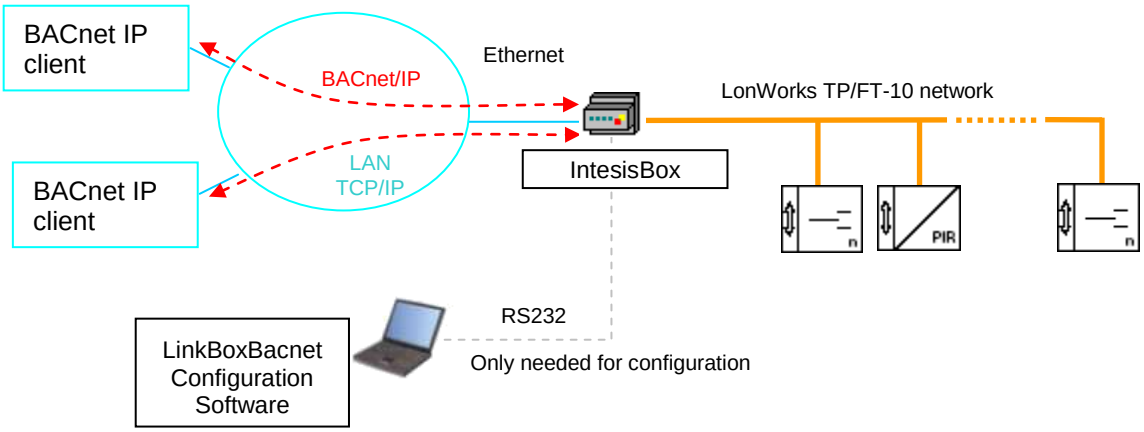
IntesisBox®
BACnet/IP Server - LON

Gateway for integration of LON devices into BACnet control systems

Integrate LonWorks devices or systems into BACnet control systems.



IntesisBox is a BACnet/IP Server device allowing read/write network variables (SNVTs) of LON devices connected to a LON network, and offering these values through standard BACnet objects. SNVT values in LON can be read/write from BACnet. ***Each LON basic data type of network variables in LON devices can be mapped into an individual BACnet object.***

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.

LON interface of IntesisBox reads continuously LON devices configured by polling. LON devices can be addressed either using Neuron-Id (physical address) or subnet/node for commissioned networks. IntesisBox has the ability to declare devices as commissioned, if needed, thus avoiding the need for a LON integration tool for commissioning (i.e. LonMaker). ***All the updated readings are maintained in IntesisBox memory for immediate interaction with the BACnet system.***

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 LON devices is also installed; using this demo project makes the engineering needed for this integration easy and quick.***

Intesis software
URL http://www.intesis.com
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IntesisBox capacity

Element	Max. (Tiny version)	Max. (Basic version)	Max. (Extended version)	Notes
Type of BACnet devices				Those supporting BACnet/IP.
Number of BACnet points	100	500	3000	Maximum number of points (BACnet objects) that can be defined into IntesisBox. Each of them can contain an individual field from a LON network variable.
Number of BACnet subscribers	8	8	8	Maximum number of BACnet subscribers accepted by IntesisBox.
Number of BACnet subscriptions (COV) requests	6000	6000	6000	Maximum number of BACnet subscriptions (COV) requests accepted by IntesisBox.
Type of LON devices				Those supporting *Free Topology* channel (FT-10)
Supported number of LON devices	128	128	128	Maximum number of different LON devices that can be defined into IntesisBox (to read/write points into them).

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

- Tiny version with capacity of 100 points. *Ref.: IBOX-BAC-LON-100*
- Basic version with capacity of 500 points. *Ref.: IBOX-BAC-LON-A*
- Extended version with capacity of 3000 points. *Ref.: IBOX-BAC-LON-B*

