IntesisBox® Modbus Server

Galaxy RS232

User's Manual

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Gateway for the integration of Honeywell Galaxy intrusion detection systems into Modbus enabled control systems.

Order code:

IBOX-MBS-GALAXY

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1 Description

1.1 Introduction

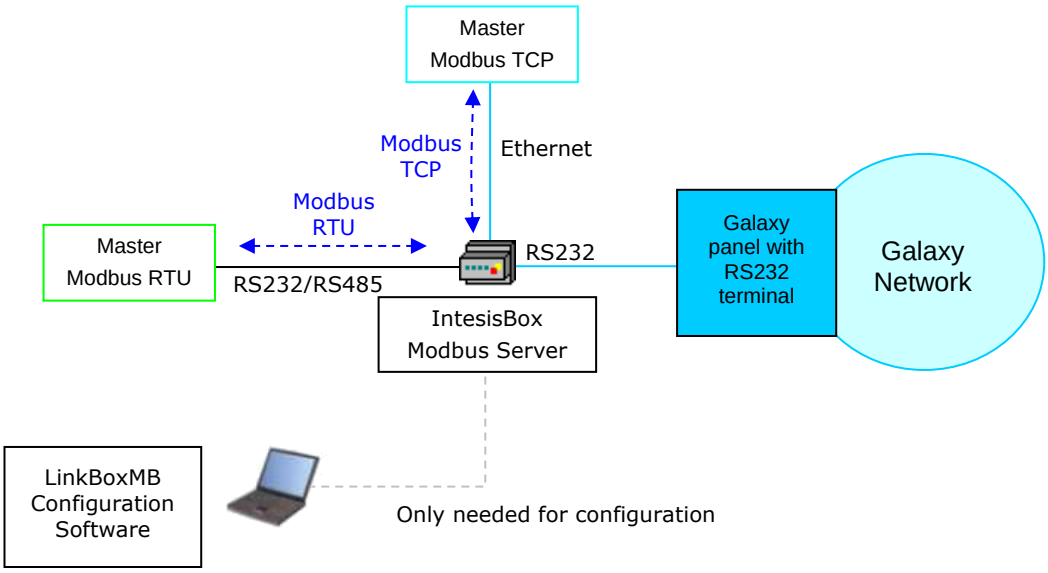
This manual addresses the integration of Honeywell (formerly Ademco Microtech) Galaxy intrusion detection systems into a Modbus master device or system, using *IntesisBox Modbus Server – Galaxy RS232* gateway.

The aim of this integration is to make available signals and resources of Galaxy panels equipped with RS232 interface to a Modbus master device or system. From the Modbus system point of view *IntesisBox Modbus Server - Galaxy* acts as a slave device, responding to data polls coming from the Modbus master. From the Galaxy system point of view acts as a third party communication device monitoring/controlling a Honeywell Galaxy alarm panel (by periodically polling it), and serving the retrieved data to the Modbus side.

Both the Galaxy Classic and 3 Series ranges are supported by IntesisBox. Galaxy 3 Series panels with a model reference ending with 'C' support an on-board RS232 port. E.g. models 3-48C, 3-144C, etc. All other 3 Series panels and the Galaxy Classic range require an optional RS232 module to be fitted to line 1.

Supported Range

- Galaxy Classic Panel – 8/18/60/500/512 zone panel.
- Galaxy Series 3 Panel with onboard RS232 – 3-48C, 3-144C, 3-520C.
- Galaxy Series 3 Panel with external RS232 module – 3-144, 3-520.
- Galaxy Dimension



Integration of Honeywell Galaxy using Intesis Modbus Server

1.2 Functionality

IntesisBox retrieves Galaxy station status information by means of periodically polling it, using the so-called SIA standard serial protocol.

Once obtained, the information about the elements on the Galaxy system is mapped within a Modbus fixed-size predefined map of registers. This way, the procedure of configuration for this integration is comparatively simple, since there is no need to choose which element is mapped to which Modbus register – all possible elements to be monitored are already available on a Modbus fixed-size map whose addresses range from 1 to 2200.

Three types of Galaxy system elements can be monitored and controlled using IntesisBox:

- **Groups** (of zones) from 1 to 32[1].
  - Possible states of groups are:
    - Unset.
    - Set.
    - Partially set.
  - Possible operations on groups are:
    - Unset.
    - Set.
    - Partially set.
    - System Reset.
    - Abort set.
    - Force set.
- **Zones** from 1 to 512[1]
  - Possible states of zones are:
    - Tamper shortcircuit.
    - Low resistance.
    - Closed.
    - High resistance.
    - Open.
    - Open circuit.
    - No-alarm/Alarm condition.
    - Non-omitted/omitted condition.
  - Possible operations on zones are:
    - Change their Non-omitted/omitted condition (typically before system set/reset).
- **Outputs** from 1 to 256[1]
  - Possible states of outputs are:
    - On/Off.
  - Possible operations on outputs are:
    - Setting them On/Off.

IntesisBox can be configured as Modbus TCP slave or Modbus RTU (RS232/RS485) slave, within the software tool LinkBoxMB.

[1] Number of supported groups, zones and outputs will vary depending on the model of the installed Galaxy station. Check section Appendix A – 3 digit and 4 digit zone addressing for more information on the zone addressing. Notice that 3 digit format is the one used by the IntesisBox.

Modbus interface of IntesisBox

1.3 Description

IntesisBox implements a Modbus slave interface, accessible either at RS232, RS485 or TCP ports (to be determined at configuration time along with its possible communication parameters – see section 0).

Fixed-size register map and implemented functions are described in the subsections below.

1.4 Modbus register map

Address range	**Range name**	**Address** (PLC fashion – starting at addr 1)	**Physical address range** (as sent in bus – starting at addr 0)	**Description and values**	**Read /Write**
1 to 10	Galaxy Link Status	1	0	Wrong passcode ▪ 0: System OK ▪ 1: Wrong passcode for remote access	R
		2	1	Communication error ▪ 0: System OK ▪ 1: Comm error with Galaxy station	R
		3 to 10	2 to 9	Not used – always 0	R
11 to 42 (10 + group number)	Group Status	11 to 42	32 to 41	Status of groups 1..32: ▪ 0: Unset ▪ 1: Set ▪ 2: Partially set ▪ 3: System Reset * ▪ 4: Abort set * ▪ 5: Force set * * These are control commands only (meant only to be written)	R/W
43 to 50	Not Defined			Not used – always 0	R
51 to 82 (50 + group number)	Group Alarm Status	51 to 82	50 to 81	Alarm status of groups 1..32: ▪ 0: Normal ▪ 1: Alarm ▪ 2: Reset Required	R
83 to 100	Not Defined			Not used – always 0	R
101 to 612 (100 + zone number)	Zone State	101 to 612	100 to 611	Status of zones 1..512: ▪ 0: Tamper S/C ▪ 1: Low resistance ▪ 2: Closed ▪ 3: High resistance ▪ 4: Open ▪ 5: Tamper O/C	R
613 to 700	Not Defined			Not used – always 0	R
701 to 1212 (700 + zone number)	Zone Alarm State	701 to 1212	700 to 1211	Alarm status of zones 1..512: ▪ 0: Normal ▪ 1: Alarm	R
1213 to 1300	Not Defined			Not used – always 0	R

Address range	Range name	Address (PLC fashion – starting at addr 1)	Physical address range (as sent in bus – starting at addr 0)	Description and values	Read /Write
1301 to 1812 (1300 + zone number)	Zone Omit Status	1301 to 1812	1300 to 1811	Omit status of zones 1..512: ▪ 0: Normal* ▪ 1: Omitted* *Values can be both read or written	R/W
1813 to 1900	Not Defined			Not used – always 0	R
1901 to 2156	Output Status	1901 to 2156	1900 to 2155	Status of outputs 1..512: ▪ 0: Off* ▪ 1: On* *Values can be both read or written	R/W
2800	Poll all zones	2800	2799	Enables Poll of all zones ▪ 0: Disabled* ▪ 1: Enabled* *Values can be both read or written	R/W
2801 to 3313	Poll individual zones	2801 to 3313	2800 to 3312	Enables Poll of individual zones ▪ 0: Disabled* ▪ 1: Enabled* *Values can be both read or written	R/W

As per Galaxy station behaviour, following is important to be taken into account:

- When an alarm condition is detected in a zone (indicated by IntesisBox's Modbus registers 701 to 1212 getting value '1') – and consequently also in its respective group (regs 51 to 82)– it can be acknowledged either locally on Galaxy station's panel (by entering suitable passcode) or else setting to value '3' (system reset) its respective group in IntesisBox's Modbus registers 11 to 42.
- Once acknowledged, the respective group will remain unset and the zone previously in alarm condition will remain in alarm condition (its corresponding Modbus register in IntesisBox in addr 701 to 1212 will remain '1') until the corresponding group is armed over again (setting a '1' in the corresponding Modbus register 11 to 42).

