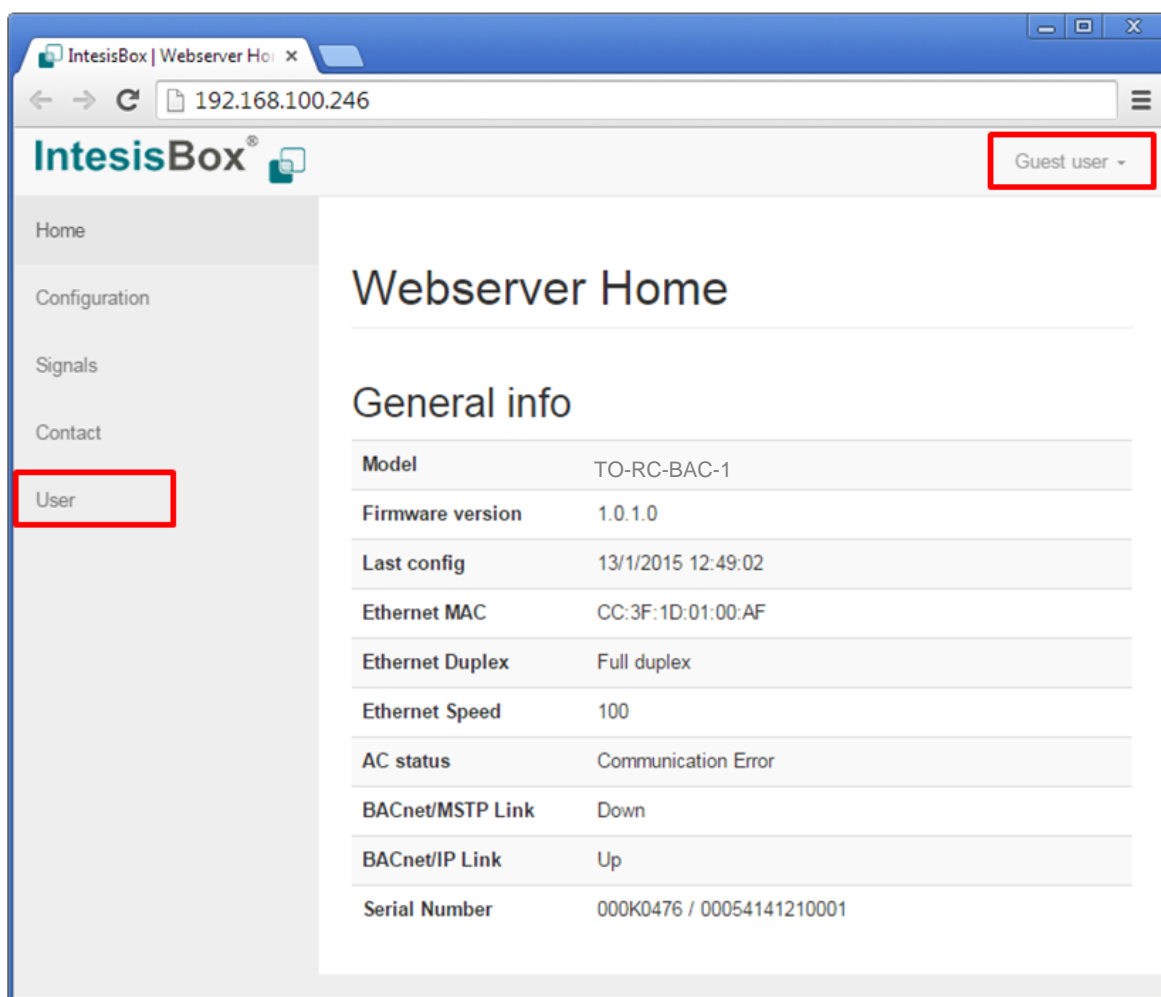
7.5 Configuration tool

In order to check the status of the device, signals values and general configuration, the TO-RC-BAC-1 includes a configuration tool. This tool is accessible only through the Ethernet port, so keep in mind that you need to switch SW3 P1 'ON'.

