



IntesisBox[®] Modbus Server

Digitally Addressable Lighting Interface (DALI)

User Manual

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Gateway for integration of DALI devices into Modbus (RTU and TCP) systems.

Order code:

IBMBSDAL0640000, 64 DALI ballasts (1 DALI channel)

IBMBSDAL1280000, 128 DALI ballasts (2 DALI channels)

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1 Description

1.1 Introduction

This document describes the integration of DALI lighting ballasts into Modbus compatible devices and systems using the IntesisBox Modbus Server to DALI communication gateway.

The aim of this integration is to monitor and control DALI lighting ballasts, remotely, from your Control Center using any commercial SCADA or monitoring software that includes a Modbus Master driver (RTU and/or TCP). To do it so, IntesisBox performs as a Modbus Server, allowing poll and write requests from any Modbus master device.

In current version of the device, following DALI device types are supported:

- DALI Fluorescent lights (DALI type 0)
- Emergency lights (DALI type 1)
- LED modules (DALI type 6)

All of them, regardless of its type, will be referred as 'ballasts', 'DALI devices' and 'ECGs' (Electronic Control Gears) indistinctively throughout the document.

Up to 64 DALI lighting devices can be fitted in a single DALI channel, and therefore controlled and monitored from IntesisBox. Depending on the version of the gateway, 1 line (64 lighting devices) or 2 lines (128 lighting devices) are supported.

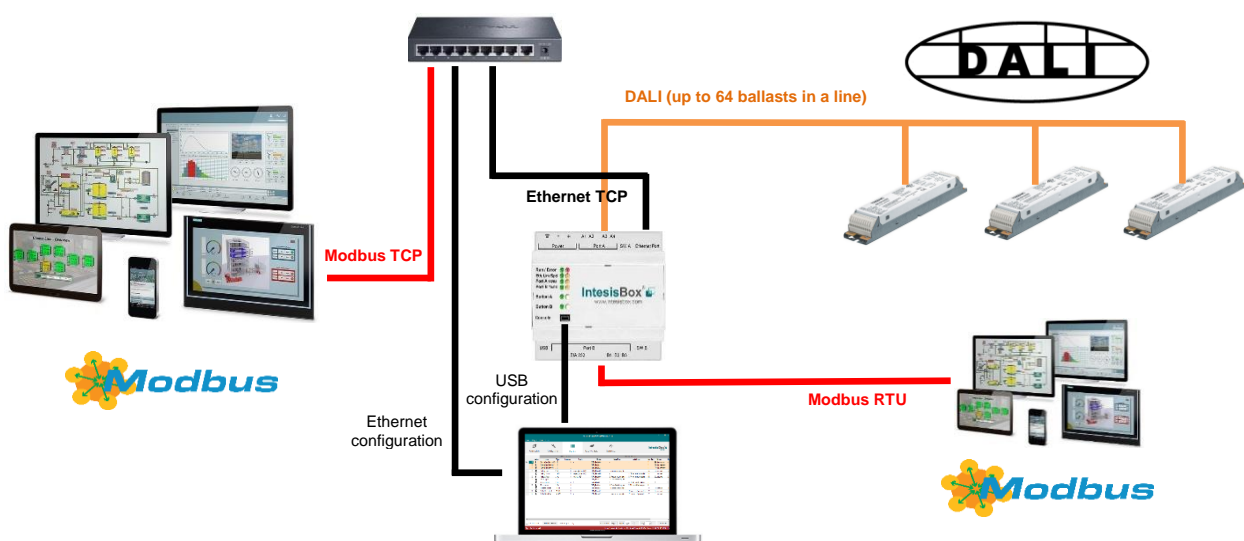
Version supporting 2 DALI channels does not have support for Modbus RTU – it's a Modbus TCP-only device.

IntesisBox needs to be configured using IntesisBox MAPS software configuration tool. In the software, Modbus and DALI lighting ballast parameters must be configured and downloaded to the IntesisBox.

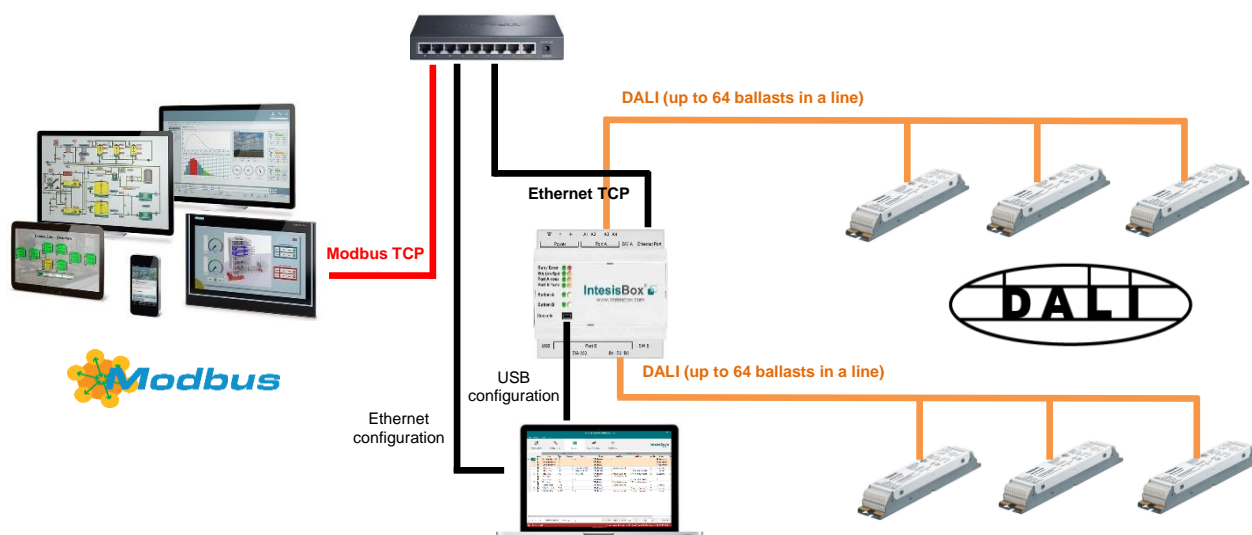
This document assumes the user is familiar with Modbus and DALI technologies and technical terms.



NOTE: There may be differences in the implementation of DALI among different ballasts and manufacturers. IntesisBox is compatible with Ballasts implementing the DALI standard and certified under the DiiA guidelines for testing and certification. Use only DALI devices having the DALI logo with IntesisBox.



**Integration of DALI into
Modbus TCP / Modbus RTU control systems (product version supporting 1 DALI channel)**



Integration of DALI into Modbus TCP / Modbus RTU control systems (product version supporting 2 DALI channels)

1.2 Functionality

IntesisBox® continuously polls (reads) all the signals of the DALI lighting ballasts in each line and maintains the updated values to be served in Modbus.

