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ADVANCED PRODUCT NEWS

Subject

Product News. New BMS gateways for PAC/VRF systems

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Summary

This technical bulletin introduces the new BMS gateways for Hitachi PAC and VRF systems

The details are indicated in the description.

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1 APPLICABLE PRODUCTS, MODEL CODE AND DATE OF SALES.

This document introduces new BMS gateways for Hitachi Air Conditioning PAC and VRF Systems. These devices are Intesis brand and validated for their use with Hitachi Air Conditioner PAC and VRF systems including Utopia IVX Premium, Standard (Comfort), Set Free Sigma and VRF Side Flow.

The following tables inform about new devices and discontinued devices and their estimated launching dates.

NEW PRODUCTS

Model Description (*1)	Model Code	Picture	Date of initial sales
HI-AC-KNX-16	70513303		July 2019 (*1)
HI-AC-KNX-64	70513304		May 2019 (*1)
HI-AC-BAC-16	70513100		May 2019 (*1)
HI-AC-BAC-64	70513101		May 2019 (*1)

Notes:

(*1) After stock consumption of discontinued models

DISCONTINUED PRODUCTS

The new products presented in the previous table will replace the current combination of HC-A8MB + BAC001 as well as the current HC-A16KNX. Therefore, the following models will be discontinued:

Model Description	Model Code	Discontinuation Date
HC-A16KNX	7E513300	Until stock finish (~July 19)
BAC001	7E512103	Until stock finish (~May 19)

Note: BAC002 – 7E512104 will remain available to be combined with CSNET Manager 2 Modbus output. An update of this BACnet gateway shall be done in the coming months in order to match perfectly with CSNET Manager.

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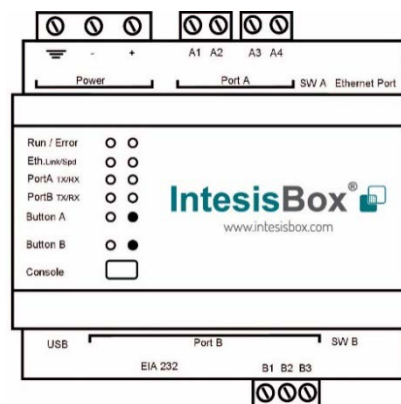
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2 NEW FEATURES.

- All HI-AC-(KNX/BAC)-(16/64) are direct H-LINK to KNX or BACNET gateways. It is no longer necessary to combine BACnet devices with the corresponding Modbus gateways.
- All new gateways will be fully certified: BACnet BTL rev. 14 or official KNX certification. This is ensuring a perfect integration of these devices with any existing BMS systems.
- New Hardware by Intesis with improved performance
- Status LED on the front cover to confirm the correct operation / communication
- USB port available for commissioning and service (log & configuration files)
- Update of the device is possible through internet
- All data available on INTESIS web site:

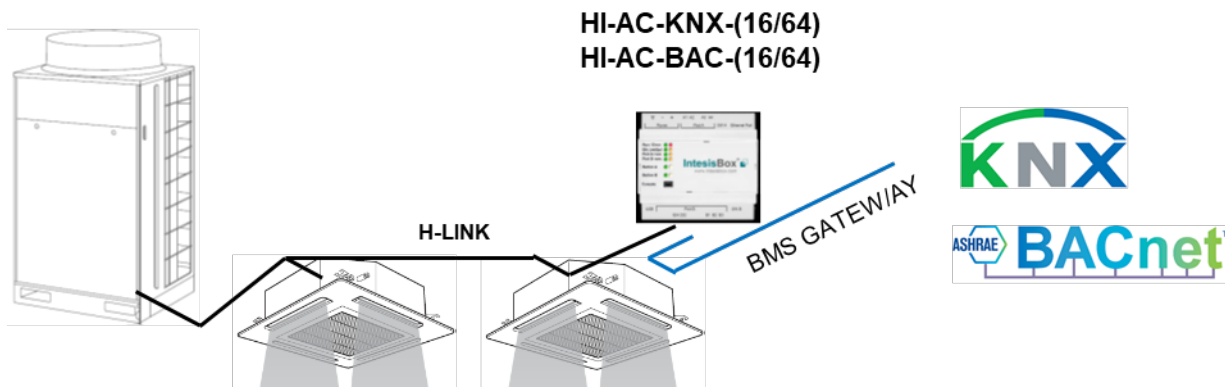


KNX: <https://www.intesisbox.com/en/hitachi-knx-central-hi-ac-knx/gateway/>

BACnet: <https://www.intesisbox.com/en/hitachi-bacnet-central-hi-ac-bac/gateway/>

3 BRIEF DESCRIPTION.

Representative connection diagram



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3.1 New Intesis gateway platform

KNX gateways

Power Supply

Must use NEC Class 2 or Limited Power Source (LPS) and SELV rated power supply.