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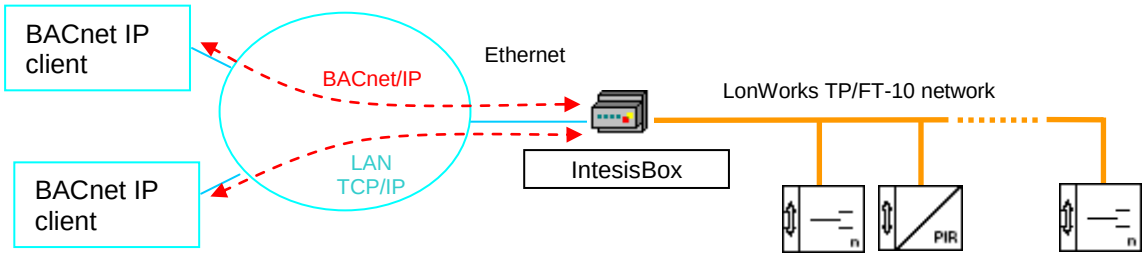
Sample applications

Integration of LonWorks and BACnet using *IntesisBox BACnet IP Server – LON* gateway.

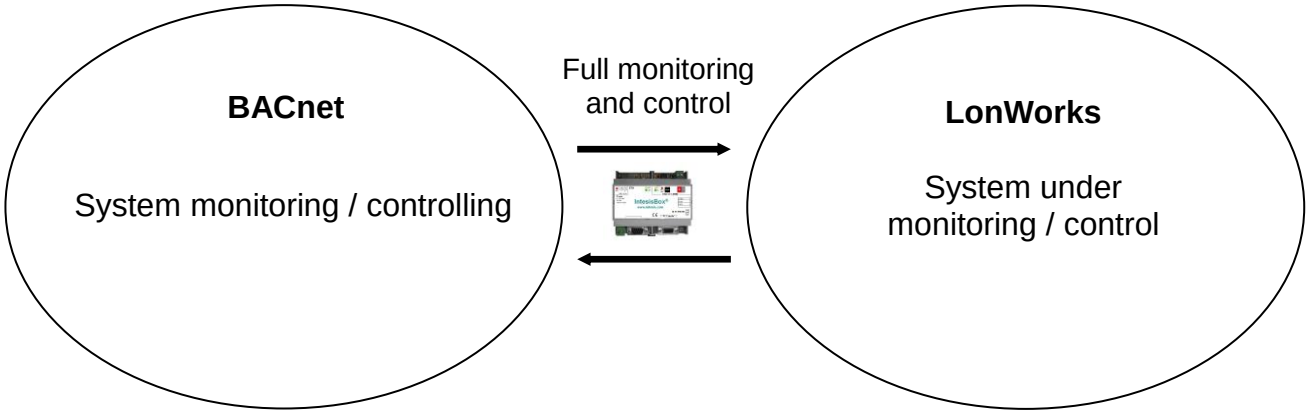


BACnet control system

- Building Management Systems (BMS).
- SCADA packages.
- Human Machine Interfaces (HMI).
- Direct Digital Controllers (DDC).
- Programmable Logic Controllers (PLC).
- …

Typical LON devices

- Lighting control systems
- Building Automation devices.
- HVAC Controllers.
- Air Conditioning gateways.
- …



