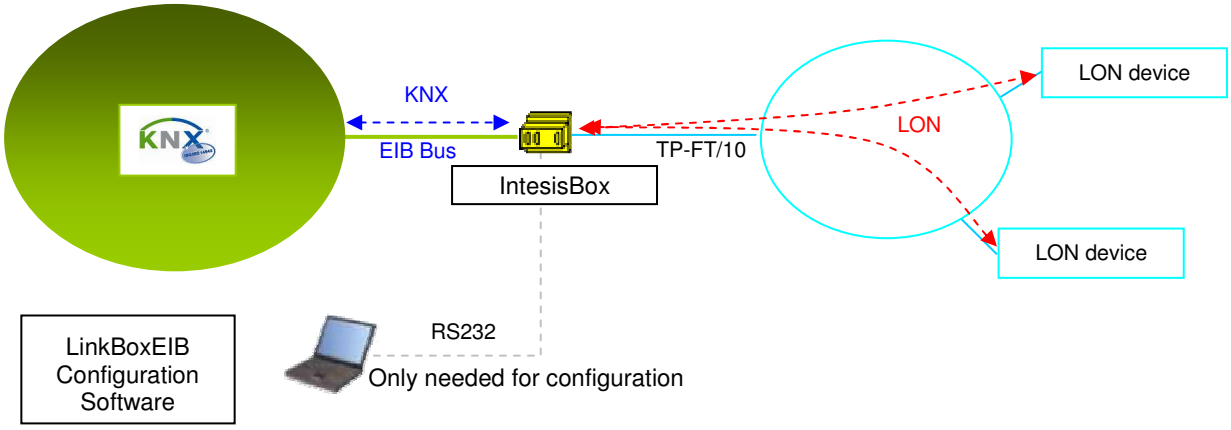
IntesisBox®
KNX - LON

Gateway for integration of LON devices into KNX systems.

Integrate Air Conditioning from the main manufacturers (DAIKIN, Mitsubishi Electric, Mitsubishi Heavy Industries, Toshiba, Fujitsu, General…) into your KNX control system.



IntesisBox is a KNX device allowing to read/write network variables (SNVTs) of LON devices connected to a LON network, and offering these values through its KNX/EIB interface. SNVT values in LON can be read/write from KNX. *Each LON basic data type of a network variable in LON devices can be mapped into an individual KNX group address.*

LON interface of IntesisBox reads continuously by polling the LON devices configured, no bindings are required between IntesisBox and the LON devices. All the updated readings are maintained in IntesisBox memory for immediate interaction with the KNX system when needed. *The IntesisBox KNX EIB interface connects directly to the KNX bus and is opto-isolated from the rest of internal electronics.*

LON devices can be addressed either using Neuron-Id (physical address) or subnet/node (commissioned devices). 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).

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, some Demo projects for integration of LON devices of the main manufacturers of Air Conditioners are provided (DAIKIN, Mitsubishi Electric, Mitsubishi Heavy, Toshiba…). Using these demo projects makes the engineering needed for this kind of integration extremely easy and quick.*

IntesisBox capacity

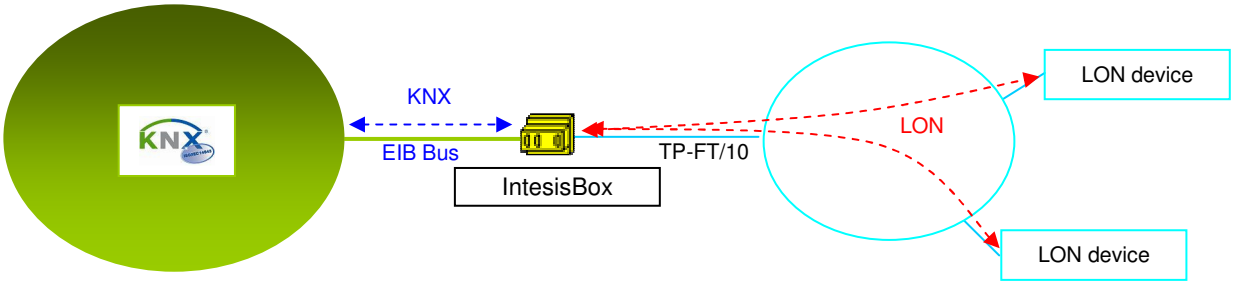
Element	Basic version	Extended version	Notes
Type of LON devices			Those supporting Twisted Pair Free Topology channel (TP/FT-10)
Number of LON network variable fields supported	500	4000	Maximum number of points (KNX group addresses) that can be defined into IntesisBox. Each of them can contain an individual field of a LON network variable.
Number of LON devices supported	64	128	Maximum number of different LON devices that can be defined into IntesisBox (to read/write points into them).