This may force to introduce additional logic to SCADA/BMS systems supervising the system. That's why, as explained in section 0, the so-called "auto-arm" feature has been implemented and can be enabled or disabled at configuration time:

- When "autoarm" feature of IntesisBox is used, IntesisBox will automatically arm a group under following situation whenever a group alarm condition is cancelled (by Galaxy system).

1.5 Functions supported

Modbus functions 03 and 04 (*read holding registers* and *read input registers*) can be used to read Modbus registers.

Modbus function 06 (*write single holding register*) must be used to write Modbus registers.

If *poll records* are used to read more than one register, it is necessary that the range of addresses requested contains valid addresses; if not the corresponding Modbus error code will be returned.

All the registers are of type integer (2 bytes) and its content is expressed in MSB..LSB.

Modbus error codes are fully supported, they will be sent whenever a non valid Modbus action or address is required.

LinkBoxMB. Configuration & monitoring tool for IntesisBox Modbus Server series

1.6 Introduction

LinkBoxMB is a Windows® compatible software developed specifically to monitor and configure IntesisBox® Modbus Server series.

The installation procedure and main functions are explained in the *LinkBoxMB User Manual*. This document can be found in the Doc folder, or can be downloaded from the link indicated in the installation sheet supplied with the IntesisBox® device.

In this section, only the specific case of Galaxy panels integration to Modbus networks will be covered.

1.7 Connections configuration

To configure the IntesisBox®'s connection parameters and to see the points list, press on the ***Config*** button in the *menu bar* (see Figure 0.1). The *Galaxy Configuration* window will open (see Figure 0.2). For integrations with large number of points, there is available an alternative CSV installation procedure explained in the LinkBoxMB User Manual.

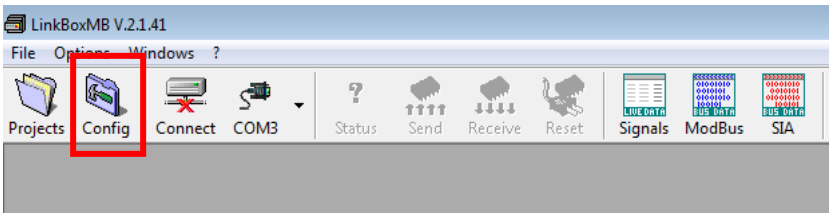


Figure 0.1 LinkBoxMB *menu bar*

1.7.1 Connection tab

Select the ***Connection*** tab to configure the connection parameters. Two subsets of information are shown in this window: Modbus RTU, Modbus TCP and Galaxy interfaces parameters (see Figure 0.2).

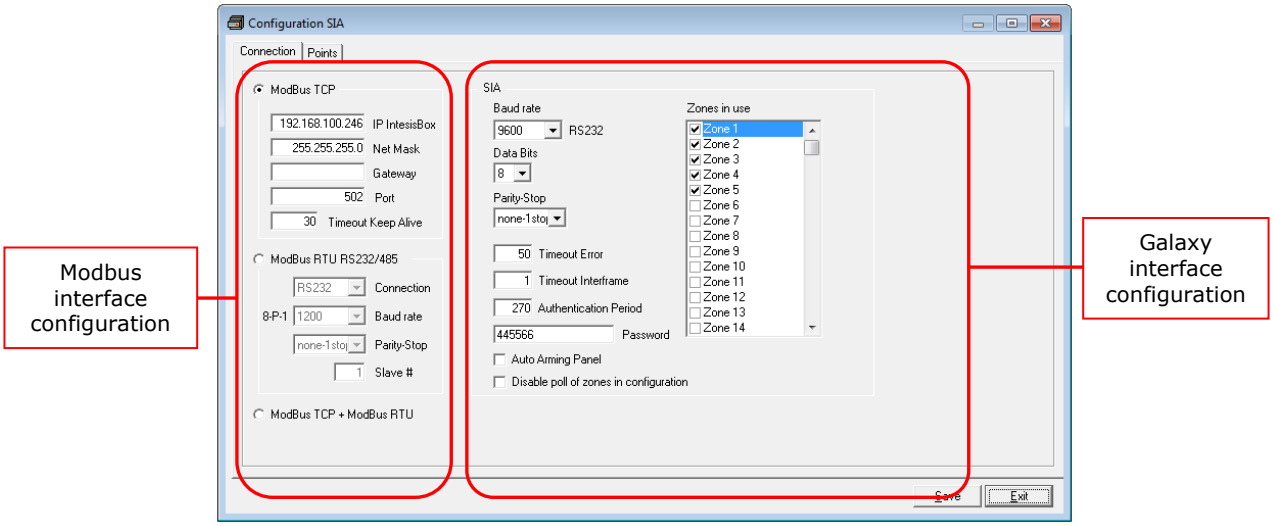


Figure 0.2 LinkBoxMB configuration tab

Next, there is an explanation for each of the configuration parameters in each mode.

- Modbus interface configuration parameters:

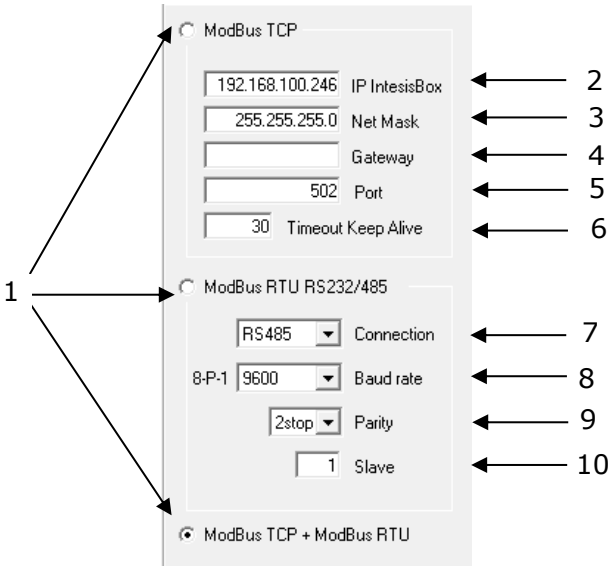


Figure 0.3 Modbus interface configuration

1. **Select the type of Modbus communication to use** (TCP, RTU or both).

If Modbus TCP is selected, then:

2. **IP IntesisBox:** Enter the IP address for IntesisBox®.
3. **Net Mask:** Enter the IP netmask for IntesisBox®.
4. **Gateway:** Enter the default gateway address for IntesisBox®; leave it blank if no router is needed.
5. **Port:** Enter the TCP port to use (default for Modbus TCP is 502).
6. **Timeout Keep Alive:** Enter the time (expressed in seconds) that IntesisBox® will wait, upon no TCP activity, to send a Keep Alive packet. Enter 0 if you don't want IntesisBox® to send any Keep Alive packet (default 30 seconds).

If Modbus RTU is selected, then:

7. **Connection:** Select the physical media (EIA232 or EIA485)[1].
8. **Baud rate:** Enter the baud rate of the serial communication.
9. **Parity:** Enter the byte parity of the serial communication.
10. **Slave:** Introduce the Slave number for the Modbus interface.

[1] In the LinkboxMB this connection is labeled as RS232 and RS485 respectively.

