IntesisBox® Modbus Server

Cerberus ISO1745

User Manual

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Gateway for the integration of Siemens Cerberus fire detection systems into Modbus enabled control systems.

Order code:

IBOX-MBS-CERBERUS

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Description

1.1 Introduction

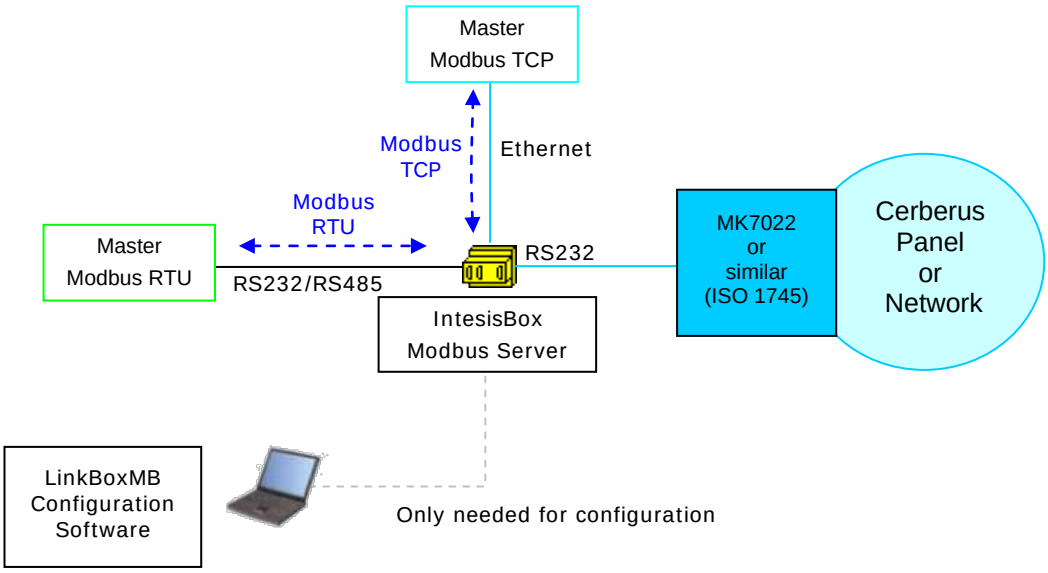
Integration of Siemens Cerberus fire panels into a Modbus master device or system, using *IntesisBox Modbus Server - Cerberus ISO1745* gateway.

The aim of this integration is to make available signals and resources of Siemens Cerberus fire panels equipped with MK7022 interface or similar (offering ISO 1745 protocol), from a Modbus master device or system. For this *IntesisBox Modbus Server - Cerberus ISO1745* gateway works, from the Modbus system point of view, acting as a Modbus slave device responding to data polls coming from the Modbus master, and from the Siemens Cerberus system point of view acting as a *Third party communication device* (Partner system connected to MK7022 communication unit as defined by Siemens Cerberus) monitoring/controlling a Siemens Cerberus single fire panel or a network of panels, and serving the data received from Cerberus to the Modbus side.

IntesisBox connects to the serial port (RS232) of the Cerberus panel (or to the interface board).

If there are more than one Cerberus panel in network, all of them can be integrated using just one IntesisBox (up to 5000 are supported in IntesisBox).

If the panels are independent (not connected in network), then one IntesisBox must be used per every panel.



Integration of Siemens Cerberus fire panels using Intesis Modbus Server

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1.2 Functionality

General overview:

The communication protocol of MK7022 of Siemens Cerberus is based on events, the statuses of the system elements (detectors, modules, etc.) are transmitted through the protocol in the form of events whenever they occur.

The role of IntesisBox consists in associate the elements of the Cerberus system with Modbus register addresses.

IntesisBox has a configuration table associating Cerberus elements with Modbus register addresses. This table is configured using LinkBoxMB software tool in a simple and friendly way.

The procedure of configuration consist in, from a list of Cerberus elements or points supplied by the fire system installer, associate the desired Modbus register addresses to the Cerberus elements wanted to be integrated (better associate consecutive Modbus register addresses to be able to poll multiple registers from Modbus master device). Once this configuration has been done with the configuration software tool LinkBoxMB, you have to download this configuration to IntesisBox via a serial connection and IntesisBox will reboot with the new configuration working.

The Cerberus elements or points can have different statuses, not only Alarm/Normal, it can be configured in IntesisBox the values in Modbus that will reflect every one of these statuses, as well as the values to use to write every one of the possible commands into Cerberus from Modbus.

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

The maximum number of points supported is 5000.

Firmware version of IntesisBox V.42.1.2 and later is enabled to read and write to Cerberus panels (commands toward the panels are supported). Previous versions V.42.x.x and V3.x.x are not enabled to write toward the panels, only read.

The different Cerberus elements or points that can be integrated are:

1801 AREA. Alarm remote transmition delay
1801 AREA. Alarm
1801 AREA. Remote transmition device
1801 AREA. Partial system Off
1801 AREA. Fault
1801 AREA. Organitation
1701 SECT. Fire
1702 SECT. Extinguishing Release
1702 SECT. Extinguishing Alarm
1702 SECT. Extinguishing Fault
1601 ZONE. Single logic
1602 ZONE. Multi logic (fire)
1602 ZONE. Multi logic (Extinguishing)
1605 ZONE. Manual call point

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1610 ZONE. Digital
1651 ZONE. Control (local I/O)
1654 ZONE. Control (programmable)
1656 ZONE. Control (programmable, distrib. contr.)
1501 ELEM. DS11-I Interactive sensor
1502 ELEM. DS11-I Manual call point
1503 ELEM. DS11-C Manual call point
1508 ELEM. DS11-A Analog plus
1510 ELEM. DS11-C Collective line
1511 ELEM. DS11-C Collective line type 2
1512 ELEM. DS11-C Collective line type 3
1520 ELEM. Digital sensor
1521 ELEM. Digital manual call point
1525 ELEM. Digital
1551 ELEM. Output without feedback
1552 ELEM. Output with feedback
1560 ELEM. Intern horn
1561 ELEM. Extern horn
1562 ELEM. Remote transmit. channel
1564 ELEM. Alarm horn (control by area CAK)
1565 ELEM. Alarm horn (user criteria activation)
1301 IBD. DS11-I Line interface
1302 IBD. MS9i Line interface
1303 IBD. DS11-A Line interface
1310 IBD. DS11-C Line interface
1320 IBD. CC11 I/O interface
1340 IBD. CC11 power supply
1390 IBD. CI11 display panel
1391 IBD. CI11 fire brigade panel
1395 IBD. CI11 Extinguishing subsystem
1201 CBD. CC11 Control unit
1202 CBD. CT11 Remote terminal
1210 CBD. CI11 Control unit fault
1210 CBD. CI11 Control unit printer
1211 CBD. CC11 Remote Control unit

The integration operation is as follow:

Once IntesisBox is configured and connected to both systems (Cerberus and Modbus), it listens continuously the Cerberus system for new events regarding the points configured in it (the table mentioned before). With every event, the new status received is updated in the Intesisbox's memory and become available to be read by the Modbus master device.

As mentioned before, the Cerberus protocol is based in spontaneous messages, that is, only element's change of status is sent through the protocol whenever it occurs. Because of this, when IntesisBox starts up, it is necessary to request the status of all panels and elements of the system to update the signals values. With this, the status of any element that is not in normal status is received by IntesisBox automatically.

1.3 Capacity of IntesisBox

Element	Max.*	Notes
Number of Panels	No limit	IntesisBox has no limit in terms of maximum number of Cerberus Panels in network supported, in fact no panels are defined into IntesisBox, just Elements or Points (existing in any Cerberus Panel in network).
Number of Points	5000	Number of Cerberus elements or points that can be defined in IntesisBox.

* These maximum values can be extended on demand

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2. Modbus interface of IntesisBox

2.1 Description

IntesisBox acts as a slave device in its Modbus interface, this interface can be the Ethernet port (if using Modbus TCP), or the RS232 port or the RS485 port (if using Modbus RTU). To access the points and resources of the IntesisBox from Modbus system, you must specify as the Modbus register addresses, those configured inside IntesisBox corresponding to Cerberus elements or points. See details below in this document.

2.2 Definition of signals

The possible signals to use are:

- **Analog Input**. Used to read Cerberus element's or point's status. Every possible status (Normal, Alarm, Fault...) of an element (detector, panel...) in the Cerberus system can be freely associated to a numerical value. This numerical value will be the point's value read from Modbus when the associated Cerberus element is in this status. All the points are of type analog from the point of view of Modbus. Also an analog virtual signal called *Communication error with Cerberus* indicates the status of the communication between IntesisBox and the Cerberus system (0=Communication failing, 1=Communication OK).

2.3 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 read 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.

3. LinkBoxMB. Configuration & monitoring tool for IntesisBox Modbus Server series

3.1 Introduction

LinkBoxMB is a Windows® compatible software developed specifically to monitor and configure Intesis Modbus Server series. It is possible to configure all external protocols available for Intesis Modbus Server and to maintain different customer's configurations based on a LinkBoxMB project for every different installation. Maintaining always on hard disk a copy of the last configuration files for every external protocol and customer, that is to say for every project.

From LinkBoxMB, as well as configure the integration signals list and connection parameters for every external protocol, it is permitted to select the serial port to use to connect to Intesis Modbus Server and the use of some tools for monitoring and debugging de device. Some of these tools will be explained in this document but only some of them, the rest of available debugging tools and commands will not be explained here because they are for exclusive use under the recommendations of Intesis Software technical support.

LinkBoxMB allows configuring all Intesis Modbus Server series independently of the external system used. For every external system, LinkBoxMB has a specific configuration window. Periodically, new free versions of LinkBoxMB are released incorporating the latest developed integrations for external systems.