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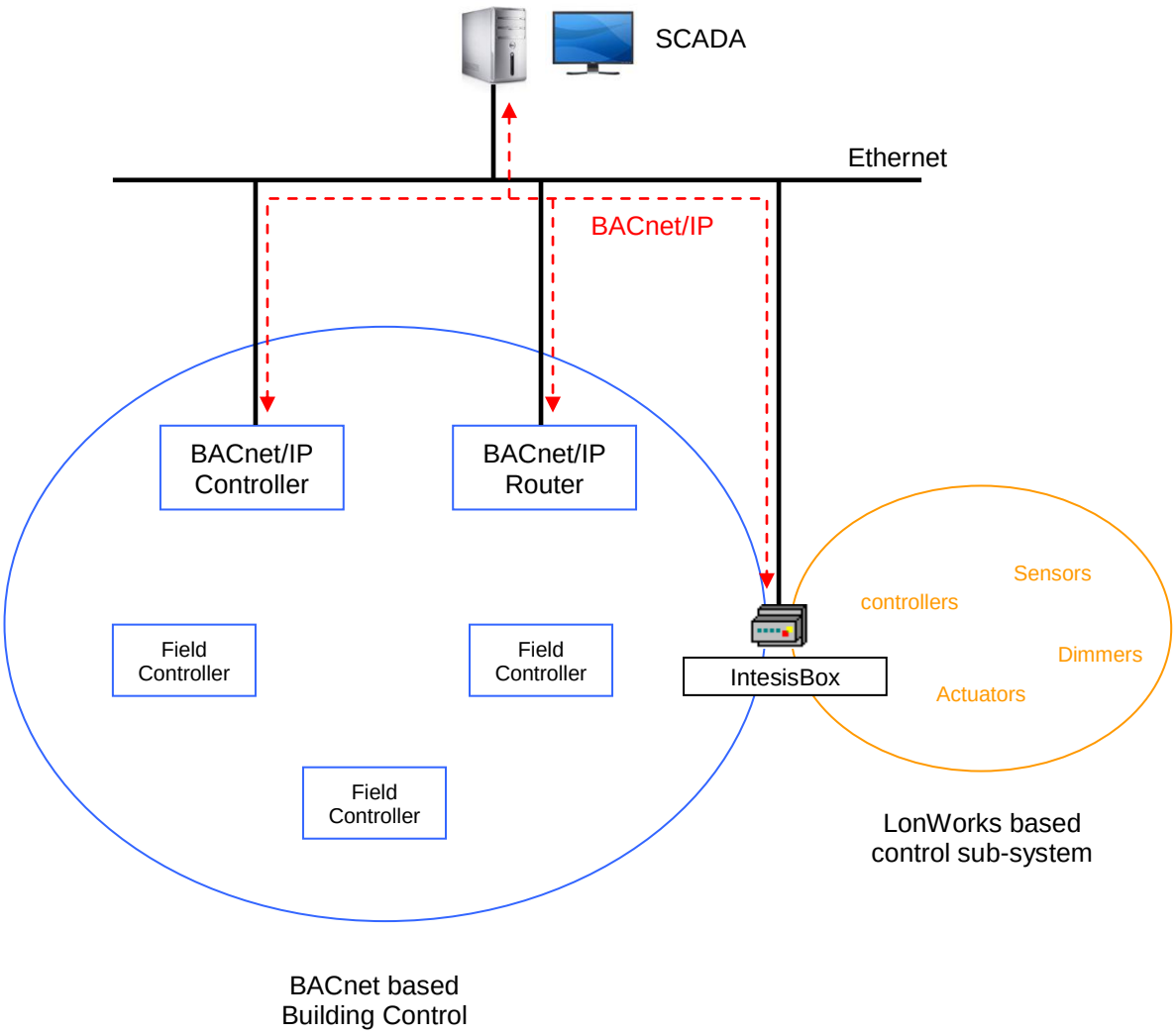
Typical applications

Integration of a LonWorks based control sub-system into BACnet based Building Management Systems



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BACnet interface of IntesisBox

BACnet interface	
Device type	Server
BACnet modes supported	BACnet/IP
BACnet configuration parameters	• IP address. • Subnet mask. • Default router address. • BACnet port. • BACnet device name. • BACnet device number (device instance number).
Interactivity with BACnet system	• Point's Read/Write allowed. • Subscription requests (COV) allowed.

BACnet interface specifications

BACnet Conformance Class Supported: Class 3
Data Link Layer Option: BACnet IP, (Annex J)

Segmented Requests/Responses Not Supported

BACnet Standard Application Services Supported and more details are explained in BACnet IP Server KNX PICS (protocol implementation conformance statement)
http://www.intesis.com/pdf/IntesisBox_BACnet_IP_Server_LON_PICS.pdf

Types of BACnet objects supported

Object Type	Property	Description
Analog Input	Present Value	Analog signal
Analog Output	Present Value	Analog signal
Analog Value	Present Value	Analog signal
Binary Input	Present Value	Digital signal
Binary Output	Present Value	Digital signal
Binary Value	Present Value	Digital signal
Multistate Input	Present Value	Multistate signal
Multistate Output	Present Value	Multistate signal
Multistate Value	Present Value	Multistate signal

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LON interface of IntesisBox

Specifications

LON supported channel: Free Topology (FT-10)

Configurable addressing options (on a 'per device' basis):
- Subnet / node
- Neuron-Id

Network variable sample rate:
- Below 60ms per network variable (each network variable may contain several fields, which will be mapped to different Modbus registers, if needed).