There are two different versions of *IntesisBox® KNX-LON* with different capacity every one of them:

- Basic version with capacity of 500 points and up to 64 LON devices. *Ref. IBOX-KNX-LON-A*.
- Extended version with capacity 4000 points and up to 128 LON devices. *Ref. IBOX-KNX-LON-B*.

Sample applications

Integration of any LON device or system into KNX control systems.

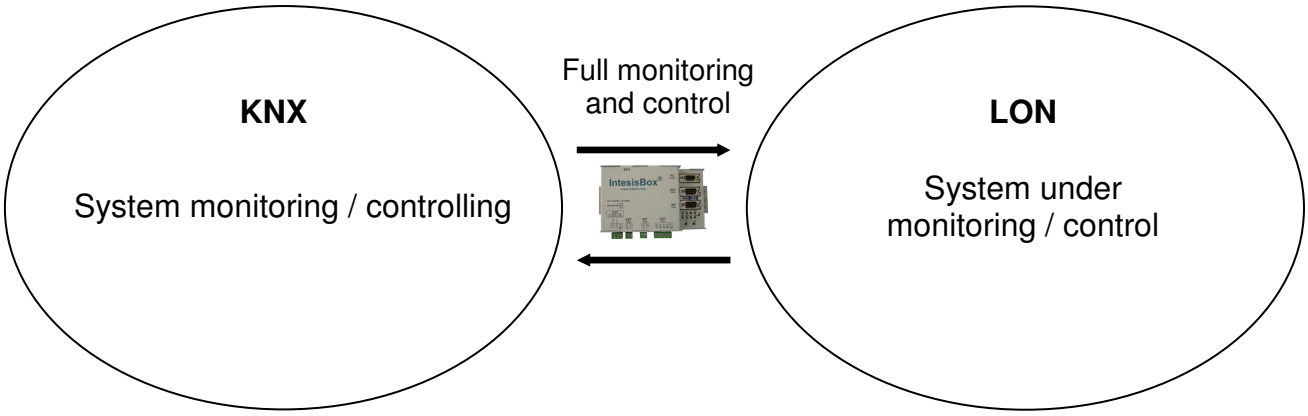


KNX control system:

- Building Automation.
- Home Automation.

Typical LON devices or Systems equipped with LON interface:

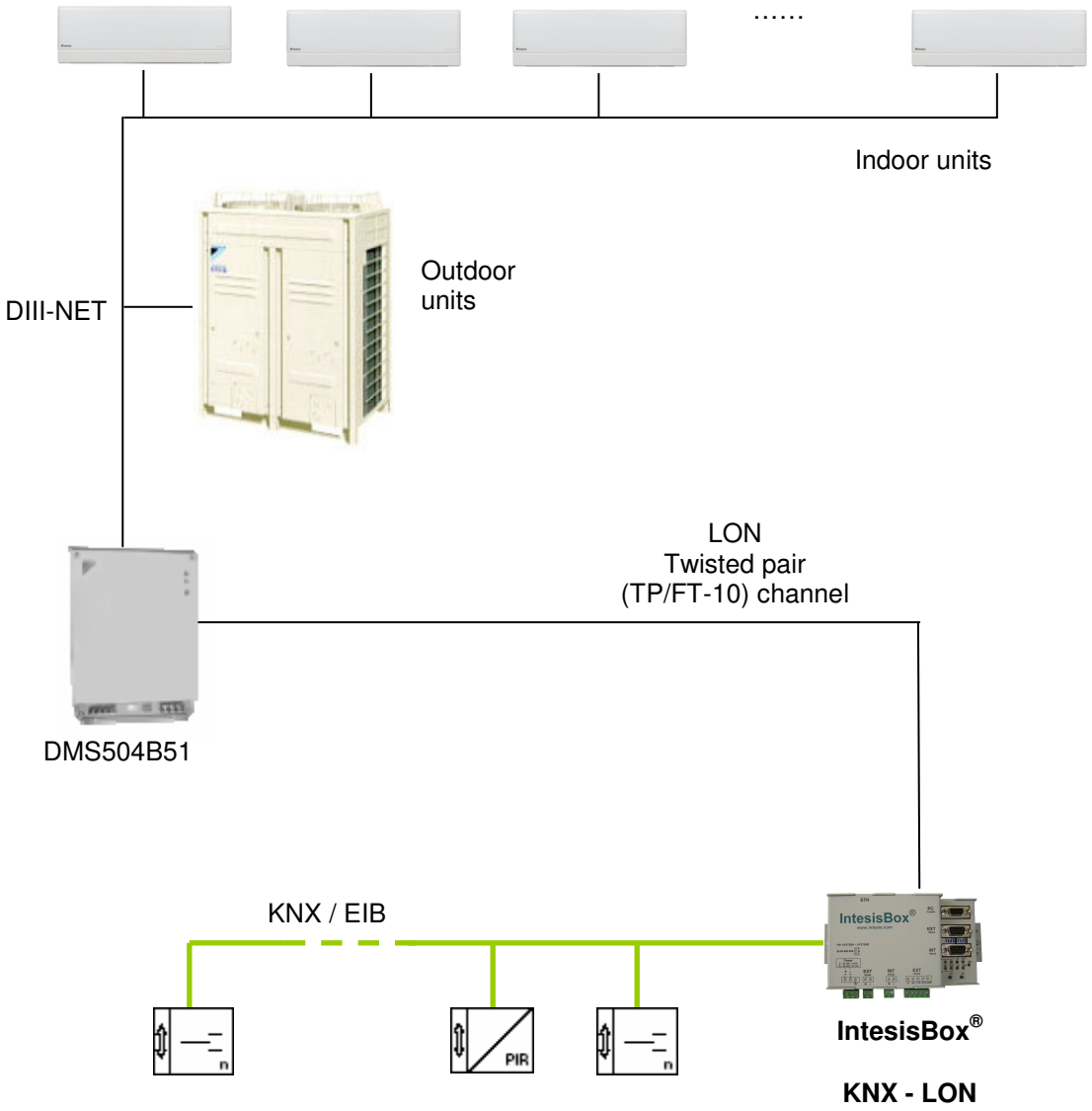
- Air conditioners (Daikin, Mitsubishi Electric, Mitsubishi Heavy, Toshiba, Fujitsu, General…).
- Chillers.
- Heaters.
- Thermostats.
- Fan coil controllers.
- Room controllers.
- Power meters.
- Energy meters.
- Building Control Systems (BMS).
- Programmable Logic Controllers (PLC).
- ...



Typical applications

Integration of Daikin VRV Air Conditioning into KNX control systems.

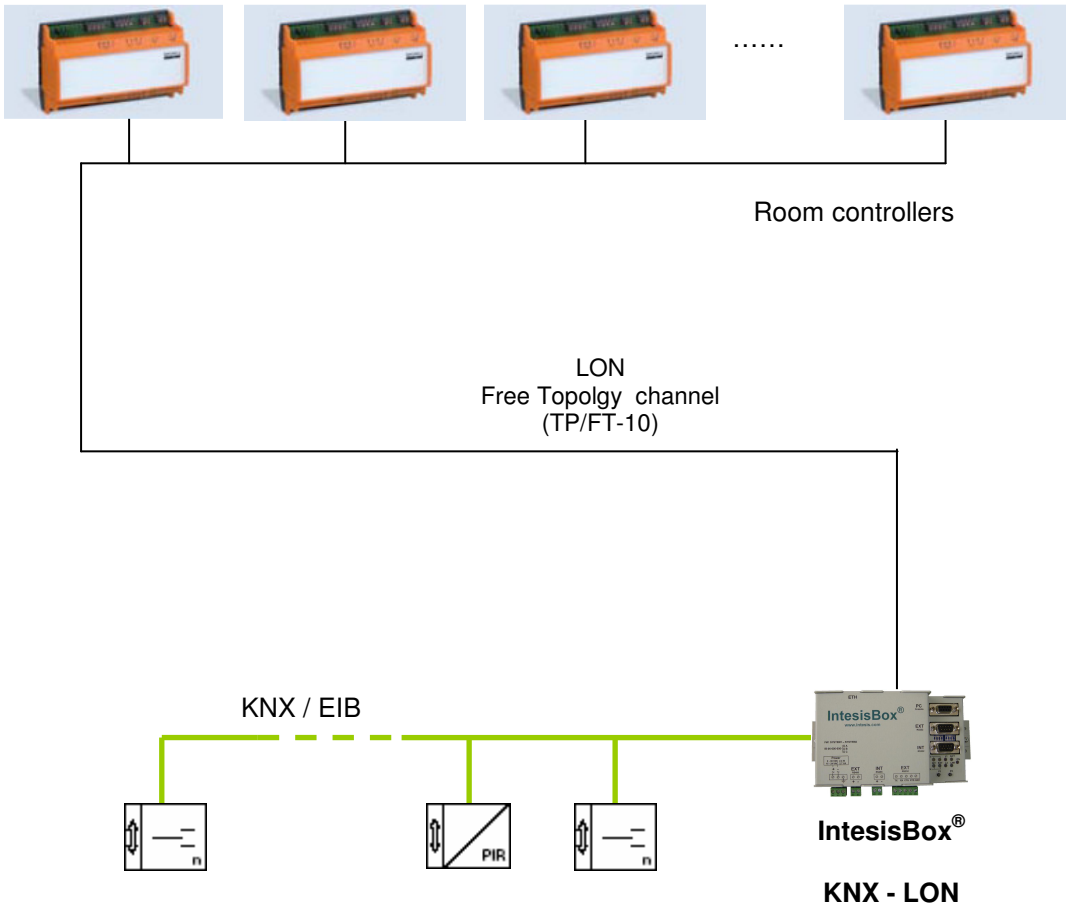
For this application, Daikin VRV Air Conditioning system must be equipped with Daikin LON gateway (model DMS504B51), this Daikin gateway is normally commissioned by Daikin technical personnel, contact your nearest Daikin distributor for details.



