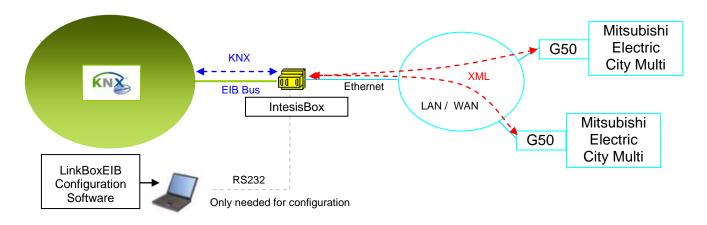# IntesisBox®

KNX - Mitsubishi Electric G50

Gateway for integration of Mitsubishi Electric City Multi air conditioners into KNX control systems.

Integrate Mitsubishi Electric City Multi Air Conditioning systems into KNX.

This integration requires the Mitsubishi Electric City Multi AC system be equipped with the Mitsubishi Electric G-50A, GB-50A or AG-150A gateway. This gateway from Mitsubishi Electric offers the signals of the City Multi AC system through XML protocol. Every G50 (G-50A, GB-50A or AG-150A) allows access to the signals of up to 50 A.C. indoor units and 50 groups of indoor units, no matter the number of outdoor units installed. In the G50, the group is the control unit, every group can have from 1 to 16 associated indoor units. This integration monitors and control groups, not indoor units, although if only one indoor unit is associated to each group then you can monitor and control indoor units individually. This G50 gateway is supplied by Mitsubishi Electric. Contact your nearest Mitsubishi Electric distributor for details.

The G50 interface of IntesisBox

IntesisBox® can *talk* to up to 2 Mitsubishi Electric G50s using XML protocol and offers the signals of all these City Multi groups through its KNX EIB interface, allowing up to 100 groups of air conditioners to be integrated into KNX. The AG-150A can be used with Expansions Cards as explained in the section IntesisBox capacity

The KNX interface 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.

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 of G50 devices is also installed, using this demo project makes the engineering needed for this integration easy and quick, almost plug&play.*

URL	http://www.intesis.com
email	info@intesis.com
tel	+34 938047134

IntesisBox capacity

Element	Capacity	Notes

Num. of G50	2	Number of independent G50 interfaces
		    2 x G-50A / GB-50A
		    2 x AG150 (without Expansion Controllers)
		    1 x AG150 (with 2 Expansion Controllers)

Number of City Multi groups: Number of G50 x 50	100	Maximum number of groups of AC indoor units that can be controlled.
Number of KNX Groups	5902	Maximum number of KNX Groups that can be used in IntesisBox.
Number of listening addresses	2000	Maximum number of KNX groups that can be used as *listening addresses*.
Number of listening addresses per KNX Group.	255	Maximum number of listening addresses that can be associated to a KNX group address.

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

- Basic version with capacity of one G50 and 15 City Multi groups. *Ref.: ME-AC-KNX-15*
- Extended version with capacity of two G50s and 100 City Multi groups. *Ref.: ME-AC-KNX-100*

⚠️ **NOTE:** Please, remember that Mitsubishi Electric AG-150A requires a software license, PC-Monitoring license (SW-Mon), that has to be purchased together with the AG-150A gateway.

