

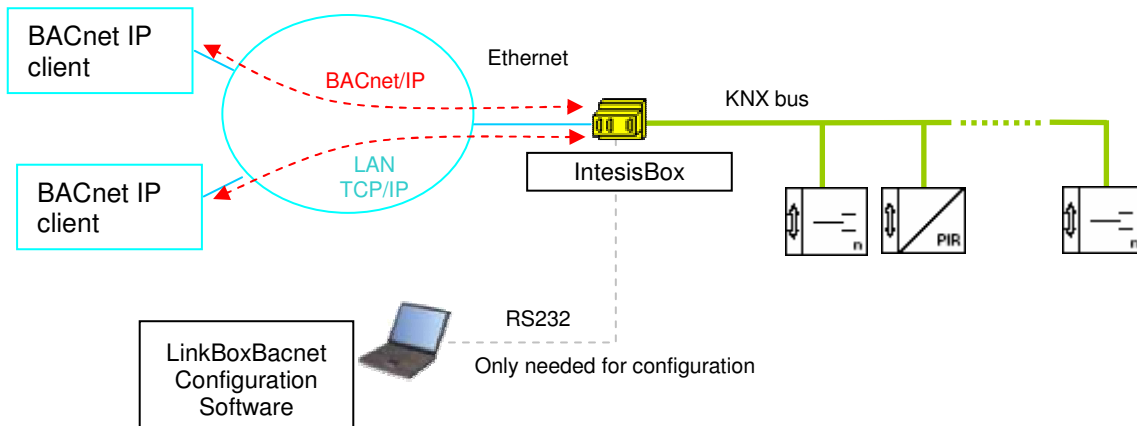


# IntesisBox®

## BACnet/IP Server - KNX

Gateway for integration of KNX systems into BACnet control systems

**Integrate KNX TP-1 (EIB) devices or systems into BACnet control systems.**



### The BACnet side of IntesisBox

IntesisBox acts as a BACnet/IP Server device in its BACnet interface, allowing other BACnet IP client devices read and write its internal points, readings can be by polling or by subscription (COV) requests.

### The KNX side of IntesisBox

IntesisBox simulates a KNX device and acts as if it was one more device into the KNX system. The IntesisBox's KNX EIB interface connects directly to the EIB bus and is opto-isolated from the rest of the internal electronics.

Any point in IntesisBox can be configured individually for different functionality. *To allow read requests, to allow write requests, to automatically send a write request to the KNX bus when its value changes, and to send a read request to the KNX bus when IntesisBox starts-up or after a bus reset.*

For each point, one main group address and different listening group addresses can be defined. This useful feature allows actions on the same internal point from multiple KNX group addresses.

### The configuration of IntesisBox

IntesisBox BACnet/IP Server series are configured using *LinkBoxBacnet*, a software tool for windows™ which is supplied along with the purchase of IntesisBox with no additional cost. *With the installation of LinkBoxBacnet, a Demo project for integration of KNX system is also installed, using this demo project makes the engineering needed for this integration easy and quick.*

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## IntesisBox capacity

Element	Basic version	Extended version	Notes
Type of BACnet devices			Those supporting BACnet/IP.
Number of BACnet points	500	3000	Maximum number of points that can be defined into IntesisBox.
Number of BACnet subscribers	8	8	Maximum number of BACnet subscribers accepted by IntesisBox.
Number of BACnet subscriptions (COV) requests	1000	6000	Maximum number of BACnet subscriptions (COV) requests accepted by IntesisBox.
KNX (EIB) groups	500	3000	Maximum number of different KNX group addresses that can be defined.
KNX (EIB) listening addresses	1000	1000	Maximum number of different KNX group addresses that can be defined as listening addresses, one or more of these listening addresses can be assigned to each point (Up to 255). With this, more than one KNX group address of the KNX system can actuate on the same IntesisBox's point.