Be sure the voltage applied is within the range admitted. The power supply can be connected to earth but only through the negative terminal, never through the positive terminal.

If using DC power supply: Respect polarity applied of terminals (+) and (-).

Ethernet / Console (UDP & TCP)

Connect the cable coming from the IP network to the connector ETH of the gateway. Use an Ethernet CAT5 cable. If communicating through the LAN of the building, contact the network administrator and make sure traffic on the port used is allowed through all the LAN path (check the gateway user manual for more information). Default IP is 192.168.100.246.

PortA / KNX

Connect the KNX TP1 bus to connectors A3 (+) and A4 (-) of gateway's PortA. Respect the polarity.

PortB / H-Link Hitachi

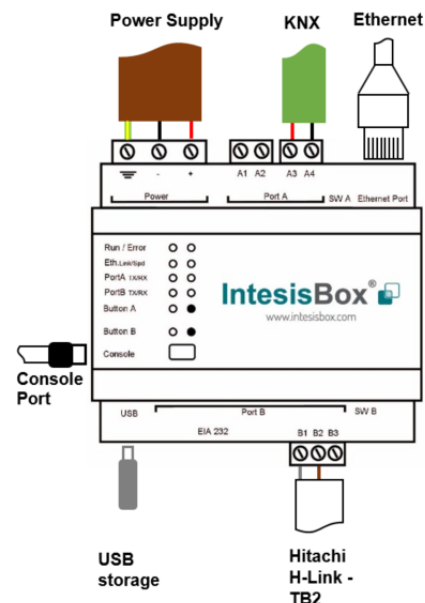
Connect the H-Link terminals (TB2) of Hitachi Outdoor Unit to the connectors B1 and B2 of gateway's PortB. There is no polarity to be respected.

Console Port

Connect a mini-type B USB cable from your computer to the gateway to allow communication between the Configuration Software and the gateway. Remember that Ethernet connection is also allowed. Check the user manual for more information.

USB

Connect a USB storage device (not a HDD) if required. Check the user manual for more information.



BACNET gateways

Power Supply

Must use NEC Class 2 or Limited Power Source (LPS) and SELV rated power supply.

Be sure the voltage applied is within the range admitted. The power supply can be connected to earth but only through the negative terminal, never through the positive terminal.

If using DC power supply: Respect polarity applied of terminals (+) and (-).

Ethernet / BACnet IP (UDP) / Console (UDP & TCP)

Connect the cable coming from the IP network to the connector ETH of the gateway. Use an Ethernet CAT5 cable. If communicating through the LAN of the building, contact the network administrator and make sure traffic on the port used is allowed through all the LAN path (check the gateway user manual for more information). Default IP is 192.168.100.246.

PortA / H-Link Hitachi

Connect the H-Link terminals (TB2) of Hitachi Outdoor Unit to the connectors A3 and A4 of gateway's PortA.

PortB / BACnet MSTP

Connect the EIA485 bus to connectors B1 (B+), B2 (A-) and B3 (SNGD) of gateway's PortB. Respect the polarity.

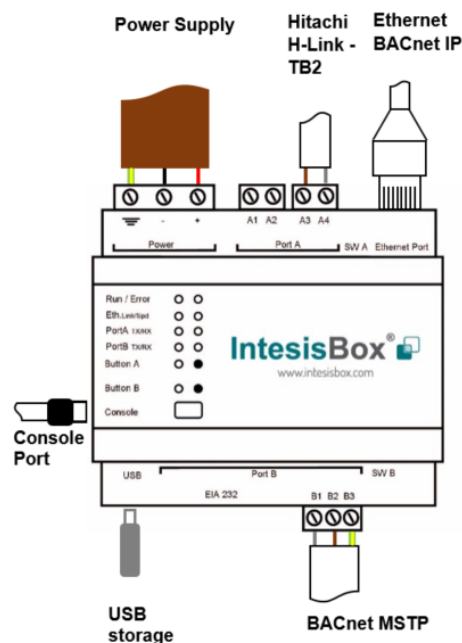
Note for PortB: Characteristics of the standard EIA485 bus: maximum distance of 1200 meters, maximum 32 devices connected to the bus, and in each end of the bus it must be a termination resistor of 120 Ω. Bus biasing and termination resistor for EIA485 can be enabled for PortB by means of a dedicated DIP switch – see table below.