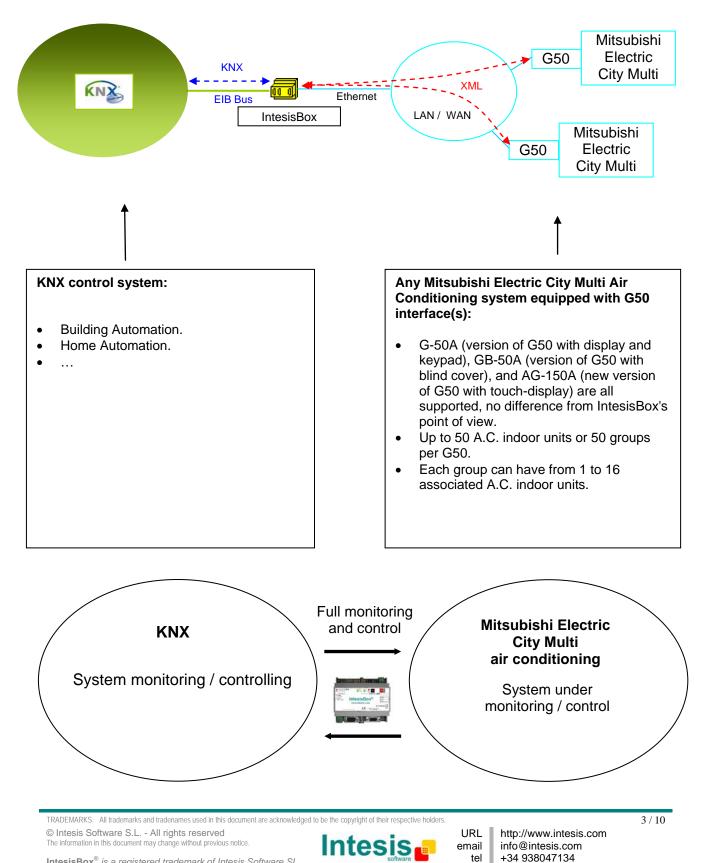|	
URL	http://www.intesis.com
email	info@intesis.com
tel	+34 938047134

Sample applications

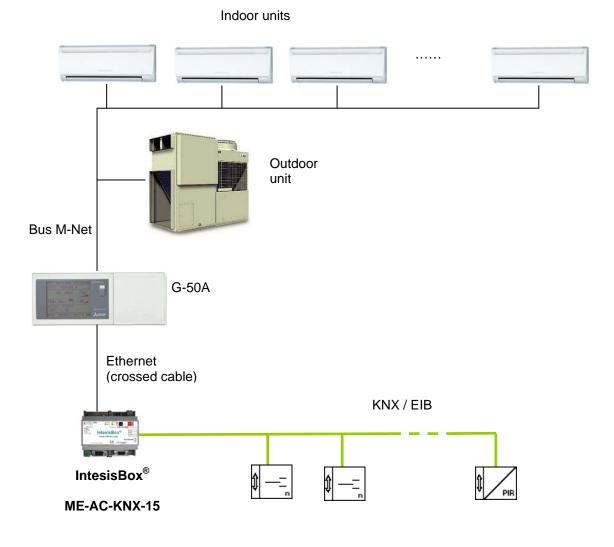**Integration of any Mitsubishi Electric City Multi Air Conditioning system equipped with G50 interface into KNX control systems.**

KNX control system:

- Building Automation.
- Home Automation.
- …

Any Mitsubishi Electric City Multi Air Conditioning system equipped with G50 interface(s):

- G-50A (version of G50 with display and keypad), GB-50A (version of G50 with blind cover), and AG-150A (new version of G50 with touch-display) are all supported, no difference from IntesisBox's point of view.
- Up to 50 A.C. indoor units or 50 groups per G50.
- Each group can have from 1 to 16 associated A.C. indoor units.

KNX

System monitoring / controlling

Full monitoring and control

Mitsubishi Electric City Multi air conditioning

System under monitoring / control

URL | http://www.intesis.com
email | info@intesis.com
tel | +34 938047134

Typical application

Full monitoring and control of a Mitsubishi Electric City Multi Air Conditioning system from KNX.

