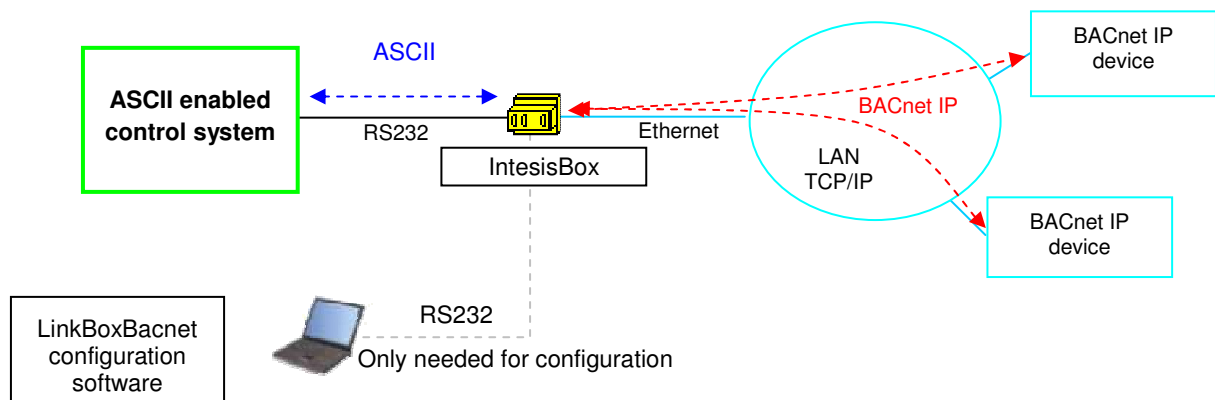# IntesisBox®

ASCII Server - BACnet/IP Client

Gateway for integration of BACnet IP devices into ASCII enabled control systems.

Integrate Daikin VRV Air Conditioners into your ASCII enabled control system (AMX, Crestron, LiteTouch…) "talking" simple ASCII messages.

Points in BACnet can be read/written from an ASCII enabled control system using simple text messages. IntesisBox is a BACnet IP client device allowing read/write points of other BACnet IP device(s) connected to a BACnet network, and offering these point's values through its ASCII interface. ASCII interface of IntesisBox uses serial RS232 communication (baud rate configurable). *For this application Daikin VRV system must be equipped with Daikin BACnet gateway DMS502B51.*

BACnet interface of IntesisBox supports reading of other BACnet devices by continuous polling or by subscription requests (COV). *All the updated readings are maintained in IntesisBox's memory ready to be served to the ASCII system when requested.*

IntesisBox can be configured to notify to the ASCII system 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 control system).*

The configuration of the IntesisBox is done with *LinkBoxBacnet*, a friendly software configuration tool for Windows® supplied along with IntesisBox with no additional cost. *With the installation of LinkBoxBacnet, a Demo project for integration an ASCII system is also installed, using this demo project makes the engineering needed for this integration easy and quick.*