Console Port

Connect a mini-type B USB cable from your computer to the gateway to allow communication between the Configuration Software and the gateway. Remember that Ethernet connection is also allowed. Check the user manual for more information.

USB

Connect a USB storage device (not a HDD) if required. Check the user manual for more information.



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3.2 System parameters

3.2.1 KNX POINTS MAP

Num	Description	Values	Read/Write
0	On/Off (all units)	0-Off, 1-On	W
1	Operating Mode (all units)	0-Auto, 1-Heat, 3-Cool, 9-Fan, 14-Dry	W
2	Fan Speed (all units)	1-Low, 2-Mid, 3-High, 4-High+	W
3	Fan Speed AUTO (all units)	1-Set auto fan; 0-Stop auto fan	W
4	Air louver position (all units)	1-Position 1..7-Position 7	W
5	Air louver position AUTO (all units)	1-Set auto Air louver; 0-Stop auto Air louver	W
6	Temperature Setpoint (°C) (all units)	Cool:19..30 °C; Heat:17..30 °C	W
7	Status_Communication Error OU	0-No error, 1-Error	R
8	Status_Outdoor Air Temperature (°C)	-50..99 °C	R
9	Status_Compressor Top Temperature (°C)	0..200 °C	R
10	Status_Total Real Compressor Freq.	0..255 Hz	R
11	Status_Total Compressor Current	0..255 A	R
12	Status_Out Exp. Valve 1 Open	0..100 %	R
13	Status_Discharge Pressure	-5.0..9.9 Mpa	R
14	Status_Suction Pressure	-5.0..9.9 Mpa	R
15	Control_On/Off	0-Off,1-On	W
16	Status_On/Off	0-Off,1-On	R
17	Control_Operation mode	0-Auto, 1-Heat, 3-Cool, 9-Fan, 14-Dry	W
18	Status_Operation mode	0-Auto, 1-Heat, 3-Cool, 9-Fan, 14-Dry	R
19	Control_Mode Cool/Heat	0-Cool, 1-Heat	W
20	Status_Mode Cool/Heat	0-Cool, 1-Heat	R
21	Control_Heat mode&ON	0%-Off, 1%-100%-On+Heat	W
22	Control_Cool mode&ON	0%-Off, 1%-100%-On+Cool	W
23	Control_Auto mode	1-Set auto mode	W
24	Status_Auto mode	1-Auto mode active, 0-Auto mode not active	R
25	Control_Heat mode	1-Set heat mode	W
26	Status_Heat mode	1-Heat mode active, 0-Heat mode not active	R
27	Control_Cool mode	1-Set cool mode	W
28	Status_Cool mode	1-Cool mode active, 0-Cool mode not active	R
29	Control_Fan mode	1-Set fan mode	W