In the technical documentation of IntesisBox, supplied with the device, extended details on how to configure IntesisBox for this application are provided.

Also, with the standard installation of LinkBoxEIB, which is the configuration software tool for IntesisBox, a Demo project for this application is provided, this demo project contain specific configuration to integrate Daikin VRV equipped with DMS504B51 interface, using this sample project the configuration and commissioning of IntesisBox for this application becomes easy and quick.

Integration of LON room controllers into KNX control systems.



LON network variable interface for each particular LON room controller should be mapped into IntesisBox configuration. *LinkBoxEIB* software eases this task by providing a list of standard network variable types (SNVTs), with their respective fields, which can be assigned to each point.

User-defined network variable types (UNVTs) can also be integrated, by entering their particular definition (*a*, *b* and *c* scale factors, basic data types of its fields …) into *LinkBoxEIB* configuration files.

Each field of each network variable can be translated into a KNX data point, of any KNX-compatible type, at the KNX side of IntesisBox.

Field values for input and output network variables can be sampled periodically (from LON to KNX). Values for input network variables can also be written (from KNX to LON).

Configuration template files for every specific manufacturer/model of LON device to be integrated can be constructed and supplied on demand. With this, the configuration of the gateway becomes easy and quick. Consult us for details.

KNX interface of IntesisBox

KNX/EIB interface	
Bus coupler	Internal KNX TP1 (EIB) opto-isolated bus coupler unit for direct connection to EIB bus. Connector: 2 poles plug-in screw terminal block.
Configuration parameters	• Physical address.
Interactivity with KNX/EIB system	• When IntesisBox starts up, or after an EIB bus reset detection, all the updated values read from LON system will be sent to KNX. *Configurable individually per point.* • Any change detected in LON system (i.e. Ambient Temperature of a VRV group) is immediately transmitted to KNX. *Configurable individually per point.* • Any point value can be updated with a read request sent to KNX when IntesisBox starts up or after a KNX bus reset detection (i.e. Temperature Set Point). *Configurable individually per point.*
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 (16 bits). • Counter (32 bits). • Counter (8 bits). • ASCII char (8 bits).

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 KNX data points, if needed).