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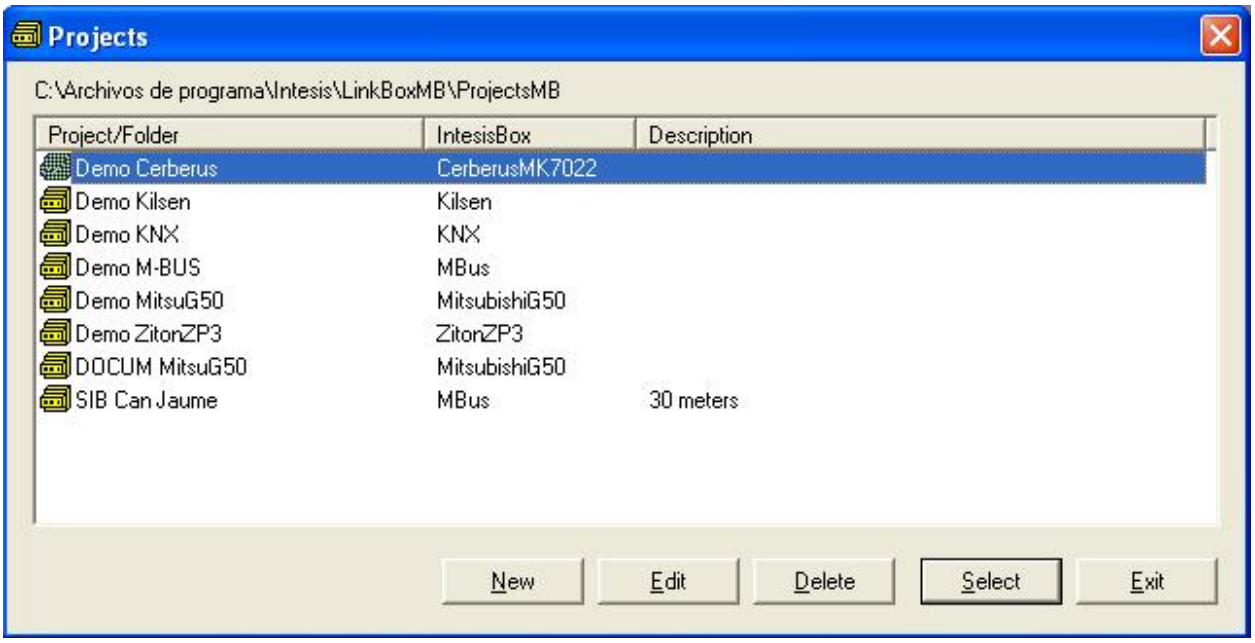
3.2 Project definition

The first step to do in LinkBoxMB for a new installation is to create the installation's project giving a descriptive name to it. When you create a project, a new folder is created with the name of the project containing the configuration files needed depending on the external protocol selected for the project. It is strongly recommended that you create a new project for every installation, if not, overwriting of configuration files of previous installations using the same external protocol may occur, loosing the configuration data for those previous installations. The projects folder is located in AppFolder\ProjectsMB, where AppFolder is the installation folder of LinkBoxMB (by default C:\Program Files\Intesis\LinkBoxMB). Inside the projects folder, a new folder will be created for every project defined in LinkBoxMB with the files needed for the project.

When you open LinkBoxMB, the project selection window will appear inviting you to select a project or create a new one. A demo project for every external protocol supported is provided with the standard installation of LinkBoxMB. You can create a new project or select a demo project based on the external protocol desired, and create a new one from the demo one selected.



Project selection window

To create a new project, select a project using the same external protocol you want to use in the new project and click on *New* button. You will be prompted to create a copy of the selected project (useful for similar installations) or create a new one.

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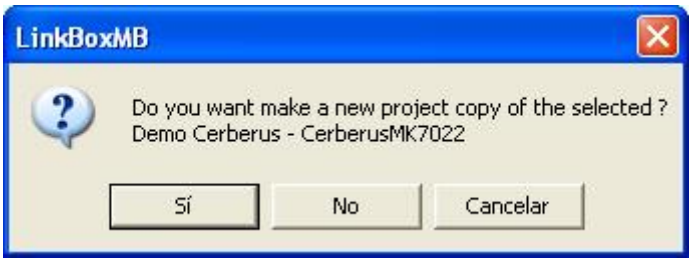
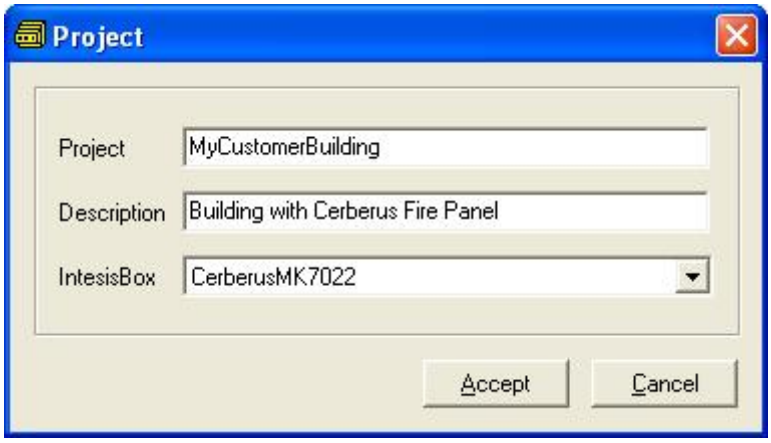


If you select *Yes* you will be prompted to specify a name and a description for the new project that will be based on the same external protocol than the selected one. If you select *No* you can specify a name, a description and an external protocol to use from the list of available external protocols.



On *Accept*, a new folder will be created inside the projects folder with the name given to the project, this folder will contain the template configuration files if the project is a brand new one, or a copy of the configuration files if it is a copy of a selected one.

A description of the files created for a Cerberus protocol based project can be found in section *Files* in this document.

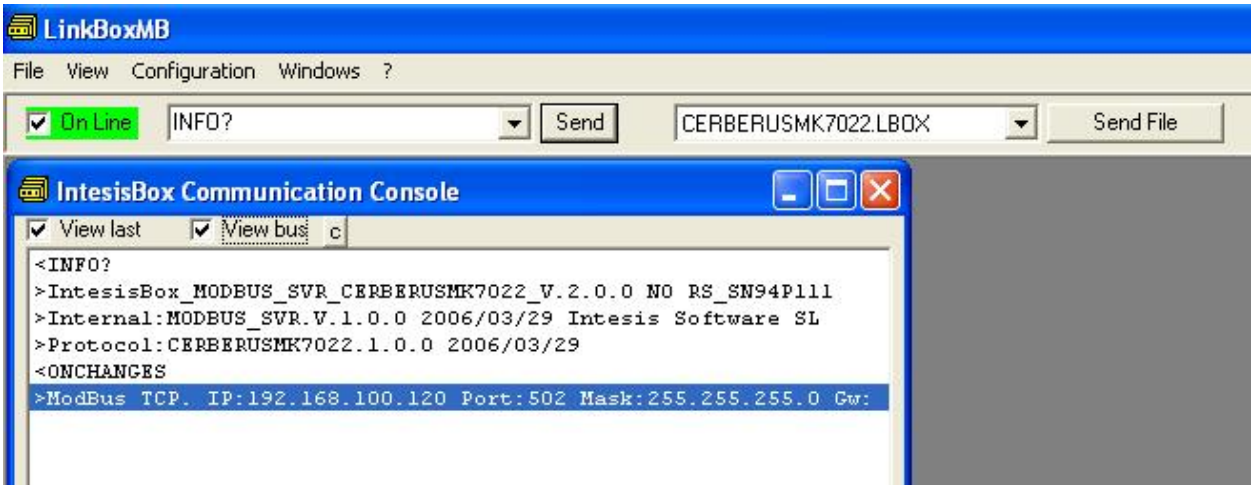
From all the possibilities of LinkBoxMB, only changes in configuration for the integration and configuration file generation can be performed while disconnected from IntesisBox (working off-line), allowing you to do these tasks in the office more comfortably. Before any monitoring or downloading action to IntesisBox can be performed, the connection between IntesisBox and the PC running LinkBoxMB must be established (working on-line). To do so follow these steps:

1. Make sure IntesisBox is powered-up a correctly connected to the Modbus system via the Ethernet connection (Modbus TCP) or serial connection (Modbus RTU) and to Cerberus system via the RS232 connection (consults details for connection and pin assignments in section *Connection*s of this document).

2. Connect a free PC serial port to the IntesisBox serial port marked as ***PC Console***. (Use the standard serial cable supplied with the device or a customer's cable following the pin assignments specified in section *Connections* in this document).

3. Select in LinkBoxMB the PC serial port used for the connection to IntesisBox. Use menu Configuration -> Connection.

4. Check the checkbox *off-line* under the menu bar (it will change automatically to *on-line*) and LinkBoxMB will ask for INFO about the IntesisBox connected to it via the serial connection, if the connection is ok then IntesisBox will respond with its identification (this can be monitored in the *IntesisBox Communication Console* window, as showed below).



Once connected to IntesisBox, all the options of LinkBoxMB are fully operative.

To monitor the communication between IntesisBox and the Modbus master device, select the menu *View -> Bus -> Modbus*. The *Modbus communication Viewer* window will be opened. This window show in real time all the communication frames between IntesisBox and the Modbus master device as well as debugging messages referent to internal protocol (Modbus) sent by IntesisBox.

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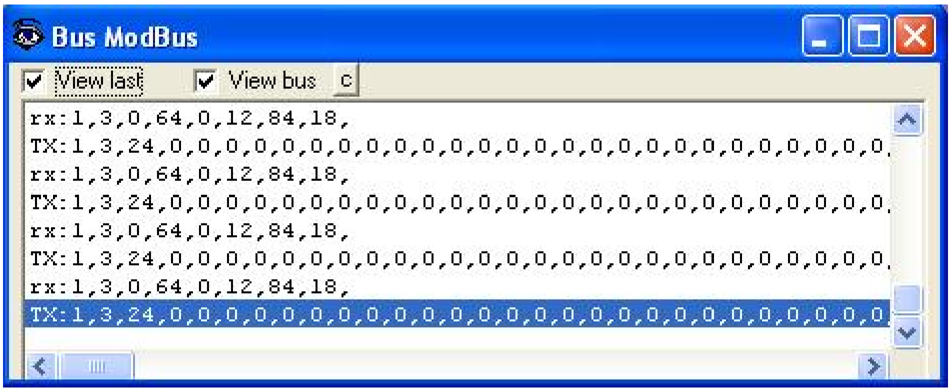

To monitor the communication between IntesisBox and the external system (Cerberus in this case), select the menu *View -> Bus -> Cerberus*. The *External protocol communication viewer* window will be opened. This window show in real time all the communication frames between IntesisBox and Cerberus system as well as debugging messages referent to external protocol (Cerberus) sent by IntesisBox.