By default the device comes with a static IP, so please check that you are in the same network domain in order to connect. The default IP is: **192.168.100.246**.

7.5.1 Home

Once you reach the page, remember to login with your user and password. To access the login site, click on "User" or use the drop down menu on the top right corner for user selection.



There are two access levels: **admin** and **operator**. The default password value for each user is **admin** → admin and **operator** → operator.

Admin has total control on the device configuration and it can control the AC unit from the web app itself. On the contrary, operator can only read information from the current configuration and can operate the AC. Priority used when using the operator mode is always set to 8.

IMPORTANT: Once configuration is done, we recommend changing the passwords to ensure access control on the gateway.

7.5.2 Configuration

On the configuration section, general **BACnet settings**, specific **BACnet MS/TP** and **BACnetIP settings**, **IP settings** and **AC settings** can be configured. Each type of parameter is grouped in different blocks.

The screenshot displays the IntesisBox Configuration web interface. The browser address bar shows the URL 192.168.100.246/configuration.html. The page title is "Configuration". The interface is divided into several sections:

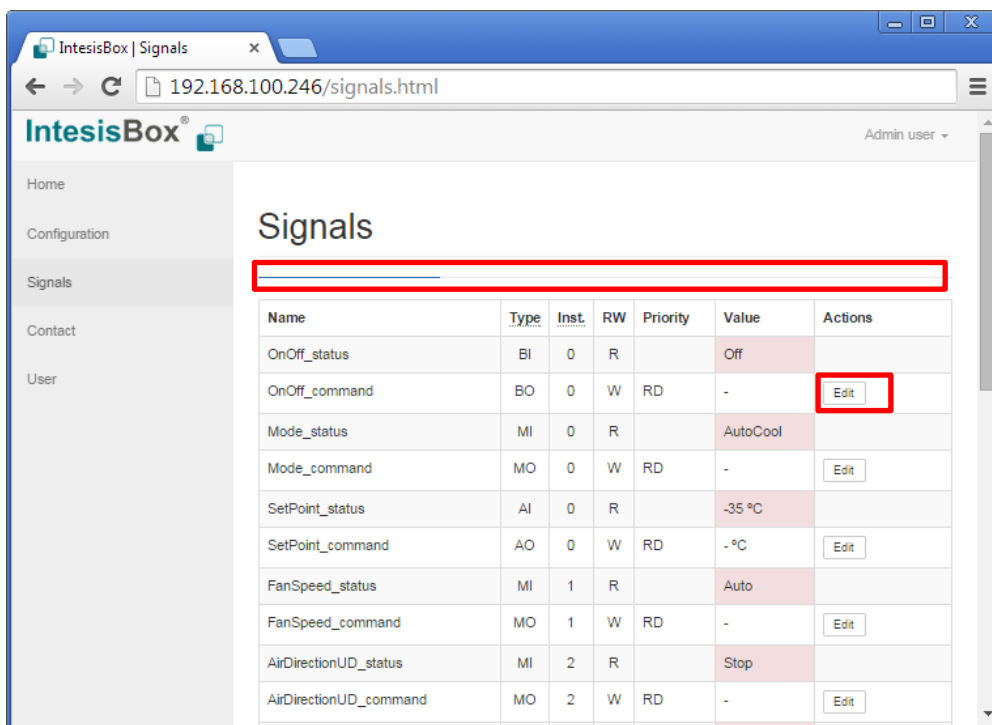
- BACnet settings:** Includes fields for Device Name (Toshiba RC Interface), Device description (Toshiba RC Interface), and Device password (Change BACnet password). It also features an "Auto device instance" checkbox (checked), a Device instance field (246001), and a Device instance base field (246000). The Media section has radio buttons for MS/TP and BACnetIP (selected). Temperature units are set to °C.
- BACnet MS/TP settings:** Includes MAC Address (1), Baud Rate (0 (auto)), and Max Masters (16).
- IP settings:** Includes IP Address (192.168.100.246), IP Netmask (255.255.255.0), IP Gateway (192.168.100.9), and DHCP (checked).
- BACnet IP settings:** Includes UDP Port (47808).

