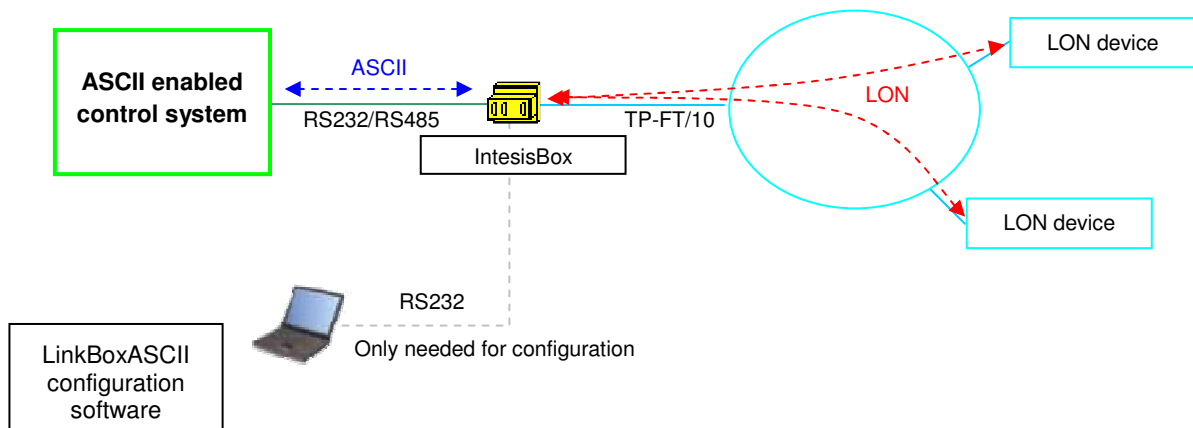# IntesisBox®
ASCII Server - LON

Gateway for integration of LON devices into ASCII enabled control systems.

Integrate Air Conditioning from the main manufacturers (DAIKIN, Mitsubishi Electric, Mitsubishi Heavy Industries, LG electronics, Toshiba, Fujitsu General…) equipped with LON interface into your ASCII enabled control system (AMX, Crestron, LiteTouch…) "talking" simple ASCII messages.

LON interface of IntesisBox reads continuously LON devices configured by polling. All the updated readings are maintained in IntesisBox's memory for immediate interaction with the ASCII system when requested. *Points in LON can be read and written easily from the ASCII controller device. Each LON basic data type of network variables in LON devices can be mapped into an individual internal register, accessible through ASCII messages.*

IntesisBox can be configured to notify to the ASCII controller whatever change of value detected for a point by means of spontaneous messages sent through the ASCII interface, configurable individually per point (no need of continuous polling by the ASCII controller). *ASCII interface of IntesisBox uses serial RS232 communication (baud rate configurable).*

IntesisBox has the ability to declare devices as commissioned, if needed, thus <u>avoiding the need for a LON integration tool for commissioning</u>. *LON devices can be addressed either using Neuron-Id (physical address) or subnet/node for commissioned networks.*

The configuration of the IntesisBox is done with *LinkBoxASCII*, a friendly software configuration tool for Windows® supplied along with IntesisBox with no additional cost. *With the installation of LinkBoxASCII, 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
email	info@intesis.com
tel	+34 938047134

IntesisBox capacity

Element	Max. (Basic version)	Max. (Extended version)	Notes
Type of LON devices			Those supporting *Free Topology* channel (FT-10)
Supported number of LON network variable fields	500	4000	Maximum number of points (ASCII registers) that can be defined into IntesisBox. Each of them can contain an individual field from a LON network variable.
Supported number of LON devices	64	128	Maximum number of different LON devices that can be defined into IntesisBox (to read/write points into them).

There are two different models of *IntesisBox® ASCII Server - LON* with different capacity each one.