When a write is done from Modbus in a gateway's Modbus writeable address, the corresponding command is sent to the corresponding DALI lighting ballast.

In the continuous polling process of the DALI channel, if there is no answer, it is indicated with a virtual signal of communication error for this ballast in its line.

The IP address and communication parameters for Modbus side of the gateway (TCP or RTU) must be set in the MAPS configuration tool.

From the configuration tool, it is also possible to scan each DALI channel for available ballasts, add them in configuration, and configure its individual parameters (short address, preset levels, scenes, etc), according to their device type (fluorescent light, emergency light, LED module).

1.3 Gateway's capacity

IntesisBox capacity is listed below:

Element	Max.	Notes
Number of DALI channels	2	Number of independent DALI channels
Number DALI lighting devices per line	64	64 DALI lighting devices are supported per line
Max number of Modbus variables per DALI device	61	Number of available signals will vary according to device type
Max number of Modbus variables per DALI group	16	Number of available signals will vary according to device type
Max number of variables per LINE	4176	16 broadcast signals + 16 signals/DALI group + 61 signals/DALI device

There are 2 different models of *IntesisBox® Modbus Server – DALI* with different capacity. The table above shows the capacity for the top model (with maximum capacity).

The 2 different models allow integrating respectively: 1 or 2 DALI channels.

Their **order codes** are:

- **IBMBSDAL0640000**. Model supporting 1 DALI channel (up to 64 DALI devices)
- **IBMBSDAL1280000**. Model supporting 2 DALI channels (up to 64 DALI devices per channel, 128 in total)

2 Modbus interface

2.1 Functions supported

This part is common for Modbus RTU and TCP.

Modbus functions 03 and 04 (*Read Holding Registers* and *Read Input Registers*) can be used to read Modbus registers.

Modbus functions 06 and 16 (*Single Multiple Holding Registers* and *Write Multiple Holding Registers*) can be used to write Modbus registers.

Configuration of poll records is possible between Modbus addresses 0 and 20000. Addresses that are not defined in section 2.4 (Modbus map of the device) are read-only and will always report 0.

Modbus error codes are supported, they will be sent whenever a non-valid Modbus address is queried.

All registers are 16-bit signed integer, in standard Modbus Big Endian (MSB/LSB) format.

IntesisBox supports Modbus RTU and Modbus TCP and both interfaces can be used simultaneously.

2.2 Modbus RTU

Modbus RTU is only available in version of the product supporting 1 DALI channel. Product version supporting 2 DALI channels provides support for Modbus TCP only.

When present, both EIA485 and EIA232 physical layers are supported. Only the lines RX, TX and GND of the EIA232 connector are used (TX and RX for EIA485).

Baud rate can be selected between 1200, 2400, 4800, 9600, 19200, 38400, 56700 and 115200. Parity (none, even or odd) and stop bits (1 or 2) can be selected as well.

Modbus slave number must be configured and the physical connection (RS232 or RS485) can also be selected.

2.3 Modbus TCP

TCP port to use (default is 502) and keep alive period must be configured.

IP settings of IntesisBox (DHCP status, own IP, net mask and default gateway) must be configured as well.

2.4 Modbus Address Map

Note that this map only applies when **Modbus Addresses** parameter is set to **Fixed**. For more information about configuration of Modbus Addresses parameter see IntesisBox MAPS Modbus Server User Manual.

2.4.1 Single DALI device signals

There are up to 94 signals for each DALI device or ballast. Their Modbus addresses can be obtained applying the following formula:

$$\text{Modbus Address} = 7000 \times \text{CHANNEL} + (100 \times \text{BALLAST}) + \text{SIGNAL NUMBER}$$

Where:

CHANNEL NUMBER; 0..1 (always 0 if using version with support for 1 DALI channel)
 BALLAST NUMBER: 0..63 (ballast short address)
 SIGNAL NUMBER: 0..93, see following table

Modbus address from the formula is expressed in link layer format. This is, first register address is 0.

Supported signals vary according to device type. Following abbreviations are done in the table:

- FL: Fluorescent light (device type 0)
- EML: Emergency light (device type 1)
- LED: LED module (device type 6)

Modbus Address First Address is 0	Ballast / Device type			Read/ Write	Register/signal name	Possible values
	FL	EML	LED			
7000 x channel + (100 x sa) + 0 <i>channel stands for DALI channel and is 0 or 1 sa stands for short address and is 0 to 63</i>	x	x	x	R	Ballast / Lamp Failure bit fields (ECG15-ECG0)	0-OK, 1-Ballast / Lamp Failure $b_i [i = sa - (16 * (\text{line}-1))]$
7000 x channel + (100 x sa) + 1	x	x	x	R	Ballast / Lamp Failure bit fields (ECG31-ECG16)	0-OK, 1-Ballast / Lamp Failure $b_i [i = sa - (16 * (\text{line}-1))]$
7000 x channel + (100 x sa) + 2	x	x	x	R	Ballast / Lamp Failure bit fields (ECG47-ECG32)	0-OK, 1-Ballast / Lamp Failure $b_i [i = sa - (16 * (\text{line}-1))]$

Modbus Address First Address is 0	Ballast / Device type			Read/Write	Register/signal name	Possible values
	FL	EML	LED			
7000 x channel + (100 x sa) + 3	x	x	x	R	Ballast / Lamp Failure bit fields (ECG63-ECG48)	0-OK, 1-Ballast / Lamp Failure b <i>i</i> [i = sa - (16 * (line-1))]
7000 x channel + (100 x sa) + 4	x	x	x	R/W	Update All ECG Status	0-Update Finished, 1-Trigger Update
7000 x channel + (100 x sa) + 5	x	x	x	R	Ballast Status	b7-PwrCycle, b6-MissShAdd, b5-ResetSt, b4-FadeRun, b3-BallLimErr, b2-LampPwrOn, b1-LampFail, b0-BallFail
7000 x channel + (100 x sa) + 6	x	x	x	R	Actual Level	0 to 100 %
7000 x channel + (100 x sa) + 7	x	x	x	R	Device Type	0-Fluorescent, 1-Emergency, 2 Discharge, 3-Halogen, 4-Incandescent, 5-Digital signal, 6-LED, 7-Switching, 8-Colour Control
7000 x channel + (100 x sa) + 8	x	x	x	R	Physical Minimum Level	0 to 100 %
7000 x channel + (100 x sa) + 9	x	x	x	R	Min Level	0 to 100 %
7000 x channel + (100 x sa) + 10	x	x	x	R	Max Level	0 to 100 %
7000 x channel + (100 x sa) + 11	x	x	x	R	Power On Level	0 to 100 %
7000 x channel + (100 x sa) + 12	x	x	x	R	System Failure Level	0 to 100 %
7000 x channel + (100 x sa) + 13	x	x	x	R	Fade Time	0 to 15
7000 x channel + (100 x sa) + 14	x	x	x	R	Fade Rate	1 to 15
7000 x channel + (100 x sa) + 15	x	x	x	R/W	Arc Power Level	0 to 100 %