- Galaxy (SIA) interface configuration parameters:

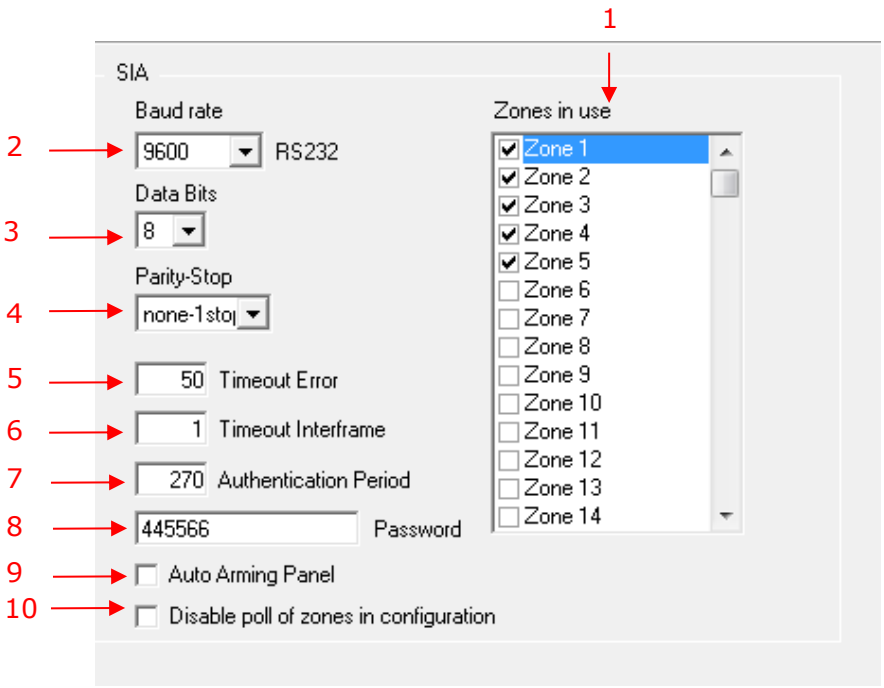


Figure 0.4 Galaxy interface configuration

1. **Zones:** Activate zones for which following information is wanted:

   - Tamper status (short-circuit, open, low resistance, …)
   - Omit status (omitted or not)

   As per SIA Galaxy protocol specification, this information needs to be retrieved individually (one poll per zone). This results in delaying all other poll requests, and consequently drastically increasing the time needed for a complete poll cycle.

   By default, all zones are disabled, achieving a higher poll speed – but then no information with regard to "tamper status" and "omit status" for zones is obtained. Alarm status for zones will be updated even though they are not enabled.

2. **Baud rate:** Baud rate to use to communicate with Galaxy RS232 interface (default is 9600bps).

3. **Data bits:** Data bits to use to communicate with Galaxy RS232 interface (default is 8 data bits).

4. **Parity-Stop:** Parity to use to communicate with Galaxy RS232 interface (default is N – no parity).

5. **Timeout Error:** Frame timeout (in milliseconds) that IntesisBox will wait for a reply of Galaxy station after triggering a request. If this timeout is elapsed with no answer from Galaxy station, IntesisBox will retry (3 times). After 3 times without receiving an answer a communication error is signalled (default is 50ms)

6. **Timeout Interframe:** Interframe timeout (poll period), in 10ms units for requests sent to SIA Galaxy station. This is the time that IntesisBox will wait between receiving an answer from SIA Galaxy and triggering the next request. Default is the minimum value, 1 (for 10ms), for the sake of achieving the maximum poll rate. Increase only if you have a reason to reduce load in Galaxy station's RS232 bus.

7. **Authentication Period:** Time of password validity. It can be set from 1 to 300 seconds, If set to '0' a password request will be sent on each individual request.

8. **Password:** Password to be used for Galaxy and IntesisBox communication (Remote Access Password, from 4 to 16 digits).

9. **Auto Arming panel**: If active, when detecting an acknowledge and reset Panel, an Armgin panel command will be sent automatically.

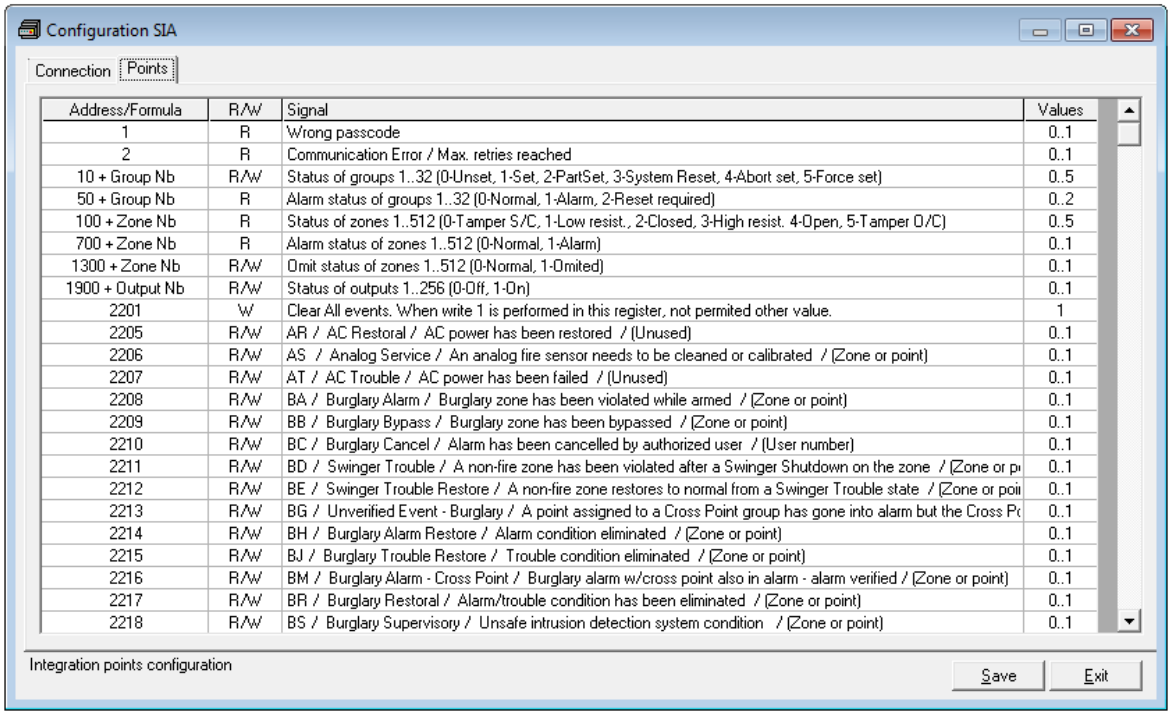
10. **Disable poll of zones in configuration:** Disablement of polling zones in configuration. This parameter can be changed during runtime through Modbus register 2800.

Additional configuration parameters should generally be left to their default value. They only might need to be tuned in some very specific cases (installations with large number of units, scenarios with large bursts of commands sent at once …)

1.7.2 Galaxy (SIA) tab

By clicking the tab "Points" in IntesisBox configuration the map of registers as seen in the Modbus side is shown.

It is fixed in size and cannot be changed.



Address/Formula	R/W	Signal	Values
1	R	Wrong passcode	0..1
2	R	Communication Error / Max. retries reached	0..1
10 + Group Nb	R/W	Status of groups 1..32 (0-Unset, 1-Set, 2-PartSet, 3-System Reset, 4-Abort set, 5-Force set)	0..5
50 + Group Nb	R	Alarm status of groups 1..32 (0-Normal, 1-Alarm, 2-Reset required)	0..2
100 + Zone Nb	R	Status of zones 1..512 (0-Tamper S/C, 1-Low resist., 2-Closed, 3-High resist. 4-Open, 5-Tamper O/C)	0..5
700 + Zone Nb	R	Alarm status of zones 1..512 (0-Normal, 1-Alarm)	0..1
1300 + Zone Nb	R/W	Omit status of zones 1..512 (0-Normal, 1-Omited)	0..1
1900 + Output Nb	R/W	Status of outputs 1..256 (0-Off, 1-On)	0..1
2201	W	Clear All events. When write 1 is performed in this register, not permited other value.	1
2205	R/W	AR / AC Restoral / AC power has been restored / (Unused)	0..1
2206	R/W	AS / Analog Service / An analog fire sensor needs to be cleaned or calibrated / (Zone or point)	0..1
2207	R/W	AT / AC Trouble / AC power has been failed / (Unused)	0..1
2208	R/W	BA / Burglary Alarm / Burglary zone has been violated while armed / (Zone or point)	0..1
2209	R/W	BB / Burglary Bypass / Burglary zone has been bypassed / (Zone or point)	0..1
2210	R/W	BC / Burglary Cancel / Alarm has been cancelled by authorized user / (User number)	0..1
2211	R/W	BD / Swinger Trouble / A non-fire zone has been violated after a Swinger Shutdown on the zone / (Zone or p	0..1
2212	R/W	BE / Swinger Trouble Restore / A non-fire zone restores to normal from a Swinger Trouble state / (Zone or poi	0..1
2213	R/W	BG / Unverified Event - Burglary / A point assigned to a Cross Point group has gone into alarm but the Cross P	0..1
2214	R/W	BH / Burglary Alarm Restore / Alarm condition eliminated / (Zone or point)	0..1
2215	R/W	BJ / Burglary Trouble Restore / Trouble condition eliminated / (Zone or point)	0..1
2216	R/W	BM / Burglary Alarm - Cross Point / Burglary alarm w/cross point also in alarm - alarm verified / (Zone or point)	0..1
2217	R/W	BR / Burglary Restoral / Alarm/trouble condition has been eliminated / (Zone or point)	0..1
2218	R/W	BS / Burglary Supervisory / Unsafe intrusion detection system condition / (Zone or point)	0..1

A detailed description of the Modbus register map is given in section 1.4 in this document.

