IntesisBox®
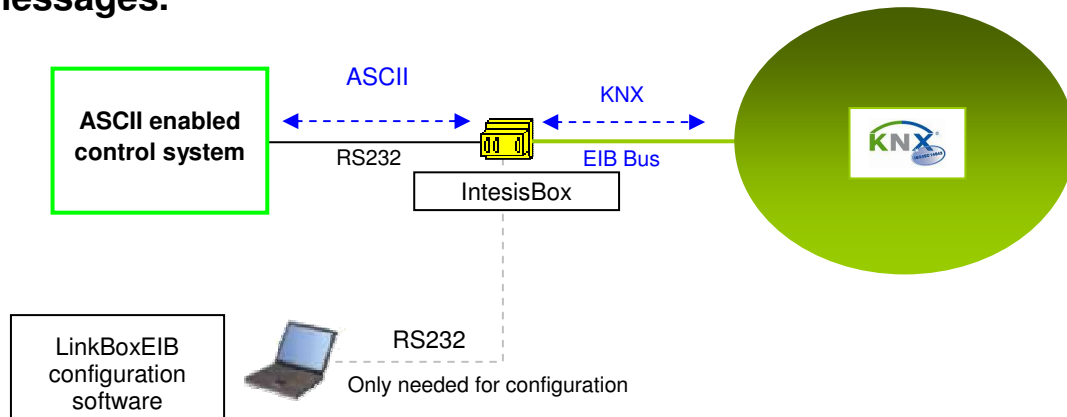## ASCII Server - KNX

Gateway for integration of KNX / EIB systems into ASCII enabled control systems.

Integrate KNX based lighting/blind control systems into your ASCII enabled control system (AMX, Crestron, LiteTouch…) "talking" simple text messages.

The KNX side of IntesisBox

IntesisBox acts as one more device into the KNX system, maintaining always in memory an updated mirror of the KNX points declared in its configuration table, ready to be served to the ASCII side when requested. *The IntesisBox's KNX TP-1 (EIB) interface connects directly to the EIB bus and is opto-isolated from the rest of the internal electronics.*

When starting-up or after an EIB bus reset, IntesisBox can send read requests to KNX to get the current values for those points required (critical signals needed to be updated in any moment in the ASCII controller), this is configurable per point. *More than one EIB group address can actuate on the same IntesisBox's point.*

The ASCII side of IntesisBox

ASCII interface of IntesisBox uses serial RS232 communication (baud rate configurable). Points in KNX can be read/written easily from the ASCII side by means of simple messages. IntesisBox can be configured to notify to the ASCII side whatever change of value detected for a point by means of spontaneous messages sent through the ASCII interface. *This is configurable individually per point (no need of continuous polling by the ASCII controller device).*