At the bottom of the configuration page, there are buttons for "Save / Reboot", "Reload", "Restore defaults", and "Reboot".

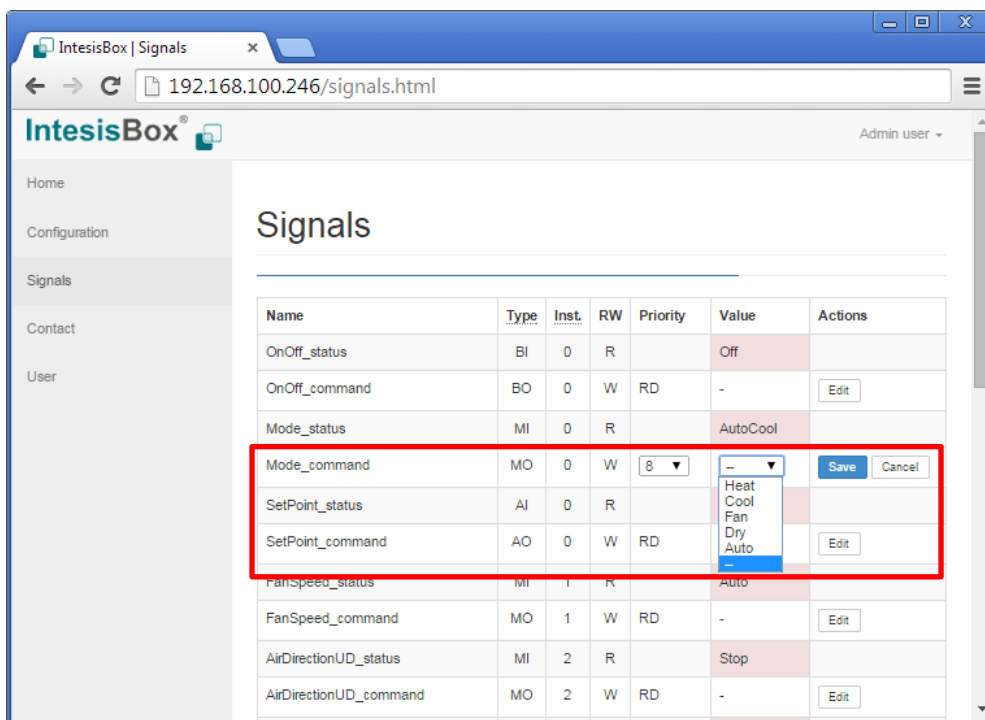
7.5.3 Signals

On this section a complete list of the available BACnet objects, their **type**, **Object Instance**, **priority** and current **value** is shown. Clicking on the "Edit" button, users will be able to command the system having feedback from both BACnet and AC system.

It also allows continuous monitoring of the current status of the variables. The refresh time for the AC information is shown using a progression bar in the top and the bottom of the signals list.



When you click on “Edit”, you will have the change of introducing a new **value** to be applied and also the **priority**.



NOTE: If you want to relinquish the selected priority, please use the ‘--’ command.