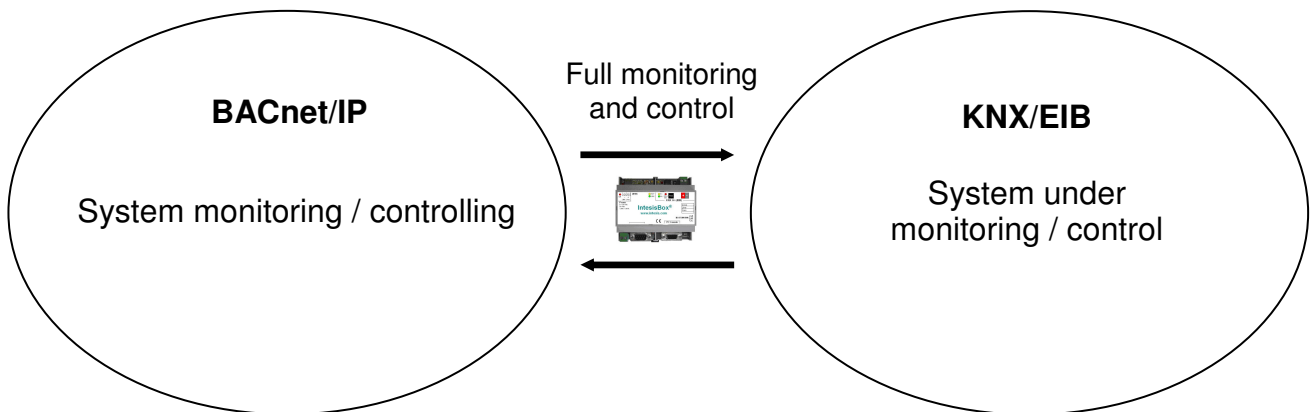
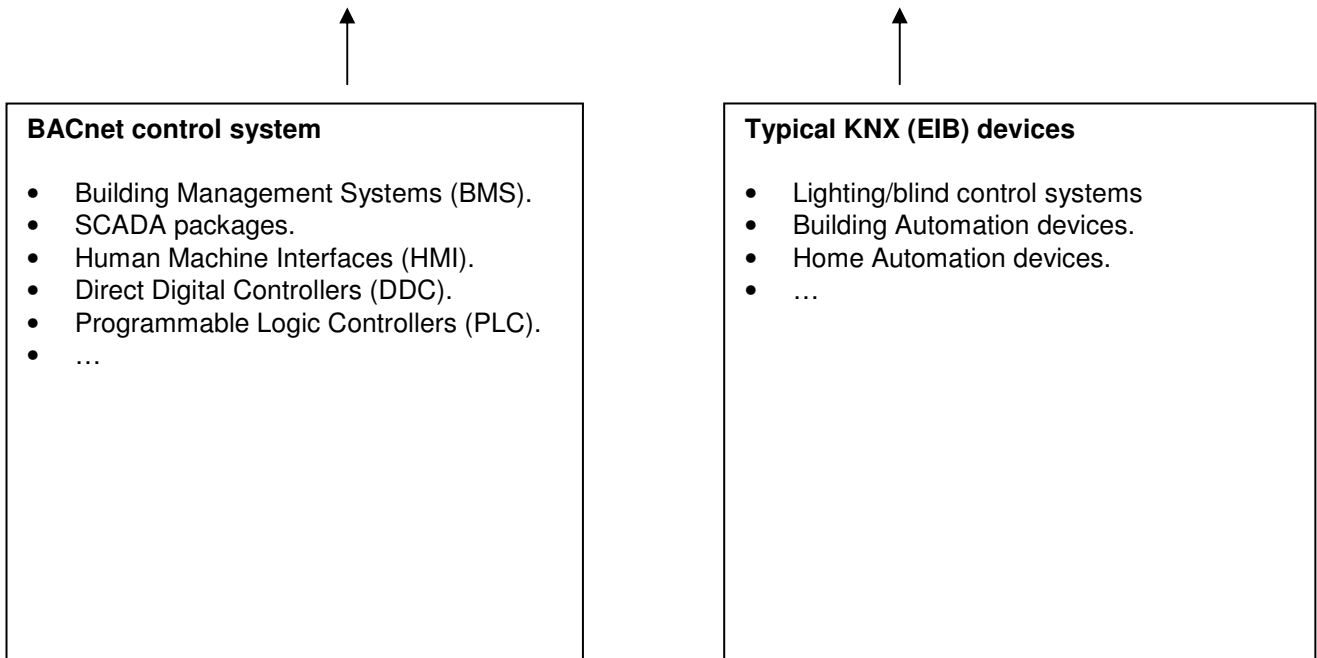
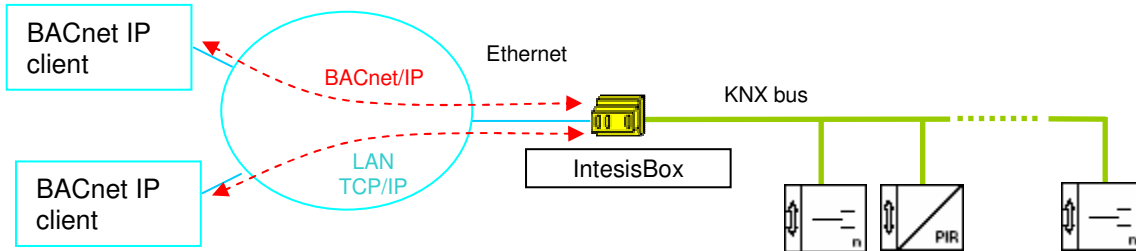
There are two versions of IntesisBox with different capacity every one of them:

- Basic version with capacity of 500 points. *Ref.: IBOX-BAC-KNX-A*
- Extended version with capacity of 3000 points. *Ref.: IBOX-BAC-KNX-B*



## Sample applications

Integration of KNX and BACnet using *IntesisBox BACnet IP Server - KNX gateway*.



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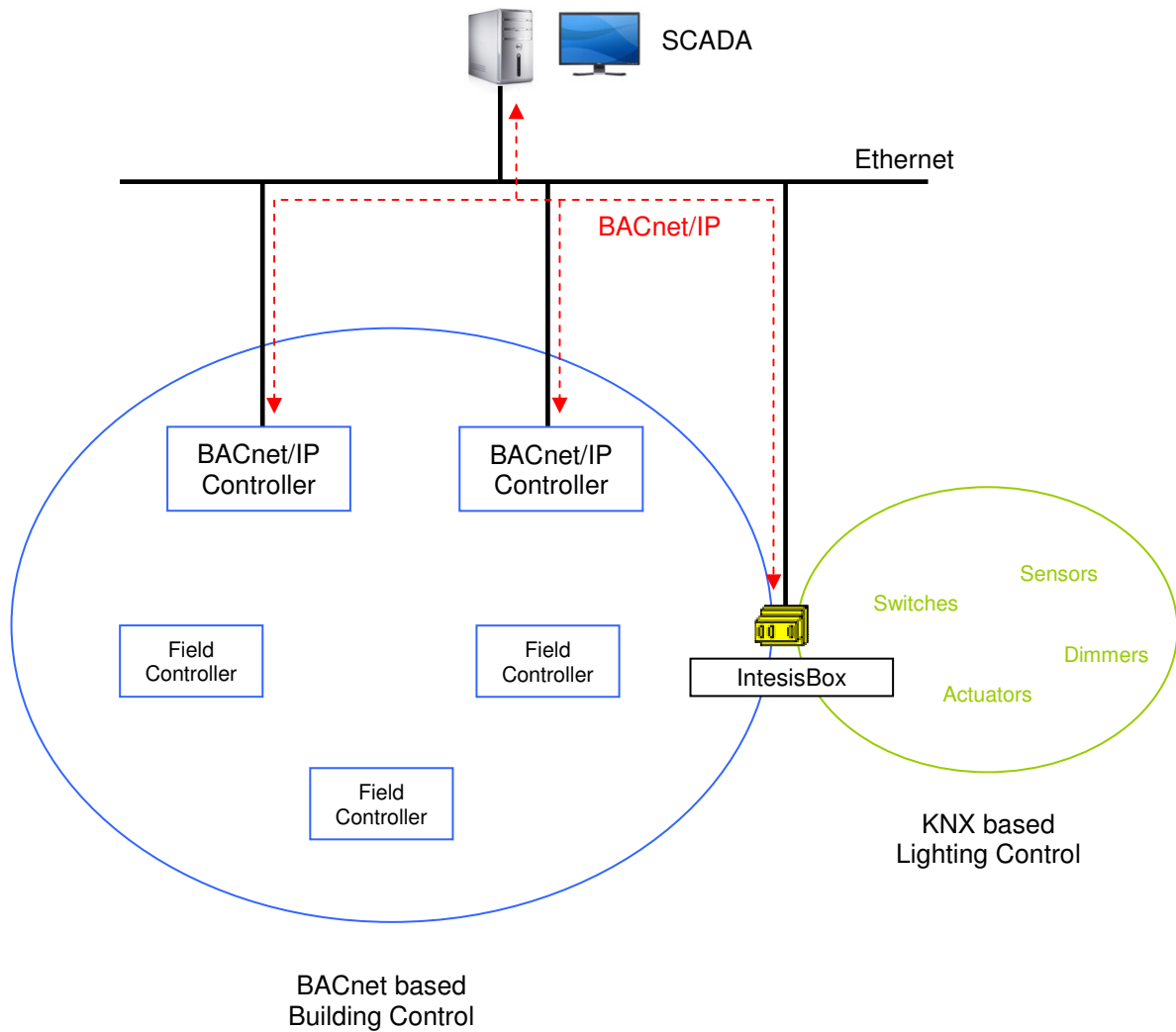
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## Typical applications