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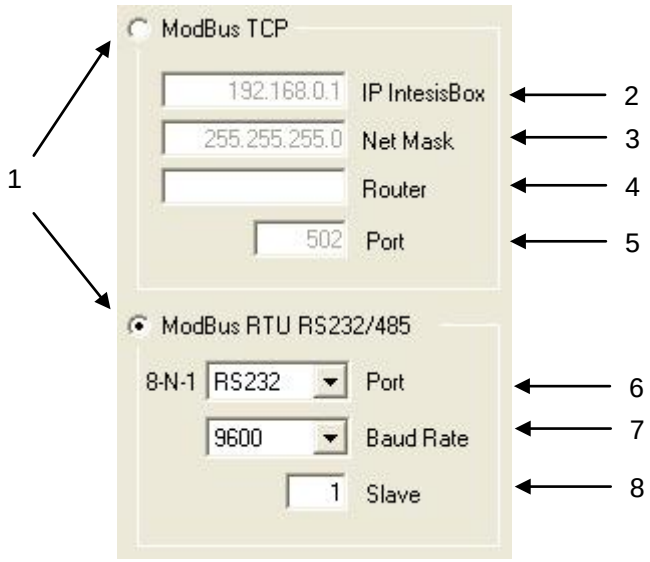
3.3 Connections configuration

To configure the IntesisBox's connection parameters and the signals list, select menu *Configuration -> IntesisBox*. The *Cerberus Configuration* window will be opened.

Select the Connection tab to configure the connection parameters.

Two kinds of information are configured using this window, the referent to the Modbus side and the referent to the Cerberus side.

Modbus side configuration parameters:



Modbus Interface Configuration

1. Select the type of connection desired (TCP or RTU).

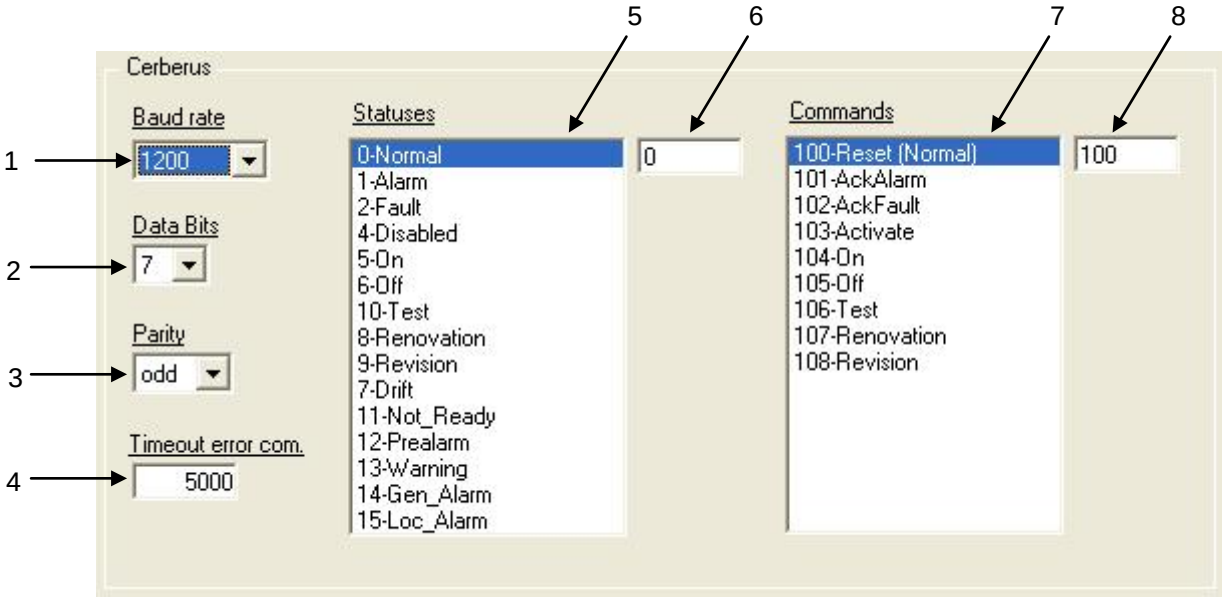
If Modbus TCP is selected, then:

2. Enter the IP address for IntesisBox.
3. Enter the IP netmask for IntesisBox.
4. Enter the default router address to use by IntesisBox, leave blank if there is no need of router address.
5. Enter the TCP port to use, by default 502.

If Modbus RTU is selected, then:

6. Select the type of port to use (RS232 or RS485).
7. Select the baud rate to use.
8. Enter the Modbus slave number for IntesisBox.

Cerberus side configuration parameters:



Cerberus Interface Configuration

1. Baud rate to use to communicate with Cerberus interface.
2. Data bits to use to communicate with Cerberus interface.
3. Parity to use to communicate with Cerberus interface.
4. Time (in milliseconds) without communicating with Cerberus to activate communication error signal.
5. Select the possible statuses for Cerberus elements or points, and
6. Assign the value you will see in the Modbus register whenever this element is in this status (255 means status not used).
7. Select the possible commands to send to Cerberus, and
8. Assign the value that will be written from Modbus to send the command to Cerberus (255 means command not used).

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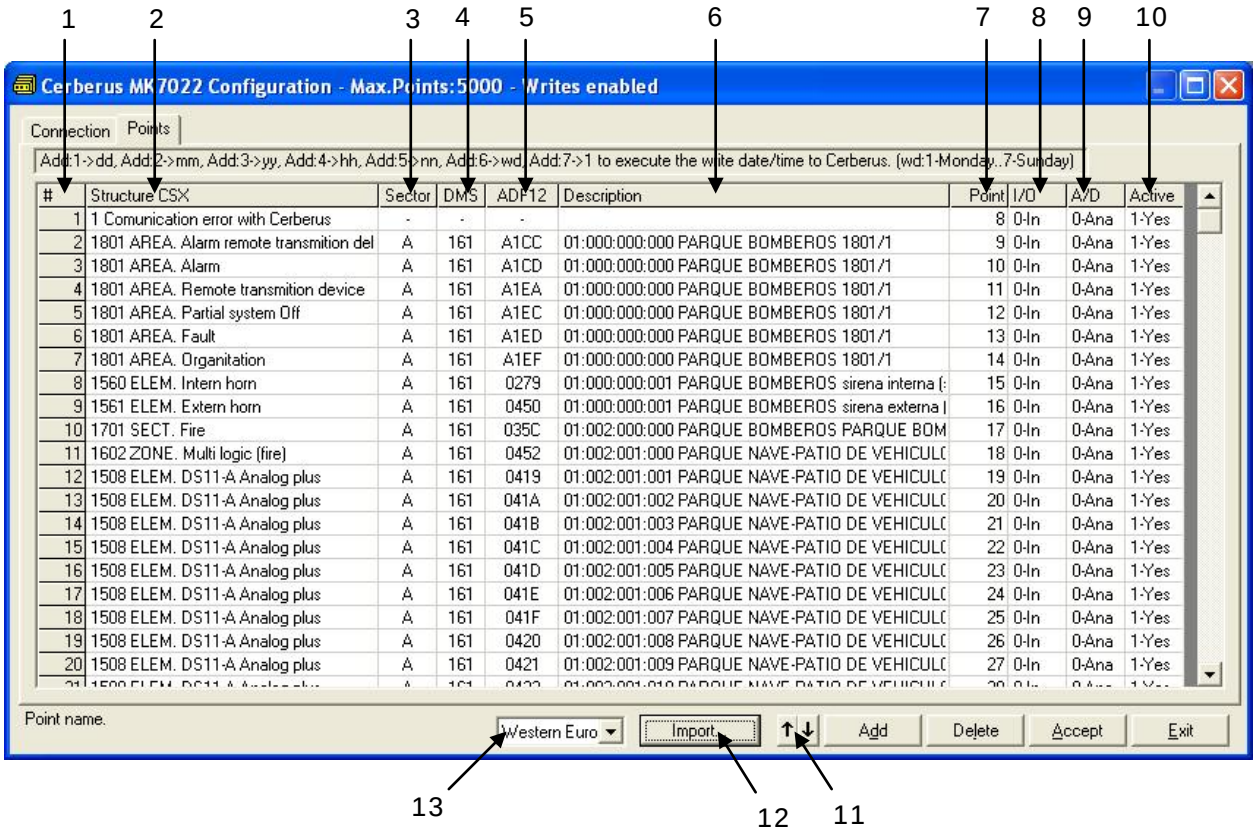
3.4 Datapoints configuration

Select the *Points* tab to configure the datapoints list.



Datapoints list

1. *#*. Datapoint number (edit not permitted). Every row in the grid corresponds to a datapoint. Datapoints (rows in the grid) can be added or deleted selecting the desired row and clicking *Add* or *Delete* buttons. The special datapoints (see below) cannot be deleted. This column is used only to enumerate the rows in the grid (datapoints).
2. *Structure CSX.* Cerberus structure, identifies the type of point into Cerberus system. Edit using the mouse right-button-click menu available on the column. The contents of this column can be automatically filled by an import of datapoints of a Cerberus CC11 configuration file, see details below.
3. *Sector*. Cerberus Sector. Possible values: A=Fire, B=Extingishing, C=Intrussion, D=Gas, E=Building Services, 0=Basic, F=Concentrator. Edit just typing the letter corresponding to the sector desired. The contents of this column can be automatically filled by an import of datapoints of a Cerberus CC11 configuration file, see details below.
4. *DMS*. Cerberus station address. Possible values: 0..999. All the points of one same station will have the same DMS number. The contents of this column can be automatically filled by an import of datapoints of a Cerberus CC11 configuration file, see details below.
5. *ADF12*. Cerberus element number. Possible values: 0000..FFFF (in hexadecimal). The contents of this column can be automatically filled by an import of datapoints of a Cerberus CC11 configuration file, see details below.

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6. *Description*. Descriptive name for the signal (optional). Useful to describe the physical location of the Cerberus element inside the building. The contents of this column can be automatically filled by an import of datapoints of a Cerberus CC11 configuration file, see details below.
7. *Point*. Modbus register address desired for the signal. Possible values: from 8 to 5000. Note that **addresses 1 to 7 are reserved for special datapoints used to modify date/time of Cerberus system**, and thus these addresses can not be assigned to normal datapoints, see details below. The contents of this column can be automatically filled by an import of datapoints of a Cerberus CC11 configuration file, see details below.
8. *I/O*. Datapoints's direction, always considered from the Modbus system point of view. Possible values: 0-Input, 1-Output, 2-Input/Output. Input means that datapoint can only be read from Modbus. Output means that datapoint can only be written from Modbus. Input/Output means that datapoint can be read/written from Modbus.
9. *A/D*. Datapoint type. Possible values: 0-Analog, 1-Digital. Edit not permitted, for this integration all the datapoints, corresponding to Cerberus elements statuses, will be analog reflecting the value given (in the *Connection* tab) per every possible status. For *Communication error* datapoint, only values of 0 or 1 are allowed, 0 means communication with Cerberus is correct, 1 means communication with Cerberus is failing.
10. *Active*. Indicates if the datapoint is active or not for the integration. Possible values: 0-No, 1-Yes. Edit using the mouse right-button-click menu available on the column. *Deactivating datapoints not used, instead of deleting them, can be useful if you want to maintain these datapoints and their configuration for future use.*
11. Buttons to move up or down in the grid a selected row or group of consecutive rows.
12. *Import*. Button to launch the import tool to import datapoints from Cerberus CC11 configuration files, see details below.
13. Select the character set used in your country to see/modify correctly the datapoints description (column *Description*).

