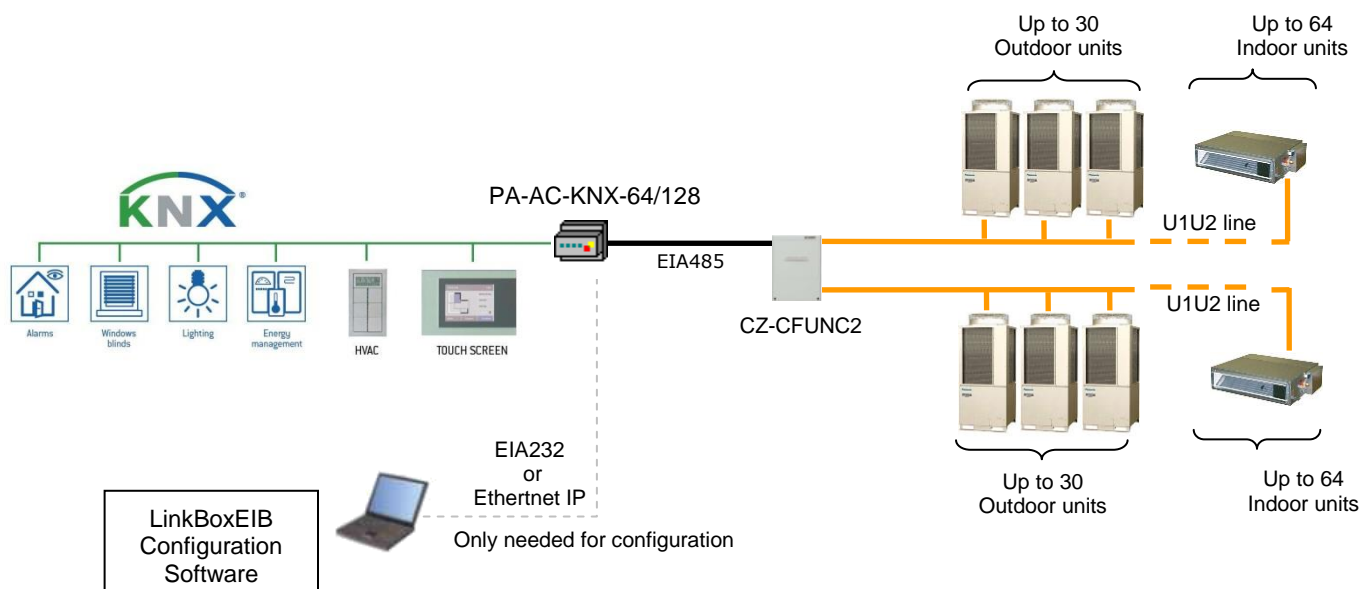# IntesisBox®
KNX – Panasonic Air Conditioners

Gateway for Panasonic ECOi and PACi system integration into KNX networks

IntesisBox is a KNX device, capable of monitoring and controlling Panasonic ECOi and PACi indoor units connected to a Panasonic CZ-CFUNC2 communication adaptor[1]. Up to 64 indoor units and 30 outdoor units can be integrated within a single channel. If you use both channels, up to 128 indoor units can be integrated.

IntesisBox simulates a KNX device and acts in the KNX system as another KNX device. The IntesisBox's KNX EIB interface connects directly to the EIB bus and is opto-isolated from the rest of the internal electronics.

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 of ECOi and PACi systems is also installed. Using this demo project makes the engineering needed for this integration easy and quick, almost plug&play.

There are two models of IntesisBox KNX – Panasonic:

- Model supporting up to 64 indoor units. Ref: PA-AC-KNX-64
- Model supporting up to 128 indoor units. Ref: PA-AC-KNX-128

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[1] CZ-CFUN2 is an accessory provided by Panasonic and should be acquired separately.

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1. IntesisBox capacity

Element	Capacity	Notes
Max Group Address	4000	Total number of KNX Groups that can be used in IntesisBox.