Integration of KNX based lighting control into BACnet based Building Management Systems



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## BACnet interface of IntesisBox

<b>BACnet interface</b>	
Device type	Server
BACnet modes supported	BACnet/IP
BACnet configuration parameters	<ul style="list-style-type: none"> <li>• IP address.</li> <li>• Subnet mask.</li> <li>• Default router address.</li> <li>• BACnet port.</li> <li>• BACnet device name.</li> <li>• BACnet device number (device instance number).</li> </ul>
Interactivity with BACnet system	<ul style="list-style-type: none"> <li>• Point's Read/Write allowed.</li> <li>• Subscription requests (COV) allowed.</li> </ul> <p><i>See BACnet interface specifications below for more details.</i></p>

### BACnet interface specifications

BACnet Conformance Class Supported: Class 3

BACnet Functional Groups Supported: Clock

BACnet Standard Application Services Supported:

	Initiate Requests	Executes Requests
ConfirmedCOVNotification	X	
Subscribe COV		X
UnconfirmedCOVNotification	X	
ReadProperty		X
ReadPropertyMultiple		X
WriteProperty		X
WritePropertyMultiple		X
ReinitializeDevice		X
TimeSynchronisation		X
WhoHas		X
I-Have	X	
Who-Is		X
I-Am	X	

Data Link Layer Option: BACnet IP, (Annex J)

No Segmented Requests/Responses Supported

### Types of BACnet objects supported

Object Type	Property	Description
Analog Input	Present Value	Analog signal. i.e. Ambient temperature.
Analog Output	Present Value	Analog signal.
Analog Value	Present Value	Analog signal. i.e. Temperature set point value.
Binary Input	Present Value	Digital signal. i.e. ON/OFF status.
Binary Output	Present Value	Digital signal. i.e. ON/OFF command.
Binary Value	Present Value	Digital signal. i.e. ON/OFF status/command.
Multistate Input	Present Value	Multistate signal. i.e. Working mode status.
Multistate Output	Present Value	Multistate signal.
Multistate Value	Present Value	Multistate signal. i.e. Working mode command.