Note that addresses from 2200 onwards are related to events received from Galaxy station. Each time an event is received, its corresponding register is set to "1". They can be cleared by writing a "1" in register 2201. Though, as explained throughout this document, most information obtained from Galaxy station is not based on events, but in polling the station.

The feature for checking last received events is provided to enable obtaining any additional information not considered by the regular poll cycle that IntesisBox is periodically performing.

Take into account that you will need to enable those events you want to receive at Galaxy station's keypad (see section 1.12).

1.8 Sending the configuration to IntesisBox®

When the configuration is finished, follow the next steps.

1.- Click on ***Save*** button to save the project to the project folder on your hard disk (more information in LinkBoxMB User Manual).

2.- You will be prompted to generate the configuration file to be sent to the gateway.

a.- If ***Yes*** is selected, the binary file (SIA.Lbox) containing the configuration for the gateway will be generated and saved also into the project folder.
b.- If ***NO*** is selected, remember that the binary file with the project needs to be generated before the IntesisBox® starts to work as expected.

3.- Once in the configuration window again, click on ***exit***. Configuration file is ready to be sent to the IntesisBox® device.

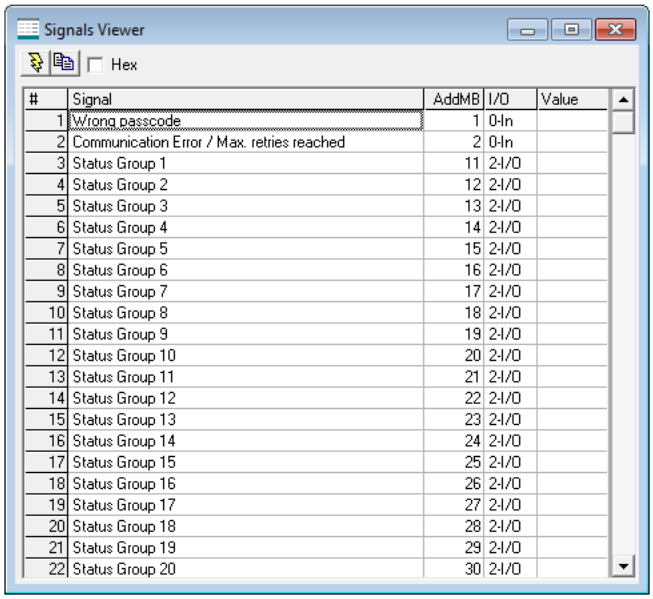
4.- Press the ***Send File*** button to send the binary file to the IntesisBox® device. The process of file transmission can be monitored in the IntesisBox® Communication Console window. IntesisBox will reboot automatically once the new configuration is loaded.

After any configuration change, do not forget to send the configuration file to the IntesisBox® using button Send File.

1.9 Signals viewer

The signals viewer is a convenient interface for testing and monitoring the communication on both interfaces of the IntesisBox: *Galaxy RS232* and *Modbus*.

Open it when IntesisBox is running -with the correct configuration- by selecting menu *View -> Signals o*n LinkBoxMB. The signals viewer window shows then all IntesisBox's datapoints with its main configuration parameters and its actual value. After a reset of IntesisBox or after sending a configuration file to the IntesisBox, all datapoints values will be updated automatically in the signals viewer. In case that you connect to the IntesisBox when it is already running, you should press the *Update* button to get updated values - press the button once to update all the signal values: from this moment the signal values will be maintained updated until the connection is closed (online checkbox is clicked).



#	Signal	AddMB	I/O	Value
1	Wrong passcode	1	0-In	
2	Communication Error / Max. retries reached	2	0-In	
3	Status Group 1	11	2-I/O	
4	Status Group 2	12	2-I/O	
5	Status Group 3	13	2-I/O	
6	Status Group 4	14	2-I/O	
7	Status Group 5	15	2-I/O	
8	Status Group 6	16	2-I/O	
9	Status Group 7	17	2-I/O	
10	Status Group 8	18	2-I/O	
11	Status Group 9	19	2-I/O	
12	Status Group 10	20	2-I/O	
13	Status Group 11	21	2-I/O	
14	Status Group 12	22	2-I/O	
15	Status Group 13	23	2-I/O	
16	Status Group 14	24	2-I/O	
17	Status Group 15	25	2-I/O	
18	Status Group 16	26	2-I/O	
19	Status Group 17	27	2-I/O	
20	Status Group 18	28	2-I/O	
21	Status Group 19	29	2-I/O	
22	Status Group 20	30	2-I/O	

It is possible to force a specific value to any signal for test purposes. To do so just double click on the row, enter the desired value and Accept in the Data Test window. The new

value entered will be available through the *Modbus* interface, the same way as if it has been received from the *Galaxy* system.

The signals viewer can be used even though only one system is connected to the IntesisBox, *Galaxy* or *Modbus.*

This way, proper communication of a Modbus master device polling the IntesisBox can be tested, without the need of having a Galaxy station connected and running.

Likewise, when a Galaxy station is connected, its behaviour can be tested and monitored from the signal viewer itself, without need of having a Modbus master attached to the IntesisBox.

The signals viewer window offers also a button to copy to the Windows Clipboard all the contents of the window (in CSV-like tab separated text format).

1.10 Files

LinkBoxMB saves the integration configuration in the following files inside the project folder:

PROJECT.INI	.ini file containing general information related to the project
SIA.INI	.ini file containing the configuration information, generated by the user when using LinkBoxMB
SIA.LBOX	Binary file created from the information in the two files described above. This is the file downloaded to the IntesisBox after configuration.

It is strongly recommended to back up the project folder containing these files in external media once the installation process is finished. This way you will be able to do future configuration changes in case of reinstallation of LinkBoxMB due, for example, to a failure of the hard disk in the PC where LinkBoxMB was installed.

The configuration cannot be uploaded from IntesisBox to LinkBoxMB, it can only be downloaded; Downloadable file SIA.LBOX does not contain all the integration information, as for example the signals description.

Set-up process and troubleshooting

1.11 Pre-requisites

It is necessary to have the Modbus master device operative and well connected to the Modbus port of IntesisBox, remember to respect the maximum of 15 meters cable distance if using RS232 communication.

It is necessary to have the Galaxy panel with its RS232 interface operative and at a distance of IntesisBox installation site of 15 meters maximum (as per RS232 communication specification).

Galaxy 3 Series panels with a model reference ending with 'C' support an on-board RS232 port. E.g. models 3-48C, 3-144C, etc. All other 3 Series panels and the Galaxy Classic range require an optional RS232 module to be fitted to line 1.

Connectors, connection cables, PC for LinkBoxMB, and other auxiliary material, if needed, are not supplied by Intesis Software for this standard integration. The items supplied by Intesis Software for this integration are:

- Intesis Modbus Server device with Galaxy SIA external protocol firmware loaded.
- LinkBoxMB software to configure IntesisBox.
- Console cable needed to download the configuration to IntesisBox.
- Product documentation.

If requested, Intesis Software also can supply:

- Standard plug-in power supplies 220Vac 50Hz to power IntesisBox.