2. KNX Interface

| 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	• The points can be read from KNX. *Configurable individually per point.* • The points can be written from KNX. *Configurable individually per point.* • A write request can be sent to KNX following a change in the point's value. *Configurable individually per point.* • The point value can be updated with a read request sent to KNX when IntesisBox starts up or after bus reset detection. *Configurable individually per point.* • Multiple KNX group addresses can actuate on the same IntesisBox's point.
Points	
Configuration parameters per point	Generic fields. • Point description. Useful to identify the point's location into the Modbus system. • Active (Yes/No). Useful to deactivate points maintaining the configuration for later use. KNX/EIB related fields. • Group address (in format P/I/S or P/S). *Is the sending group address.* • Listening addresses (in format P/I/S or P/S separated by comma). The gateway will listen for write requests for these listening addresses, when received then it will act as if they were for the main group address defined. This is very useful to translate actions to the Panasonic system coming from different KNX commands, for example from an individual start/stop button and also from a general start/stop button. • R. Specifies if the point accepts read requests from KNX. • W. Specifies if the point accepts write requests from KNX. • T. Specifies if a write request will be sent to KNX when the point's value changes. • U. Specifies if the point's value must be updated with a read request sent to KNX when the gateway starts up or after a bus reset detection. *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.* • EIS (Datapoint). *See EIS supported below.* **The configuration of this part must be done in co-operation with the engineer in charge of setting up the whole KNX system. Some of the data to introduce in this part must be supplied by the KNX engineer.**
KNX EIS (Datapoints) supported	• Switching (1 bit) • Counter (8 bits) • Counter (16 bits) • Float (16 bits) • DPT 1.100 (1 bit) • DPT 20.105 (8bits)

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3. Panasonic Interface

Property	Datapoint Type	Flags				Description
		W	**R**	**T**	**U**	
On/Off	1 – Switching (1bit)	W	R	T		**Start/Stop AC Unit** 0 – OFF, 1 – ON
Operation Mode	EIS 14 (8bit)	W	R	T		**Operation Mode** 0 – Cool, 1 – Heat, 2 – Fan, 3 – Dry, 4 – Auto
	DPT 20.105 (8bit)	W	R	T		**Operation Mode** 0 – Auto, 1 – Heat, 3 – Cool, 9 – Fan, 14 – Dry
	DPT 1.100 (1bit)	W	R	T		**Operation Mode** 0 – Cool, 1 – Heat
Mode::Cool	1 – Switching (1bit)	W	R	T		0 – Inactive, 1 – Active
Mode::Heat	1 – Switching (1bit)	W	R	T		0 – Inactive, 1 – Active
Mode::Dry	1 – Switching (1bit)	W	R	T		0 – Inactive, 1 – Active
Mode::Fan	1 – Switching (1bit)	W	R	T		0 – Inactive, 1 – Active
Mode::Auto	1 – Switching (1bit)	W	R	T		0 – Inactive, 1 – Active

Only one of these objects will be set / read to "1" at the same time (all objects will be updated on bus upon a Mode change)

Property	Datapoint Type	W	R	T	U	Description
Set Temperature	EIS 5 – Float (2byte)	W	R	T		Temperature Set Point (only integer numbers allowed) -15..60 ºC
Fan Speed	14 – Counter (8bit)	W	R	T		**AC Fan Speed** 0 – Auto, 1 – Low, 2 – Mid, 3 – High
FanSpeed::Auto	1 – Switching (1bit)	W	R	T		0 – Inactive, 1 – Active
FanSpeed::Low	1 – Switching (1bit)	W	R	T		0 – Inactive, 1 – Active
FanSpeed::Mid	1 – Switching (1bit)	W	R	T		0 – Inactive, 1 – Active
FanSpeed::High	1 – Switching (1bit)	W	R	T		0 – Inactive, 1 – Active

Only one of these objects will be set / read to "1" at the same time (all objects will be updated on bus upon a FanSpeed change)

Property	Datapoint Type	W	R	T	U	Description
Air Direction	14 – Counter (8bit)	W	R	T		**AC Air Direction** 0 – Horizontal …. 4 – Vertical; 5 – Swing
Filter Sign	1 – Switching (1bit)		R	T		**Filter status** 0 – No alarm, 1 – Filter sign present
Filter Sign clear	1 – Switching (1bit)	W		T		**Filter Alarm Reset** 1 – Filter sign reset
Error Code	10 – Counter (16bit)		R	T		**Error Code** More info in User Manual
Room Temperature	EIS 5 – Float (2byte)		R	T		**Room Temperature (only integer numbers)** Read: -35ºC to 92ºC
IU Exist	1 – Switching (1bit)		R	T		**Indoor Unit present in the System** 0 – Not present, 1 – Present
RC Prohibition OnOff	1 – Switching (1bit)	W	R	T		**Remote Control Enablement / Disablement** 0 – Remote control enabled, 1 – Remote control disabled
RC Prohibition Mode	1 – Switching (1bit)	W	R	T		**Remote Control Enablement / Disablement** 0 – Remote control enabled, 1 – Remote control disabled
RC Prohibition SetPoint	1 – Switching (1bit)	W	R	T		**Remote Control Enablement / Disablement** 0 – Remote control enabled, 1 – Remote control disabled
RC Prohibition FanSpeed	1 – Switching (1bit)	W	R	T		**Remote Control Enablement / Disablement** 0 – Remote control enabled, 1 – Remote control disabled
RC Prohibition AirDirection	1 – Switching (1bit)	W	R	T		**Remote Control Enablement / Disablement** 0 – Remote control enabled, 1 – Remote control disabled