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## KNX / EIB interface of IntesisBox

<b>KNX interface</b>			
Bus coupler	Internal KNX TP1 (EIB) opto-isolated bus coupler unit for direct connection to EIB bus. Connector: 2 poles plug-in screw terminal bloc.		
Configuration parameters	<ul style="list-style-type: none"> <li>Physical address.</li> </ul>		
Interactivity with KNX/EIB system	<ul style="list-style-type: none"> <li>The points can be read from KNX/EIB.</li> <li>The points can be written from KNX/EIB.</li> <li>A telegram can be sent to KNX/EIB following a change in the point's value.</li> <li>The point value can be updated with a read request sent to KNX system when the IntesisBox starts up. <i>Configurable individually per point.</i></li> <li>Multiple KNX group addresses can actuate on the same IntesisBox's point.</li> </ul>		
<b>Points</b>			
Configuration parameters per point	<p>Generic fields.</p> <ul style="list-style-type: none"> <li>Point description. Useful to identify the point's location into the building and its functionality from any BACnet explorer.</li> <li>Active (Yes/No). Useful to deactivate points maintaining the configuration for later use.</li> </ul> <p>BACnet related fields.</p> <ul style="list-style-type: none"> <li>Point name. Can be built automatically by the configuration software tool LinkBoxBacnet with a fix format (useful to identify the point's KNX group address and BACnet object type from any BACnet explorer), or user defined.</li> <li>BACnet object type. <i>See BACnet object types supported.</i></li> <li>BACnet object instance number. Can be assigned automatically or manually.</li> </ul> <p>KNX/EIB related fields.</p> <ul style="list-style-type: none"> <li>Group address (in format P/I/S or P/S). <i>Is the sending group address.</i></li> <li>Listening addresses (in format P/I/S or P/S separated by comma). IntesisBox will listen for KNX/EIB telegrams of these listening addresses, and when received it will act as if they were of the main group address defined. This is very useful to translate actions to the BACnet system coming from different KNX/EIB devices, for example from an individual start/stop button and also from a general start/stop button. <i>Up to 1000 listening addresses can be defined in total. Up to 255 listening addresses can be defined per point.</i></li> <li>R. Specifies if the point accepts read requests from the KNX/EIB system.</li> <li>W. Specifies if the point accepts write requests from the KNX/EIB system.</li> <li>T. Specifies if a write request telegram will be sent to the KNX/EIB system when the point's value changes.</li> <li>U. Specifies if a read request will be sent to KNX to update the point's value when IntesisBox starts up or after a bus reset detection. <i>If U is specified in this field, the read request will be of the main group address. If U2 is specified in this field, the read request will be of the first listening address defined.</i></li> <li>EIS (Datapoint). <i>See EIS supported below.</i></li> </ul> <p><i>The configuration of this part must be done in co-operation with the engineer in charge of setting up the whole KNX/EIB system. Some of the data to introduce in this part must be supplied by the KNX/EIB engineer.</i></p>		
KNX EIS (Datapoints) supported	<ul style="list-style-type: none"> <li>Switching (1 bit).</li> <li>Dimming (4 bits).</li> <li>Float (16 bits).</li> <li>Scaling (8 bits).</li> <li>Drive control (1 bit).</li> </ul>	<ul style="list-style-type: none"> <li>Priority (2 bits).</li> <li>Float IEEE (32 bits).</li> <li>Counter (8 bits).</li> <li>Counter (16 bits).</li> <li>Counter (32 bits).</li> </ul>	<ul style="list-style-type: none"> <li>ASCII char (8 bits).</li> </ul>