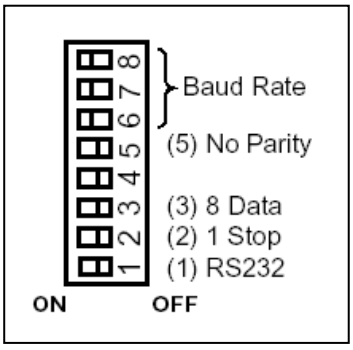
1.12 Galaxy station configuration

RS232 Interface Module

The Galaxy RS232 module, if used, should be installed on line 1 only.

Configure the 8-way DIP switch on it as follows (recommended):

Switch		Setting
1	Protocol: RS232	Off
2	Stop Bits: 1 *	Off
3	Data Bits: 8 *	Off
4	Parity: n/a	Off
5	Parity Enable: None *	Off
6	Baud Rate: 9600 *	On
7	Baud Rate	Off
8	Baud Rate	On



* Recommended values, in any case set in LinkBoxMB the baud rate, and the byte format format to match the one's configured here.

Check the RS232 module is configured from LED LD1. This will flash once per second (0.1 sec on, 0.9 sec off) to indicate normal communications between the module and panel.

Refer to the Galaxy document IO1-0054 for more information.

RS232 port for those Galaxy stations having it onboard (instead of using a separate module) is configured by accessing the keypad in the panel (see next subsection).

Configuration of the Galaxy Station

Use the Galaxy keypad to configure the RS232 module.

- Enter Engineer code + ENT + engineer code + ENT. This will grant access for changing the configuration information. Default engineer code is 112233
- Using keys A, B, ENT (enter) and ESC (escape), navigate through the menu and go to option 56=Communications.
- Select option 2=RS232
- Set 1=Mode to Direct
- Set 2=Format to SIA (might appear as OEM). Select SIA level 4.
- It will ask then which events you want to enable to be triggered in the RS232 communication port. They can all be left to OFF, since IntesisBox periodically polls Galaxy station (instead of parsing events).
- Set 1=Account No. to any 4-6 digit number.
- In case of having onboard RS232 port also set [4] Comms Setup: Baud Rate 9600bps*; Data Bits 8*; Stop Bits 1*; Parity No parity*.
- Leave the menu using the esc key.

* Recommended values, in any case set in LinkBoxMB the baud rate, and the byte format to match the one's configured here.

Refer to the Galaxy Programming Manual for more information.

Access Codes

Make a note of the Remote Access code (*default 543210*). This is the last user number, e.g. User 250 on a 3-144 panel or user 999 on a 3-520 panel.

This password should be configured within the LinkBoxMB, the configuration software of IntesisBox, later.

1.13 Set-up procedure

1. Install LinkBoxMB on your laptop, use the setup program supplied for this and follow the instructions given by the Installation wizard.

2. Install IntesisBox in the desired installation site. The mounting can be on DIN rail or on a stable not vibrating surface (DIN rail mounted inside a metallic industrial cabinet connected to ground beside the Galaxy communication interface or Panel is recommended).

3. Connect the communication cable coming from the Modbus master device to the port marked as **Modbus** of IntesisBox (using either RS232, RS485 or Ethernet port depending on the desired type of Modbus communication). (See details for this communication cable in section *Connections* of this document).

4. Connect the communication cable coming from the RS232 port of the Galaxy station or communication module to the port marked as **Galaxy** of IntesisBox. (See details for this communication cable in section *Connections* of this document).

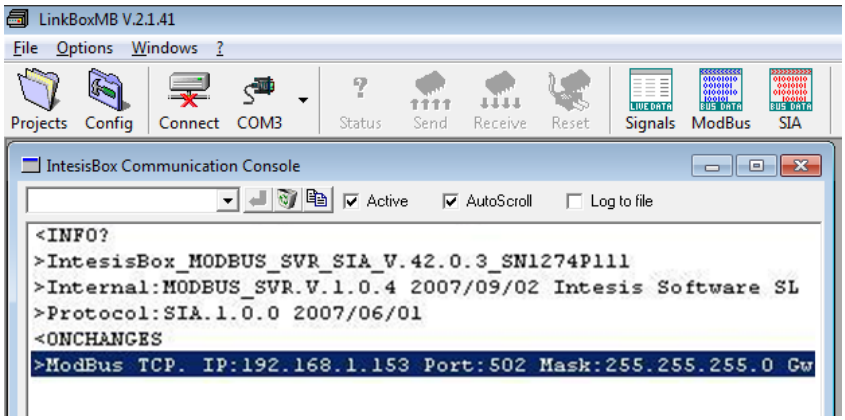
5. Power up IntesisBox. The supply voltage can be 9 to 30 Vdc or just 24 Vac. You can use also the standard plug-in power supply 220/125VAC-12VDC/300mA supplied with the device (if requested). Take care of the polarity of the supply voltage applied.

   WARNING! In order to avoid earth loops that can damage IntesisBox and/or any other equipment connected to it, we strongly recommend:

   - The use of DC power supplies, floating or with the negative terminal connected to earth. **Never use a DC power supply with the positive terminal connected to earth**.
   - The use of AC power supplies only if they are floating and not powering any other device.

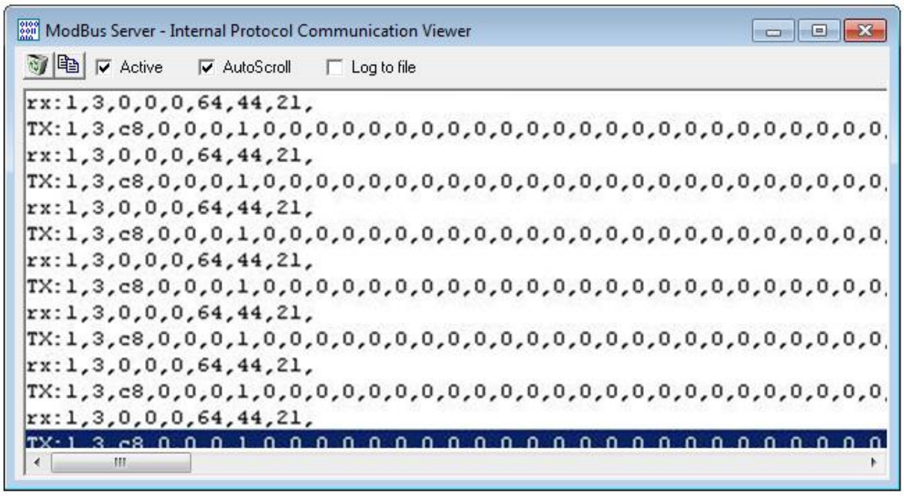
6. Connect the communication cable coming from the serial port of your laptop PC to the port marked as **PC Console** of IntesisBox. (See details for this communication cable in section *Connections* of this document).

7. Open LinkBoxMB, create a new project selecting a copy of the one named **DEMO SIA Galaxy** and give it the name desired, select the serial port used to connect to IntesisBox (menu Configuration -> Connection) and switch working mode to *on-line* (checkbox *off-line/on-line*). The IntesisBox identification must appear in the *IntesisBox communication console* window as showed below.

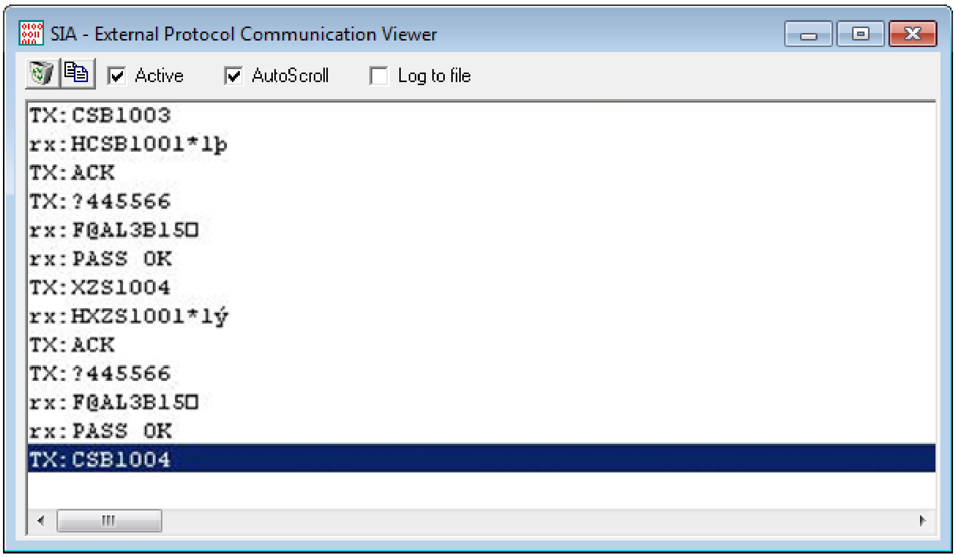


8. Modify the configuration as desired, save it and download the configuration file to IntesisBox as explained before.

9. Open the *Modbus Communication Viewer* window (menu View -> Bus -> Modbus) and check that there is communication activity, some TX frames and some other rx frames. This means that the communication with the Modbus master device is ok. In case there is no communication activity between IntesisBox and the Modbus master device check that it is operative, check the baud rate, and check also the communication cable used to connect both devices. (See details for this communication cable in section *Connections* of this document).