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4. Configuration tool

LinkBoxEIB	• Visual engineering tool, ease 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 operation 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 IntesisBox in the field.
	• Connection to the IntesisBox for configuration downloading and signals monitoring using a 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 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 IntesisBox, for debugging and adjust purposes (Reset, Date/time consultation/adjust, Firmware version request…).

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5. Mechanical & Electrical characteristics

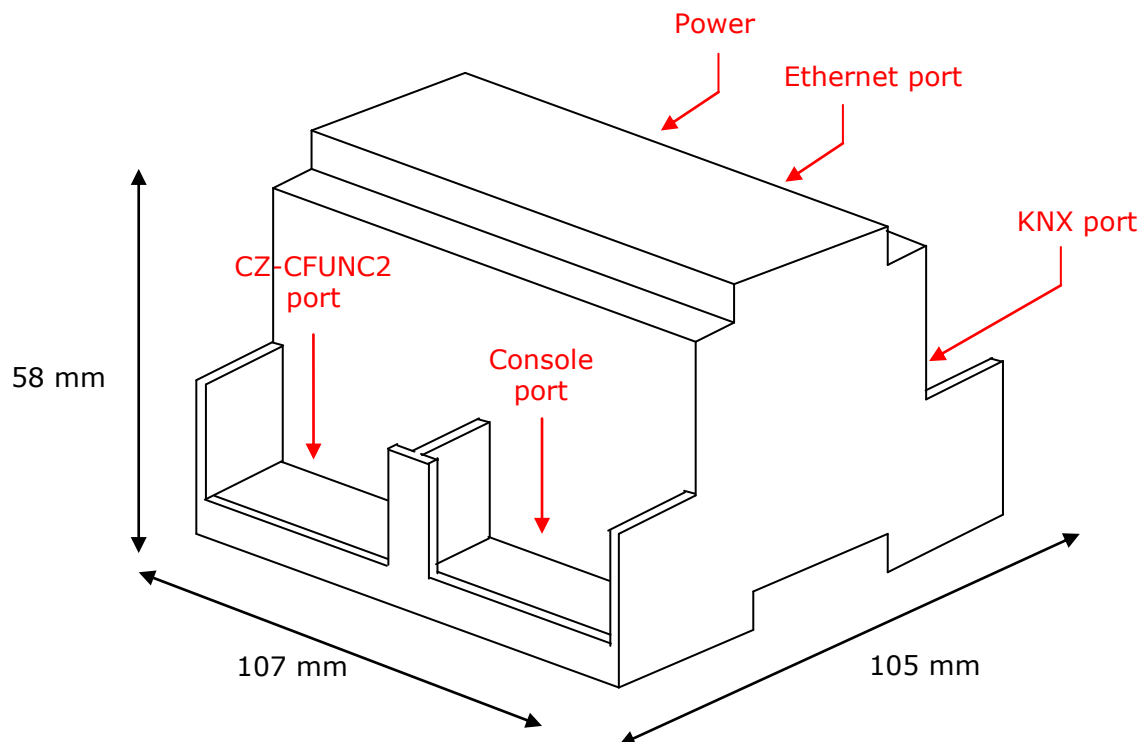|	
Enclosure	Plastic, type PC (UL 94 V-0). Dimensions: 107mm x 105mm x 58mm.
Color	Light Grey / RAL 7035.
Power	9 to 30Vdc +/-10%, Max.: 125mA. 24Vac +/-10% 50-60Hz, Max.: 127mA Must use a NEC Class 2 or Limited Power Source (LPS) and SELV rated power supply. Plug-in terminal block for power connection (2 poles).
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
Mounting	Wall. DIN rail EN60715 TH35.
KNX port	1 x KNX TP1 (EIB) opto-isolated (Plug-in screw terminal block 2 poles).
Ethernet port	1 x Ethernet 10Base-T (RJ45)
CZ-CFUNC2 port	1 x EIA485 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)
Console port	EIA232. (DB9 female connector, DCE). SELV
Configuration	Via console port[2].
Firmware	Allows upgrades via console port.
Operational temperature	0°C to 40°C
Operational humidity	5 to 95%, non condensing
Protection	IP20 (IEC60529).
RoHS conformity	Compliant with RoHS directive (2002/95/CE).
Norms and standards	CE conformity to EMC directive (2004/108/EC) and Low-voltage directive (2006/95/EC) EN 61000-6-2 ; EN 61000-6-3 ; EN 60950-1 ; EN 50491-3