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## Configuration tool

### LinkBoxBacnet

- Visual engineering tool, easy of use, for IntesisBox's configuration and monitoring, compatible with Microsoft Windows™ operating systems, supplied with the purchase of IntesisBox with no additional cost.
- Multi-window tool allowing to monitor simultaneously the communication activity with both protocols (systems) and the real time values for all the points allowing to modify any value (very useful for test purposes), console window showing debug and operating status messages, and configuration windows to configure all the IntesisBox's parameters and points.
- Points configuration in plain text files (tab separated) for easy and quick configuration using Microsoft Excel (very useful in projects with a lot of points).
- Allows configuring the IntesisBox's parameters and points while in off-line, this is, not connected to the gateway. You can configure/modify the IntesisBox's parameters comfortably in the office and later download the configuration to the gateway in the field.
- Connection to the IntesisBox for download the configuration and monitoring the operation by using a serial COM port of the PC (serial cable also supplied with the IntesisBox).
- Allows configuring all the external protocols available for IntesisBox® BACnet/IP Server series.
- Upgrades for this software tool available free of charge whenever a new protocol is added to the IntesisBox® BACnet/IP Server series.
- Multi-project tool allowing to have in the engineer's PC the configuration for all the sites where different IntesisBox® BACnet/IP Server series gateways have been installed.
- Multi-language tool, all the language-dependent strings are in a plain text file (tab separated) for easy modification or addition of new languages.
- A list of system commands is available to send to the IntesisBox, for debugging and adjust purposes (Reset, Date/time consultation/adjust, Firmware version request...).

Configuration KNX - Max.Points:500 GroupsKNX:500 List.AddressKNX:1000

Connection Signals

#	Data type	Description	EIS	Group	Listening addresses	R	W	T	U	Bac.Name	Bac.Ty	Bac.ID	Active
1	0-Error co	Error com. KNX								BUS_KNX_ERR_COM	3-BI	0	1-Yes
2	1-Data	Test BI - KNX input 1	1 - Switching (1 bit)	1/0/1			W		U	Test BI - KNX input 1	3-BI	1	1-Yes
3	1-Data	Test BI - KNX input 2	1 - Switching (1 bit)	1/0/2			W		U	Test BI - KNX input 2	3-BI	2	1-Yes
4	1-Data	Test BI - KNX input 3	1 - Switching (1 bit)	1/0/3			W		U	Test BI - KNX input 3	3-BI	3	1-Yes
5	1-Data	Test BI - KNX input 4	1 - Switching (1 bit)	1/0/4			W		U	Test BI - KNX input 4	3-BI	4	1-Yes
6	1-Data	Test BO - KNX out 1 cmd	1 - Switching (1 bit)	1/0/5		R		T		Test BO - KNX out 1 cmd	4-BO	0	1-Yes
7	1-Data	Test BO - KNX out 2 cmd	1 - Switching (1 bit)	1/0/6		R		T		Test BO - KNX out 2 cmd	4-BO	1	1-Yes
8	1-Data	Test BO - KNX out 1 stat	1 - Switching (1 bit)	1/0/7			W		U	Test BO - KNX out 1 stat	3-BI	5	1-Yes
9	1-Data	Test BO - KNX out 2 stat	1 - Switching (1 bit)	1/0/8			W		U	Test BO - KNX out 2 stat	3-BI	6	1-Yes
10	1-Data	Test BO - KNX out 3 cmd	1 - Switching (1 bit)	1/0/9		R		T		Test BO - KNX out 3 cmd	4-BO	2	1-Yes
11	1-Data	Test BO - KNX out 4 cmd	1 - Switching (1 bit)	1/0/10		R		T		Test BO - KNX out 4 cmd	4-BO	3	1-Yes
12	1-Data	Test BO - KNX out 3 stat	1 - Switching (1 bit)	1/0/11			W		U	Test BO - KNX out 3 stat	3-BI	7	1-Yes
13	1-Data	Test BO - KNX out 4 stat	1 - Switching (1 bit)	1/0/12			W		U	Test BO - KNX out 4 stat	3-BI	8	1-Yes

Object Bacnet type  Auto Bac.Name ↑↓ Add Delete Save Exit

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## Technical characteristics