8 AC Unit Types compatibility

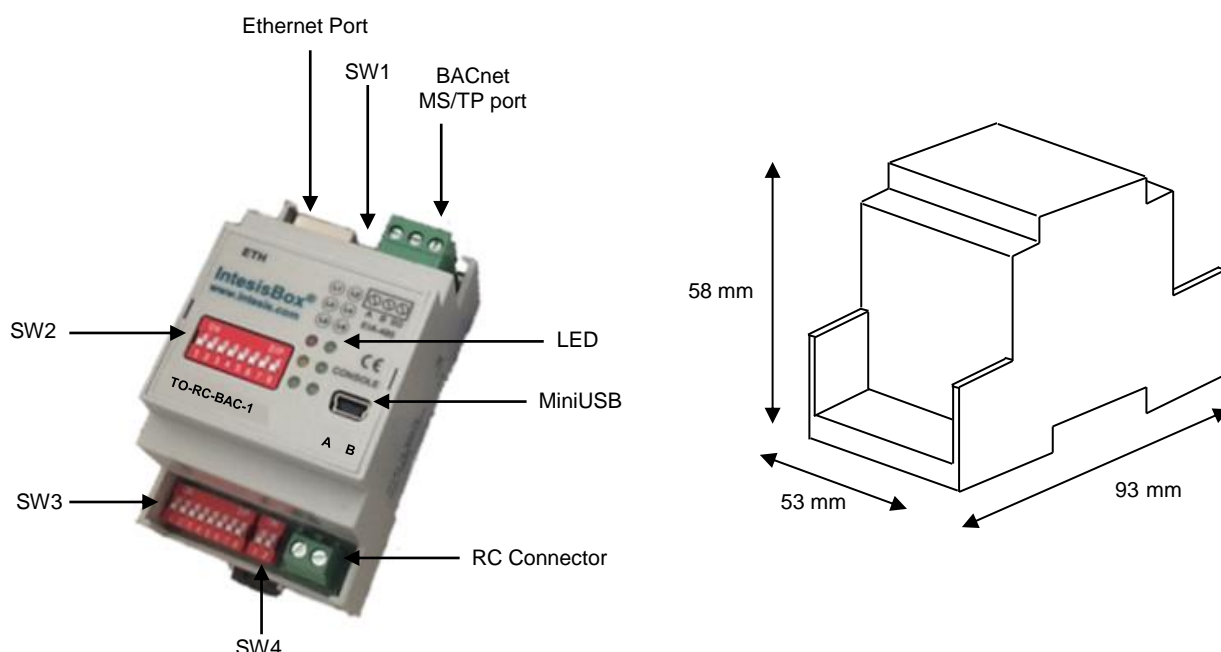
Please, check compatibility list at to know which Toshiba units are compatible with our gateway.

http://www.intesis.com/pdf/IntesisBox_TO-RC-xxx-1_AC_Compatibility.pdf

9 Mechanical & electrical characteristics

Enclosure	Plastic, type PC (UL 94 V-0). Dimensions: 93mm x 53mm x 58mm. Weight: 85 g
Color	Light Grey. RAL 7035.
Terminal wiring (for power supply and 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
Console Port	Mini USB port for console usage
Mounting	Wall. DIN rail EN60715 TH35.
BACnet MS/TP port	1 x EIA485 Plug-in screw terminal block (2 poles + GND)
BACnet IP port	1 x Ethernet 100BT RJ45.
LED indicators	6 x Gateway/Communication status
Operational temperature	0°C to +40°C
Operational humidity	5% to 95%, non-condensing
Isolation Voltage	4000 VDC (between AC unit and EIA-485) 1000 VDC (between AC unit and USB)
Protection	IP20 (IEC60529).
RoHS conformity	Compliant with RoHS directive (2002/95/CE).
Certifications	CE conformity to EMC directive (2004/108/EC) and Low-voltage directive (2006/95/EC) EN 61000-6-1 ;EN 61000-6-3; EN 60950-1; EN 50491-3 This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: 1) This device may not cause harmful interference 2) This device must accept any interference received, including interference that may cause undesired operation.