Modbus Address First Address is 0	Ballast / Device type			Read/ Write	Register/signal name	Possible values
	FL	EML	LED			
7000 x channel + (100 x sa) + 16	x	x	x	R/W	Arc Power Off / On	0-Off; 1-100 %
7000 x channel + (100 x sa) + 17	x	x	x	R/W	Step Down / Up	0-Step Down, 1-Step Up
7000 x channel + (100 x sa) + 18	x	x	x	W (trigger)	Recall Min Level	1-Recall Min Level
7000 x channel + (100 x sa) + 19	x	x	x	W (trigger)	Recall Max Level	1-Recall Max Level
7000 x channel + (100 x sa) + 20	x	x	x	R/W	Go to Scene	0 to 15
7000 x channel + (100 x sa) + 21	x	x	x	R/W	Store Current Level as Scene	0 to 15
7000 x channel + (100 x sa) + 22	x	x	x	R/W	Clear/Remove Scene	0 to 15
7000 x channel + (100 x sa) + 23	x	x	x	R/W	Set Fade Time	0 to 15
7000 x channel + (100 x sa) + 24	x	x	x	R/W	Set Fade Rate	1 to 15
7000 x channel + (100 x sa) + 25	x	x	x	R/W	Set Min Level	0 to 100 %
7000 x channel + (100 x sa) + 26	x	x	x	R/W	Set Max Level	0 to 100 %
7000 x channel + (100 x sa) + 27	x	x	x	R/W	Set Power-on Level	0 to 100 %

Modbus Address First Address is 0	Ballast / Device type			Read/ Write	Register/signal name	Possible values
	FL	EML	LED			
7000 x channel + (100 x sa) + 28	x	x	x	R/W	Set System-failure Level	0 to 100 %
7000 x channel + (100 x sa) + 29				R	Not used	Default to 0
7000 x channel + (100 x sa) + 30				R	Not used	Default to 0
7000 x channel + (100 x sa) + 31				R	Not used	Default to 0
7000 x channel + (100 x sa) + 32				R	Not used	Default to 0
7000 x channel + (100 x sa) + 33				R	Not used	Default to 0
7000 x channel + (100 x sa) + 34				R	Not used	Default to 0
7000 x channel + (100 x sa) + 35	x			R/W	Set System-failure Level	0 to 100 %
7000 x channel + (100 x sa) + 36				R	Not used	Default to 0
7000 x channel + (100 x sa) + 37				R	Not used	Default to 0
7000 x channel + (100 x sa) + 38				R	Not used	Default to 0
7000 x channel + (100 x sa) + 39				R	Not used	Default to 0
7000 x channel + (100 x sa) + 40				R	Not used	Default to 0

Modbus Address First Address is 0	Ballast / Device type			Read/ Write	Register/signal name	Possible values
	FL	EML	LED			
7000 x channel + (100 x sa) + 41				R	Not used	Default to 0
7000 x channel + (100 x sa) + 42		x		R	Failure Status	b7-FunctFail, b6-DurFail, b5-DurTestDelay, b4-FunctTestDelay, b3-EmLampFail, b2-BattFail, b1-BattDurFail, b0-CircFail
7000 x channel + (100 x sa) + 43		x		R	Emergency Mode	b7-HardSwOn, b6-HardInhibit, b5-DurTestProg, b4-FunctTestProg, b3-ExtdEmMode, b2-EmMode, b1-NormMode, b0-RestMode
7000 x channel + (100 x sa) + 44		x		R	Emergency Status	b7-PhysicSel, b6-Ident, b5-DurTestPend, b4-FunctTestPend, b3-BattFull, b2-DurTestDone, b1-FunctTestDone, b0-InhibitMode
7000 x channel + (100 x sa) + 45		x		R	Emergency Battery Charge	0 to 100 %
7000 x channel + (100 x sa) + 46		x		R	Next Function Test	0 to 16384 hours
7000 x channel + (100 x sa) + 47		x		R	Next Duration Test	0 to 16384 hours
7000 x channel + (100 x sa) + 48		x		R	Function Test Interval	0-Disabled, 1 to 255 days
7000 x channel + (100 x sa) + 49		x		R	Duration Test Interval	0-Disabled, 1 to 97 weeks
7000 x channel + (100 x sa) + 50		x		R	Test Execution Timeout	0 to 255 days
7000 x channel + (100 x sa) + 51		x		R	Prolong Time	0 to 127,5 minutes
7000 x channel + (100 x sa) + 52		x		R	Duration Test Result	0 to 510 minutes

Modbus Address First Address is 0	Ballast / Device type			Read/ Write	Register/signal name	Possible values
	FL	EML	LED			
7000 x channel + (100 x sa) + 53		x		R	Lamp Total Operation Time	0 to 1016 hours
7000 x channel + (100 x sa) + 54		x		R	Emergency Level	0 to 100 %
7000 x channel + (100 x sa) + 55		x		R	Emergency Min Level	0 to 100 %
7000 x channel + (100 x sa) + 56		x		R	Emergency Max Level	0 to 100 %
7000 x channel + (100 x sa) + 57		x		R	Rated Duration	0 to 510 minutes
7000 x channel + (100 x sa) + 58		x		R	Features	b7-RelightRestSup, b6-PhysicSelSup, b5-HardInSup, b4-AdjsEmLvl, b3-AutoTestCap, b2-SwitchMainCG, b1-MainCG, b0-IntegralEmCG
7000 x channel + (100 x sa) + 59		x		R	Lamp Emergency Time	0 to 254 hours
7000 x channel + (100 x sa) + 60		x		W	Rest	1-Extinguish Lamp
7000 x channel + (100 x sa) + 61		x		W	Inhibit	1-Start Inhibit mode
7000 x channel + (100 x sa) + 62		x		W	Re-Light/Reset Inhibit	1-Cancel Inhibit Mode
7000 x channel + (100 x sa) + 63		x		W	Start Function Test	1-Start Function Test
7000 x channel + (100 x sa) + 64		x		W	Start Duration Test	1-Start Duration Test
7000 x channel + (100 x sa) + 65		x		W	Stop Test	1-Stop Function/Duration Test