The configuration of IntesisBox

IntesisBox KNX series are configured using *LinkBoxEIB,* a software tool for windows™ which is supplied along with the purchase of IntesisBox with no additional cost. *With the standard installation of LinkBoxEIB, a Demo project for integration with an ASCII control system is also installed, using this demo project makes the engineering needed for this integration easy and quick.*
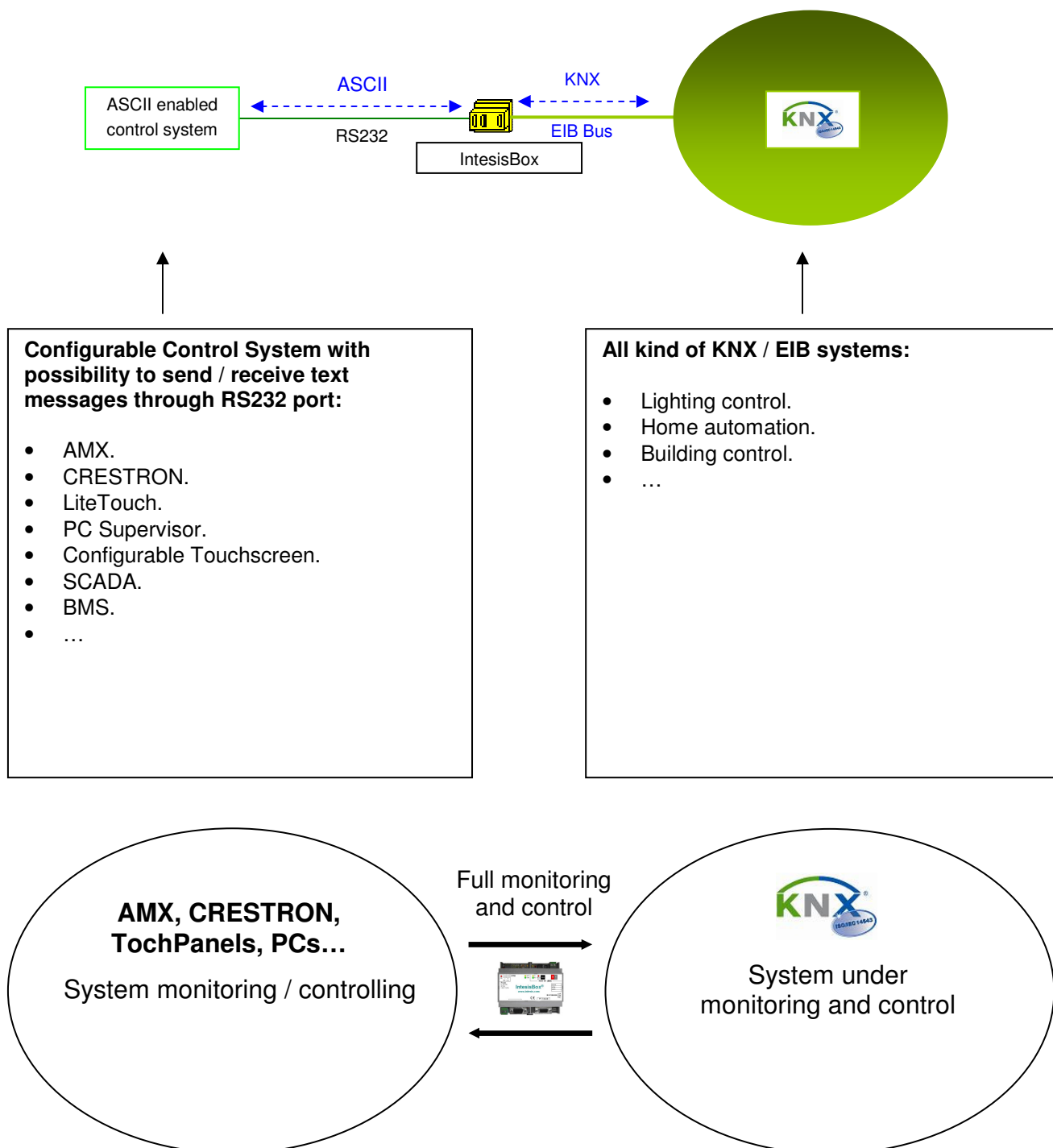
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IntesisBox capacity

Element	Capacity	Notes
KNX (EIB) groups	4000	Maximum number of KNX group addresses that can be defined.
KNX (EIB) listening addresses	1000	Maximum number of KNX group addresses that can be defined as *listening addresses*, one or more of these listening addresses can be assigned to each point. With this, more than one KNX group address of the KNX system can actuate on the same IntesisBox's point.

Ref.: IBOX-ASCII-KNX

Intesis software

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Sample applications

Monitoring and control of KNX / EIB systems from configurable devices allowing to send and receive simple text messages through RS232 port.