Indoor units

……

Outdoor unit

Bus M-Net

G-50A

Ethernet (crossed cable)

KNX / EIB

IntesisBox®

ME-AC-KNX-15

URL | http://www.intesis.com
email | info@intesis.com
tel | +34 938047134

KNX/EIB interface of IntesisBox

General	
Max. Number of Mitsubishi Elec.G50s	Up to 2 G50s (up to 100 groups) are supported.
Virtual signals	• One communication error virtual signal per every G50 device defined. • One communication error virtual signal per every group into the G50 device. All these virtual signals also available from KNX.
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 bloc.
Configuration parameters	• Physical address.
Interactivity with KNX/EIB system	• All the signals per group and functionality offered by the G50 are directly available from KNX. • When IntesisBox starts up, or after a KNX bus reset detection, all the current values read from the G50 will be sent to KNX. *Configurable individually per point.* • Any change detected in Mitsubishi Electric system (i.e. Ambient Temperature of a group) is immediately transmitted to KNX. *Configurable individually per point.* • Any point's 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.* • Multiple KNX group addresses can actuate on the same IntesisBox's point. • Mode, Air Direction, Fan Speed, and Ventilation of each G50 group allow extended functionality for monitoring/control (*Multibit* feature), they can be monitored/controlled from KNX using objects of type EIS6 (Value 8bits) (i.e. writing the value corresponding to the Mode desired: 0, 1, 2, 3…) or also using simpler objects of type EIS1 (switching) (i.e. one different object per each possible Mode: Cool, Heat…). This allows for example to fix a given Mode or Fan Speed using a simple switching object.
Points	
Parameters configurable per point	G50 related fields. • Active (Yes/No). Useful to deactivate G50 points not wanted to be accessible from KNX. 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). IntesisBox will listen for KNX write requests of these listening addresses, when received then it will act as if they where for the sending group address defined. This is very useful to translate actions to the Mitsubishi Electric 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 a read request will be sent to KNX to get the current value when the IntesisBox starts up or after a KNX bus reset detection.
KNX EIS (Datapoints)	Each point has a predefined and fixed KNX EIS associated according to the type of signal in the air conditioner.

URL	http://www.intesis.com
email	info@intesis.com
tel	+34 938047134

G50 interface of IntesisBox

G50 interface	
Device type	Client.
Configuration Parameters	Polling interval (1..600 seconds). Per each G50 defined: • Descriptive name. • IP address. • TCP port.

Signals available from KNX per each Mitsubishi Electric City Multi A.C. indoor unit or group of indoor units.

Property	Description / Status
Drive	**Start/Stop** Read/Write: ON, OFF
Mode[1]	**AC Mode** Read/Write: COOL, DRY, FUN, HEAT, AUTO, HEAT RECOVERY, LC_AUTO, BYPASS Read: AUTO HEAT, AUTO COOL
SetTemp[1]	**Temperature Set Point** (only integer numbers allowed) *Read/Write:* If the option of virtual SetPoint Temperature is deactivated (see in section 3.3 of this document). *Write:* If the option of virtual SetPoint Temperature is activated, to be configured from extern KNX sensor (see in section 3.3 of this document). For COOL or DRY mode:19..30 ºC, for HEAT mode: 17..28 ºC, for AUTO mode:19..28 ºC)
AirDirection	**Air output direction** Read/Write: HORIZONTAL, MID1, MID2, VERTICAL, SWING
FanSpeed	**AC fan speed or LOSSNAY** Read/Write: HIGH, MIDH, MIDL, LOW
RemoCon	**Prohibition for General control from the local panel** Read/Write: PROHIBIT, PERMIT
DriveItem	**Prohibition for ON/OFF control from the local panel** Read/Write: CHK_ON, CHK_OFF
ModeItem	**Prohibition for Mode control from the local panel** Read/Write: CHK_ON, CHK_OFF
SetTempItem	**Prohibition for Set Point control from the local panel** Read/Write: CHK_ON, CHK_OFF
FilterItem	**Prohibition for Filter Reset control from the local panel** Read/Write: CHK_ON, CHK_OFF
Ventilation	**Operational status for LOSSNAY or OA** Read/Write: HIGH, LOW, OFF
FilterSign	**Status for Filter Dirty** Read: ON, OFF Write: RESET
ErrorSign	**Error status** Read: ON, OFF Write: RESET