Modbus Address First Address is 0	Ballast / Device type			Read/ Write	Register/signal name	Possible values
	FL	EML	LED			
7000 x channel + (100 x sa) + 66		x		W	Reset Function Test Done Flag	1-Reset Function Flag
7000 x channel + (100 x sa) + 67		x		W	Reset Duration Test Done Flag	1-Reset Duration Flag
7000 x channel + (100 x sa) + 68		x		W	Reset Lamp Time	1-Lamp Emergency Time Reset
7000 x channel + (100 x sa) + 69		x		R/W	Store Test Execution Timeout	0 to 255 days
7000 x channel + (100 x sa) + 70		x		R/W	Store Prolong Time	0 to 127,5 minutes
7000 x channel + (100 x sa) + 71		x		R/W	Store Function Test Interval	0-Disabled, 1 to 255 days
7000 x channel + (100 x sa) + 72		x		R/W	Store Duration Test Interval	0-Disabled, 1 to 97 weeks
7000 x channel + (100 x sa) + 73		x		R/W	Store Emergency Level	0 to 100 %
7000 x channel + (100 x sa) + 74				R	Not used	Default to 0
7000 x channel + (100 x sa) + 75				R	Not used	Default to 0
7000 x channel + (100 x sa) + 76				R	Not used	Default to 0
7000 x channel + (100 x sa) + 77				R	Not used	Default to 0
7000 x channel + (100 x sa) + 78				R	Not used	Default to 0

Modbus Address First Address is 0	Ballast / Device type			Read/ Write	Register/signal name	Possible values
	FL	EML	LED			
7000 x channel + (100 x sa) + 79				R	Not used	Default to 0
7000 x channel + (100 x sa) + 80			x	R	Failure Status	b7-RefMeasurFail, b6-ThermLightLvl, b5-ThermShut, b4-CurrProtAct, b3-LoadInc, b2-LoadDec, b1-OpenC, b0-ShortC
7000 x channel + (100 x sa) + 81			x	R	Gear Type	b3-dcSuppPoss, b2-acSuppPoss, b1-LEDModInt, b0-LEDPowerSInt
7000 x channel + (100 x sa) + 82			x	R	Dimming Curve	0-Standard Logarithmic Dim Curve, 1-Linear Dim Curve
7000 x channel + (100 x sa) + 83			x	R	Possible Operating Modes	b3-HighCurrPulMod, b2-OutCurrContr, b1-AMModePoss, b0-PWMModePoss
7000 x channel + (100 x sa) + 84			x	R	Features	b7-PhysicSelSupp, b6-LightLvlRedReq, b5-ThermShutReq, b4-CurrProtActReq, b3-LoadIncReq, b2-LoadDecReq, b1-OpenCQ, b0-ShortCQ
7000 x channel + (100 x sa) + 85			x	R	Reference Running	0-No, 1-Yes
7000 x channel + (100 x sa) + 86			x	R	Current Protector	0-Disabled, 1-Enabled
7000 x channel + (100 x sa) + 87			x	R	Operating Mode	b4-NonLogDimCurveAct, b3-HighCurrPulModeAct, b2-OutCurrContr, b1-AMModeAct, b0-PWMModeAct
7000 x channel + (100 x sa) + 88			x	R	Fast Fade Time	0 to 27
7000 x channel + (100 x sa) + 89			x	R	Min Fast Fade Time	0 to 27
7000 x channel + (100 x sa) + 90			x	W	Reference System Power	1-Trigger DALI Power Referencing

Modbus Address <small>First Address is 0</small>	Ballast / Device type			Read/ Write	Register/signal name	Possible values
	FL	EML	LED			
7000 x channel + (100 x sa) + 91			x	R/W	Enable/Disable Current Protector	0-Disable, 1-Enable
7000 x channel + (100 x sa) + 92			x	R/W	Select Dimming Curve	0-Standard Logarithmic Dim Curve, 1-Linear Dim Curve
7000 x channel + (100 x sa) + 93			x	R/W	Store Fast Fade Time	0 to 27

2.4.2 DALI groups' signals

DALI supports group addressing of ballasts. Up to 16 groups can be defined in a DALI channel. In IntesisBox, there are up to 16 signals for each DALI group. Their Modbus addresses can be obtained applying the following formula:

$$\text{Modbus Address} = 7000 \times \text{channel} + (20 \times \text{GROUP}) + \text{SIGNAL NUMBER}$$

Where:

LINE NUMBER; 0..1 (always 0 if using version with support for 1 DALI channel)
 GROUP NUMBER: 0..15 (ballast group)
 SIGNAL NUMBER: 6400..6415, see following table

Modbus address from the formula is expressed in link layer format. This is, first register address is 0.

Supported signals vary according to device type. Following abbreviations are done in the table:

- FL: Fluorescent light (device type 0)
- EML: Emergency light (device type 1)
- LED: LED module (device type 6)

Modbus Address First Address is 0	Ballast / Device type			Read/ Write	Register/signal name	Possible values
	FL	EML	LED			
7000 * line + (20 * gr) + 6400 <i>line stands for DALI channel and is 0 or 1 gr stands for DALI group and is 0 to 15</i>	x	x	x	R/W	Arc Power Level	0 to 100 %
7000 * line + (20 * gr) + 6401	x	x	x	R/W	Arc Power Off / On	0-Off; 1-100 %
7000 * line + (20 * gr) + 6402	x	x	x	R/W	Step Down / Up	0-Step Down, 1-Step Up
7000 * line + (20 * gr) + 6403	x	x	x	W	Recall Min Level	1-Recall Min Level
7000 * line + (20 * gr) + 6404	x	x	x	W	Recall Max Level	1-Recall Max Level
7000 * line + (20 * gr) + 6405	x	x	x	R/W	Go to Scene	0 to 15
7000 * line + (20 * gr) + 6406	x	x	x	R/W	Store Current Level as Scene	0 to 15
7000 * line + (20 * gr) + 6407	x	x	x	R/W	Clear/Remove Scene	0 to 15
7000 * line + (20 * gr) + 6408	x	x	x	R/W	Set Fade Time	0 to 15
7000 * line + (20 * gr) + 6409	x	x	x	R/W	Set Fade Rate	1 to 15
7000 * line + (20 * gr) + 6410	x	x	x	R/W	Set Min Level	0 to 100 %
7000 * line + (20 * gr) + 6411	x	x	x	R/W	Set Max Level	0 to 100 %
7000 * line + (20 * gr) + 6412	x	x	x	R/W	Set Power-on Level	0 to 100 %

Modbus Address First Address is 0	Ballast / Device type			Read/Write	Register/signal name	Possible values
	FL	EML	LED			
$7000 * \text{line} + (20 * \text{gr}) + 6413$	x	x	x	R/W	Set System-failure Level	0 to 100 %
$7000 * \text{line} + (20 * \text{gr}) + 6414$	x			R/W	Burn-in time Status	0-Stopped, 1-Running
$7000 * \text{line} + (20 * \text{gr}) + 6415$	x			R/W	Burn-in time	0-Stop, 1-Start

2.4.3 Broadcast signals

Broadcast signals allow to control all ballasts in the same line from an individual signal. Their Modbus addresses can be obtained applying the following formula:

$$\text{Modbus Address} = 7000 \times \text{channel} + \text{SIGNAL NUMBER}$$

Where:

LINE NUMBER; 0..1 (always 0 if using version with support for 1 DALI channel)
 SIGNAL NUMBER: 6800..6815, see following table

Modbus address from the formula is expressed in link layer format. This is, first register address is 0.