10 Dimensions



11 Error codes

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

ErrorCode	Error CodeM	Error in RC	Error Category	Error Description
0	N/A	N/A	TO-RC-BAC-1	No active error
01	A01	A01	GHP Engine Issues	GHP - Engine oil pressure fault
02	A02	A02		GHP - Engine oil level fault
03	A03	A03		GHP - Engine over speed
04	A04	A04		GHP - Engine under speed
05	A05	A05		GHP - Ignition power supply failure
06	A06	A06		GHP - Engine start up failure
07	A07	A07		GHP - Fuel gas valve failure
08	A08	A08		GHP - Engine stalled
09	A09	A09		GHP - Engine overload
0A	A10	A10		GHP - High exhaust gas temp
0B	A11	A11		GHP - Engine oil level failure
0C	A12	A12		GHP - Throttle actuator fault
0D	A13	A13		GHP - Fuel gas valve adjustment failure
0E	A14	A14		GHP - Engine oil pressure sensor fault
0F	A15	A15		GHP - Starter power output short circuit
10	A16	A16		GHP - Starter motor locked
11	A17	A17		GHP - Starter current (CT) coil failed
13	A19	A19		GHP - Wax Valve (3 Way) fault
14	A20	A20		GHP - Cooling water temp high
15	A21	A21		GHP - Cooling water level fault
16	A22	A22		GHP - Cooling water pump fault
17	A23	A23		GHP - Engine crank angle sensor failure
18	A24	A24		GHP - Engine cam angle sensor failure
19	A25	A25		GHP - Clutch fault
1A	A26	A26		GHP - Misfire
1B	A27	A27	GHP - Catalyst temperature fault	
1C	A28	A28	GHP - Generator fault	
1D	A29	A29	GHP - Converter fault	
1E	A30	A30	GHP - Fuel gas pressure low	
21	C01	C01	Central Controller Issues	Duplicated setting of control address
22	C02	C02		Central control number of units mis-matched
23	C03	C03		Incorrect wiring of central control
24	C04	C04		Incorrect connection of central control
25	C05	C05		System Controller fault, error in transmitting comms signal, i/door or o/door unit not working, wiring fault

26	C06	C06		System Controller fault, error in receiving comms signal, i/door or o/door unit not working, wiring fault, CN1 not connected correctly	
2C	C12	C12		Batch alarm by local controller	
30	C16	C16		Transmission error from adaptor to unit	
31	C17	C17		Reception error to adaptor from unit	
32	C18	C18		Duplicate central address in adaptor	
33	C19	C19		Duplicate adaptor address	
34	C20	C20		Mix of PAC & GHP type units on adaptor	
35	C21	C21		Memory fault in adaptor	
36	C22	C22		Incorrect address setting in adaptor	
37	C23	C23		Host terminal software failure	
38	C24	C24		Host terminal hardware failure	
39	C25	C25		Host terminal processing failure	
3A	C26	C26		Host terminal communication failure	
3C	C28	C28		Reception error of S-DDC from host terminal	
3D	C29	C29		Initialization failure of S-DDC	
3F	C31	C31		Configuration change detected by adaptor	
41	E01	E01		Addressing and Communication Problems	Remote control detecting error from indoor unit, Address not set/Auto address failed. Check interconnecting wiring etc. Re-address system.
42	E02	E02			Remote detecting error from indoor unit,
43	E03	E03			Indoor unit detecting error from remote,
44	E04	E04			Indoor seeing error from outdoor. Qty of i/d units connected are less than qty set. Check; all i/d units are ON, reset turn off all units wait 5min power up
45	E05	E05	Indoor unit detecting error from outdoor unit, Error in sending comms signal		
46	E06	E06	Outdoor unit detecting error from indoor unit, Error in receiving comms signal		
47	E07	E07	Outdoor unit detecting error from indoor unit, Error in sending comms signal		
48	E08	E08	Incorrect setting indoor/controller, Indoor address duplicated		
49	E09	E09	Incorrect setting indoor/controller, Remote address duplicated or IR wireless controller not disabled		
4A	E10	E10	Indoor unit detecting error from 'option' plug, Error in sending comms signal		
4B	E11	E11	Indoor unit detecting error from 'option' plug, Error in receiving comms signal		
4C	E12	E12	Auto addressing failed, Auto address connector CN100 shorted during auto addressing		
4D	E13	E13	Indoor unit failed to send signal to remote controller		
4E	E14	E14	Setting Failure, Duplication of master indoor units		