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

Intesis software

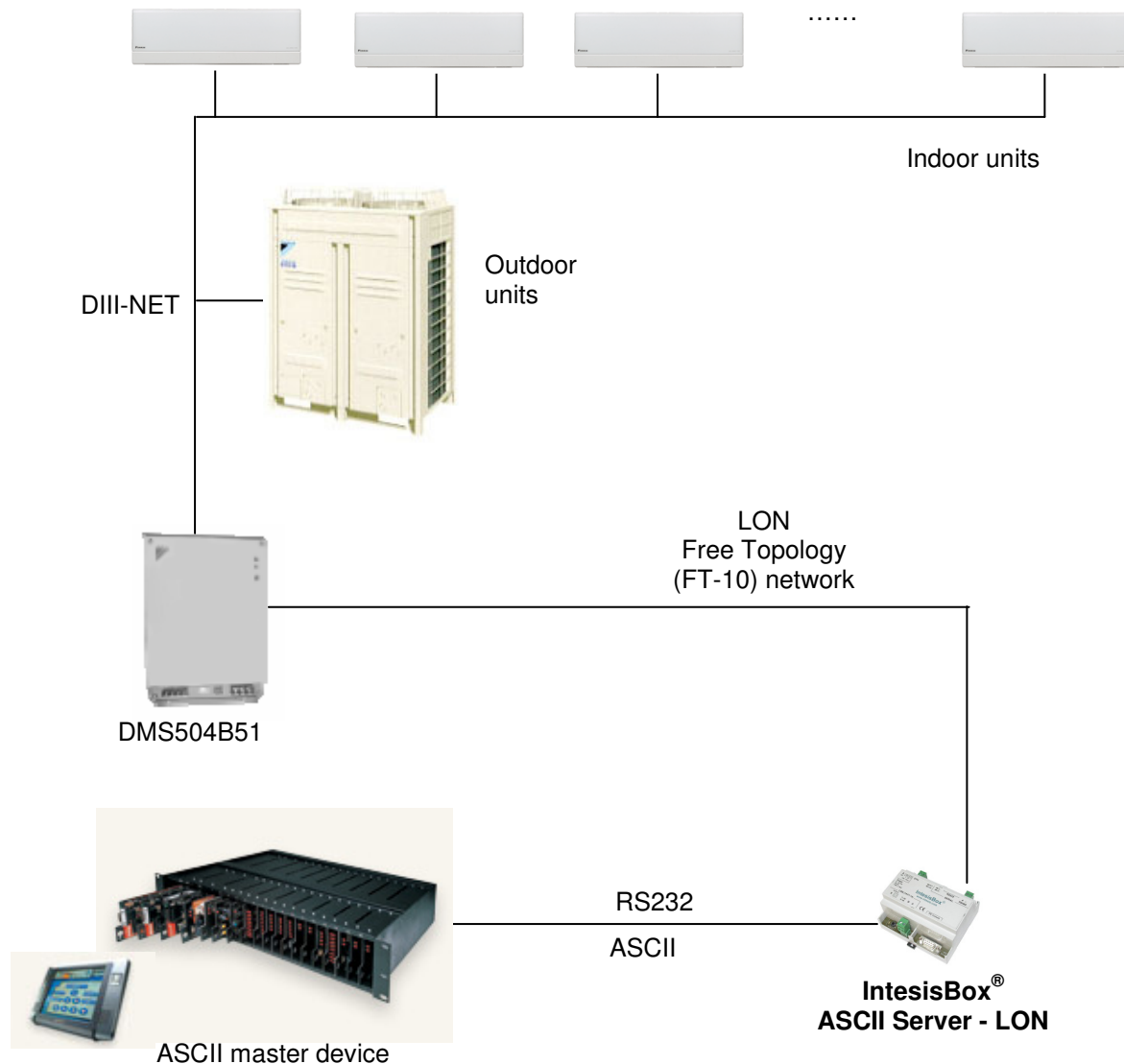URL | http://www.intesis.com
email | info@intesis.com
tel | +34 938047134

Sample applications

Integration of any LON device or system into ASCII enabled control systems.

Control system with ASCII master interface.

- BMS.
- SCADA.
- PLC.
- AMX.
- Crestron.
- LiteTouch.
- …

Typical LON devices or Systems equipped with LON interface:

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

ASCII

System supervising / controlling

Full supervision and control

LON

System under supervision / control

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

Typical applications

Integration of Daikin VRV Air Conditioning into ASCII enabled 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.

Indoor units

Outdoor units

DIII-NET

LON
Free Topology
(FT-10) network

DMS504B51

RS232
ASCII

**IntesisBox®
ASCII Server - LON**

ASCII master device

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

Also, if you are interested in this kind of application, Intesis Software can provide you sample projects for IntesisBox, these sample projects contain specific configuration to integrate any brand of air conditioning with LonWorks connectivity, with these sample projects the configuration and commissioning of IntesisBox for this kind of application becomes easy and quick, almost plug & play.

Intesis software

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

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 ASCII messages are always of fix format and associated to point's internal addresses, no matter the parameters of the LON SNVT associated.

This means that there is no need to change the ASCII controller program whenever the LON configuration changes. When this happens just change the configuration of the gateway and that's all, the ASCII controller programming 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 LON, 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 actual 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**)

Intesis software

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

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 ASCII datapoints, if needed).