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30	Status_Fan mode	1-Fan mode active, 0-Fan mode not active	R
31	Control_Dry mode	1-Set dry mode	W
32	Status_Dry mode	1-Dry mode active, 0-Dry mode not active	R
33	Control_Fan speed scaling	Thresholds (0%..37%; 38%..62%; 63%..87%; 88%..100%)	W
34	Status_Fan speed scaling	Thresholds (25%; 50%; 75%; 100%)	R
35	Control_Fan speed low	1-Set fan speed low	W
36	Status_Fan speed low	1-Speed low active, 0-Speed low not active	R
37	Control_Fan speed mid	1-Set fan speed mid	W
38	Status_Fan speed mid	1-Speed mid active, 0-Speed mid not active	R
39	Control_Fan speed high	1-Set fan speed high	W
40	Status_Fan speed high	1-Speed high active, 0-Speed high not active	R
41	Control_Fan speed high+	1-Set fan speed high+	W
42	Status_Fan speed high+	1-Speed high+ active, 0-Speed high+ not active	R
43	Control_Fan speed Man/Auto	0-Manual; 1-Auto	W
44	Status_Fan speed Man/Auto	0-Manual; 1-Auto	R
45	Control_Air louver position scaling	Thresholds (0..21%;22..36%;37..50%;51..64%;65..79%;80..93%; 94..100%)	W
46	Status_Air louver position scaling	Thresholds (0..14%;15..29%;30..43%;44..57%;58..71%;72..86%; 87..100%)	R
47	Control_Air louver position auto	1-Set auto Air louver, 0-Stop auto Air louver	W
48	Status_Air louver position auto	1-Air louver auto active, 0-Air louver auto not active	R
49	Control_Air louver position-1	1-Set position-1 Air louver	W
50	Status_Air louver position-1	1-Air louver position-1 active, 0-Air louver position-1 not active	R
51	Control_Air louver position-2	1-Set position-2 Air louver	W
52	Status_Air louver position-2	1-Air louver position-2 active, 0-Air louver position-2 not active	R
53	Control_Air louver position-3	1-Set position-3 Air louver	W
54	Status_Air louver position-3	1-Air louver position-3 active, 0-Air louver position-3 not active	R
55	Control_Air louver position-4	1-Set position-4 Air louver	W
56	Status_Air louver position-4	1-Air louver position-4 active, 0-Air louver position-4 not active	R
57	Control_Air louver position-5	1-Set position-5 Air louver	W
58	Status_Air louver position-5	1-Air louver position-5 active, 0-Air louver position-5 not active	R
59	Control_Air louver position-6	1-Set position-6 Air louver	W
60	Status_Air louver position-6	1-Air louver position-6 active, 0-Air louver position-6 not active	R
61	Control_Air louver position-7	1-Set position-7 Air louver	W

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62	Status_Air louver position-7	1-Air louver position-7 active, 0-Air louver position-7 not active	R
63	Control_Temperature Setpoint (°C)	Cool:19..30 °C; Heat:17..30 °C	W
64	Status_Temperature Setpoint (°C)	Cool:19..30 °C; Heat:17..30 °C	R
65	Status_AC Ambient Temperature (°C)	-63..63 °C	R
66	Status_Remote Sensor Temperature (°C)	-63..63 °C	R
67	Status_Outlet Temperature (°C)	-63..63 °C	R
68	Status_GasPipe Temperature (°C)	-63..63 °C	R
69	Status_LiquidPipe Temperature (°C)	-63..63 °C	R
70	Status_Unit error	0-No error, 1-Error	R
71	Status_Unit error code	0-No Error, X-Error (100..999)	R
72	Status_FilterSign	0-Normal, 1-Alarm	R
73	Control_FilterReset	0-No reset, 1-Reset	W
74	Status_Communication status	0-Not exist, 1-Exist	R
75	Allow Control_On/Off Remote control	0-Allowed, 1-Not allowed	W
76	Status Allow_On/Off Remote control	0- Allowed, 1-Not allowed	R
77	Allow Control_Mode Remote control	0- Allowed, 1- Not allowed	W
78	Status Allow_Mode Remote control	0- Allowed, 1- Not allowed	R
79	Allow Control_Setpoint Remote control	0- Allowed, 1 Not allowed	W
80	Status Allow_Setpoint Remote control	0- Allowed, 1- Not allowed	R
81	Allow Control_Fan Remote control	0- Allowed 1- Not allowed	W
82	Status Allow_Fan Remote control	0- Allowed, 1- Not allowed	R
83	Status_Unit type	<i>Not used</i>	R
84	Status_Unit adress	0..63	R
85	Status_System adress	0..63	R
86	Status_Dehumidification	<i>Not used</i>	R
87	Control_Dehumidification correction	<i>Not used</i>	W
88	Status_Dehumidification correction	<i>Not used</i>	R
89	Status_Compresor stop cause	X-Cause (0-254), 255-Operation Off	R
90	Status_Indoor Unit expansion valve open	0..100 %	R
91	Status_Operation condition	0-Off, 1-Thermo Off, 2-Thermo On, 3-Alarm	R
92	Status_RC SW Temperature (°C)	-63..63 °C	R
93	Status_RC SW Configuration	0-Without RCS, 1-With RCS	R

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3.2.2 BACNET OBJECTS MAP

Gateway Objects

Object-name	Description	Object-type	Object-instance
Device HI-AC-BAC	Hitachi VRF to BACnet Gateway	Device	246 <i>Instance number of device object can be configured with MAPS</i>