Supported network variable types:
- All standard network variable types published by LonMark International are directly supported by configuration tool, *LinkBoxBacnet*.
- Support for user-defined network variable types can be added in each case, by entering their definition in *LinkBoxBacnet*. In this case, following information needs to be provided:
    - Scale factors: *a*, *b* and *c*
    - Number of fields
    - Basic LON data type of each field

Supported basic LON data types

Basic LON data type	Description
Signed short	8-bit signed data
Unsigned short	8-bit unsigned data
Enum	8-bit unsigned data
Signed long	16-bit signed data
Unsigned long	16-bit unsigned data
Signed quad	32-bit signed data
Unsigned quad	32-bit unsigned data
Float	32-bit IEEE float
Bitfield	1 to 8-bit length unsigned bit field

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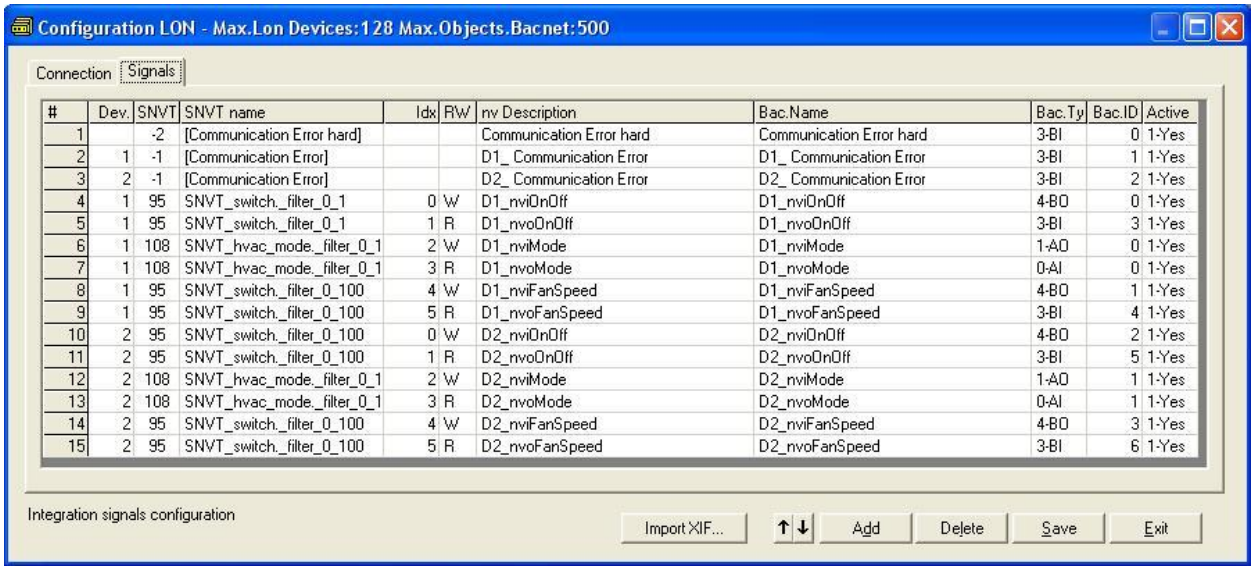
Configuration tool

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. • Point's 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 having 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…).

In LinkBoxBacnet, an embedded tool for import XIF files makes the configuration of the IntesisBox for integration of any kind of LON device easy and quick.