Supported network variable types:
- All standard network variable types published by LonMark International are directly supported by configuration tool, *LinkBoxASCII*.
- Support for user-defined network variable types can be added in each case, by entering their definition in *LinkBoxASCII*. 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 bitfield

Configuration tool

LinkBoxASCII	• Visual engineering tool, easy of use, for gateway's configuration and supervision compatible with Microsoft Windows operating systems, supplied with the gateway free of charge.
	• Multi-window tool allowing to supervise simultaneously the communication activity with both protocols (systems), real time values for all the signals allowing to modify any value (very useful for test purposes), console window showing debug and working status messages, and configuration windows to configure all the gateway's parameters and signals.
	• Signals 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 gateway's parameters and signals while in off-line (not connected to the gateway).
	• Connection to the gateway for download the configuration and supervision by using serial COM port of the PC (serial cable supplied with the gateway).
	• Allows configuring all the external protocols available for IntesisBox® ASCII series.
	• Upgrades for this software tool available free of charge whenever a new protocol is added to the IntesisBox® ASCII series.
	• Multi-project tool allowing having in the engineer's PC the configuration for all the sites with different IntesisBox® ASCII 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 gateway for debugging and adjust purposes (Reset, Date/time consultation/adjust, Firmware version request…).

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

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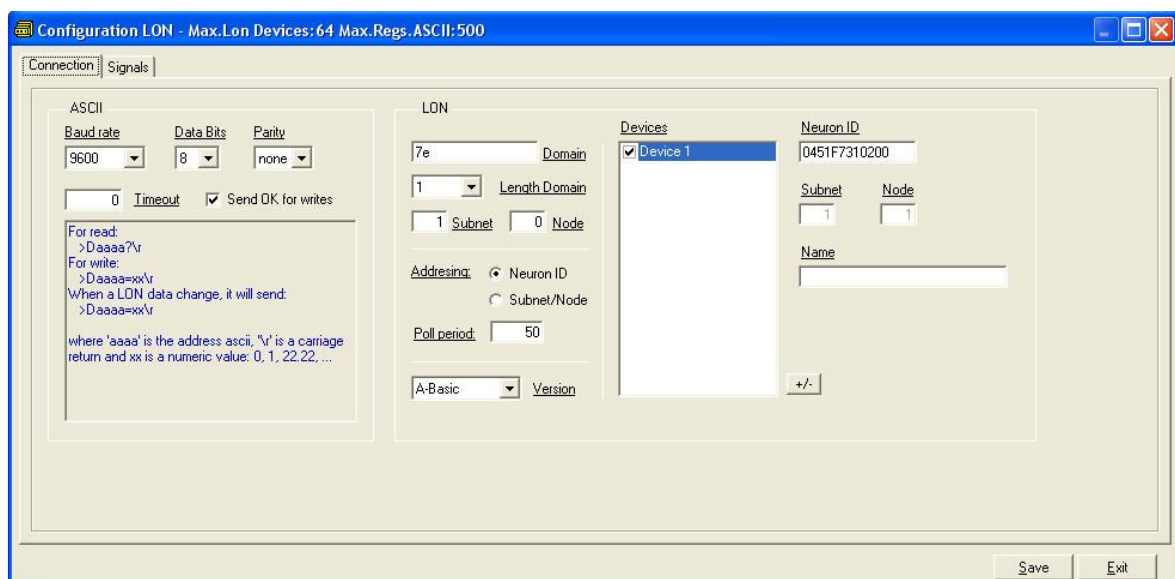
Technical characteristics