IntesisBox sends and receives text messages (ASCII characters) with a predefined format (see below specifications of this format), the system monitoring / controlling connected to the RS232 port of IntesisBox must be programmed to read and write those messages in the required format.
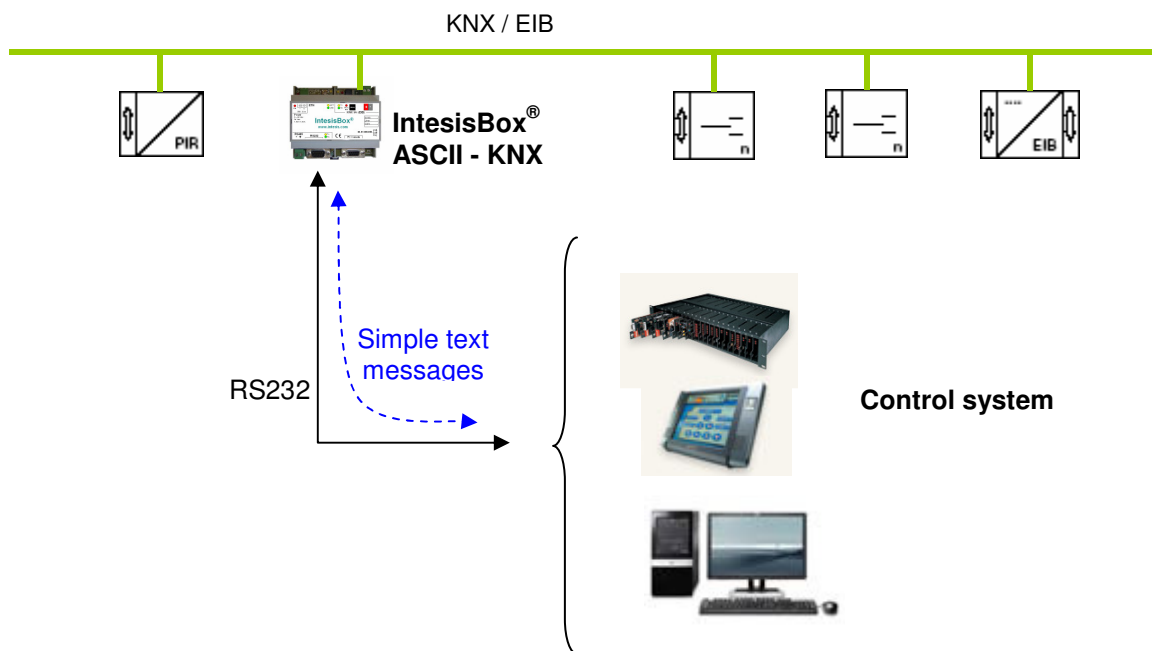
Configurable Control System with possibility to send / receive text messages through RS232 port:

- AMX.
- CRESTRON.
- LiteTouch.
- PC Supervisor.
- Configurable Touchscreen.
- SCADA.
- BMS.
- …

All kind of KNX / EIB systems:

- Lighting control.
- Home automation.
- Building control.
- …

AMX, CRESTRON, TochPanels, PCs…

System monitoring / controlling

Full monitoring and control

System under monitoring and control

Typical applications

Integration of KNX based lighting/blind control systems into ASCII enabled control systems (BMS, PLC, SCADA...), or controllers (AMX, Crestron, LiteTouch…).

IntesisBox is an intelligent gateway which manages KNX and ASCII interfaces independently, maintaining always in its memory an updated mirror of the KNX installation (of the points declared in its configuration table). This means no bottle necks due to different communication throughputs between both systems or lack of performance when managing many points, common problems found when using traditional bridges or media converters.

IntesisBox allows an internal point's map fully and freely configurable, offering full KNX monitoring and control by using simple text messages through its RS232 interface.

IntesisBox ASCII Server - KNX allow to integrate in your supervision software or control system all kind of KNX/EIB systems in a easy and quick way, without need of long time and expensive processes of hardware and software development for direct communication with KNX devices.

ASCII interface of IntesisBox

Type of communication supported

- Serial RS232 (DB9 male connector, DTE).
- Baud rate configurable from 1200 to 57600 bps.
- 8 data bits, no parity, 1 stop bit.

Data Format

All text messages are always of fix format and associated to point's internal addresses, no matter the KNX parameters associated to the point.

This means that <u>there is no need to change the ASCII controller program whenever the KNX configuration changes</u>. When this happens just change the configuration of the gateway and that's all, the ASCII controller program remains exactly the same.