10. Open the *External Protocol Communication Viewer* window (menu View -> Bus SIA) and check that there is communication activity, some TX frames and some other rx frames as showed in the figure below. This means that the communication with the Galaxy station system is ok. In case of no communication activity between IntesisBox and Galaxy station check that the RS232 communication interface is operative, configured and connected to the Galaxy station, and check also the communication cable used to connect both devices. (See details for this communication cable in section *Connections* of this document).



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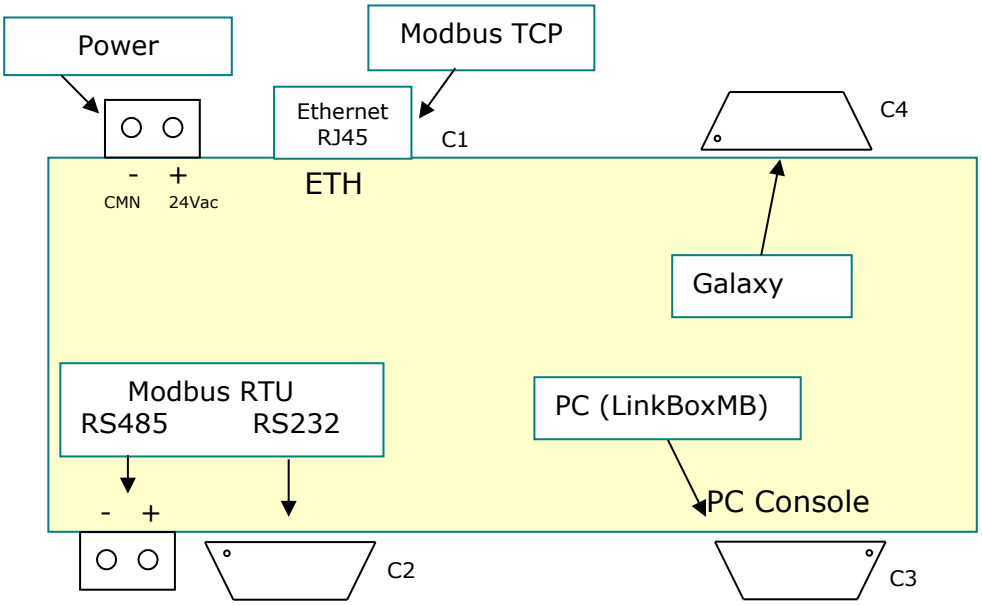
Connections



Connect IntesisBox's Modbus Port to the control system

Using cable, connect the control system to the IntesisBox, either using Modbus TCP through the IntesisBox's ethernet port, or Modbus RTU through the IntesisBox's RS232 port or RS485 port. See details of the cable below.

IntesisBox (DB9 M)	C2	Modbus RTU Connection (RS232 using DB9 connector)		Modbus master RS232
Cable (DB9 F)				Cable
RX	2	←		TX
TX	3	→		RX
GND	5	↔		GND

IntesisBox (Terminal block 2p)	RS485	Modbus RTU Connection (RS485 using terminal block)		Modbus master RS485
Cable				Cable
TX/RX +	+	↔		TX/RX +
TX/RX -	-	↔		TX/RX -

IntesisBox (RJ45 H)	C1 Eth	Modbus TCP Connection		Master TCP (RJ45 H)
Cable (RJ45 M)		(using Ethernet)		Cable (RJ45 M)
		Cable UTP/FTP Cat5 Crossed		Direct to device
		Cable UTP/FTP Cat5 Straight	Hub	Through hub or switch

Connect IntesisBox's Serial Port to Galaxy System

Using cable, connect the Galaxy system to the IntesisBox's serial port marked as *Galaxy RS232*. See details of the cable below.

IntesisBox (DB9 M)	C4	Galaxy connection (Internal RS232, 4-way terminal block)		Galaxy 4-way terminal block
Cable (DB9 F)		RS-232		Cable
RX	2	←		TX
TX	3	→		RX
				CTS
				RTS
GND	5	↔		0V

IntesisBox (DB9 M)	C4	Galaxy connection (RS232 Module, DB25 male connector) RS-232		Galaxy (DB25 M)
Cable (DB9 F)				Cable (DB25 F)
RX	2	←	2	TX
TX	3	→	3	RX
GND	5	↔	7	GND

Connection of IntesisBox's Console Port to the PC COM port for configuration of IntesisBox using LinkBoxMB

IntesisBox (DB9 F)	C3	PC (LinkBoxMB) Connection		PC (DB9 M)
Cable (DB9 M)		RS-232 (Straight)		Cable (DB9 F)
TX	2	→	2	RX
RX	3	←	3	TX
GND	5	↔	5	GND

Mechanical & Electrical characteristics

Enclosure	Plastic, type PC (UL 94 V-0). Dimensions: 107mm x 105mm x 58mm.
Colour	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	Surface. Wall. DIN rail EN60715 TH35.
Modbus TCP port	1 x Ethernet 10BT RJ45.
Modbus RTU ports	1 x RS232. DB9 male connector (DTE). 1 x RS485. Plug-in terminal bloc (2 poles).
Galaxy RS232 port	1 x RS232. DB9 male connector (DTE).
LED indicators	1 x Power. 2 x Galaxy RS232 port activity (Tx, Rx). 2 x Modbus RTU port 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	-40°C to +70°C
Operational humidity	5% to 95%, non condensing
Protection	IP20 (IEC60529).
RoHS conformity	Compliant with RoHS directive (2002/95/CE).

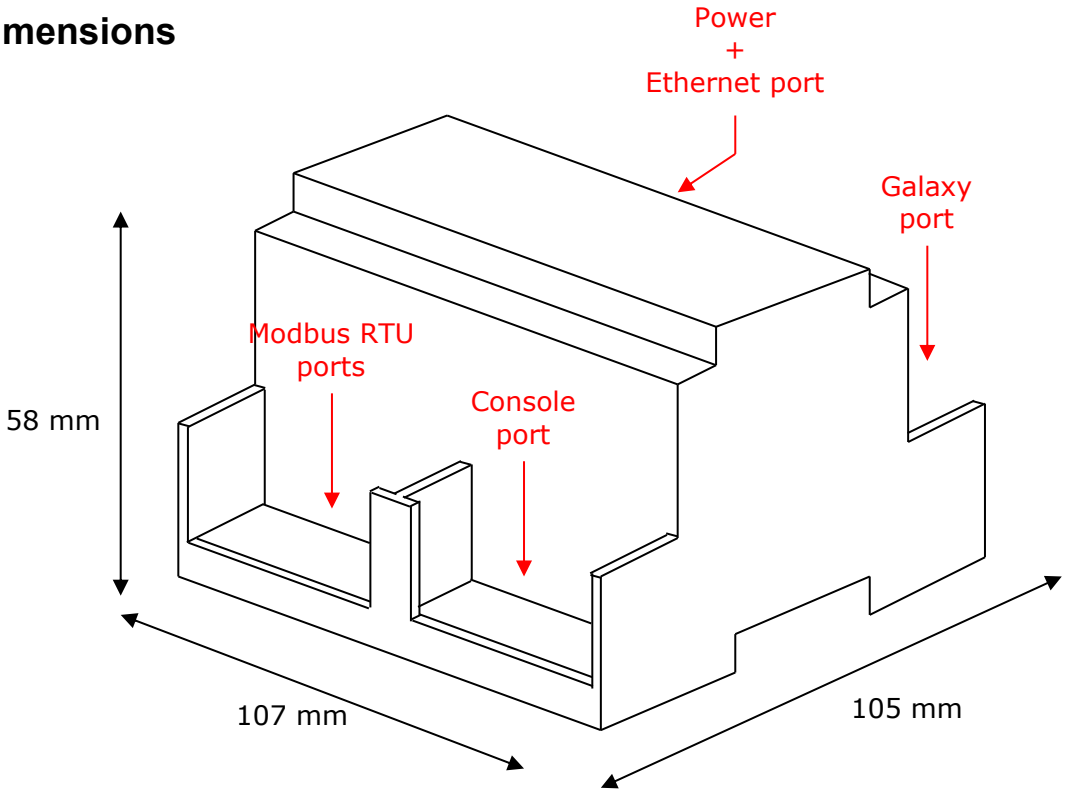
[1] Standard cable DB9male-DB9female 1,8 meters long is supplied with the device for connection to a PC COM port for configuring and monitoring the device. The configuration software, compatible with Windows® operating systems, is also supplied.