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

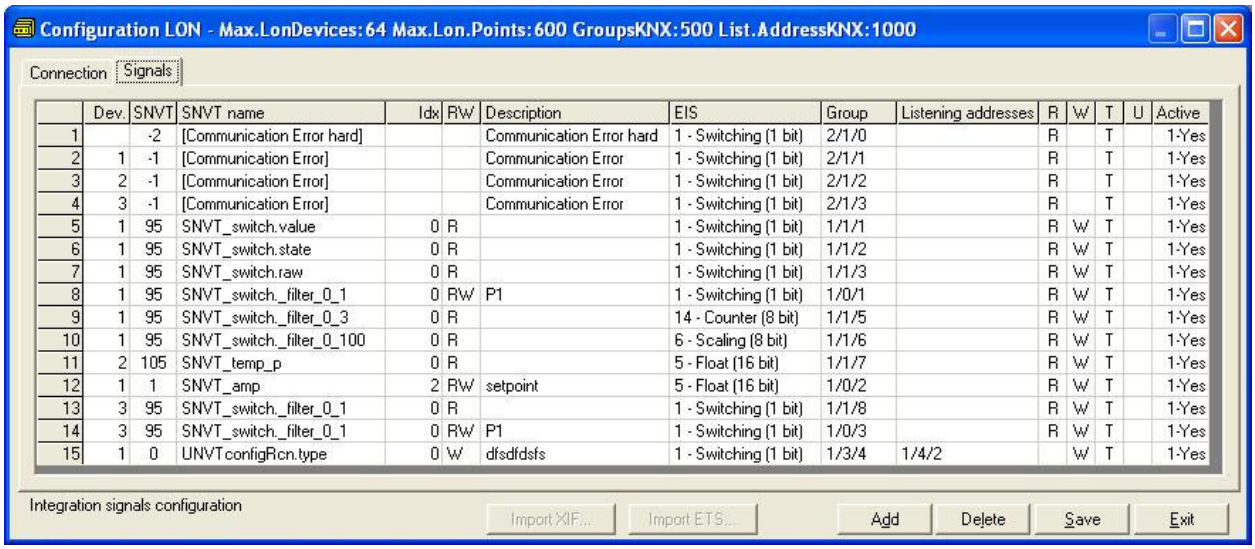
Supported basic LON data types

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 bitfield

Configuration tool

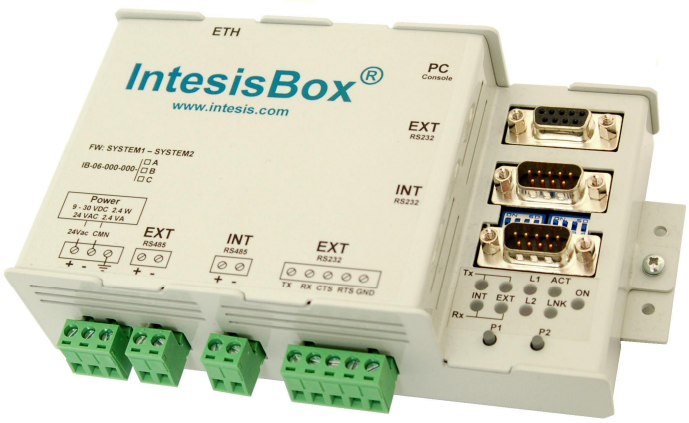
LinkBoxEIB	• Visual engineering tool, easy of use, for IntesisBox's configuration and monitoring compatible with Microsoft Windows operating systems, supplied with the purchase of IntesisBox with no additional cost. • Multi-window tool allowing to monitor simultaneously the communication activity with both protocols (systems), 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 the IntesisBox's parameters and internal points. • Point 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 (not connected to the gateway). • Connection to the IntesisBox for download the configuration and monitoring by using serial COM port of the PC (serial cable also supplied). • 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 having in the engineer's PC the configuration for all the sites with different IntesisBox® KNX series gateways. • 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 LinkBoxEIB, an embedded tool for import XIF files and ETS exported CSV files makes the configuration of the IntesisBox easy and quick.