IntesisBox capacity

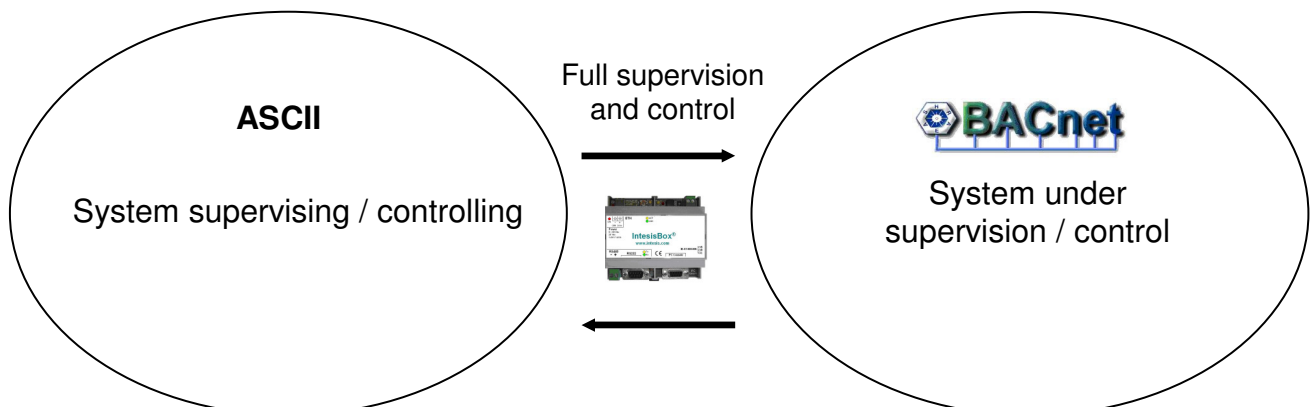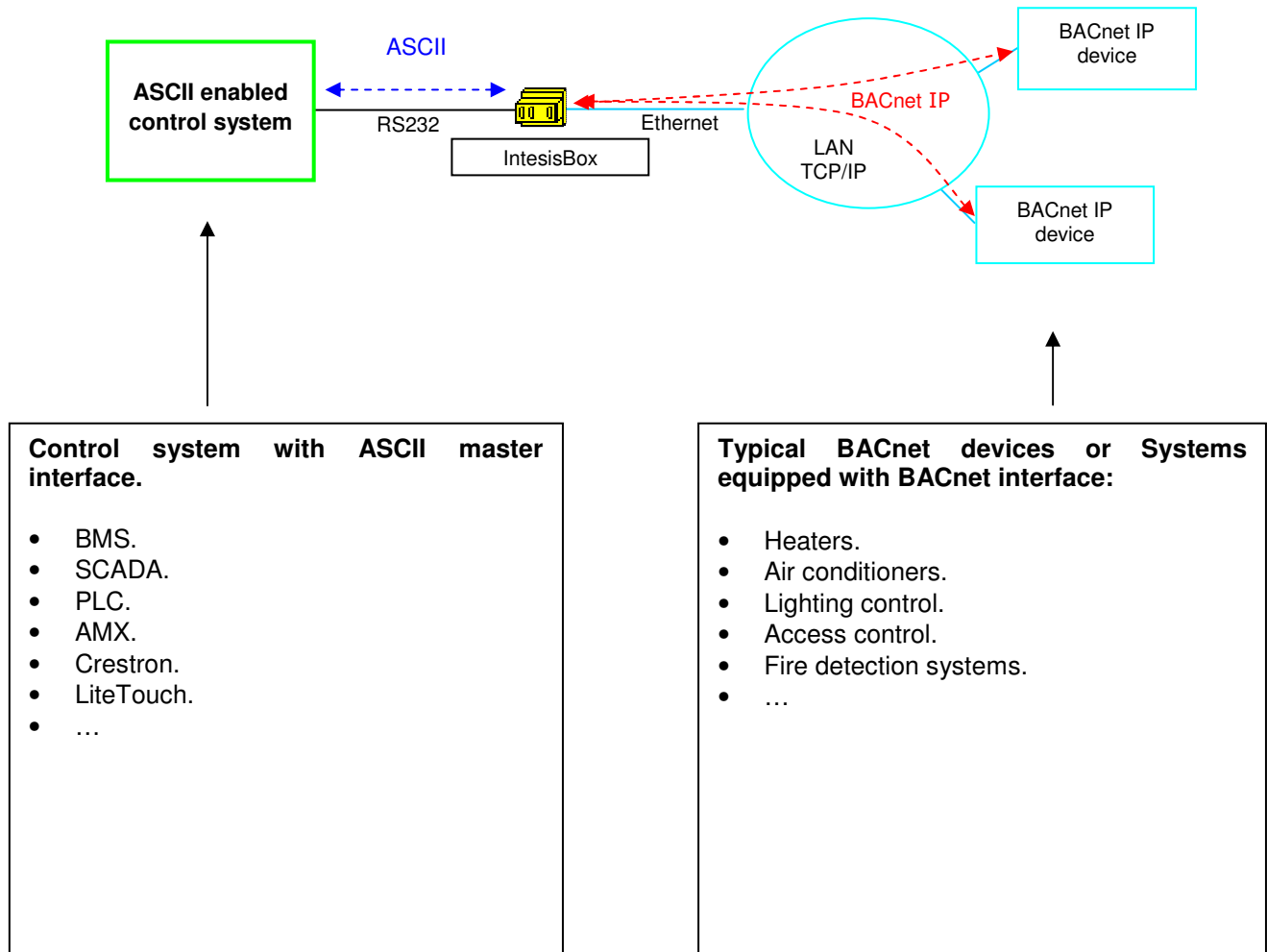| Element	Max. (Basic version)	Max. (Extended version)	Notes
Type of BACnet devices			Only those supporting *BACnet ASHRAE 135 – 2001 Annex J - BACnet/IP protocol*, commonly referred as BACnet/IP.
BACnet points supported	500	7000	Maximum number of points that can be defined into IntesisBox.
BACnet IP devices supported	1	16	Maximum number of different BACnet IP devices that can be defined into IntesisBox (to read/write points into them).