Functional characteristics

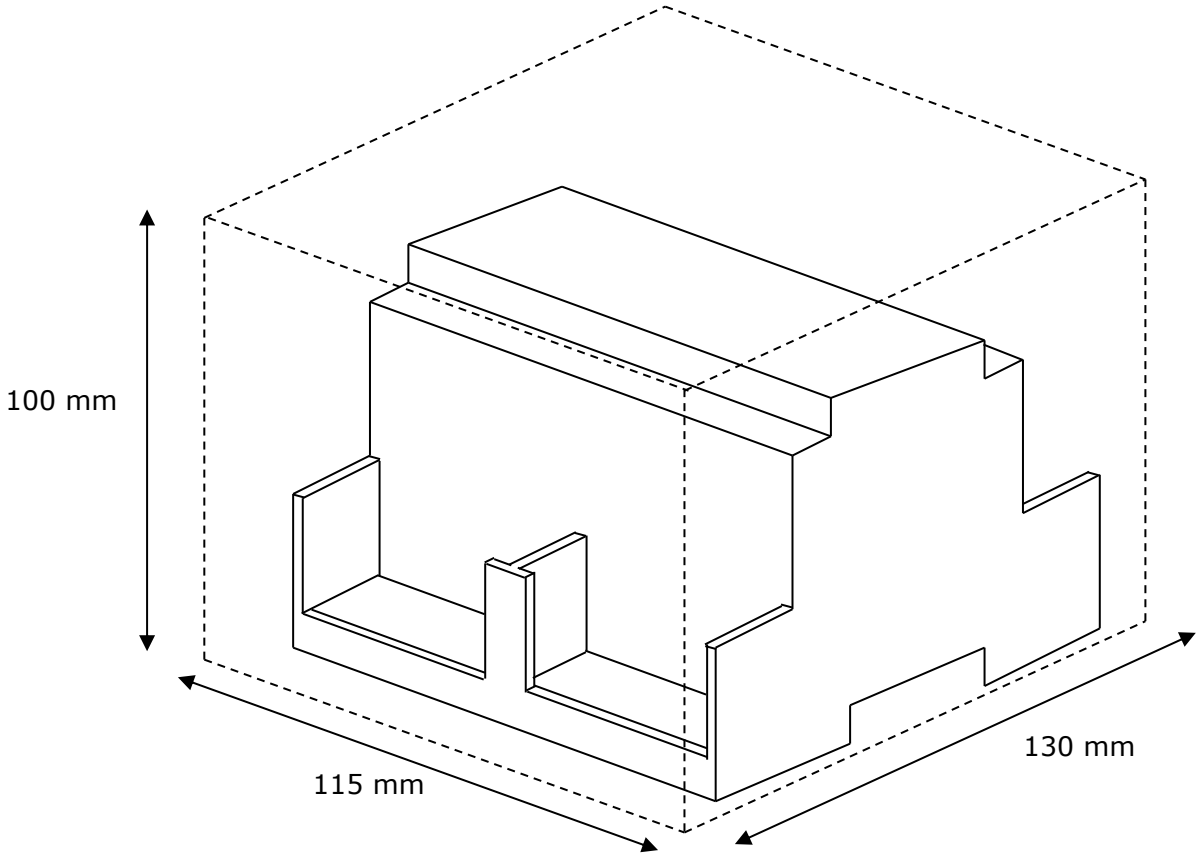
General	
Number of points	~2000
Virtual signals	Communication error with Galaxy system. Wrong passcode for Galaxy system. (both available from Modbus)
Galaxy RS232 interface	
Type	External system connected to onboard RS232 card (Galaxy 3 Series panels with model reference ending with 'C'), or separate RS232 module (Galaxy 3 series with model reference not ending with 'C' and Galaxy Classic range). It uses SIA alliance serial protocol.
Configuration parameters	• Baud rate. • Data bits. • Parity. • Timeout for communication error signal activation. • Poll period. • Enablement of "auto-arming" feature (re-arming a group once its alarm has been acknowledged). • Remote access passcode. • Zones to be polled.
Interactivity with Galaxy system	Read/Write allowed.

Modbus interface	
Device type	Slave.
Modbus modes supported	TCP, RTU RS232 or RS485.
Modbus TCP configuration parameters	• IP address. • Subnet mask. • Default gateway. • TCP port.
Modbus RTU configuration parameters	• RS232/RS485. • Baud rate. • Slave number.
Points	
Type of points	▪ **Groups** ○ Possible states of groups are: ▪ Unset. ▪ Set. ▪ Partially set. ○ Possible operations on groups are: ▪ Unset. ▪ Set. ▪ Partially set. ▪ System Reset. ▪ Abort set. ▪ Force set. ▪ **Zones** ○ Possible states of zones are: ▪ Tamper shortcircuit. ▪ Low resistance. ▪ Closed. ▪ High resistance. ▪ Open. ▪ Open circuit. ▪ No-alarm/Alarm condition. ▪ Non-omitted/omitted condition. ○ Possible operations on zones are: ▪ Change their Non-omitted/omitted condition (typically before system set/reset). ▪ **Outputs** ○ Possible states of outputs are: ▪ On/Off. ○ Possible operations on outputs are: ▪ Setting them On/Off.
Modbus data types	All the points are of data type UNSIGNED INT in the Modbus interface.

Dimensions



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



Appendix A – 3 digit and 4 digit zone addressing

There are two different possible enumeration systems to specify the GALAXY SIA system zones.

One uses **4 digits** and it is created when joining the values bus, rio and detector. The other one, which is more compact, uses only **3 digits**. Our device is using the compact form (3 digits), so you need a conversion if you use the 4 digit format.

Please, find below the correspondence table between the 4 digit and the 3 digit enumeration for the 512 possible zones.

Bus	Rio	Det	4 Digit	3 Digit
1	0	1	1001	1
1	0	2	1002	2
1	0	3	1003	3
1	0	4	1004	4
1	0	5	1005	5
1	0	6	1006	6
1	0	7	1007	7
1	0	8	1008	8
1	1	1	1011	9
1	1	2	1012	10
1	1	3	1013	11
1	1	4	1014	12
1	1	5	1015	13
1	1	6	1016	14
1	1	7	1017	15
1	1	8	1018	16
1	2	1	1021	17
1	2	2	1022	18
1	2	3	1023	19
1	2	4	1024	20
1	2	5	1025	21
1	2	6	1026	22
1	2	7	1027	23
1	2	8	1028	24
1	3	1	1031	25
1	3	2	1032	26
1	3	3	1033	27
1	3	4	1034	28

Bus	Rio	Det	4 Digit	3 Digit
1	3	5	1035	29
1	3	6	1036	30
1	3	7	1037	31
1	3	8	1038	32
1	4	1	1041	33
1	4	2	1042	34
1	4	3	1043	35
1	4	4	1044	36
1	4	5	1045	37
1	4	6	1046	38
1	4	7	1047	39
1	4	8	1048	40
1	5	1	1051	41
1	5	2	1052	42
1	5	3	1053	43
1	5	4	1054	44
1	5	5	1055	45
1	5	6	1056	46
1	5	7	1057	47
1	5	8	1058	48
1	6	1	1060	49
1	6	2	1062	50
1	6	3	1063	51
1	6	4	1064	52
1	6	5	1065	53
1	6	6	1066	54
1	6	7	1067	55
1	6	8	1068	56