Message to read a point's value: **>Daaaa?\r**

aaaa *is a 4 digits number indicating the internal point's address inside IntesisBox.*
\r means carriage return character (HEX 0D, DEC 13).

Message to write a point's value: **>Daaaa=vv\r**

aaaa *is a 4 digits number indicating the internal point's address inside IntesisBox.*
vv *is the desired value for the point (it can be just integer or fractional, decimal point is used to separate integer and fractional parts if the number is fractional).*
\r means carriage return character (HEX 0D, DEC 13).

Message informing about a point's value: **>Daaaa=vv\r**

aaaa *is a 4 digits number indicating the internal point's address inside IntesisBox.*
vv *is the actual value of the point (it can be just integer or fractional, decimal point is used to separate integer and fractional parts if the number is fractional).*
\r means carriage return character (HEX 0D, DEC 13).

This type of message is sent spontaneously by IntesisBox when receiving a change from KNX, or sent in response to a previous poll of the point.

Messages to indicate erroneous actions:

>E01\r   *Is returned when trying to read a point not configured in IntesisBox.*
>E02\r   *Is returned when trying to write a point not permitted to be written.*

Examples:

>D0001?\r Message sent to IntesisBox to read value of point 1.
>D0001=23.5\r Message sent by IntesisBox to inform about the current value of point 1 (value=23.5).
>D0001=24.5\r Message sent to IntesisBox to write a value of point 1 (value=24.5).

Acknowledgement

IntesisBox can be configured to respond with an ACK message after executing a successful write request (ACK message is **>OK\r**)

KNX interface of IntesisBox

IntesisBox connects directly to the EIB bus (KNX TP-1) thanks to its internal EIB bus coupling unit, and acts as one more device of the KNX system with the same behavior and configuration characteristics. Internally, the bus coupling circuitry is opto-isolated from the rest of the electronics of the device to prevent damage of all the system in case of electrical pulse or over-voltage coming from the EIB bus.

IntesisBox manages all the communication with KNX according to its configuration.

- On receiving a write request from KNX, if it is of a KNX group associated to an internal point, IntesisBox updates the point's value in memory, ready to be served to the ASCII interface when requested. Optionally you can configure IntesisBox to automatically notify this change to the ASCII system by means of a spontaneous message (this is configurable individually per point).

- When point's write is made through the ASCII interface, the corresponding write request telegram will be sent KNX, to the associated KNX group (only if the point is configured to do so, this means if the point is configured as "T" - Transmit).

- IntesisBox continuously checks the status of the KNX TP-1 (EIB) bus, if a bus loss is detected, due to a bus power failure for example, on restoration of the EIB bus IntesisBox will re-transmit the status of all the groups configured as "T" (transmit) and also read requests will be send to KNX to get the current values for points configured as "U" or "U2".

Every point defined in IntesisBox has the following KNX / EIB features associated to it:

Feature	Description
EIS (DataPoint) *	KNX data type to encode the point's value.
Group *	Is the KNX group address associated to the point. It is also the KNX group to which will be applied the reading(R), writing(W), transmit(T) and update(U or U2) features. Is the EIB sending group or main group.
Listening addresses	These are the KNX group addresses that will also actuate on the point, apart of the main EIB group address mentioned above.
R	Read. If this flag is activated, it means that this point will accept read requests from KNX.
W	Write. If this flag is activated, it means that this point will accept write requests from KNX.
T	Transmit. If this flag is activated, it means that when the value of this point changes in IntesisBox, a write request will be sent to KNX indicating the new value for the group address related.
U or U2	Update. If flag "U" is activated, it means that when the gateway starts up or after an EIB bus reset detection, a read request will be sent to KNX (of the main EIB group), then the received value will update the point's value in IntesisBox's memory as it would happen for a normal write request of this EIB group from KNX. If flag "U2" is activated, it means that when the gateway starts up or after an EIB bus reset detection, a read request will be sent to KNX (of the first listening address defined), then the received value will update the point's value in IntesisBox's memory as it would happen for a normal write request of this EIB group (the first listening address defined) from KNX.