There are two different models of *IntesisBox® ASCII Server - BACnet/IP Client* with different capacity every one of them.

- Basic version with capacity of 500 points and 1 BACnet/IP device.
  Ref.: IBOX-ASCII-BAC-A

- Extended version with capacity of 7000 points and 16 BACnet/IP devices.
  Ref.: IBOX-ASCII-BAC-B

Intesis software

URL http://www.intesis.com
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Sample applications

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

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.

Control system with ASCII master interface.

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

Typical BACnet devices or Systems equipped with BACnet interface:

- Heaters.
- Air conditioners.
- Lighting control.
- Access control.
- Fire detection systems.
- …

ASCII

System supervising / controlling

Full supervision and control

BACnet

System under supervision / control

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Typical application

Integration of Daikin VRV Air Conditioning system into ASCII enabled control systems (AMX, Crestron, LiteTouch…).

For this application, Daikin VRV Air Conditioning system must be equipped with Daikin BACnet gateway (model DMS502B51), 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 is provided.

Intesis Software provides sample projects for IntesisBox with specific configuration to integrate Daikin VRV system, with these sample projects the configuration and commissioning of IntesisBox for this application becomes easy and quick, almost plug & play.

Intesis
software

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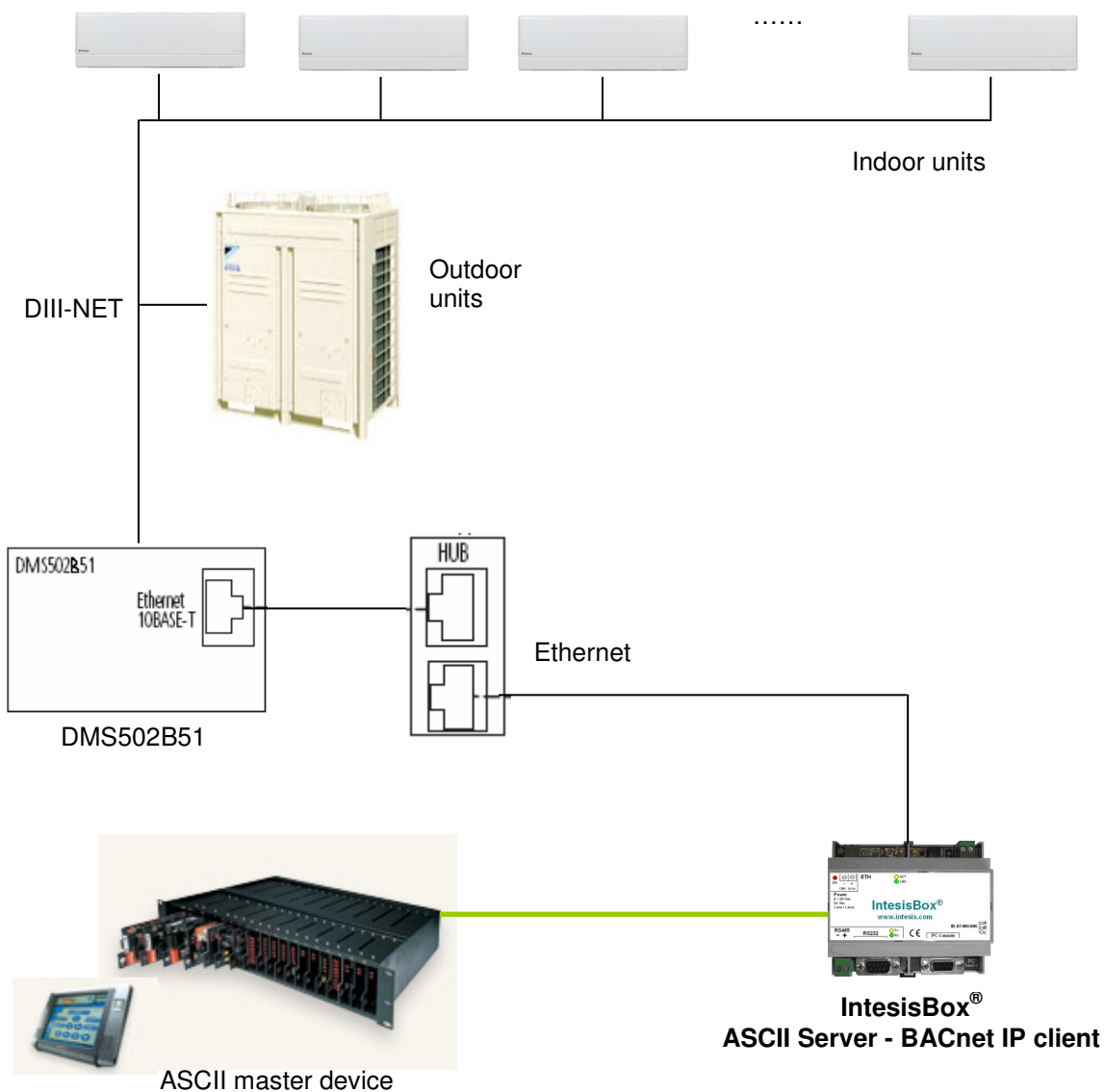