#	Dev.	SNVT	SNVT name	Idx	RW	nv Description	Bac.Name	Bac.Ty	Bac.ID	Active
1		-2	[Communication Error hard]			Communication Error hard	Communication Error hard	3-BI	0	1-Yes
2	1	-1	[Communication Error]			D1_ Communication Error	D1_ Communication Error	3-BI	1	1-Yes
3	2	-1	[Communication Error]			D2_ Communication Error	D2_ Communication Error	3-BI	2	1-Yes
4	1	95	SNVT_switch._filter_0_1	0	W	D1_nviOnOff	D1_nviOnOff	4-BO	0	1-Yes
5	1	95	SNVT_switch._filter_0_1	1	R	D1_nvoOnOff	D1_nvoOnOff	3-BI	3	1-Yes
6	1	108	SNVT_hvac_mode._filter_0_1	2	W	D1_nviMode	D1_nviMode	1-AO	0	1-Yes
7	1	108	SNVT_hvac_mode._filter_0_1	3	R	D1_nvoMode	D1_nvoMode	0-AI	0	1-Yes
8	1	95	SNVT_switch._filter_0_100	4	W	D1_nviFanSpeed	D1_nviFanSpeed	4-BO	1	1-Yes
9	1	95	SNVT_switch._filter_0_100	5	R	D1_nvoFanSpeed	D1_nvoFanSpeed	3-BI	4	1-Yes
10	2	95	SNVT_switch._filter_0_100	0	W	D2_nviOnOff	D2_nviOnOff	4-BO	2	1-Yes
11	2	95	SNVT_switch._filter_0_100	1	R	D2_nvoOnOff	D2_nvoOnOff	3-BI	5	1-Yes
12	2	108	SNVT_hvac_mode._filter_0_1	2	W	D2_nviMode	D2_nviMode	1-AO	1	1-Yes
13	2	108	SNVT_hvac_mode._filter_0_1	3	R	D2_nvoMode	D2_nvoMode	0-AI	1	1-Yes
14	2	95	SNVT_switch._filter_0_100	4	W	D2_nviFanSpeed	D2_nviFanSpeed	4-BO	3	1-Yes
15	2	95	SNVT_switch._filter_0_100	5	R	D2_nvoFanSpeed	D2_nvoFanSpeed	3-BI	6	1-Yes

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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 is a 2 poles plug-in terminal block.
Mounting options	Wall DIN rail EN60715 TH35.
BACnet/IP port	1 x Ethernet 10BT RJ45.
LON Port	1 x LON (TP-FT/10) (2 poles plug-in screw terminal block).
LED indicators	1 x Power. 2 x LON port activity (Tx, Rx). 2 x Ethernet port link and activity (LNK, ACT). 1 x LON service.[1]
Push buttons	1 x LON service switch.[1]
Console port	EIA232. DB9 female connector (DCE).
Configuration	Via console port.[2]
Firmware	Allows upgrades via console port.
Functional temperature range	0°C to +70°C
Functional humidity range	25-90% at 50ºC, non condensing
Protection	IP20 (IEC60529).
RoHS conformity	Compliant with RoHS directive (2002/95/CE).
Certifications	CE

1 Not used for the moment. Reserved for future use.

2 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, compatible with MS Windows® operating systems, is also supplied.