* Configuration for this feature is mandatory.

All the mentioned flags (R, W, T, U and U2) related to the KNX part are configurable per point in the gateway.

KNX EIS (Datapoints) supported	- Switching (1 bit). - Dimming (4 bits). - Float (16 bits). - Scaling (8 bits). - Drive control (1 bit). - Priority (2 bits).	- Float IEEE (32 bits). - Counter (8 bits). - Counter (16 bits). - Counter (32 bits). - ASCII char (8 bits).

Intesis software

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Configuration tool

LinkBoxEIB	• Visual engineering tool, easy of use, for IntesisBox's configuration and supervision compatible with Microsoft Windows operating systems, supplied with the purchase of IntesisBox with no additional cost.
	• Multi-window tool allowing to supervise 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 operation status messages, and configuration windows to configure all IntesisBox's parameters and signals.
	• 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 IntesisBox in the field.
	• Connection to IntesisBox for downloads the configuration and monitoring by using a serial COM port of the PC (serial cable also supplied with the gateway).
	• Allows configuring all the external protocols available for IntesisBox® KNX series.
	• Upgrades for this software tool available free of charge whenever a new protocol is added to the IntesisBox® KNX series.
	• Multi-project tool allowing to have in the engineer's PC the configuration for all the sites where different IntesisBox® KNX 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 gateway, for debugging and adjust purposes (Reset, Date/time consultation/adjust, Firmware version request…).

Configuration ASCII Max.Points:4000 GroupsKNX:4000 List.AddressKNX:1000

#	Type	Add	R/W	A/D	Spontaneous	Description	EIS	Group	Listening addresses	R	W	T	U	Active
1	0-ErrBusKNX	1	0-R	1-Dig	1-Spon	Error comunicación KNX	-							1-Yes
2	1-Data	2	0-R	1-Dig	1-Spon	Only read from KNX	1 - Switching (1 bit)	1/0/1			W		U	1-Yes
3	1-Data	3	1-W	1-Dig	1-Spon	Only write to KNX	1 - Switching (1 bit)	1/0/2		R		T		1-Yes
4	1-Data	4	2-R/W	1-Dig	1-Spon	Read & write from/to KNX	1 - Switching (1 bit)	1/0/3		R	W	T		1-Yes
5	1-Data	5	2-R/W	0-Ana	1-Spon	Read & write from/to KNX	5 - Float (16 bit)	1/0/4		R	W	T		1-Yes
6	1-Data	6	1-W	1-Dig	1-Spon	Only write to KNX	1 - Switching (1 bit)	1/0/22		R		T		1-Yes
7	1-Data	7	2-R/W	0-Ana	1-Spon	Read & write from/to KNX	5 - Float (16 bit)	1/0/5			W	T	U	1-Yes
8	1-Data	8	2-R/W	0-Ana	1-Spon	Read & write from/to KNX	5 - Float (16 bit)	1/0/6			W	T	U	1-Yes
9	1-Data	9	2-R/W	0-Ana	1-Spon	Read & write from/to KNX	5 - Float (16 bit)	1/0/7			W	T	U	1-Yes
10	1-Data	10	2-R/W	0-Ana	1-Spon	Read & write from/to KNX	5 - Float (16 bit)	1/0/8			W	T	U	1-Yes
11	1-Data	11	2-R/W	0-Ana	1-Spon	Read & write from/to KNX	5 - Float (16 bit)	1/0/9			W	T	U	1-Yes
12	1-Data	12	2-R/W	0-Ana	1-Spon	Read & write from/to KNX	5 - Float (16 bit)	1/0/10			W	T	U	1-Yes
13	1-Data	13	2-R/W	0-Ana	1-Spon	Read & write from/to KNX	5 - Float (16 bit)	1/0/11			W	T	U	1-Yes