Supported signals vary according to device type. Following abbreviations are done in the table:

- FL: Fluorescent light (device type 0)
- EML: Emergency light (device type 1)
- LED: LED module (device type 6)

Modbus Address First Address is 0	Ballast / Device type			Read/ Write	Register/signal name	Possible values
	FL	EML	LED			
7000 * line + 6800 <i>line stands for DALI channel and is 0 or 1</i>	x	x	x	R/W	Arc Power Level	0 to 100 %
7000 * line + 6801	x	x	x	R/W	Arc Power Off / On	0-Off; 1-100 %
7000 * line + 6802	x	x	x	R/W	Step Down / Up	0-Step Down, 1-Step Up
7000 * line + 6803	x	x	x	W	Recall Min Level	1-Recall Min Level
7000 * line + 6804	x	x	x	W	Recall Max Level	1-Recall Max Level
7000 * line + 6805	x	x	x	R/W	Go to Scene	0 to 15
7000 * line + 6806	x	x	x	R/W	Store Current Level as Scene	0 to 15
7000 * line + 6807	x	x	x	R/W	Clear/Remove Scene	0 to 15
7000 * line + 6808	x	x	x	R/W	Set Fade Time	0 to 15
7000 * line + 6809	x	x	x	R/W	Set Fade Rate	1 to 15
7000 * line + 6810	x	x	x	R/W	Set Min Level	0 to 100 %
7000 * line + 6811	x	x	x	R/W	Set Max Level	0 to 100 %
7000 * line + 6812	x	x	x	R/W	Set Power-on Level	0 to 100 %

Modbus Address First Address is 0	Ballast / Device type			Read/ Write	Register/signal name	Possible values
	FL	EML	LED			
7000 * line + 6813	x	x	x	R/W	Set System-failure Level	0 to 100 %
7000 * line + 6814	x			R/W	Burn-in time Status	0-Stopped, 1-Running
7000 * line + 6815	x			R/W	Burn-in time	0-Stop, 1-Start

3 Connections

Find below information regarding the IntesisBox connections available.

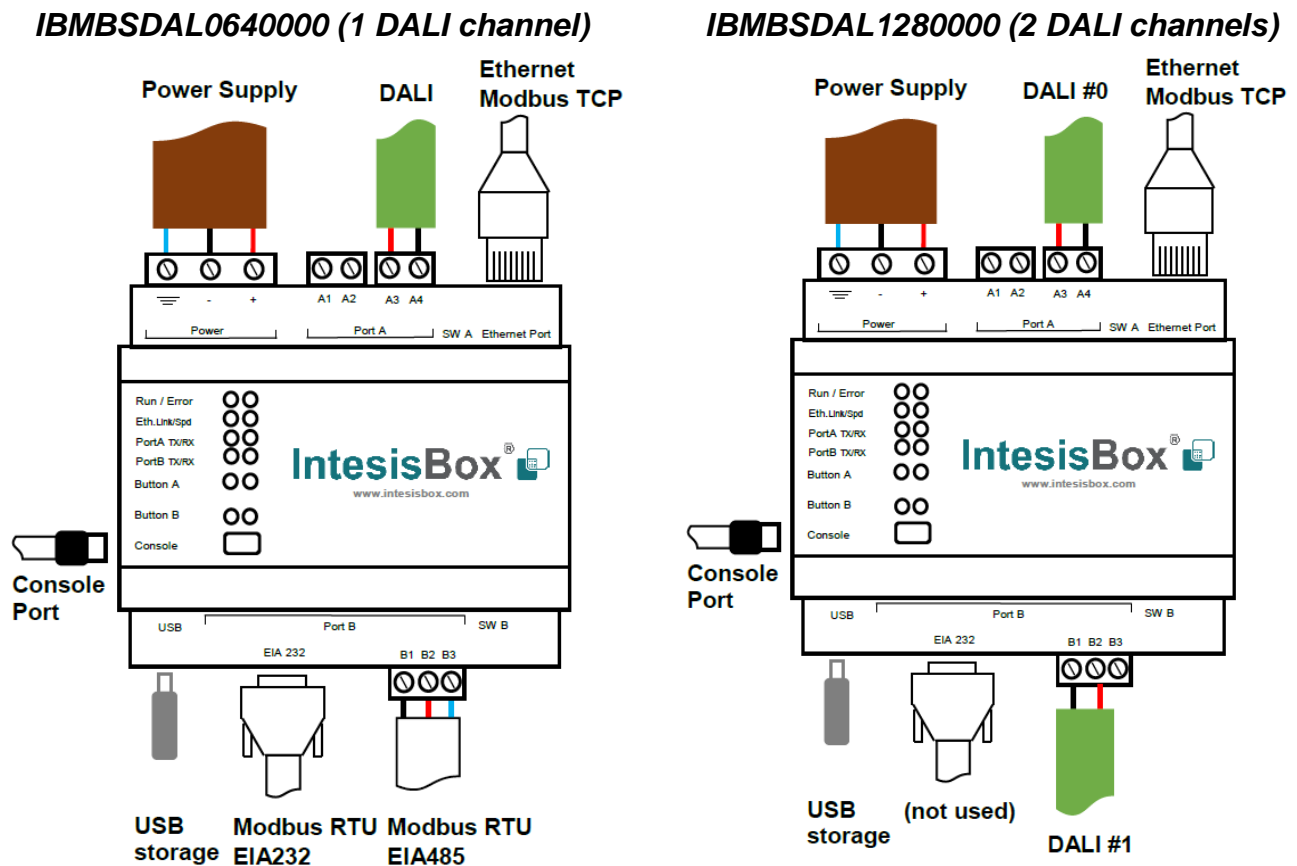


Figure 3.1 Gateway's connections

Power Supply

Must use NEC Class 2 or Limited Power Source (LPS) and SELV rated power supply. Respect polarity applied of terminals (+) and (-). Be sure the voltage applied is within the range admitted (check table below). The power supply can be connected to earth but only through the negative terminal, never through the positive terminal.

Ethernet / Modbus TCP

Connect the cable coming from the IP network to the connector ETH of the gateway. Use an Ethernet CAT5 cable. If communicating through the LAN of the building, contact the network administrator and make sure traffic on the port used is allowed through all the LAN path (check the gateway user manual for more information). With factory settings, after powering up the gateway, DHCP will be enabled for 30 seconds. After that time, if no IP is provided by a DHCP server, the default IP 192.168.100.246 will be set.