Central Control Objects

Object-name	Description	Object-type	Object-instance
On/Off (all units)	0-Off,1-On	BO	0
Mode (all units)	1-Heat,2-Cool,3-Fan,4-Dry,5-Auto	MO	0
FanSpeed (all units)	1-Auto,2-Low,3-Mid,4-High,5-	MO	1
Air louver Position swing (all units)	1-Auto,2-Pos1..8-Pos7	MO	2
Temperature Setpoint (all units)	Cool: 19..30 °C; Heat: 17..30 °C	AO	0

Outdoor Unit Objects

Oxx is a generic prefix for the BACnet object name, where:

Variable	Description
"Oxx"	Outdoor Unit address (1..64)

Object-name	Description	Object-	Object-instance
OUxx_Outdoor Air Temp.	-50..99 °C	AI	(xx *25)+1000+0
OUIX_Comp.Top Temp.	0..200 °C	AI	(xx *25)+1000+1
OUIX_Total Real Comp. Freq.	0..255 Hz	AI	(xx *25)+1000+2
OUIX_Total Comp. Current	0..255 A	AI	(xx *25)+1000+3
OUIX_Out Exp. Valve 1 Open	0..100 %	AI	(xx *25)+1000+4
OUIX_Discharge Pressure	-5.0..9.9 MPa	AI	(xx *25)+1000+5
OUIX_Suction Pressure	-5.0..9.9 MPa	AI	(xx *25)+1000+6
OUIX_Communication Status	0-Not Exit, 1-Exist	BI	(xx *25)+1000+0

Indoor Unit Objects

OxxUxx is a generic prefix for the BACnet object name, where:

Variable	Description
"Oxx"	Outdoor Unit address (1..64)
"Uxx"	Indoor Unit address (1..64)

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Object-name	Description	Object-type	Object-instance
OxxUxxOn/Off_S	0-Off,1-On	BI	(xxx *100) + 0
OxxUxxOn/Off_C	0-Off,1-On	BO	(xxx *100) + 0
OxxUxxMode_S	1-Heat,2-Cool,3-Fan,4-Dry,5-Auto	MI	(xxx *100) + 0
OxxUxxMode_C	1-Heat,2-Cool,3-Fan,4-Dry,5-Auto	MO	(xxx *100) + 0
OxxUxxSetpoint_S	Cool:19..30 °C; Heat:17..30 °C	AI	(xxx *100) + 0
OxxUxxSetpoint_C	Cool:19..30 °C; Heat:17..30 °C	AO	(xxx *100) + 0
OxxUxxFanSpeed_S	1-Auto,2-Low,3-Mid,4-High,5-High+	MI	(xxx *100) + 1
OxxUxxFanSpeed_C	1-Auto,2-Low,3-Mid,4-High,5-High+	MO	(xxx *100) + 1
OxxUxxAirLouver Position_S	1-Auto,2-Pos1..8-Pos7	MI	(xxx *100) + 2
OxxUxxAirLouver Position_C	1-Auto,2-Pos1..8-Pos7	MO	(xxx *100) + 2
OxxUxxRemote Sensor Temp.	-63..63°C	AI	(xxx *100) + 1
OxxUxxInlet Temp.	-63..63°C	AI	(xxx *100) + 2
OxxUxxOutlet Temp.	-63..63°C	AI	(xxx *100) + 3
OxxUxxGasPipe Temp.	-63..63°C	AI	(xxx *100) + 4
OxxUxxLiquidPipe Temp.	-63..63°C	AI	(xxx *100) + 5
OxxUxxUnit Error code		AI	(xxx *100) + 6
OxxUxxFilterSign	0-Normal, 1-Alarm	BI	(xxx *100) + 1
OxxUxxFilterReset	1-Reset	BO	(xxx *100) + 1
OxxUxxCommunication Status	0-Not Exit, 1-Exist	BI	(xxx *100) + 2
OxxUxxAllow On/Off from RC_S	0-Allowed, 1-Not allowed	BI	(xxx *100) + 3
OxxUxxAllow On/Off from RC_C	0-Allowed, 1-Not allowed	BO	(xxx *100) + 2
OxxUxxAllow Mode from RC_S	0-Allowed, 1-Not allowed	BI	(xxx *100) + 4
OxxUxxAllow Mode from RC_C	0-Allowed, 1-Not allowed	BO	(xxx *100) + 3
OxxUxxAllow Setpoint from	0-Allowed, 1-Not allowed	BI	(xxx *100) + 5
OxxUxxAllow Setpoint from	0-Allowed, 1-Not allowed	BO	(xxx *100) + 4
OxxUxxAllow Fan from RC_S	0-Allowed, 1-Not allowed	BI	(xxx *100) + 6
OxxUxxAllow Fan from RC_C	0-Allowed, 1-Not allowed	BO	(xxx *100) + 5
OxxUxxUnit type	1:Not Defined,2-SS,3-FC,4-VRF,	MI	(xxx *100) + 3
OxxUxxUnit Address	1..64	AI	(xxx *100) + 7
OxxUxxSystem Address	1..64	AI	(xxx *100) + 8
OxxUxxDehumidification	0-Disabled, 1-Enabled	BI	(xxx *100) + 7
OxxUxxDehum. Correction_S	1-0, 2-(-1), 3-(-2)	MI	(xxx *100) + 4
OxxUxxDehum. Correction_C	1-0, 2-(-1), 3-(-2)	MO	(xxx *100) + 3
OxxUxxComp. Stop Cause	255-Operation Off, Other-See manual	AI	(xxx *100) + 9
OxxUxxExp. Valve Open	0..100	AI	(xxx *100) + 10
OxxUxxOperat. Condition	1-Off, 2-Thermo Off, 3-Thermo On, 4-	MI	(xxx *100) + 5
OxxUxxRC SW Temp.	-63..63°C	AI	(xxx *100) + 11
OxxUxxRC SW Config	0-With RCS, 1-Without RCS	BI	(xxx *100) + 8