Integration signals configuration   ↑↓   Add   Delete   Save   Exit

Intesis software

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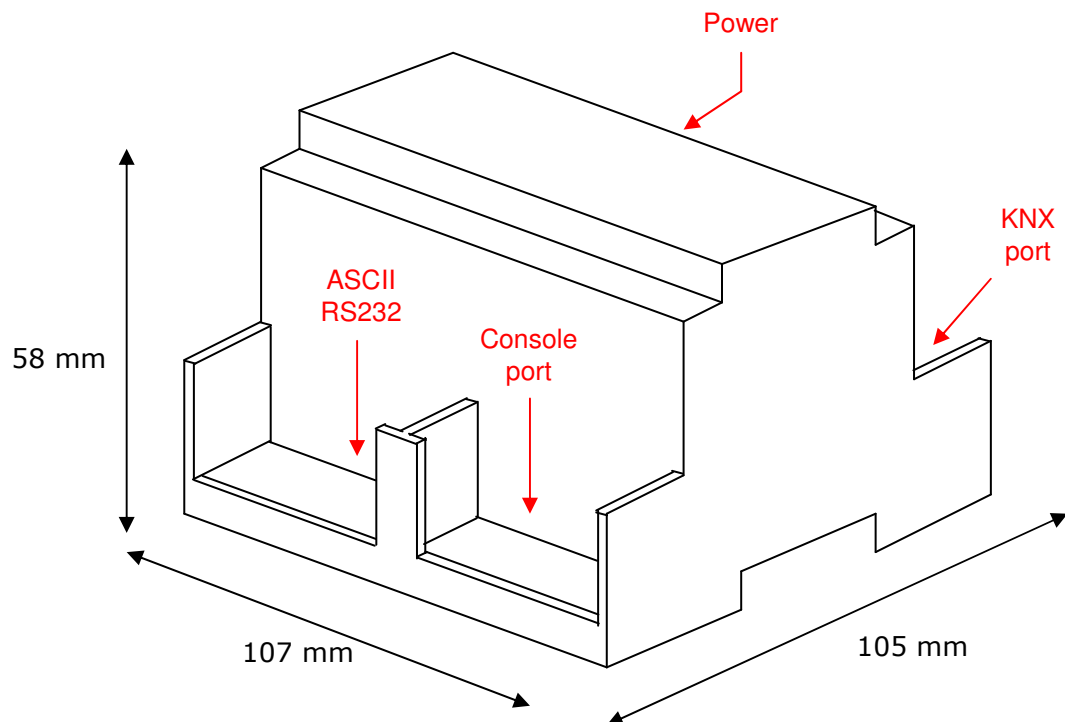## Mechanical & Electrical characteristics

Enclosure	Plastic, type PC (UL 94 V-0). Dimensions: 107mm x 105mm x 58mm.
Color	Light Grey. RAL 7035.
Power	9 to 30Vdc +/-10% 1.4W. 24Vac +/-10% 1.4VA. Plug-in screw terminal bloc for power connection (2 poles).
Mounting	Wall. DIN rail EN60715 TH35.
ASCII port	1 x Serial RS232 (DB9 male DTE).
KNX EIB port	1 x KNX TP1 (EIB) opto-isolated (Plug-in screw terminal block 2 poles).
LED indicators	1 x Power. 2 x Serial port (ASCII) activity (Tx, Rx). 2 x KNX port activity (Tx, Rx). 1 x KNX programming/bus.[1]
Push buttons	1 x KNX programming.[1]
Console port	RS232. DB9 female connector (DCE).
Configuration	Via console port.[2]
Firmware	Allows upgrades via console port.
Operational temperature	-40℃ to +70℃
Operational relative humidity	5% to 95%, non condensing
Protection	IP20 (IEC60529).
RoHS conformity	Compliant with RoHS directive (2002/95/CE).
Certifications	CE

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[1] Not operational 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 LinkBoxEIB, compatible with MS Windows® operating systems, is also supplied with the device.

Intesis
software

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Dimensions

Power

ASCII
RS232

Console
port

KNX
port

58 mm

107 mm

105 mm

Recommended available space for its installation into a cabinet (wall or DIN rail mounting), with space enough for external connections:

100 mm

115 mm

130 mm

Intesis software

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