[1] PWFY units have a different mode and setTemp map explained in the signals column in LinkBoxEIB (section 3.4 in the User Manual)

URL | http://www.intesis.com
email | info@intesis.com
tel | +34 938047134

InletTemp	**Ambient Temperature** ***Read/Write:*** If the option of virtual SetPoint Temperature is deactivated (see in section 3.3 of this document). ***Write:*** If the option of virtual SetPoint Temperature is activated, to be measured from extern KNX sensor (see in section 3.3 of this document). Range: 0.0 to 99.9
G50 Communication Error	**Communication error with G50** Virtual signal generated by IntesisBox to indicate the status of the communication with the G50.
Group Communication Error	**Group communication error** Virtual signal generated by IntesisBox to indicate that the group is not configured into the G50.

URL	http://www.intesis.com
email	info@intesis.com
tel	+34 938047134

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. - 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 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 (not connected to the IntesisBox). - 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…).

URL	http://www.intesis.com
email	info@intesis.com
tel	+34 938047134

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 pole plug-in screw terminal bloc.
Mounting options	Wall DIN rail EN60715 TH35.
KNX (EIB) port	1 x KNX TP1 (EIB) opto-isolated (Plug-in screw terminal block 2 poles).
G50 port	1 x Ethernet 10BT RJ45 connector.
LED indicators	1 x Power. 2 x KNX port activity (Tx, Rx). 2 x Ethernet port (LNK, ACT). 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 range	0°C to +70°C
Operational humidity range	5% to 95%, non condensing
Protection	IP20 (IEC60529).
RoHS conformity	Compliant with RoHS directive (2002/95/CE).
Certifications	CE

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

Dimensions
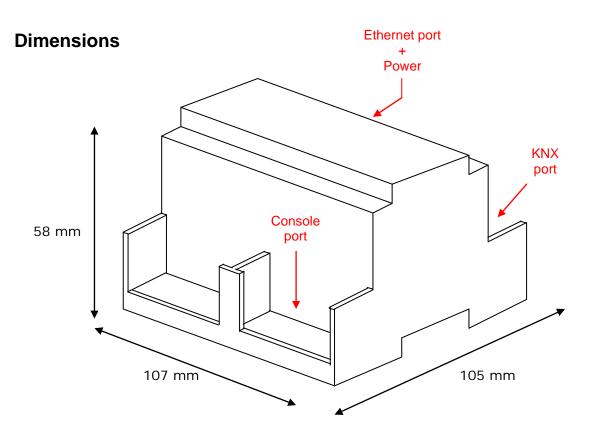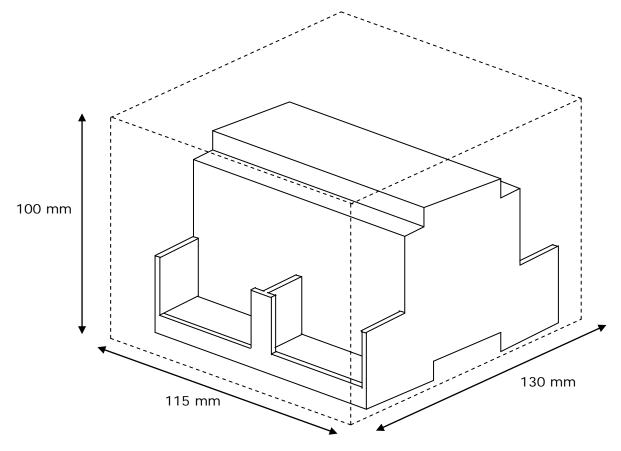
Ethernet port
+
Power

KNX
port

58 mm

Console
port

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

130 mm

115 mm

URL | http://www.intesis.com
email | info@intesis.com
tel | +34 938047134