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Notes:

Object-type	Meaning
AI	Analog-Input
AO	Analog-Output
BI	Binary-Input
BO	Binary-Output
MI	Multistate-Input
MO	Multistate-Outpu

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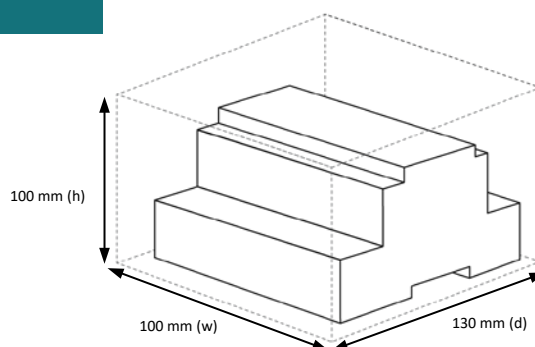
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3.3 Brief gateways' data

KNX Hardware

Enclosure	Plastic, type PC (UL 94 V-0) Net dimensions (d×w×h): 90x88x56 mm Recommended space for installation (d×w×h): 130x100x100mm Color: Light Grey. RAL 7035
Mounting	Wall. DIN rail EN60715 TH35.
Terminal Wiring (for power supply and low-voltage signals)	Per terminal: solid wires or stranded wires (twisted or with ferrule) 1 core: 0.5mm ² ... 2.5mm ² 2 cores: 0.5mm ² ... 1.5mm ² 3 cores: not permitted
Power	1 x Plug-in screw terminal block (3 poles) 9 to 36VDC +/-10%, Max.: 140mA. 24VAC +/-10% 50-60Hz, Max.: 127mA Recommended: 24VDC
Ethernet	1 x Ethernet 10/100 Mbps RJ45 2 x Ethernet LED: port link and activity
Port A	1 x KNX TP-1 Plug-in screw terminal block orange (2 poles) 2500VDC isolation from other ports KNX power consumption: 5mA Voltage rating: 29VDC 1 x Plug-in screw terminal block green (2 poles) Reserved for future use
Switch A (SWA)	1 x DIP-Switch for PORT A configuration: Reserved for future use
PORT B	1 x Serial EIA232 (SUB-D9 male connector) Reserved for future use 1 x H-Link Plug-in screw terminal block (3 poles) 1500VDC isolation from other ports
Switch B (SWB)	1 x DIP-Switch for PORT B configuration: Reserved for future use (leave OFF, default)

Battery	Size: Coin 20mm x 3.2mm Capacity: 3V / 225mAh Type: Manganese Dioxide Lithium
Console Port	Mini Type-B USB 2.0 compliant 1500VDC isolation
USB port	Type-A USB 2.0 compliant Only for USB flash storage device (USB pen drive) Power consumption limited to 150mA (HDD connection not allowed)
Push Button	Button A: Check the user manual Button B: Check the user manual
Operation Temperature	0°C to +60°C
Operational Humidity	5 to 95%, no condensation
Protection	IP20 (IEC60529)
LED Indicators	10 x Onboard LED indicators 2 x Run (Power)/Error 2 x Ethernet Link/Speed 2 x Port A TX/RX 2 x Port B TX/RX 1 x Button A indicator 1 x Button B indicator