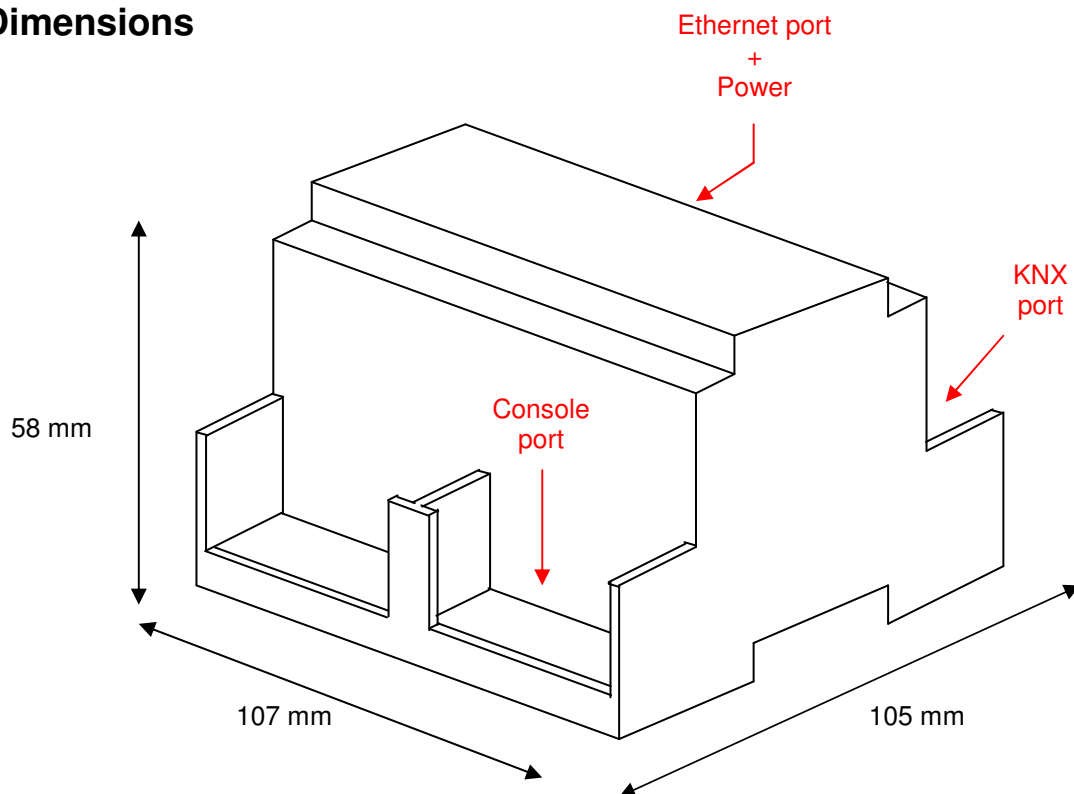
Envelope	Plastic type PC (UL 94 V-0). Size: 107mm x 105mm x 58mm.
Color	Grey. RAL 7035.
Power	9 to 30VDC +/-10% 1.4W. 24VAC +/-10% 1.4VA. Power connector: Plug-in screw terminal block (2 poles).
Mounting options	Desktop Wall DIN rail EN60715 TH35.
BACnet/IP port	1 x Ethernet 10BT (RJ45).
KNX (EIB) port	1 x KNX TP1 (EIB) opto-isolated (Plug-in screw terminal block 2 poles).
LED indicators	1 x Power. 2 x KNX port activity (Tx, Rx). 2 x Ethernet port (LNK, ACT). 1 x KNX programming/bus. <sup>1</sup>
Push buttons	1 x KNX programming. <sup>1</sup>
Console port	RS232. DB9 female connector (DCE).
Configuration	Via console port. <sup>2</sup>
Firmware	Allows upgrades via console port.
Operational temperature range	-40°C to +70°C
Operational relative humidity range	5% to 95%, non condensing
Protection	IP20 (IEC60529).
RoHS conformity	Compliant with RoHS directive (2002/95/CE).
Certifications	CE

<sup>1</sup> Not operational for the moment. Reserved for future use.