PortA / DALI #0

Connect the DALI bus to connectors A4 (+), A3 (-) of gateway's PortA. IntesisBox provides 16VDC (+/-2%) DALI voltage to the bus.

PortB / Modbus RTU (IBMBSDAL0640000 / 1 DALI channel)

Connect the EIA485 bus to connectors B1 (-), B2 (+) and B3 (SNGD) of gateway's PortB. Respect the polarity.

Remember the characteristics of the standard EIA485 bus: maximum distance of 1200 meters, maximum 32 devices connected to the bus, and in each end of the bus it must be a termination resistor of 120 Ω. The gateway has an internal bus biasing circuit that incorporates the termination resistor. If you install the gateway in one of the ends of the bus, then do not install an additional termination resistor in that end.

PortB / DALI #1 (IBMBSDAL1280000 / 2 DALI channels)

Connect the DALI bus to connectors B2 (+), B1 (-) of gateway's PortA. IntesisBox provides 16VDC (+/-2%) DALI voltage to the bus.

Console Port

Connect a mini-type B USB cable from your computer to the gateway to allow communication between the Configuration Software and the gateway. Remember that Ethernet connection is also allowed. Check the user manual for more information.

USB

Connect a USB storage device (not a HDD) if required. Check the user manual for more information.

Ensure proper space for all connectors when mounted (see section 66).

3.1 Powering the device

A power supply working with any of the voltage range allowed is needed (check section 5). Once connected the RUN led (Figure above) will turn on.

WARNING! In order to avoid earth loops that can damage the gateway 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.**

3.2 Connection to DALI channel.

Connect + and – terminals of the DALI bus of your DALI channel to IntesisBox' DALI port. Bus has polarity, but most DALI ballasts are polarity insensitive.

Having your DALI channel powered up, you can perform a quick DALI connectivity test by pressing Port A / Port B buttons:

- When pressing Port A / Port B button, a broadcast command that will toggle the ballasts between 100% and 0% level will be sent.
- After 30s timeout of not pressing the button, ballasts will return back to its original level.

DALI commands coming from Modbus will continue to be executed while doing this test.

3.3 Connection to Modbus

3.3.1 Modbus TCP

Same ethernet connection as for Mitsubishi's Centralized Controller is used. Connect the communication cable coming from the network hub or switch to the Ethernet port of IntesisBox. The cable to be used shall be a straight Ethernet UTP/FTP CAT5 cable.

3.3.2 Modbus RTU

Connect the communication cable coming from the Modbus network to the port marked as Port B of IntesisBox. Connect the EIA485 bus to connectors B1 (-), B2 (+) and B3 (SNGD) of gateway's PortB. Respect the polarity.

Remember the characteristics of the standard EIA485 bus: maximum distance of 1200 meters, maximum 32 devices (without repeaters) connected to the bus, and in each end of the bus it must be a termination resistor of 120 Ω . The gateway has an internal bus biasing circuit that incorporates the termination resistor. Bus biasing and termination resistor for EIA485 can be enabled for PortB by means of a dedicated DIP switch.

3.4 Connection to PC (Configuration tool)

This action allows the user to have access to configuration and monitoring of the device. Two methods to connect to the PC can be used:

- **Ethernet:** Using the Ethernet port of the IntesisBox.
- **USB cable:** To connect the device to the PC, the USB cable supplied should be plugged to the USB Console port.

4 Set-up process and troubleshooting

4.1 Pre-requisites

It is necessary to have the Modbus RTU or TCP master/client device (BMS side device) operative and properly connected to the corresponding port of the gateway. It is also required to have a DALI installation connected to the gateway, in its respective dali port/s.

Connectors, connection cables, PC for the usage of the Configuration Tool and other auxiliary material, if needed, are not supplied by Intesis for this standard integration.

Items supplied with this product for this integration are:

- IntesisBox gateway.
- Link to download the configuration tool.
- USB Console cable to communicate with IntesisBox.
- Product documentation.

4.2 IntesisBox MAPS. Configuration & monitoring tool for IntesisBox

4.2.1 Introduction

IntesisBox MAPS is a Windows® compatible software developed specifically to monitor and configure IntesisBox new generation gateways.

The installation procedure and main functions are explained in the *IntesisBox MAPS User Manual*. This document can be downloaded from the link indicated in the installation sheet supplied with the IntesisBox device or in the product website at www.intesisbox.com

In this section, only the specific case of DALI to Modbus will be covered.

Please check the IntesisBox MAPS user manual for specific information about the different parameters and how to configure them.

4.2.2 Connection

To configure the IntesisBox connection parameters press on the **Connection** button in the *menu bar*.

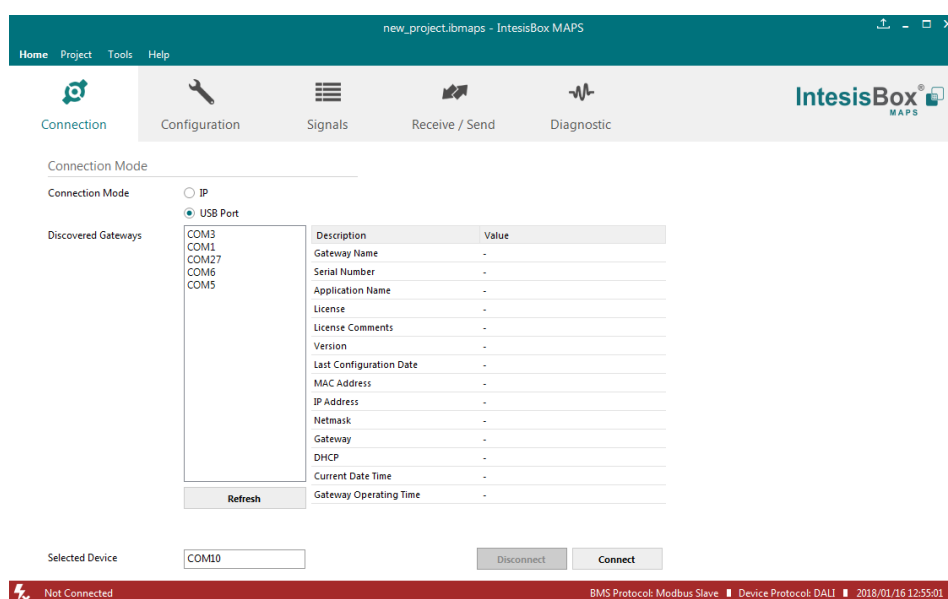


Figure 4.1 MAPS connection

4.2.3 Configuration tab

Select the **Configuration** tab to configure the connection parameters. Three subsets of information are shown in this window: General (Gateway general parameters), Modbus Slave (Modbus interface configuration) and DALI (DALI channel/s and DALI devices configuration).