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China	India	NA	
ASEAN and Others	ME	LA	
Taiwan	Africa	Brazil	

NOTE ()

HITACHI

ADVANCED PRODUCT NEWS

Subject

Product News. New BMS gateways for PAC/VRF systems

DATE: MAY-19

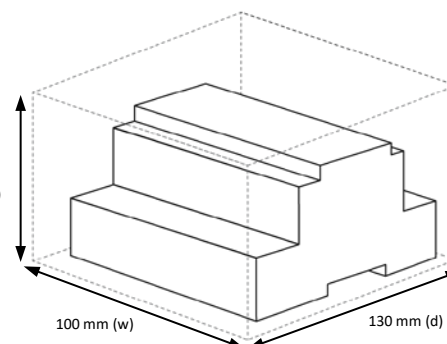
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BACnet Hardware

Enclosure	Plastic, type PC (UL 94 V-0) Net dimensions (dxwxh): 90x88x56 mm Recommended space for installation (dxwxh): 130x100x100mm Color: Light Grey. RAL 7035	Battery	Size: Coin 20mm x 3.2mm Capacity: 3V / 225mAh Type: Manganese Dioxide Lithium
Mounting	Wall. DIN rail EN60715 TH35.	Console Port	Mini Type-B USB 2.0 compliant 1500VDC isolation
Terminal Wiring (for power supply and low-voltage signals)	Per terminal: solid wires or stranded wires (twisted or with ferrule) 1 core: 0.5mm ² ... 2.5mm ² 2 cores: 0.5mm ² ... 1.5mm ² 3 cores: not permitted	USB port	Type-A USB 2.0 compliant Only for USB flash storage device (USB pen drive) Power consumption limited to 150mA (HDD connection not allowed)
Power	1 x Plug-in screw terminal block (3 poles) 9 to 36VDC +/-10%, Max.: 140mA. 24VAC +/-10% 50-60Hz, Max.: 127mA Recommended: 24VDC	Push Button	Button A: Not used Button B: Sends I-Am message to all BACnet ports
Ethernet	1 x Ethernet 10/100 Mbps RJ45 2 x Ethernet LED: port link and activity	Operation Temperature	0°C to +60°C
Port A	1 x H-Link Plug-in screw terminal block orange (2 poles) 1500VDC isolation from other ports 1 x Plug-in screw terminal block green (2 poles) Reserved for future use	Operational Humidity	5 to 95%, no condensation
Switch A (SWA)	1 x DIP-Switch for serial EIA485 configuration: Reserved for future use	Protection	IP20 (IEC60529)
PORT B	1 x Serial EIA232 (SUB-D9 male connector) <i>Not used</i> 1 x Serial EIA485 Plug-in screw terminal block (3 poles) A, B, SGND (Reference ground or shield) 1500VDC isolation from other ports	LED Indicators	10 x On board LED indicators 1 x Error LED 1 x Power LED 2 x Ethernet Link/Speed 2 x Port A TX/RX 2 x Port B TX/RX 1 x Button A indicator 1 x Button B indicator
Switch B (SWB)	1 x DIP-Switch for serial EIA485 configuration: Position 1: ON: 120 Ω termination active Off: 120 Ω termination inactive Position 2-3: ON: Polarization active Off: Polarization inactive		

100 mm

100 mm (h)



Johnson Controls-Hitachi Air Conditioning Spain, S.A.U.

APN-2019006

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4. CONFIGURATION TOOL

IntesisBox MAPS is a Windows® compatible software developed specifically to monitor and configure IntesisBox new generation gateways.

This application shall be download from:

(See instructions to download and install the latest version)

https://intesisbox.com/intesis/software/intesisbox_maps_installer.exe

Use the Ethernet connection or the Console Port (mini USB type B connector included) to get communication between the gateway and the configuration tool.

The installation procedure and main functions are explained in:

- the IntesisBox MAPS KNX User Manual.
- the IntesisBox MAPS BACnet User Manual.

These documents can be downloaded from the link indicated in the installation sheet supplied with the IntesisBox device or in the product website at www.intesisbox.com