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IMPORTANT NOTES:

- Modbus addresses 1 to 7 are reserved for the following special datapoints that can be used to modify the Date/Time of the Cerberus system from Modbus:

Address	Datapoint	Format / Values accepted	Description
1	Day	DD (1..31)	Day
2	Month	MM (1..12)	Month
3	Year	YY (0..99)	Year
4	Hour	HH (0..23)	Hour
5	Minute	NN (0..59)	Minute
6	Day of the week	D (1..7)	Day of the week (1-Monday…7-Sunday)
7	Send Date/Time	0 or 1	Writing 1 in this address will force the sending to Cerberus of the specified Date/Time in registers 1 to 6. Registers 1 to 6 specifying Date/Time structure must be written previously with the correct data. If the data of any of the registers 1 to 6 is not correct, then the Date/Time modification will be rejected by Cerberus.

- Data for columns *Structure CSX, Sector, DMS, ADF12,* and *Description* indicating the physical location of the Cerberus point into the building, must be supplied by the technician that has set up the Cerberus system. Having this data, is just a matter of assign the desired Modbus register address to every Cerberus point. These fields can be also automatically filled by an import of a CC11 Cerberus configuration file (see details below), this CC11 file must be supplied by the technician that has setup the Cerberus system.
- Columns *DMS* and *Point* can be filled using auto-enumeration function, see details below.
- For columns *I/O* and *Active* you can assign the same value to some consecutive rows, follow these steps:
  1. Select the desired cells to modify with the mouse left button (click and drag).
  2. Open contextual menu with the mouse right button.
  3. Select the value desired from the options of the contextual menu. All the previously selected cells will change to this value selected.

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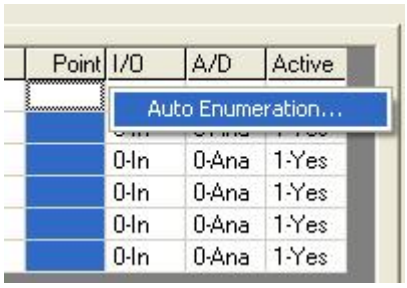
In columns *DMS* and *Point* you can enter the desired value individually per cell or you can auto enumerate consecutive cells, for this last follow these steps:

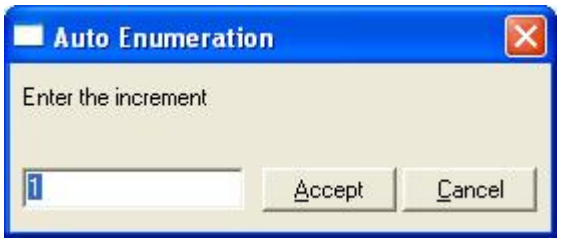
1. Select using the left mouse button (clicking and dragging) all the rows in the list to which you want to automatically assign values (must be consecutive rows).

2. Click right mouse button over the selected fields and select *Auto Enumeration* option from the pop-up menu that will appear.



3. Enter the first value to assign.

4. Enter the increment between consecutive assignments. For example, to assign consecutive Modbus addresses automatically for column *Point*, select 8 for the first value and an increment of 1, the values (Modbus addresses) generated will be 8,9,10,11,12.. and so on. For example, to assign the same value in the *DMS* field to all the rows corresponding to the same Cerberus station just select the desired value for DMS and an increment of 0.

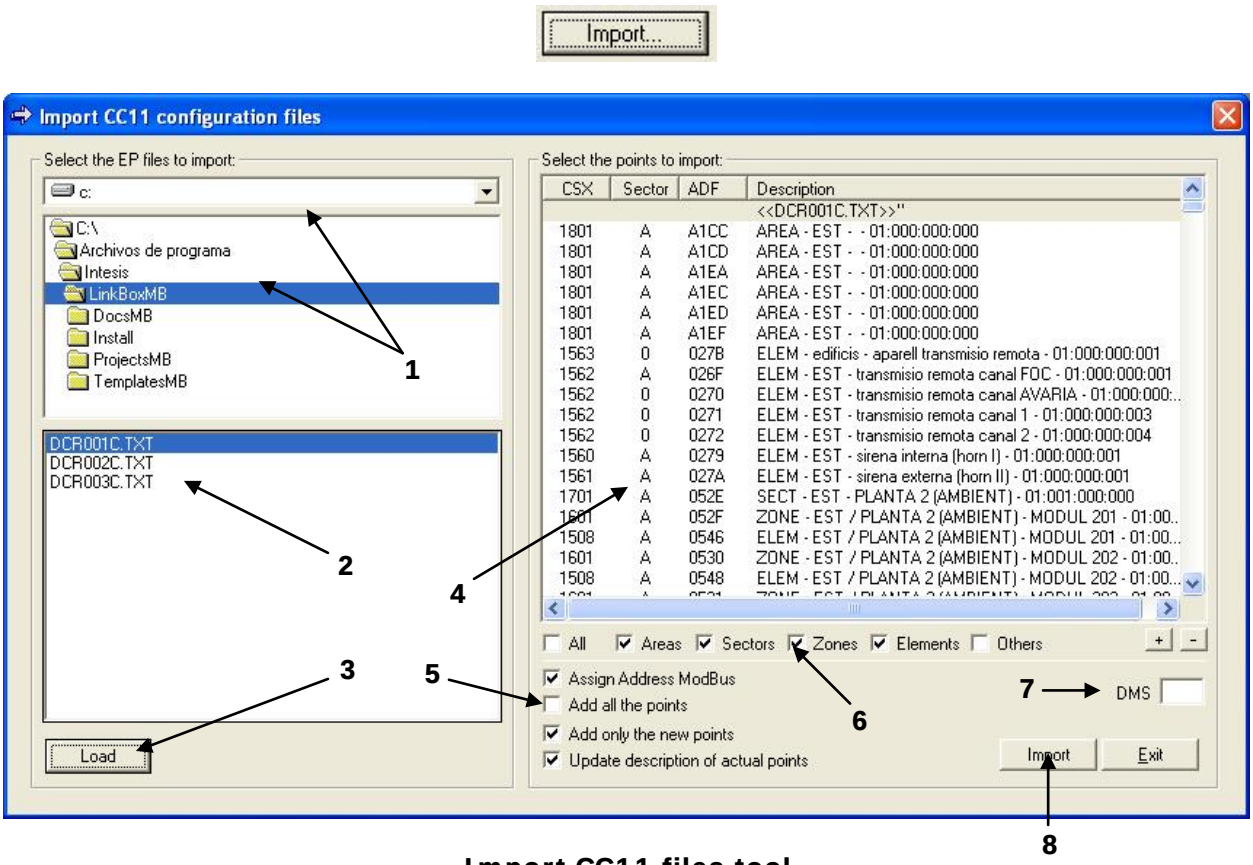


3.4.1 Importing Cerberus datapoints from a CC11 configuration file.

All the information related to Cerberus datapoints can be imported from a Cerberus CC11 configuration file supplied by the Cerberus technician. Every CC11 file corresponds to a CC11 station and contains the entire configuration for this station. For a given station, along with the CC11 file, the DMS number must be also supplied by the technician, this is the number assigned to the station into the Cerberus network.

All this information can be directly imported into the datapoints list using the tool to import CCC11 files embedded into LinkBoxMB. To do so follow these steps:

- Click on button *Import* in the bottom of the datapoints list. The *Import CC11 files* window will be opened.



Import CC11 files tool

- Using the drive and folder selectors (**1**), select the path where the CC11 file is located.
- Using the files selector (**2**), select the file you want to load in the import tool and click on button Load (**3**). The contents of the file loaded will be showed in the point's selector (**4**).
- Using the points selector (**4**) select the points you want to import, select the type of Cerberus datapoints to be imported (**6**), enter the DMS number supplied by the Cerberus technician for this station (**7**), and select also the options for the import (**5**). Finally click on button *Import* (**8**) to import the selected points into the datapoints list. A message will appear informing about the results of the import as showed in the figure below.

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Selecting points in the point's selector (**4**):

To select one or more points just select them using the standard windows method for selecting some elements in a list (using left mouse button in combination with CTRL key to select non consecutive points, or clicking and dragging using left mouse button or the key combinations *SHIFT+ARROW UP* or *SHIFT+ARROW DOWN* to select consecutive points). The whole contents of the points selector can be selected or deselected clicking on buttons + or - , respectively.

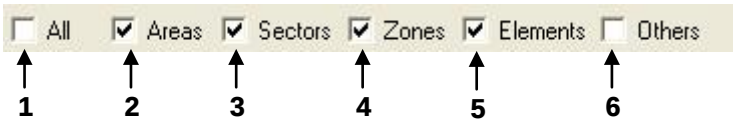
Selecting all the contents of the points selector and clicking on *Import* button with the default import options selected, will perform the following:

For an empty datapoints list (a new installation):
- Addition of all the points to the list.
- Automatic assignment of consecutive Modbus addresses for the points (the first 7 addresses will not be assigned because they are reserved for special Date/Time datapoints).

For an already filled datapoints list (an existing installation that is being expanded):
- Addition to the list of only the points not previously existing in the list.
- Automatic assignment of consecutive Modbus address for new points.
- Update of the name for those points already existing in the list.

Import options:

Of course these options apply only to points selected in the point's selector.



1. Select this to import all type of datapoints.
2. Select this to import datapoints of type Area.
3. Select this to import datapoints of type Sector.
4. Select this to import datapoints of type Zone.
5. Select this to import datapoints of type Element.
6. Select this to import datapoints of any other type not specified above.