The screenshot displays the IntesisBox MAPS software interface. The top menu bar includes 'Home', 'Project', 'Tools', and 'Help'. Below this is a toolbar with icons for 'Connection', 'Configuration' (selected), 'Signals', 'Receive / Send', and 'Diagnostic'. The main window is titled 'new_project.libmaps - IntesisBox MAPS'. On the left, a sidebar shows 'General', 'Modbus Slave', and 'DALI' tabs, with 'General' currently selected. The 'General' tab contains three sections: 'General Configuration' with fields for 'Gateway Name' (IBOX-MBS-DALI) and 'Project Description' (IntesisBox DALI to Modbus Slave Gateway); 'Connection' with a checked 'Enable DHCP' box and fields for 'IP Address' (192.168.100.246), 'Netmask' (255.255.255.0), 'Default Gateway', and 'Password'; and 'USB Host' with an 'Edit USB Configuration' button set to 'USB'. At the bottom, a status bar shows 'Not Connected' on the left and 'BMS Protocol: Modbus Slave | Device Protocol: DALI | 2018/01/16 12:55:42' on the right.

Figure 4.2 IntesisBox MAPS configuration tab

General, *Modbus Slave* and *DALI* tabs are explained in IntesisBox MAPS user manual for IntesisBox Modbus Server Series.

4.2.4 Signals

All available registers, its corresponding description and other main parameters are listed in the signals tab. Depending on the configuration of the Modbus Addresses parameter, on the Modbus Slave tab, active signals may vary, and edition may be allowed or not.

For more information about configuration of Modbus Addresses parameter, see IntesisBox MAPS Modbus Server User Manual on:

https://www.intesisbox.com/intesis/product/media/intesisbox_maps_modbus_server_user_manual_en.pdf?v=2.2

new_project.bmaps - IntesisBox MAPS

Home

Project

Tools

Help

Connection

Configuration

Signals

Receive / Send

Diagnostic

#	Active	Description	# Bits	Format	Address	Bit	Read / Write	Unit ID	Trig / Poll
1	<input checked="" type="checkbox"/>	Ballast / Lamp Failure [0-OK, 1-Ballast / Lam...	16	4: BitFields	0	0	0: Read	ECG 1	T/P
2	<input checked="" type="checkbox"/>	Update All ECG Status [0-Update Finished, 1...	16	0: Unsigned	4	-	2: Read / Write	ECG 1	-
3	<input checked="" type="checkbox"/>	Ballast Status [b7-PwrCycle, b6-MiscShutd...	16	0: Unsigned	5	-	0: Read	ECG 1	T/P
4	<input checked="" type="checkbox"/>	Actual Level [0 to 100 %]	16	0: Unsigned	6	-	0: Read	ECG 1	T/P
5	<input checked="" type="checkbox"/>	Device Type [0-Fluorescent, 1-Emergency, 2...	16	0: Unsigned	7	-	0: Read	ECG 1	T
6	<input checked="" type="checkbox"/>	Physical Minimum Level [0 to 100 %]	16	0: Unsigned	8	-	0: Read	ECG 1	T
7	<input checked="" type="checkbox"/>	Min Level [0 to 100 %]	16	0: Unsigned	9	-	0: Read	ECG 1	T
8	<input checked="" type="checkbox"/>	Max Level [0 to 100 %]	16	0: Unsigned	10	-	0: Read	ECG 1	T
9	<input checked="" type="checkbox"/>	Power On Level [0 to 100 %]	16	0: Unsigned	11	-	0: Read	ECG 1	T
10	<input checked="" type="checkbox"/>	System Failure Level [0 to 100 %]	16	0: Unsigned	12	-	0: Read	ECG 1	T
11	<input checked="" type="checkbox"/>	Fade Time [0 to 15]	16	0: Unsigned	13	-	0: Read	ECG 1	T
12	<input checked="" type="checkbox"/>	Fade Rate [1 to 15]	16	0: Unsigned	14	-	0: Read	ECG 1	T
13	<input checked="" type="checkbox"/>	Arc Power Level [0 to 100 %]	16	0: Unsigned	15	-	2: Read / Write	ECG 1	-
14	<input checked="" type="checkbox"/>	Arc Power Off / On [0-Off, 1-100 %]	16	0: Unsigned	16	-	2: Read / Write	ECG 1	-
15	<input checked="" type="checkbox"/>	Step Up / Down [0-Step Down, 1-Step Up]	16	0: Unsigned	17	-	2: Read / Write	ECG 1	-
16	<input checked="" type="checkbox"/>	Recall Min Level [1-Recall Min Level]	16	0: Unsigned	18	-	1: Trigger	ECG 1	-
17	<input checked="" type="checkbox"/>	Recall Max Level [1-Recall Max Level]	16	0: Unsigned	19	-	1: Trigger	ECG 1	-
18	<input checked="" type="checkbox"/>	Go to Scene [0 to 15]	16	0: Unsigned	20	-	2: Read / Write	ECG 1	-
19	<input checked="" type="checkbox"/>	Store Current Level as Scene [0 to 15]	16	0: Unsigned	21	-	2: Read / Write	ECG 1	-
20	<input checked="" type="checkbox"/>	Clear/Remove Scene [0 to 15]	16	0: Unsigned	22	-	2: Read / Write	ECG 1	-
21	<input checked="" type="checkbox"/>	Set Fade Time [0 to 15]	16	0: Unsigned	23	-	2: Read / Write	ECG 1	-
22	<input checked="" type="checkbox"/>	Set Fade Rate [1 to 15]	16	0: Unsigned	24	-	2: Read / Write	ECG 1	-
23	<input checked="" type="checkbox"/>	Set Min Level [0 to 100 %]	16	0: Unsigned	25	-	2: Read / Write	ECG 1	-
24	<input checked="" type="checkbox"/>	Set Max Level [0 to 100 %]	16	0: Unsigned	26	-	2: Read / Write	ECG 1	-
25	<input checked="" type="checkbox"/>	Set Power-on Level [0 to 100 %]	16	0: Unsigned	27	-	2: Read / Write	ECG 1	-
26	<input checked="" type="checkbox"/>	Set System-failure Level [0 to 100 %]	16	0: Unsigned	28	-	2: Read / Write	ECG 1	-
27	<input type="checkbox"/>	Failure Status [b7-FunctFail, b6-DurFail, b5...	16	0: Unsigned	42	-	0: Read	ECG 1	T/P
28	<input type="checkbox"/>	Emergency Mode [b7-HandSwOn, b6-Hand...	16	0: Unsigned	43	-	0: Read	ECG 1	T/P

Figure 4.3 IntesisBox MAPS Signals tab

4.2.5 Sending the configuration to IntesisBox

When the configuration is finished, follow the steps to program the gateway.