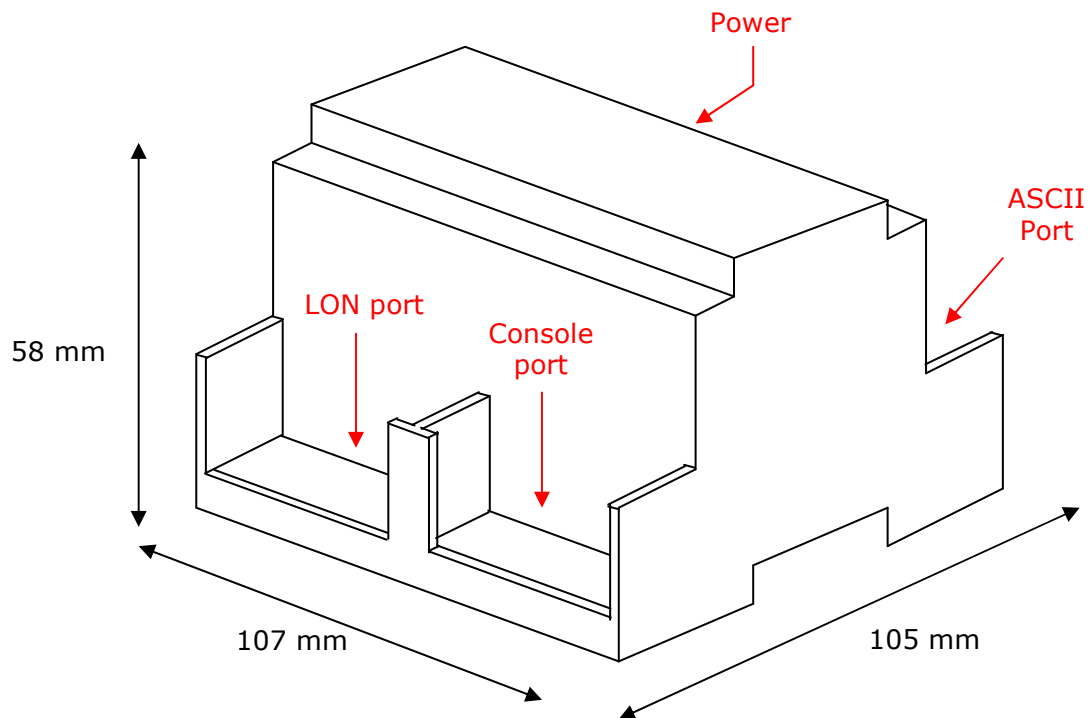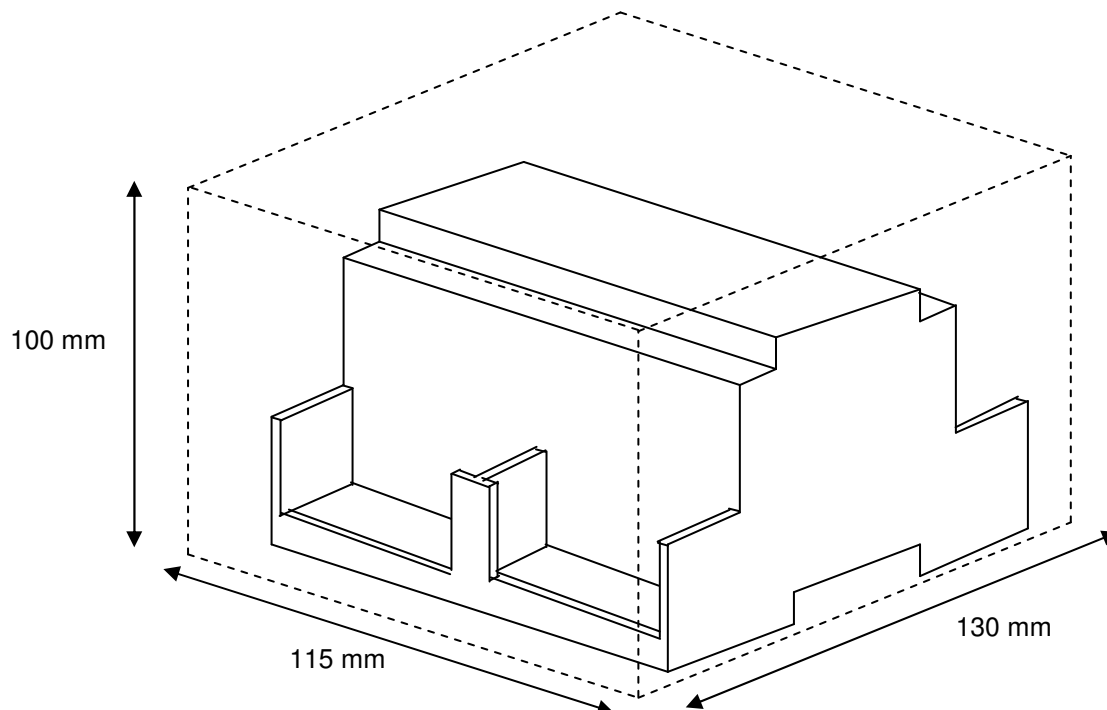|	
Envelope	Plastic, type PC (UL 94 V-0). Size: 107mm x 105mm x 58mm.
Color	Grey. RAL 7035.
Power	9 to 30Vdc +/-10% 1.4W. 24Vac +/-10% 1.4VA. Power connector is a 2 poles plug-in terminal block.
Mounting options	Wall DIN rail EN60715 TH35.
ASCII port	1 x Serial RS232 (DB9 male DTE).
LON Port	1 x LON (TP-FT/10) (2 poles plug-in screw terminal block).
LED indicators	1 x Power. 2 x LON port activity (Tx, Rx). 2 x ASCII port activity (Tx, Rx). 1 x LON Service.[1]
Push buttons	1 x LON Service.[1]
Console port	RS232. DB9 female connector (DCE).
Configuration	Via console port.[2]
Firmware	Allows upgrades via console port.
Functional temperature range	-25°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.

Intesis software

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

Dimensions

External dimensions:

Power

ASCII Port

LON port

Console 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

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