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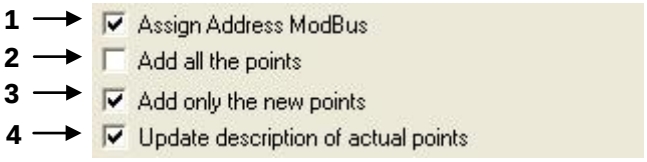
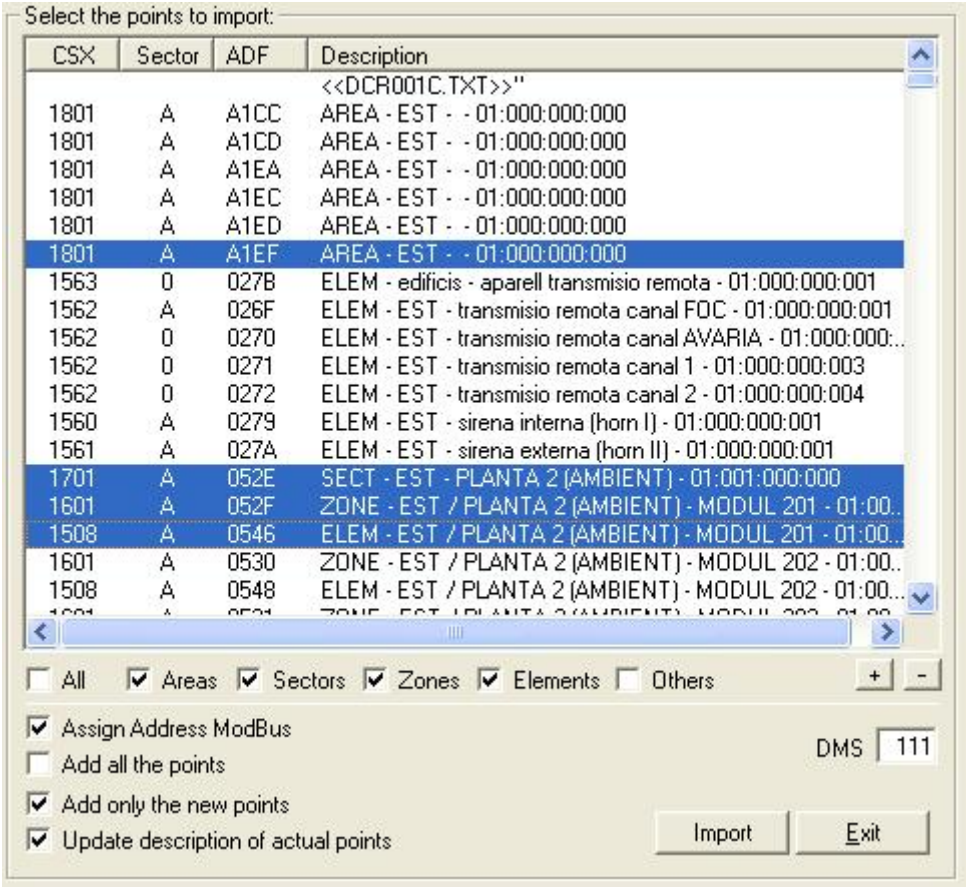


7. Select this to automatically assign Modbus addresses to the new points added in the datapoints list.
8. Select this to append all the points selected to the datapoints list, although already existing in the list.
9. Select this to append only to the datapoints list those points not already existing in the list.
10. Select this to update the field description of the selected points already existing in the list.

Example:

Selecting the following in the points selector and in the import options



Will generate the following datapoints in the datapoints list

#	Structure CSX	Sector	DMS	ADF12	Description	Point	I/O	A/D	Active
1	1801 AREA. Organitation	A	111	A1EF	AREA - EST - - 01:000:000:000	8	0-In	0-Ana	1-Yes
2	1701 SECT. Fire	A	111	052E	SECT - EST - PLANTA 2 (AMBIENT) - 01:001:000:000	9	0-In	0-Ana	1-Yes
3	1601 ZONE. Single logic	A	111	052F	ZONE - EST / PLANTA 2 (AMBIENT) - MODUL 201 - (	10	0-In	0-Ana	1-Yes
4	1508 ELEM. DS11-A Analog plus	A	111	0546	ELEM - EST / PLANTA 2 (AMBIENT) - MODUL 201 - 0	11	0-In	0-Ana	1-Yes

3.4.2 Status and commands available for every Cerberus datapoint type.

The following table shows the available statuses/commands for every Cerberus datapoint type, as well as its default value in Modbus side to read/write the datapoint.

	STS	0	1	2	3	4	5	9	7	8	9	10	11	12	13	14
	CMD	100	101	102	103	104	105	106	107	108						
1801 AREA. Alarm remote transmition delay	STS	0-Delay Off				4-Delay On										
	CMD	100-Delay Off														
1801 AREA. Alarm	STS	0-Normal													13-General_Alarm	14-Local_Alarm
	CMD	100-Reset	101-AckAlarm													
1801 AREA. Remote transmition device	STS	0-Inactive		2-Fault	3-Disabled											
	CMD			102-AckFault												
1801 AREA. Partial system Off	STS	0-Normal	1-Part of system Off													
	CMD															
1801 AREA. Fault	STS	0-Normal		2-Fault												
	CMD															
1801 AREA. Organitation	STS	0-Day mode	1-Night Mode													
	CMD	100-Day mode	101-Night Mode													
1701 SECT. Fire	STS	0-Normal	1-Alarm													
	CMD	100-Reset	101-AckAlarm													
1702 SECT. Extinguishing Release	STS	0-Enabled	1-Active		3-Disabled											
	CMD															
1702 SECT. Extinguishing Alarm	STS	0-Normal	1-Alarm													
	CMD	100-Reset	101-AckAlarm													
1702 SECT. Extinguishing Fault	STS	0-Normal		2-Fault												
	CMD	102-AckFault														
1601 ZONE. Single logic	STS	0-Normal	1-Alarm				5-Off	6-Test	7-Renovation	8-Revision		10-Not ready		12-Warning		
	CMD	100-Reset	101-AckAlarm	102-AckWarning		104-On	105-Off	106-Test	107-Renovation	108-Revision						
1602 ZONE. Multi logic (fire)	STS	0-Normal	1-Alarm				5-Off	6-Test	7-Renovation	8-Revision		10-Not ready		12-Warning		
	CMD	100-Reset	101-AckAlarm	102-AckWarning		104-On	105-Off	106-Test	107-Renovation	108-Revision						
1602 ZONE. Multi logic (Extinguishing)	STS	0-Normal	1-Alarm				5-Off	6-Test	7-Renovation	8-Revision		10-Not ready	11-Prealarm	12-Warning		
	CMD	100-Reset	101-AckAlarm	102-AckWarning		104-On	105-Off	106-Test	107-Renovation	108-Revision						
1605 ZONE. Manual call point	STS	0-Normal	1-Alarm				5-Off	6-Test				10-Not ready				
	CMD	100-Reset	101-AckAlarm	102-AckWarning		104-On	105-Off	106-Test								
1610 ZONE. Digital	STS	0-Normal	1-Alarm				5-Off	6-Test				10-Not ready				
	CMD	100-Reset	101-AckAlarm			104-On	105-Off	106-Test								
1651 ZONE. Control (local I/O)	STS	0-Inactive		2-Fault			5-Off									
	CMD	100-Reset		102-AckFault		104-On	105-Off									
1654 ZONE. Control (programmable)	STS	0-Inactive	1-Active				5-Off									
	CMD	100-Deactivate			103-Activate	104-On	105-Off									
1656 ZONE. Control (programmable, distrib. contr.)	STS	0-Inactive	1-Active				5-Off									
	CMD	100-Deactivate			103-Activate	104-On	105-Off									
1501 ELEM. DS11-I Interective sensor	STS	0-Inactive	1-Active	2-Fault			5-Off	6-Test			9-Drif					
	CMD			102-AckFault		104-On	105-Off									
1502 ELEM. DS11-I Manual call point	STS	0-Inactive	1-Active	2-Fault			5-Off	6-Test				10-Not ready				
	CMD			102-AckFault		104-On	105-Off									
1503 ELEM. DS11-C Manual call point	STS	0-Inactive	1-Active	2-Fault			5-Off	6-Test				10-Not ready				
	CMD			102-AckFault		104-On	105-Off									
1508 ELEM. DS11-A Analog plus	STS	0-Inactive	1-Active	2-Fault			5-Off	6-Test			9-Drif					
	CMD			102-AckFault		104-On	105-Off									
1510 ELEM. DS11-C Collective line	STS	0-Inactive	1-Active	2-Fault			5-Off	6-Test			9-Drif					
	CMD			102-AckFault		104-On	105-Off									
1511 ELEM. DS11-C Collective line type 2	STS	0-Inactive	1-Active	2-Fault			5-Off	6-Test			9-Drif					
	CMD			102-AckFault		104-On	105-Off									
1512 ELEM. DS11-C Collective line type 3	STS	0-Inactive	1-Active	2-Fault			5-Off	6-Test			9-Drif					
	CMD			102-AckFault		104-On	105-Off									
1520 ELEM. Digital sensor	STS	0-Inactive	1-Active	2-Fault			5-Off	6-Test			9-Drif					
	CMD			102-AckFault		104-On	105-Off									
1521 ELEM. Digital manual call point	STS	0-Inactive	1-Active	2-Fault			5-Off					10-Not ready				
	CMD			102-AckFault		104-On	105-Off									
1525 ELEM. Digital	STS	0-Inactive	1-Active	2-Fault			5-Off									
	CMD			102-AckFault		104-On	105-Off									