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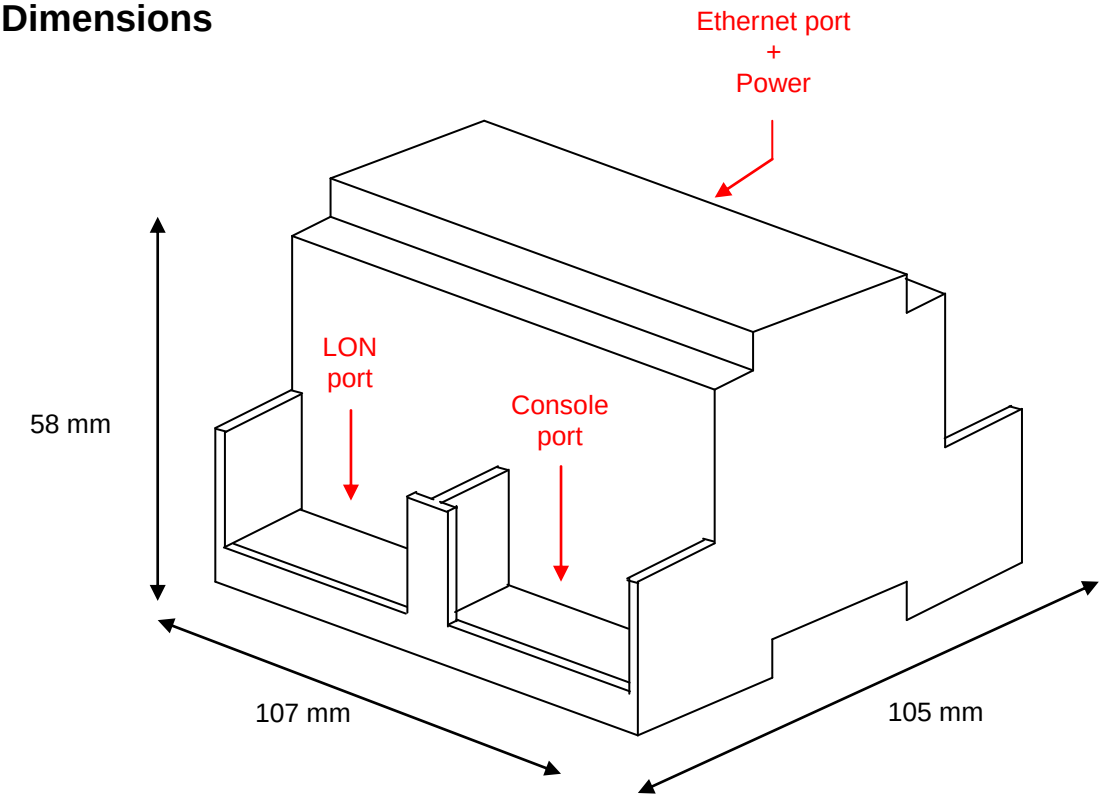
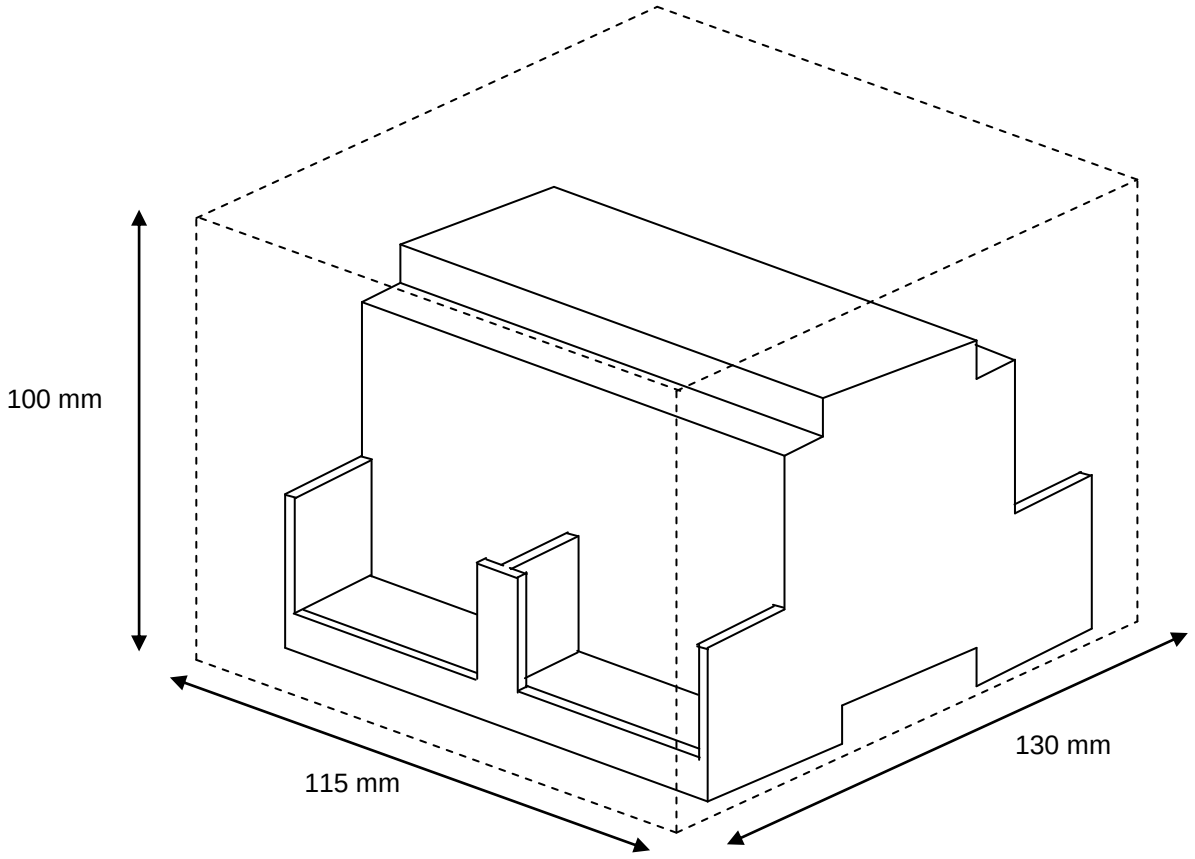
Dimensions



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



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