Bus	Rio	Det	4 Digit	3 Digit
1	7	1	1071	57
1	7	2	1072	58
1	7	3	1073	59
1	7	4	1074	60
1	7	5	1075	61
1	7	6	1076	62
1	7	7	1077	63
1	7	8	1078	64
1	8	1	1081	65
1	8	2	1082	66
1	8	3	1083	67
1	8	4	1084	68
1	8	5	1085	69
1	8	6	1086	70
1	8	7	1087	71
1	8	8	1088	72
1	9	1	1091	73
1	9	2	1092	74
1	9	3	1093	75
1	9	4	1094	76
1	9	5	1095	77
1	9	6	1096	78
1	9	7	1097	79
1	9	8	1098	80
1	10	1	1101	81
1	10	2	1102	82
1	10	3	1103	83
1	10	4	1104	84

Bus	Rio	Det	4 Digit	3 Digit
1	10	5	1105	85
1	10	6	1106	86
1	10	7	1107	87
1	10	8	1108	88
1	11	1	1111	89
1	11	2	1112	90
1	11	3	1113	91
1	11	4	1114	92
1	11	5	1115	93
1	11	6	1116	94
1	11	7	1117	95
1	11	8	1118	96
1	12	1	1121	97
1	12	2	1122	98
1	12	3	1123	99
1	12	4	1124	100
1	12	5	1125	101
1	12	6	1126	102
1	12	7	1127	103
1	12	8	1128	104
1	13	1	1131	105
1	13	2	1132	106
1	13	3	1133	107
1	13	4	1134	108
1	13	5	1135	109
1	13	6	1136	110
1	13	7	1137	111
1	13	8	1138	112

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Bus	Rio	Det	4 Digit	3 Digit
1	14	1	1141	113
1	14	2	1142	114
1	14	3	1143	115
1	14	4	1144	116
1	14	5	1145	117
1	14	6	1146	118
1	14	7	1147	119
1	14	8	1148	120
1	15	1	1151	121
1	15	2	1152	122
1	15	3	1153	123
1	15	4	1154	124
1	15	5	1155	125
1	15	6	1156	126
1	15	7	1157	127
1	15	8	1158	128
2	0	1	2001	129
2	0	2	2002	130
2	0	3	2003	131
2	0	4	2004	132
2	0	5	2005	133
2	0	6	2006	134
2	0	7	2007	135
2	0	8	2008	136
2	1	1	2011	137
2	1	2	2012	138
2	1	3	2013	139
2	1	4	2014	140
2	1	5	2015	141
2	1	6	2016	142
2	1	7	2017	143
2	1	8	2018	144
2	2	1	2021	145
2	2	2	2022	146
2	2	3	2023	147
2	2	4	2024	148
2	2	5	2025	149
2	2	6	2026	150
2	2	7	2027	151
2	2	8	2028	152
2	3	1	2031	153
2	3	2	2032	154
2	3	3	2033	155
2	3	4	2034	156
2	3	5	2035	157
2	3	6	2036	158
2	3	7	2037	159
2	3	8	2038	160
2	4	1	2041	161
2	4	2	2042	162
2	4	3	2043	163
2	4	4	2044	164
2	4	5	2045	165
2	4	6	2046	166
2	4	7	2047	167
2	4	8	2048	168
2	5	1	2051	169
2	5	2	2052	170
2	5	3	2053	171
2	5	4	2054	172
2	5	5	2055	173
2	5	6	2056	174
2	5	7	2057	175
2	5	8	2058	176
2	6	1	2061	177
2	6	2	2062	178
2	6	3	2063	179
2	6	4	2064	180
2	6	5	2065	181
2	6	6	2066	182
2	6	7	2067	183
2	6	8	2068	184
2	7	1	2071	185
2	7	2	2072	186
2	7	3	2073	187
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2	7	5	2075	189
2	7	6	2076	190
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2	10	1	2101	209
2	10	2	2102	210
2	10	3	2103	211
2	10	4	2104	212
2	10	5	2105	213
2	10	6	2106	214
2	10	7	2107	215
2	10	8	2108	216
2	11	1	2111	217
2	11	2	2112	218
2	11	3	2113	219
2	11	4	2114	220
2	11	5	2115	221
2	11	6	2116	222
2	11	7	2117	223
2	11	8	2118	224
2	12	1	2121	225
2	12	2	2122	226
2	12	3	2123	227
2	12	4	2124	228
2	12	5	2125	229
2	12	6	2126	230
2	12	7	2127	231
2	12	8	2128	232
2	13	1	2131	233
2	13	2	2132	234
2	13	3	2133	235
2	13	4	2134	236
2	13	5	2135	237
2	13	6	2136	238
2	13	7	2137	239
2	13	8	2138	240
2	14	1	2141	241
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2	14	3	2143	243
2	14	4	2144	244
2	14	5	2145	245
2	14	6	2146	246
2	14	7	2147	247
2	14	8	2148	248
2	15	1	2151	249
2	15	2	2152	250
2	15	3	2153	251
2	15	4	2154	252
2	15	5	2155	253
2	15	6	2156	254
2	15	7	2157	255
2	15	8	2158	256
3	0	1	3001	257
3	0	2	3002	258
3	0	3	3003	259
3	0	4	3004	260
3	0	5	3005	261
3	0	6	3006	262
3	0	7	3007	263
3	0	8	3008	264
3	1	1	3011	265
3	1	2	3012	266
3	1	3	3013	267
3	1	4	3014	268
3	1	5	3015	269
3	1	6	3016	270
3	1	7	3017	271
3	1	8	3018	272
3	2	1	3021	273
3	2	2	3022	274
3	2	3	3023	275
3	2	4	3024	276

Bus	Rio	Det	4 Digit	3 Digit
3	2	5	3025	277
3	2	6	3026	278
3	2	7	3027	279
3	2	8	3028	280
3	3	1	3031	281
3	3	2	3032	282
3	3	3	3033	283
3	3	4	3034	284
3	3	5	3035	285
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3	3	7	3037	287
3	3	8	3038	288
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3	4	2	3042	290
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4	6	2	4062	433
4	6	3	4063	434
4	6	4	4064	435
4	6	5	4065	436
4	6	6	4066	437
4	6	7	4067	438
4	6	8	4068	439

Bus	Rio	Det	4 Digit	3 Digit
4	7	1	4071	440
4	7	2	4072	441
4	7	3	4073	442
4	7	4	4074	443
4	7	5	4075	444
4	7	6	4076	445
4	7	7	4077	446
4	7	8	4078	447
4	8	1	4081	448
4	8	2	4082	449
4	8	3	4083	450
4	8	4	4084	451
4	8	5	4085	452
4	8	6	4086	453
4	8	7	4087	454
4	8	8	4088	455
4	9	1	4091	456
4	9	2	4092	457
4	9	3	4093	458
4	9	4	4094	459
4	9	5	4095	460

Bus	Rio	Det	4 Digit	3 Digit
4	9	6	4096	461
4	9	7	4097	462
4	9	8	4098	463
4	10	1	4101	464
4	10	2	4102	465
4	10	3	4103	466
4	10	4	4104	467
4	10	5	4105	468
4	10	6	4106	469
4	10	7	4107	470
4	10	8	4108	471
4	11	1	4111	472
4	11	2	4112	473
4	11	3	4113	474
4	11	4	4114	475
4	11	5	4115	476
4	11	6	4116	477
4	11	7	4117	478
4	11	8	4118	479
4	12	1	4121	480
4	12	2	4122	481

Bus	Rio	Det	4 Digit	3 Digit
4	12	3	4123	482
4	12	4	4124	483
4	12	5	4125	484
4	12	6	4126	485
4	12	7	4127	486
4	12	8	4128	487
4	13	1	4131	488
4	13	2	4132	489
4	13	3	4133	490
4	13	4	4134	491
4	13	5	4135	492
4	13	6	4136	493
4	13	7	4137	494
4	13	8	4138	495
4	14	1	4141	496
4	14	2	4142	497
4	14	3	4143	498
4	14	4	4144	499
4	14	5	4145	500
4	14	6	4146	501
4	14	7	4147	502

Bus	Rio	Det	4 Digit	3 Digit
4	14	8	4148	504
4	15	1	4151	505
4	15	2	4152	506
4	15	3	4153	507
4	15	4	4154	508
4	15	5	4155	509
4	15	6	4156	510
4	15	7	4157	511
4	15	8	4158	512