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	STS	0	1	2	3	4	5	9	7	8	9	10	11	12	13	14
	CMD	100	101	102	103	104	105	106	107	108						
1551 ELEM. Output without feedback	STS	0-Inactive	1-Active	2-Fault			5-Off									
	CMD	100-Deactivate	103-Activate	102-AckFault		104-On	105-Off									
1552 ELEM. Output with feedback	STS	0-Inactive	1-Active	2-Fault			5-Off									
	CMD	100-Deactivate	103-Activate	102-AckFault		104-On	105-Off									
1560 ELEM. Intern horn	STS	0-Inactive	1-Active	2-Fault			5-Off									
	CMD			102-AckFault												
1561 ELEM. Extern horn	STS	0-Inactive	1-Active	2-Fault			5-Off									
	CMD	100-Deactivate	103-Activate	102-AckFault		104-On	105-Off									
1562 ELEM. Remote transmit. channel	STS	0-Inactive	1-Active	2-Fault			5-Off									
	CMD			102-AckFault												
1564 ELEM. Alarm horn (control by area CAK)	STS	0-Inactive	1-Active	2-Fault			5-Off									
	CMD	100-Deactivate	103-Activate	102-AckFault		104-On	105-Off									
1565 ELEM. Alarm horn (user criteria activation)	STS	0-Inactive	1-Active	2-Fault			5-Off									
	CMD	100-Deactivate	103-Activate	102-AckFault		104-On	105-Off									
1301 IBD. DS11-I Line interface	STS	0-Normal	1-Alarm	2-Fault												
	CMD	100-Reset	101-AckAlarm													
1302 IBD. MS9i Line interface	STS	0-Normal	1-Alarm	2-Fault												
	CMD	100-Reset	101-AckAlarm													
1303 IBD. DS11-A Line interface	STS	0-Normal	1-Alarm	2-Fault												
	CMD	100-Reset	101-AckAlarm													
1310 IBD. DS11-C Line interface	STS	0-Normal		2-Fault												
	CMD			102-AckFault												
1320 IBD. CC11 I/O interface	STS	0-Normal		2-Fault												
	CMD			102-AckFault												
1340 IBD. CC11 power supply	STS	0-Normal	1-Battery	2-Fault												
	CMD			102-AckFault												
1390 IBD. CI11 display panel	STS	0-Normal		2-Fault												
	CMD			102-AckFault												
1391 IBD. CI11 fire brigade panel	STS	0-Normal		2-Fault												
	CMD			102-AckFault												
1395 IBD. CI11 Extinguishing subsystem	STS	0-Normal		2-Fault												
	CMD			102-AckFault												
1201 CBD. CC11 Control unit	STS	0-Normal	1-Alarm	2-Fault												
	CMD	100-Reset	101-AckAlarm	102-AckFault												
1202 CBD. CT11 Remote terminal	STS	0-Normal		2-Fault												
	CMD			102-AckFault												
1210 CBD. CI11 Control unit fault	STS	0-Normal	1-Alarm	2-Fault												
	CMD	100-Reset	101-AckAlarm	102-AckFault												
1210 CBD. CI11 Control unit printer	STS	0-Normal		2-Fault												
	CMD			102-AckFault												
1211 CBD. CC11 Remote Control unit	STS	0-Normal		2-Fault												
	CMD			102-AckFault												

For example, analysing the second row of the table, we have:

Datapoint type: **1801 AREA. Alarm**

Values read through Modbus => Status of the point
0 => Normal
13 => General Alarm
14 => Local Alarm

Values written through Modbus => Command sent to Cerberus for the point
100 => Reset
101 => AckAlarm

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Note that the same value read/written in Modbus represent different statuses/commands depending on the type of Cerberus datapoint.

The following tables show the default values for statuses and for commands, all these default values can be modified in *Connection* tab.

STATUSES

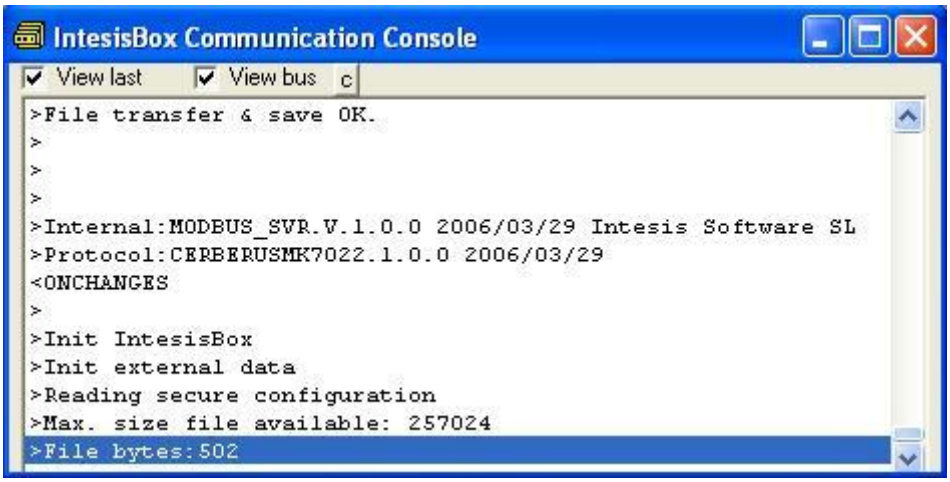
Value	Mean					
0	Normal	Inactive	Delay Off	Day Mode		
1	Alarm	Active	Delay On	Night Mode	Battery	Part of system Off
2	Fault					
3	Disabled					
4	On					
5	Off					
6	Test					
7	Renovation					
8	Revision					
9	Drift					
10	Not_Ready					
11	Prealarm					
12	Warning					
13	Gen_Alarm					
14	Loc_Alarm					

COMMANDS

Value	Mean			
100	Reset	Deactivate	Delay Off	Day Mode
101	AckAlarm	Activate	Delay On	Night Mode
102	AckFault	AckWarning		
103	Activate			
104	On			
105	Off			
106	Test			
107	Renovation			
108	Revision			

3.5 Sending the configuration to IntesisBox

When the configuration has been saved (button *Accept*) and the IntesisBox configuration binary file has been generated (remember to select yes when asked if you want to generate the IntesisBox file), to send the configuration file to IntesisBox click on the button ***Send File***. The process of file transmission can be monitored in the *IntesisBox Communication Console* window. If the file transmission is ok, IntesisBox will reboot automatically with the new configuration loaded.



Remember that saving the configuration and generating the IntesisBox file only saves to the hard disk on the PC the configuration files. **Do not forget to send the configuration file to the IntesisBox using button *Send File*.**

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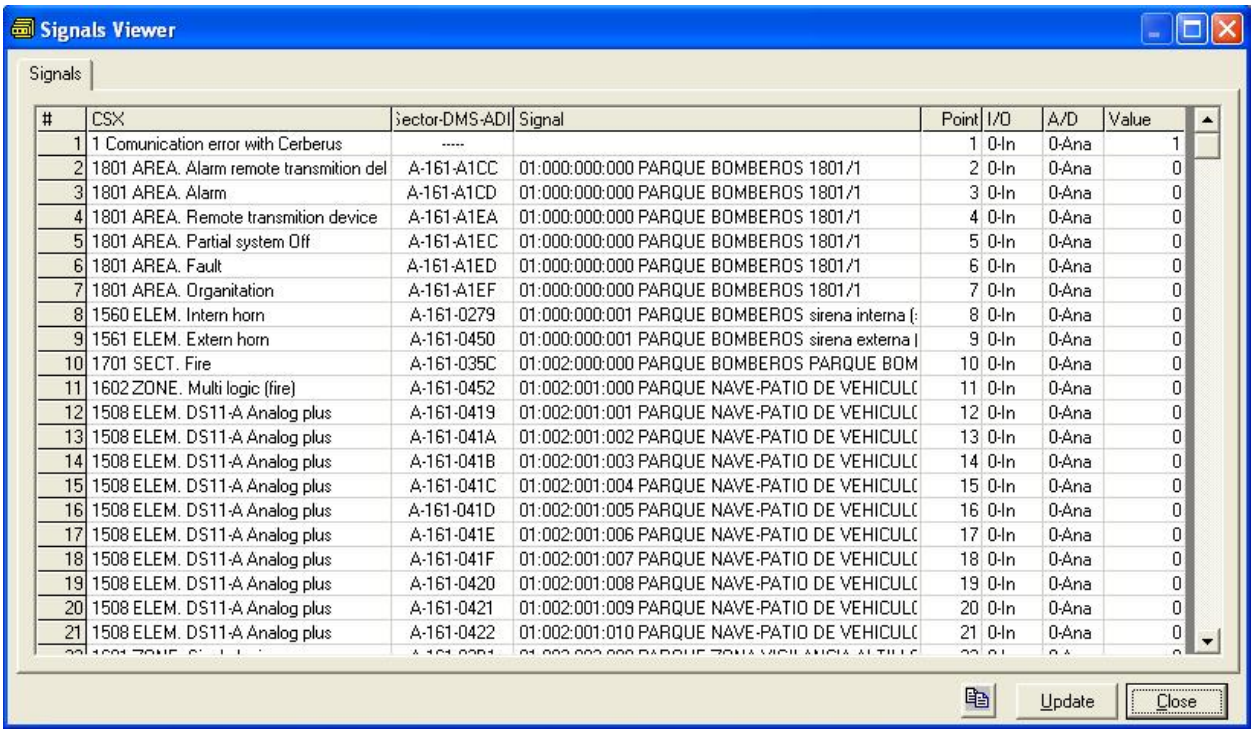
3.6 Signals viewer

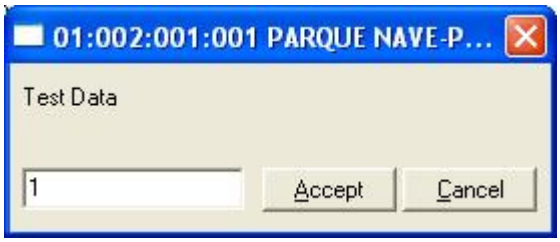
Once IntesisBox is running with the correct configuration, to supervise the status of the configured signals, select menu *View -> Signals*. The Signals Viewer window will be opened. This window shows all the active IntesisBox's datapoints with its main configuration parameters and its real time value in the column Value. After a reset of IntesisBox or after sending a configuration file to the IntesisBox, all the datapoints values will be updated automatically in the signals viewer, in case you connect to the IntesisBox when it is already running, you should press the *Update* button to get updated values, press just once the button to update all the signal values, from this moment the signal values will be maintained updated until the connection is closed.