	Dev.	SNVT	SNVT name	Idx	RW	Description	EIS	Group	Listening addresses	R	W	T	U	Active
1		-2	[Communication Error hard]			Communication Error hard	1 - Switching (1 bit)	2/1/0		R		T		1-Yes
2	1	-1	[Communication Error]			Communication Error	1 - Switching (1 bit)	2/1/1		R		T		1-Yes
3	2	-1	[Communication Error]			Communication Error	1 - Switching (1 bit)	2/1/2		R		T		1-Yes
4	3	-1	[Communication Error]			Communication Error	1 - Switching (1 bit)	2/1/3		R		T		1-Yes
5	1	95	SNVT_switch.value	0	R		1 - Switching (1 bit)	1/1/1		R	W	T		1-Yes
6	1	95	SNVT_switch.state	0	R		1 - Switching (1 bit)	1/1/2		R	W	T		1-Yes
7	1	95	SNVT_switch.raw	0	R		1 - Switching (1 bit)	1/1/3		R	W	T		1-Yes
8	1	95	SNVT_switch._filter_0_1	0	RW	P1	1 - Switching (1 bit)	1/0/1		R	W	T		1-Yes
9	1	95	SNVT_switch._filter_0_3	0	R		14 - Counter (8 bit)	1/1/5		R	W	T		1-Yes
10	1	95	SNVT_switch._filter_0_100	0	R		6 - Scaling (8 bit)	1/1/6		R	W	T		1-Yes
11	2	105	SNVT_temp_p	0	R		5 - Float (16 bit)	1/1/7		R	W	T		1-Yes
12	1	1	SNVT_amp	2	RW	setpoint	5 - Float (16 bit)	1/0/2		R	W	T		1-Yes
13	3	95	SNVT_switch._filter_0_1	0	R		1 - Switching (1 bit)	1/1/8		R	W	T		1-Yes
14	3	95	SNVT_switch._filter_0_1	0	RW	P1	1 - Switching (1 bit)	1/0/3		R	W	T		1-Yes
15	1	0	UNVTconfigRcn.type	0	W	dfsdfdsfs	1 - Switching (1 bit)	1/3/4	1/4/2		W	T		1-Yes

Mechanical & Electrical characteristics

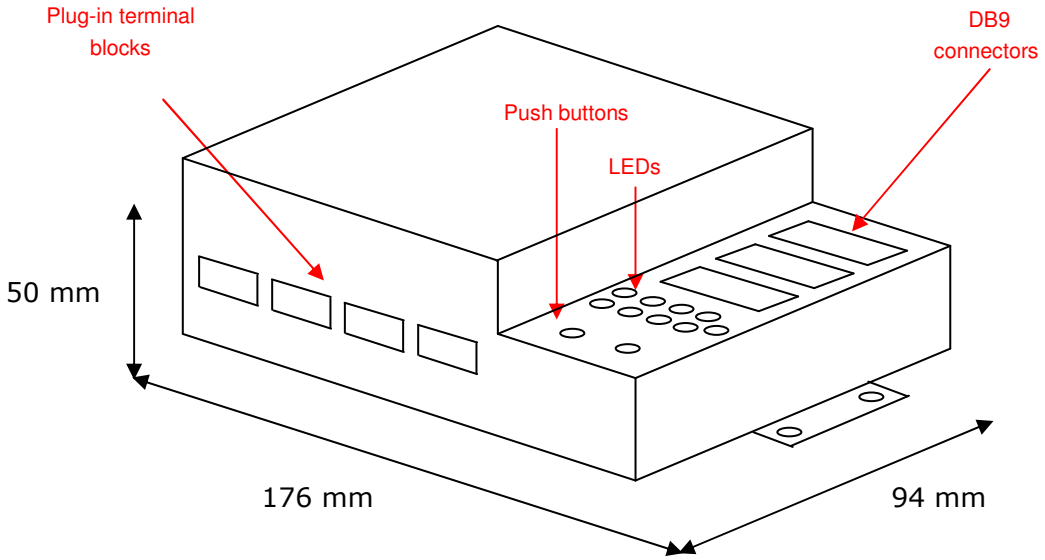


Envelope	Metallic (aluminium). Size: 176mm x 94mm x 50mm.
Color	Grey. RAL 7035.
Power	9 to 30Vdc +/-10% 2.4W. 24Vac +/-10% 2.4VA. Power connector is a 3 poles plug-in terminal block (power + earth).
Mounting options	Desktop Wall DIN rail EN60715 TH35 (using external adapters also supplied with the device).
Ports	1 x LON (TP-FT/10) (2 poles plug-in terminal block). 1 x KNX TP1 (EIB) (2 poles plug-in terminal block).
LED indicators	1 x Power. 2 x LON port activity (Tx, Rx). 2 x KNX port activity (Tx, Rx). 2 x generic use (L1, L2).[1]
Push buttons	2 x generic use (P1, P2).[1]
Console port	RS232. DB9 female (DCE).
Configuration	Via console port.[2]
Firmware	Allows upgrades via console port.
Operational temperature range	-40ºC to +70ºC
Operational humidity range	5% to 95%, non condensation
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.

Dimensions



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