4F	E15	E15		Auto addressing failed, Number of indoor units connected are less than number set
50	E16	E16		Auto addressing failed, Number of indoor units connected are more than number set
51	E17	E17		Group control wiring error, Main indoor unit not sending signal for sub indoor units
52	E18	E18		Group control wiring error, Main indoor unit not receiving signal for sub indoor units
54	E20	E20		Auto addressing failed, No indoor units connected
58	E24	E24		Auto addressing failed, Error on sub outdoor unit
59	E25	E25		Auto addressing failed, Error on outdoor unit address setting
5A	E26	E26		Auto addressing failed, Quantity of main and sub outdoor units do not correspond to the number set on main outdoor unit P.C.B.
5D	E29	E29		Auto addressing failed, Sub outdoor unit not receiving comms for main outdoor unit
5F	E31	E31		Between units, Comms failure with MDC, does E31 remain after power is re-instated? If so replace PCB. & power PCB
61	F01	F01	Sensor Faults	Indoor Heat Exch inlet temp sensor failure (E1)
62	F02	F02		Indoor Heat Exch freeze temp sensor failure (E2)
63	F03	F03		Indoor Heat Exch outlet temp sensor failure (E3)
64	F04	F04		Outdoor Discharge temp sensor failure (TD) or (DISCH1)
65	F05	F05		Outdoor Discharge temp sensor failure (DISCH2)
66	F06	F06		Outdoor Heat Exch temp sensor failure (C1) or (EXG1)
67	F07	F07		Outdoor Heat Exch temp sensor failure (C2) or (EXL1)
68	F08	F08		Outdoor Air temp sensor failure (TO)
6A	F10	F10		Indoor inlet temp sensor failure
6B	F11	F11		Indoor outlet temp sensor failure
6C	F12	F12		Outdoor Intake sensor failure (TS)
6D	F13	F13		GHP - Cooling water temperature sensor failure
70	F16	F16		Outdoor High pressure sensor failure
71	F17	F17		GHP - Cooling water temperature sensor fault
72	F18	F18		GHP - Exhaust gas temperature sensor fault
74	F20	F20		GHP Clutch coil temperature fault
77	F23	F23		Outdoor Heat Exch temp sensor failure (EXG2)
78	F24	F24		Outdoor Heat Exch temp sensor failure (EXL2)
7D	F29	F29		Indoor EEPROM error
7E	F30	F30		Clock Function (RTC) fault
7F	F31	F31		Outdoor EEPROM error