ASCII interface of IntesisBox

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, not matter the parameters of the external point associated.

This means that there is no need to change the ASCII control system messages used whenever the BACnet configuration changes. When this happens just change the configuration of the gateway and that's all, the ASCII control system 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 BACnet, 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).

Acknowledgment

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

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BACnet IP interface of IntesisBox

Specifications

BACnet Conformance Class Supported: Class 3

BACnet Standard Application Services Supported:

	Initiate Requests	Executes Requests
ConfirmedCOVNotification		X
Subscribe COV	X	
UnconfirmedCOVNotification		X
ReadProperty	X	
WriteProperty	X	
Who-Is	X	
I Am		X

Data Link Layer Option: BACnet IP, (Annex J)

No Segmented Requests/Responses Supported

BACnet Standard Object Types Supported

Object Type	Property	Description
Analog Input	Present Value	Analog signal. i.e. Ambient temperature.
Analog Output	Present Value	Analog signal.
Analog Value	Present Value	Analog signal. i.e. Temperature set point value.
Binary Input	Present Value	Digital signal. i.e. ON/OFF status.
Binary Output	Present Value	Digital signal. i.e. ON/OFF command.
Binary Value	Present Value	Digital signal. i.e. ON/OFF status/command.
Multistate Input	Present Value	Multistate signal. i.e. Working mode status.
Multistate Output	Present Value	Multistate signal.
Multistate Value	Present Value	Multistate signal. i.e. Working mode command.