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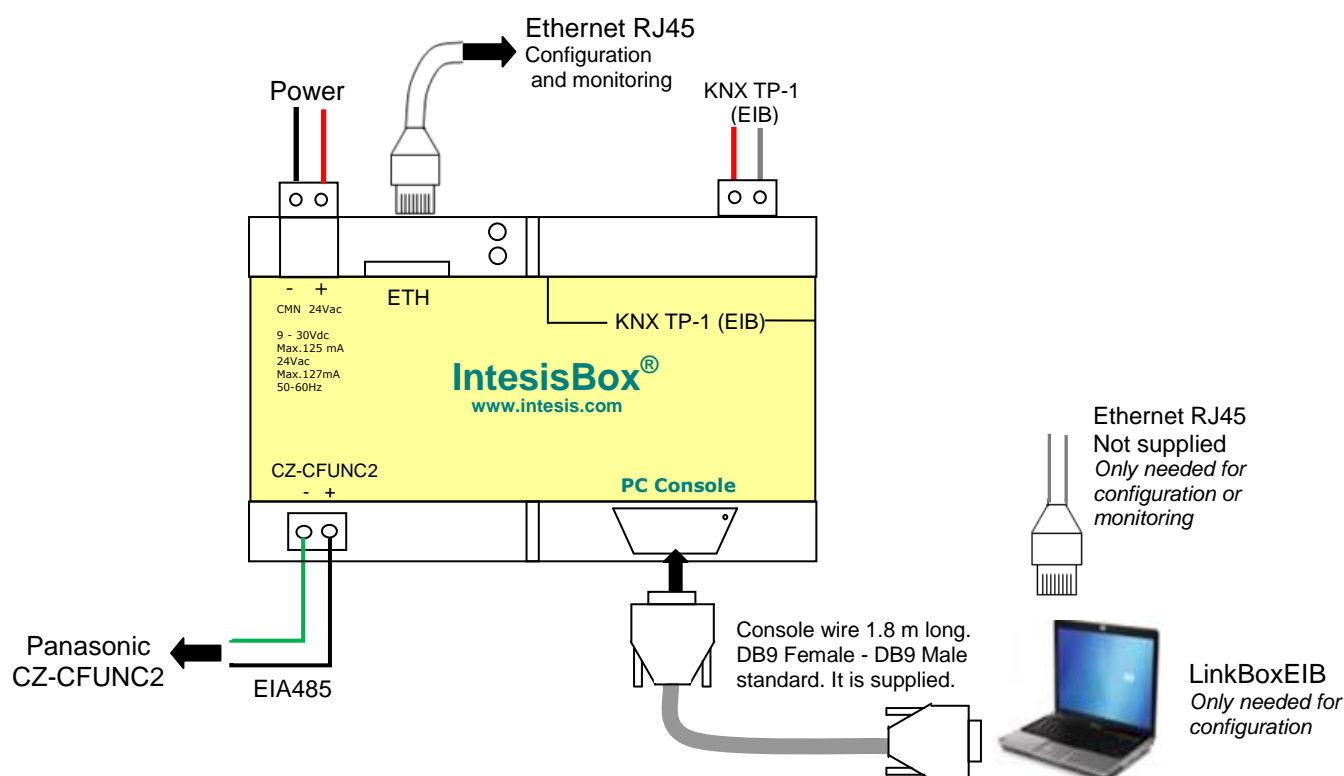
[2] Standard cable DB9male-DB9female 1,8 meters long is supplied with the device for connection to a PC COM port for configuring and monitoring the device. The configuration software, compatible with Windows® operating systems, is also supplied.

Intesis software

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6. Dimensions

External dimensions

Power

Ethernet port

KNX port

CZ-CFUNC2 port

Console port

58 mm

107 mm

105 mm

Free space recommended in the install location of the device, with spacing enough for external connections.

100 mm

115 mm

130 mm

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