81	H01	H01	Compressor Issues	Compressor Fault, Over current (Comp1)	
82	H02	H02		Compressor Fault, Locked rota current detected (Comp1)	
83	H03	H03		Compressor Fault, No current detected (Comp1)	
85	H05	H05		Compressor Fault, Discharge temp not detected (Comp1)	
86	H06	H06		Compressor Fault, Low Pressure trip	
87	H07	H07		Compressor Fault, Low oil level	
88	H08	H08		Compressor Fault, Oil sensor Fault (Comp1)	
8B	H11	H11		Compressor Fault, Over current (Comp2)	
8C	H12	H12		Compressor Fault, Locked rota current detected (Comp2)	
8D	H13	H13		Compressor Fault, No current detected (Comp2)	
8F	H15	H15		Compressor Fault, Discharge temp not detected (Comp2)	
95	H21	H21		Compressor Fault, Over current (Comp3)	
96	H22	H22		Compressor Fault, Locked rota current detected (Comp3)	
97	H23	H23		Compressor Fault, No current detected (Comp3)	
99	H25	H25		Compressor Fault, Discharge temp not detected (Comp3)	
9B	H27	H27		Compressor Fault, Oil sensor fault (Comp2)	
9C	H28	H28		Compressor Fault. Oil sensor (connection failure)	
9F	H31	H31		Compressor Fault. IPM trip (IMP current on temperature)	
C1	L01	L01		Incorrect Settings	Setting Error, Indoor unit group setting error
C2	L02	L02			Setting Error, Indoor/outdoor unit type/model miss-matched
C3	L03	L03	Duplication of main indoor unit address in group control		
C4	L04	L04	Duplication of outdoor unit system address		
C5	L05	L05	2 or more controllers have been set as 'priority' in one system - shown on controllers set as 'priority'		
C6	L06	L06	2 or more controllers have been set as 'priority' in one system - shown on controllers not set as 'priority'		
C7	L07	L07	Group wiring connected on and individual indoor unit		
C8	L08	L08	Indoor unit address/group not set		
C9	L09	L09	Indoor unit capacity code not set		
CA	L10	L10	Outdoor unit capacity code not set		
CB	L11	L11	Group control wiring incorrect		
CD	L13	L13	Indoor unit type setting error, capacity		
CF	L15	L15	Indoor unit paring fault		
D0	L16	L16	Water heat exch unit setting failure		
D1	L17	L17	Miss-match of outdoor unit with different refrigerant		
D2	L18	L18	4-way valve failure		

D3	L19	L19		Water heat exch unit duplicated address
D5	L21	L21		Gas type setup failure
E1	P01	P01	Indoor Unit Problems	Indoor unit fault, Fan motor thermal overload
E2	P02	P02		Outdoor unit fault, Compressor motor thermal overload, over or under voltage
E3	P03	P03		Outdoor unit fault, Compressor discharge temperature too high (Comp1) over 111 °C. Low on ref gas, exp valve, pipework damage.
E4	P04	P04		Outdoor unit fault, High pressure trip
E5	P05	P05		Outdoor unit fault, Open phase on power supply. Check power on each phase, inverter pcb, control pcb
E9	P09	P09		Indoor unit fault, Ceiling panel incorrectly wired
EA	P10	P10		Indoor unit fault, Condensate float switch opened
EB	P11	P11		GHP - Water Heat exch low temp (frost protection) fault
EC	P12	P12		Indoor unit fault, Fan DC motor fault
EE	P14	P14		Input from leak detector (If fitted)
EF	P15	P15		Refrigerant loss, high discharge temp and EEV wide open and low compressor current draw.
F0	P16	P16		Outdoor unit fault, Open phase on compressor power supply
F1	P17	P17		Outdoor unit fault, Compressor discharge temperature too high (Comp2) over 111 degC. Low on ref gas, exp valve, pipework damage.
F2	P18	P18		Outdoor unit fault, By-pass valve failure
F3	P19	P19		Outdoor unit fault, 4 way valve failure, i/door temp rises in cooling or fills in heating. Check wiring, coil, pcb output, valve operation.
F4	P20	P20		Ref gas, high temp/pressure fault, heat exch temp high C2, 55-60 degC, cooling over-load, sensor fault.
F6	P22	P22		Outdoor unit fan motor fault, fan blade jammed, check connections, does fan turn freely, motor resistance 30-40ohm on each pair, no fan fault, yes pcb fault.
FA	P26	P26		Outdoor unit fault, Compressor overcurrent - check winding resistance, Inverter failure - check internal resistance term HIC + & - to UVW 200-300Kohm or
FC	P29	P29		Outdoor unit fault, Inverter circuit fault - Motor-current Detection Circuit (MDC) fault, check comp windings, sensors C1 & TS, if ok possible pcb failure.
FD	P30	P30		Indoor unit fault, System controller detected fault on sub indoor unit
FF	P31	P31	Simultaneous operation multi control fault, Group controller fault	
65535 (-1)	N/A	N/A	TO-RC-BAC-1	Error in the communication of TO-RC-BAC-1device with the AC unit

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