#	CSX	Sector-DMS-ADI	Signal	Point	I/O	A/D	Value
1	1 Comunication error with Cerberus	-----		1	0-In	0-Ana	1
2	1801 AREA. Alarm remote transmition del	A-161-A1CC	01:000:000:000 PARQUE BOMBEROS 1801/1	2	0-In	0-Ana	0
3	1801 AREA. Alarm	A-161-A1CD	01:000:000:000 PARQUE BOMBEROS 1801/1	3	0-In	0-Ana	0
4	1801 AREA. Remote transmition device	A-161-A1EA	01:000:000:000 PARQUE BOMBEROS 1801/1	4	0-In	0-Ana	0
5	1801 AREA. Partial system Off	A-161-A1EC	01:000:000:000 PARQUE BOMBEROS 1801/1	5	0-In	0-Ana	0
6	1801 AREA. Fault	A-161-A1ED	01:000:000:000 PARQUE BOMBEROS 1801/1	6	0-In	0-Ana	0
7	1801 AREA. Organitation	A-161-A1EF	01:000:000:000 PARQUE BOMBEROS 1801/1	7	0-In	0-Ana	0
8	1560 ELEM. Intern horn	A-161-0279	01:000:000:001 PARQUE BOMBEROS sirena interna [:	8	0-In	0-Ana	0
9	1561 ELEM. Extern horn	A-161-0450	01:000:000:001 PARQUE BOMBEROS sirena externa [	9	0-In	0-Ana	0
10	1701 SECT. Fire	A-161-035C	01:002:000:000 PARQUE BOMBEROS PARQUE BOM	10	0-In	0-Ana	0
11	1602 ZONE. Multi logic (fire)	A-161-0452	01:002:001:000 PARQUE NAVE-PATIO DE VEHICULC	11	0-In	0-Ana	0
12	1508 ELEM. DS11-A Analog plus	A-161-0419	01:002:001:001 PARQUE NAVE-PATIO DE VEHICULC	12	0-In	0-Ana	0
13	1508 ELEM. DS11-A Analog plus	A-161-041A	01:002:001:002 PARQUE NAVE-PATIO DE VEHICULC	13	0-In	0-Ana	0
14	1508 ELEM. DS11-A Analog plus	A-161-041B	01:002:001:003 PARQUE NAVE-PATIO DE VEHICULC	14	0-In	0-Ana	0
15	1508 ELEM. DS11-A Analog plus	A-161-041C	01:002:001:004 PARQUE NAVE-PATIO DE VEHICULC	15	0-In	0-Ana	0
16	1508 ELEM. DS11-A Analog plus	A-161-041D	01:002:001:005 PARQUE NAVE-PATIO DE VEHICULC	16	0-In	0-Ana	0
17	1508 ELEM. DS11-A Analog plus	A-161-041E	01:002:001:006 PARQUE NAVE-PATIO DE VEHICULC	17	0-In	0-Ana	0
18	1508 ELEM. DS11-A Analog plus	A-161-041F	01:002:001:007 PARQUE NAVE-PATIO DE VEHICULC	18	0-In	0-Ana	0
19	1508 ELEM. DS11-A Analog plus	A-161-0420	01:002:001:008 PARQUE NAVE-PATIO DE VEHICULC	19	0-In	0-Ana	0
20	1508 ELEM. DS11-A Analog plus	A-161-0421	01:002:001:009 PARQUE NAVE-PATIO DE VEHICULC	20	0-In	0-Ana	0
21	1508 ELEM. DS11-A Analog plus	A-161-0422	01:002:001:010 PARQUE NAVE-PATIO DE VEHICULC	21	0-In	0-Ana	0

The signals viewer can be used although only one system is connected to the IntesisBox, *Cerberus* or *Modbus*, and is very useful for supervision and test.

It is possible to force a specific value to any signal for test purposes, to do so just double click on the row and select 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 *Cerberus* system.



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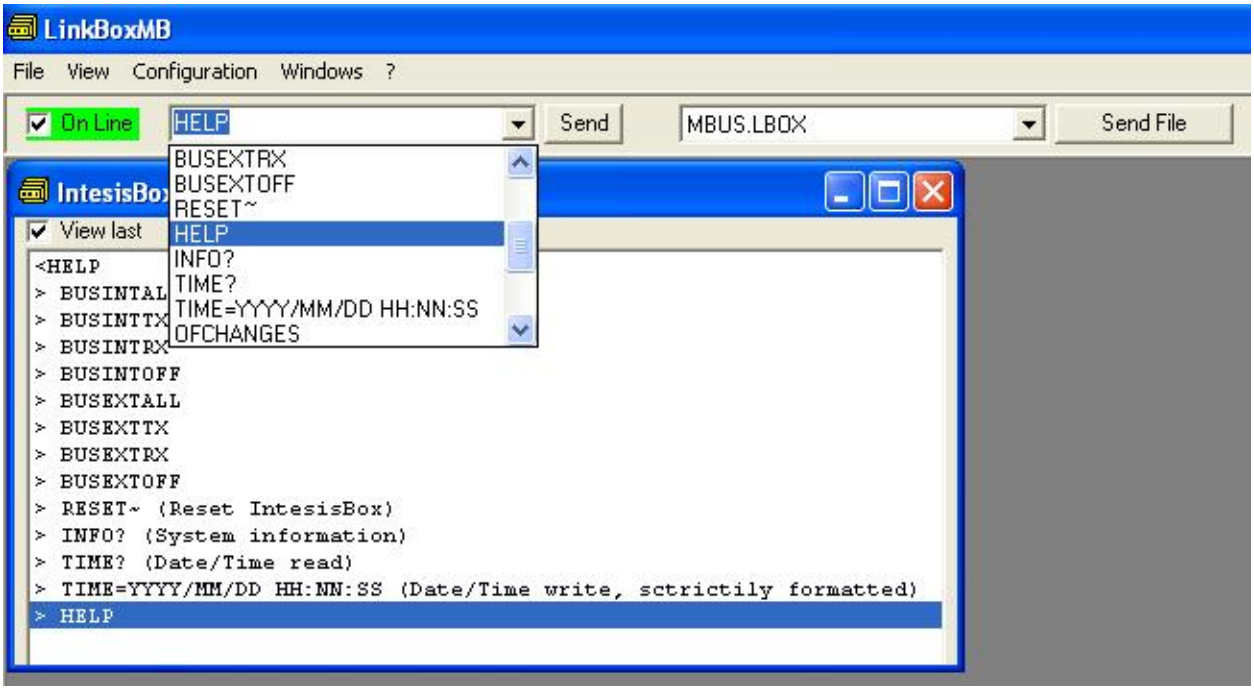
This tool is very useful to test the communication in the Modbus side from the Modbus master device for example, without the need to have the Cerberus system connected and running.

The signals viewer window has a button to copy to the Windows Clipboard all the contents of the window (in tab separated text format).

3.7 System commands

LinkBoxMB includes an option to send to IntesisBox a set of system commands for debugging and control purposes; this list is available in the commands list as shown in the figure below. To send a command to IntesisBox just select it from the list, or type it with the correct format, and press *Enter* or click on button *Send*. IntesisBox will act accordingly with the command received; the process can be monitored in the IntesisBox Communication Console window. The use of some of these commands can be critical for IntesisBox normal functioning, having this in mind use only these commands following the recommendations of Intesis Software technical support. A list of the more commonly used commands and the way to use them will be returned by IntesisBox after sending the HELP command.



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3.8 Files

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

PROJECT.INI	.ini file containing general information referent to the project
CERBERUSMK7022.INI	.ini file containing the information referent to the connection window and other special adjustments
CERBERUSMK7022.DAT	Text file (tab separated values) with the signals information (signals list). This file can be edited (with Excel for example) to change the configuration quicker and easier. Later on, when selecting *Configuration -> IntesisBox* in LinkBoxMB, if the changes have been made respecting the correct format, all the changes in the configuration done from Excel will be reflected in the signals list.
CERBERUSMK7022.LBOX	Binary file created from the information in the two files described above. This is the file downloaded to the IntesisBox.

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, only can be downloaded; the download file CERBERUSMK7022.LBOX does not contain all the integration information, as for example the signals description.

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4. Set-up process and troubleshooting

4.1 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 Cerberus interface MK7022 or other similar communication interface for Cerberus systems (with protocol ISO 1745) operative and at a distance of IntesisBox installation site of 15 meters maximum (due to RS232 communication).

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 Cerberus ISO1745 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.

4.2 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 Cerberus 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 (used either RS232, RS485 or Ethernet port depending on the type of Modbus communication to use). (See details for this communication cable in section *Connections* of this document).

4. Connect the communication cable coming from the RS232 port of the Cerberus communication interface to the port marked as **Cerberus** 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:

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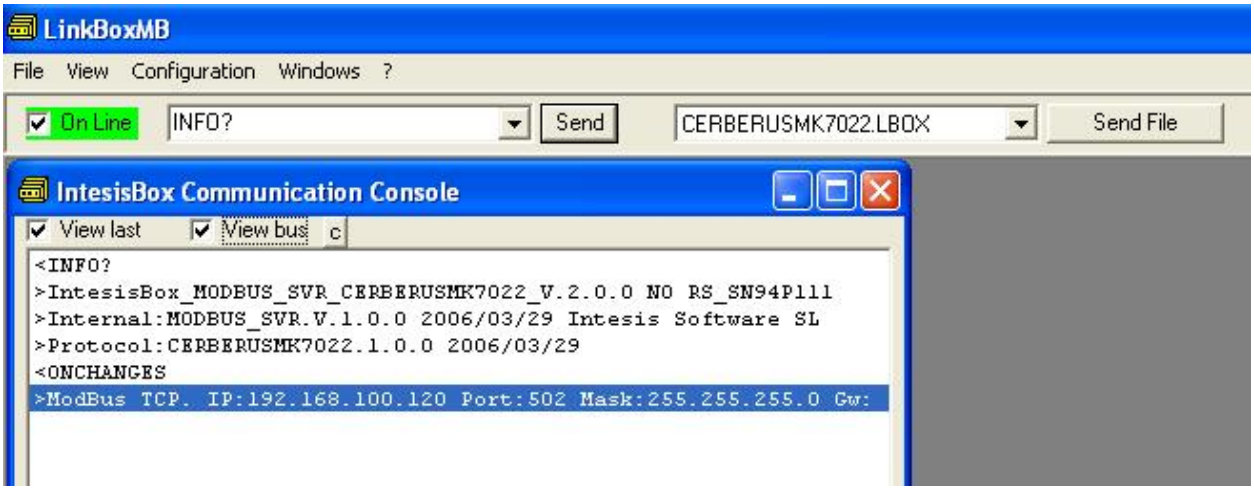
- The use of DC power supplies, floating or with the negative terminal connected to earth. **Never use a DC power supply with the positive terminal connected to earth**.
- The use of AC power supplies only if they are floating and not powering any other device.

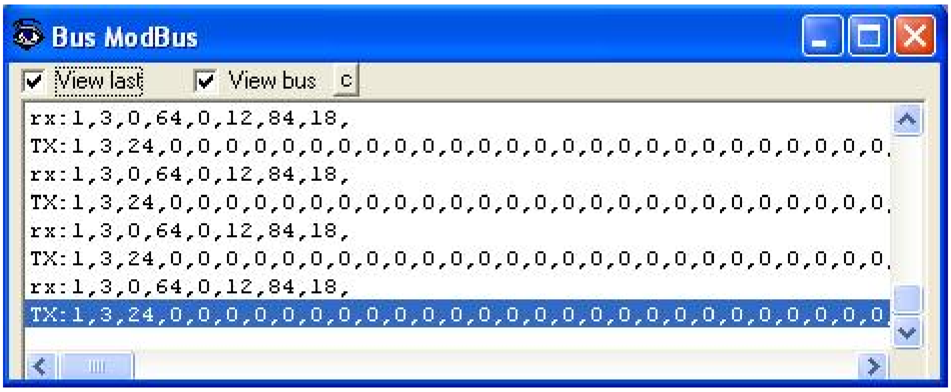
6. Connect the communication cable coming from the serial port of your laptop PC to the port marked as **PC Console** of IntesisBox. (See details for this communication cable in section *Connections* of this document).