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Configuration tool

LinkBoxBacnet	• 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® BACnet series.
	• Upgrades for this software tool available free of charge whenever a new protocol is added to the IntesisBox® BACnet series.
	• Multi-project tool allowing having in the engineer's PC the configuration for all the sites with different IntesisBox® BACnet 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…).

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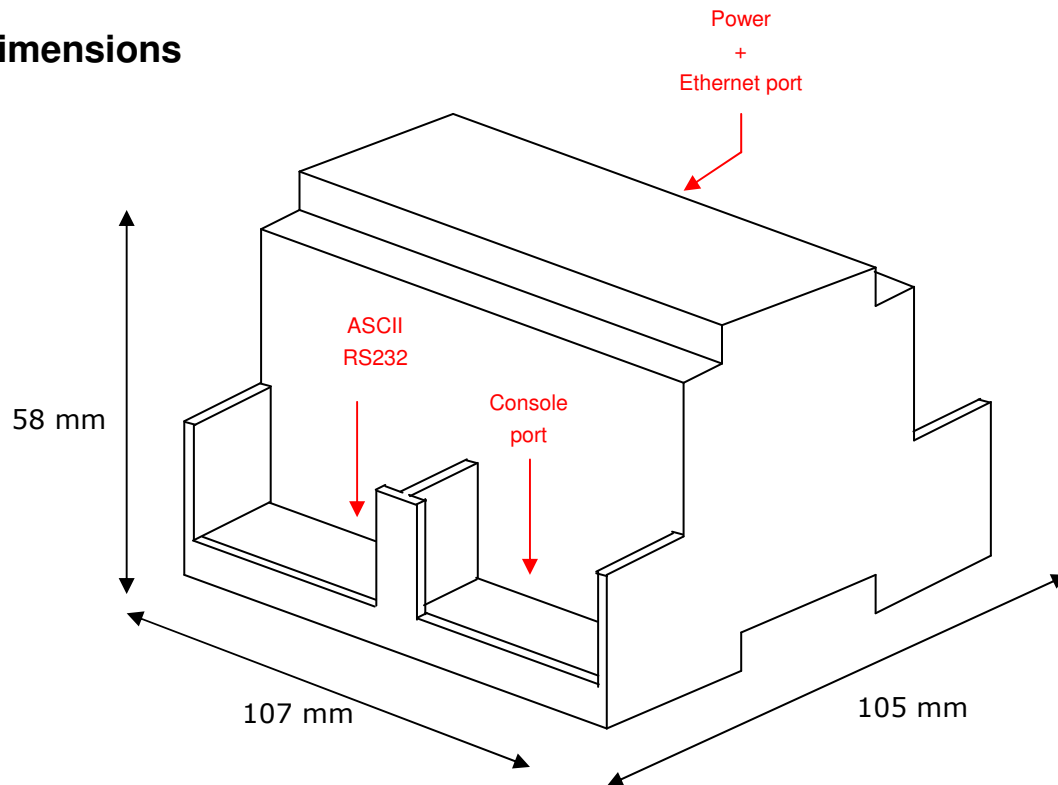email info@intesis.com
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Mechanical & Electrical characteristics

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 terminal bloc for power connection (2 poles).
Mounting	Wall. DIN rail EN60715 TH35.
ASCII port	1 x Serial RS232 (DB9 male DTE).
BACnet IP port	1 x Ethernet 10BT RJ45.
LED indicators	1 x Power. 2 x Serial port (ASCII) activity (Tx, Rx). 2 x Ethernet port link and activity (LNK, ACT).
Console port	RS232. DB9 female connector (DCE).
Configuration	Via console port.[1]
Firmware	Allows upgrades via console port.
Operational temperature	0°C to +70°C
Operational humidity	5% to 95%, non condensing
Protection	IP20 (IEC60529).
RoHS conformity	Compliant with RoHS directive (2002/95/CE).
Certifications	CE

[1] 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.

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Dimensions

Power
+
Ethernet port

58 mm

ASCII
RS232

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

115 mm

130 mm