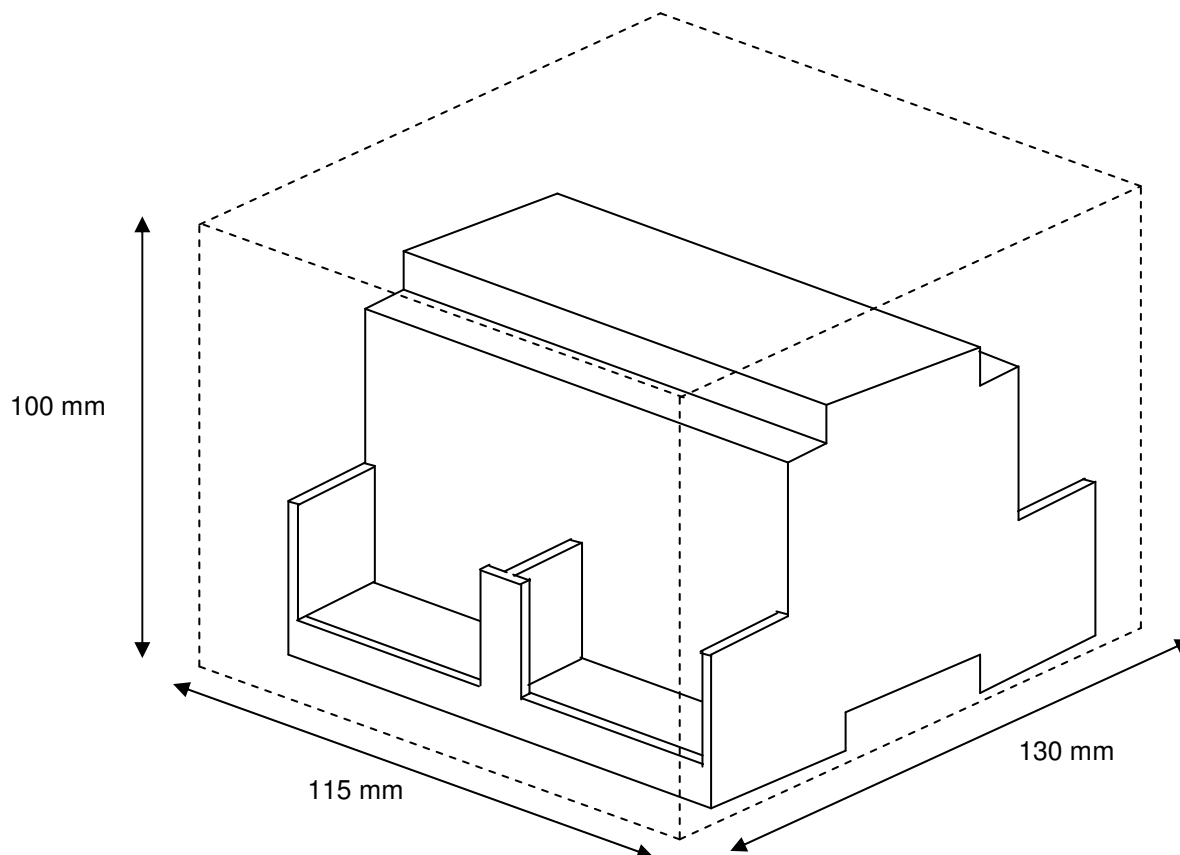
<sup>2</sup> Along with the device it is also supplied a standard DB9 male - DB9 female 1.8 m. cable for configuring and monitoring the device using a PC via serial COM port. The configuration software LinkBoxBacnet (free of charge), compatible with MS Windows® operating systems, is also supplied with the device.



## Dimensions



Free space recommended to install the device into a cabinet (wall or DIN rail mounting), with space enough for external connections:



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