7. Open LinkBoxMB, create a new project selecting a copy of the one named **DEMO Cerberus** 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.



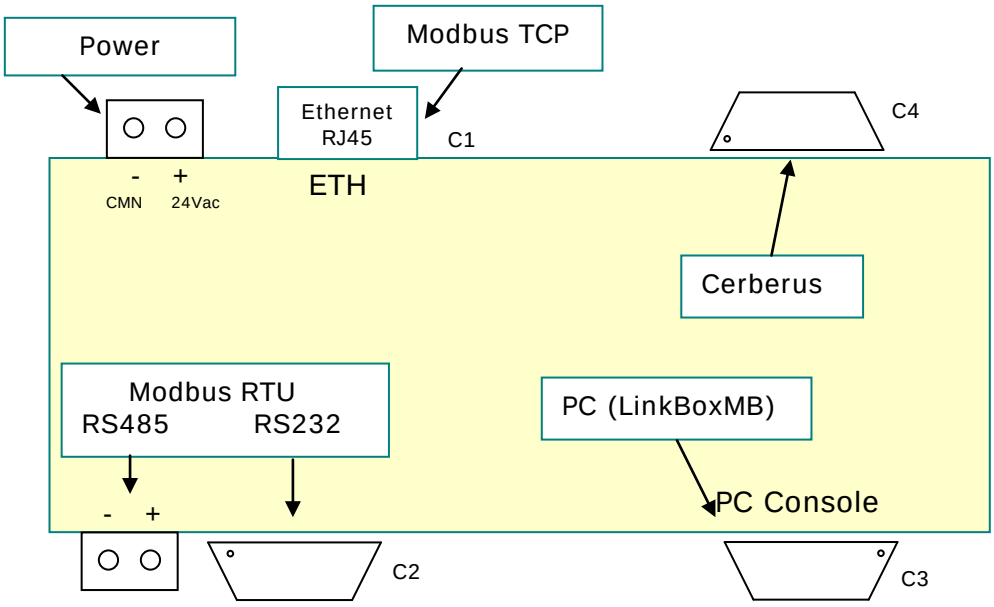
8. Modify the configuration as desired, save it and download the configuration file to IntesisBox as explained before.

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 Cerberus) 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 Cerberus system is ok. In case of no communication activity between IntesisBox and Cerberus check that the Cerberus communication interface is operative and configured and connected to the Cerberus panel or network, and check also the communication cable used to connect both devices. (See details for this communication cable in section *Connections* of this document).

5. Connections



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 -

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

IntesisBox (DB9 M)	C4	Cerberus connection RS-232		ISO1745 interface
Cable (DB9 F)				Cable
RX	2	←		TX
TX	3	→		RX
GND	5	↔		GND

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

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6. 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).
Cerberus port	1 x RS232. DB9 male connector (DTE).
LED indicators	1 x Power. 2 x Cerberus 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.

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7. Functional characteristics

General	
Max. points	5000
Virtual signals	Communication error with Cerberus system. Available from Modbus.
Cerberus interface	
Type	Partner system connected to ISO1745 Communication unit (RS232) as defined by Siemens Cerberus. Compliant with Cerberus MK7022 Communication unit interface (SW Version 10).
Configuration parameters	• Baud rate. • Data bits. • Parity. • Timeout for communication error signal activation. • Every possible status (Normal, Alarm, Fault…) of a device (detector, panel…) and also every possible command of the Cerberus system can be freely associated to a numerical value to be read/write from Modbus. *This numerical value will be the point's value read from Modbus when the associated Cerberus device is in this status, or the value to write to send the specified command to Cerberus. All the points are of type analog from the point of view of Modbus.*
Interactivity with Cerberus 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	
Parameters configurable per point	Generic fields. • Point description. Useful to identify the point's location into the building. • Active (Yes/No). Useful to deactivate points maintaining the configuration for later use. Cerberus related fields. • Structure CSX (Area/Section/Zone/Element/IBD/CBD). • Sector. • DMS. • ADF12. This info. must be supplied by the engineer that has set up the Cerberus system. Modbus related fields. • Point address (1…5000). This info., along with the points description, must be supplied to the engineer in charge of setting up the integration into the Modbus system.
Modbus data types	All the points are of data type UNSIGNED INT in the Modbus interface.

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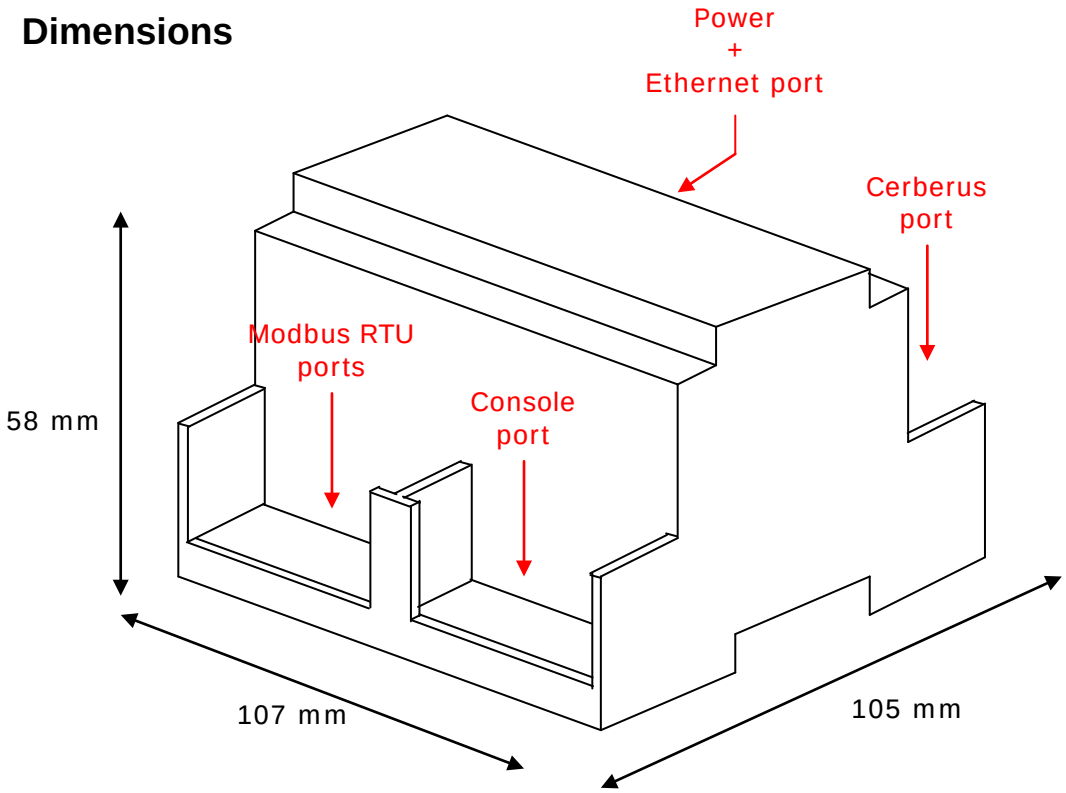
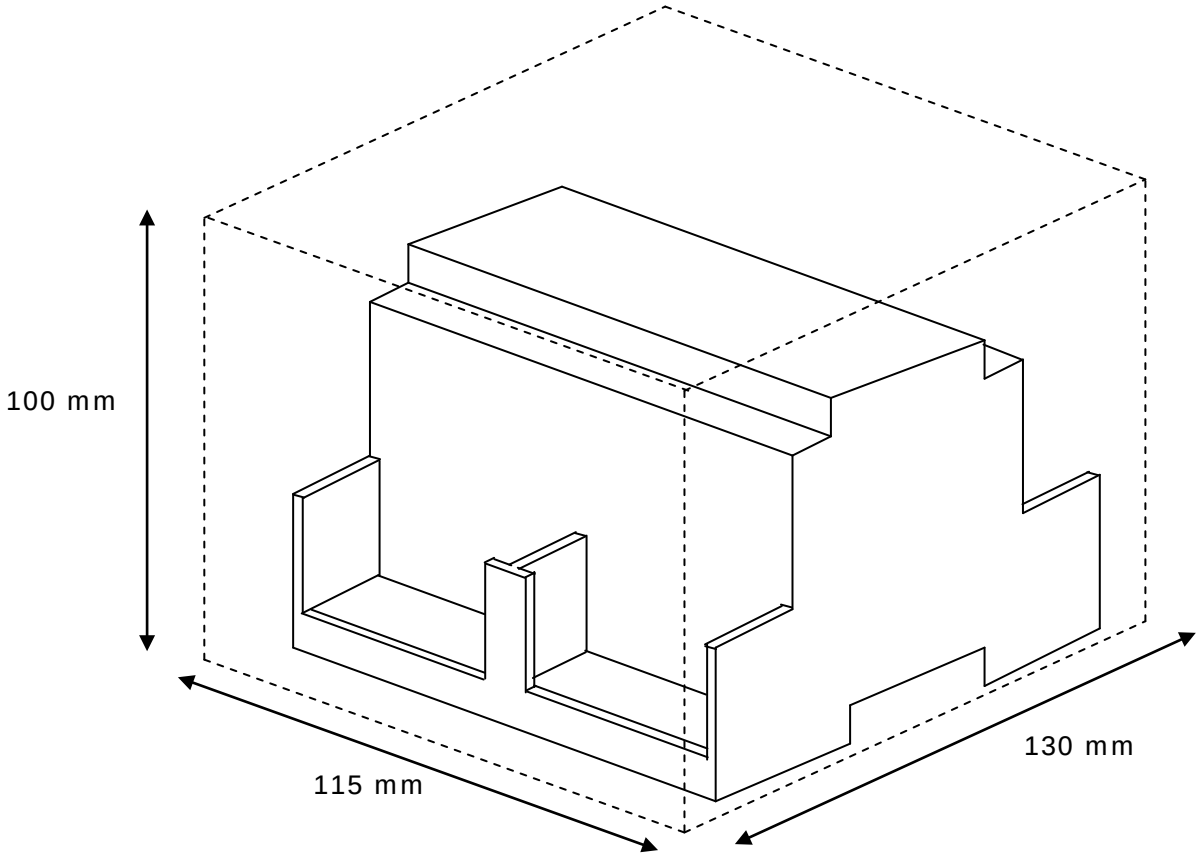
8. Dimensions



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



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