- 1.- Click on **Save** button to save the project to the project folder on your hard disk (more information in IntesisBox MAPS User Manual).
- 2.- You will be prompted to generate the configuration file to be sent to the gateway.
 - a.- If **Yes** is selected, the file 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.- 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.

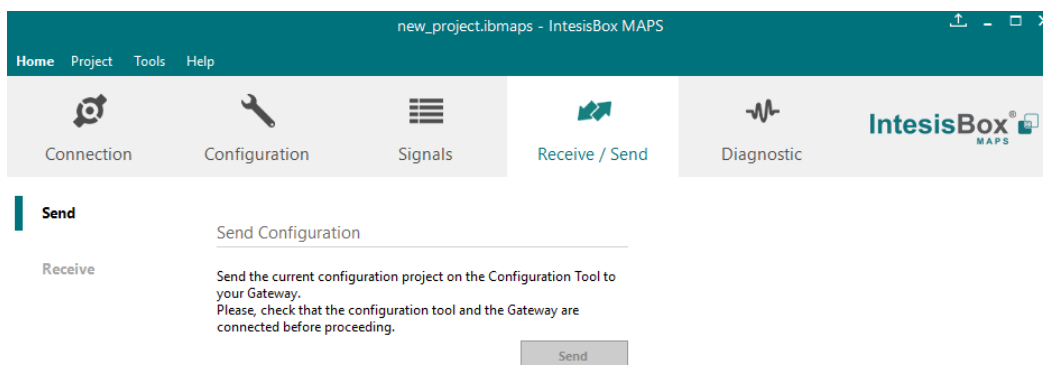


Figure 4.4 IntesisBox MAPS Receive/Send tab

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

4.2.6 Diagnostic

To help integrators in the commissioning tasks and troubleshooting, the Configuration Tool offers some specific tools and viewers.

In order to start using the diagnostic tools, the connection with the Gateway must be established.

The Diagnostic section is composed by two main parts: Tools and Viewers.

- **Tools**

Use the tools section to check the current hardware status of the box, log communications into compressed files to be sent to the support, change the Diagnostic panels' view or send commands to the gateway.

- **Viewers**

In order to check the current status, viewer for the Internal and External protocols are available. It is also available a generic Console viewer for general information about communications and the gateway status. Finally a Signals Viewer to simulate the BMS behavior or to check the current values in the system.

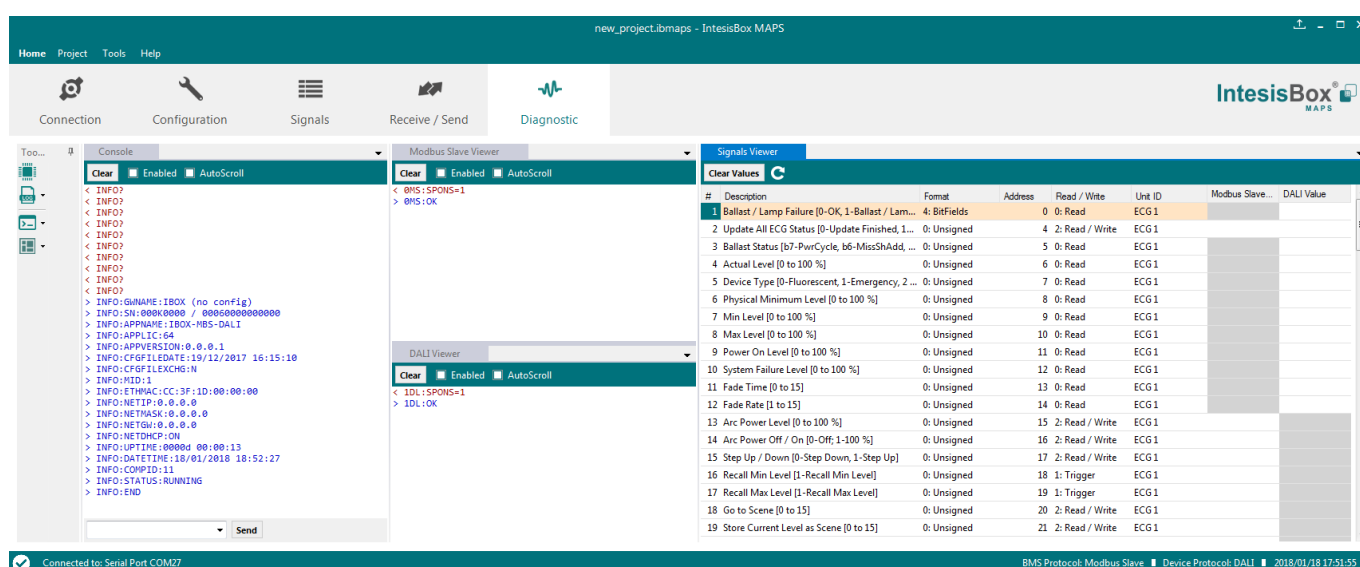


Figure 4.5 Diagnostic

More information about the Diagnostic section can be found in IntesisBox MAPS user manual for IntesisBox Modbus Server Series.

4.3 Set-up procedure

1. Install IntesisBox MAPS 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. Installation can be on DIN rail or on a stable not vibrating surface (DIN rail mounted inside a metallic industrial cabinet connected to ground is recommended).
3. If using Modbus RTU, connect the communication cable coming from the EIA485 port of the Modbus RTU installation to the port marked as Port B of IntesisBox (More details in section 3).

If using, Modbus TCP, connect the communication cable coming from the Ethernet port of the Modbus TCP installation to the port marked as Ethernet Port of IntesisBox (More details in section 3).

4. Connect the communication cable coming from DALI network to the port marked as Port A of IntesisBox (More details in section 3).
5. If using two DALI channels, connect communication cable coming from second DALI network to the port marked as Port B of IntesisBox (More details in section 3).
6. Power up IntesisBox. The supply voltage should be any of the voltage range allowed (check section 5).. 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.**

7. If you want to connect using IP, connect the Ethernet cable from the laptop PC to the port marked as Ethernet of IntesisBox (More details in section 3).

If you want to connect using USB, connect the USB cable from the laptop PC to the port marked as Console of IntesisBox (More details in section 3).

8. Open IntesisBox MAPS, create a new project for Modbus and select the IBOX-MBS-DALI-Template project.
9. Modify the configuration as desired, save it and download the configuration file to IntesisBox as explained in section 4.2.5 .
10. Visit the Diagnostic section, enable COMMS and check that there is communication activity, some TX frames and some other RX frames. This means that the communication with the Centralized Controller and Modbus Master devices is OK. In case there is no communication activity between IntesisBox and the Centralized Controller and/or Modbus devices, check that those are operative: check the baud rate, the communication cable used to connect all devices and any other communication parameter.

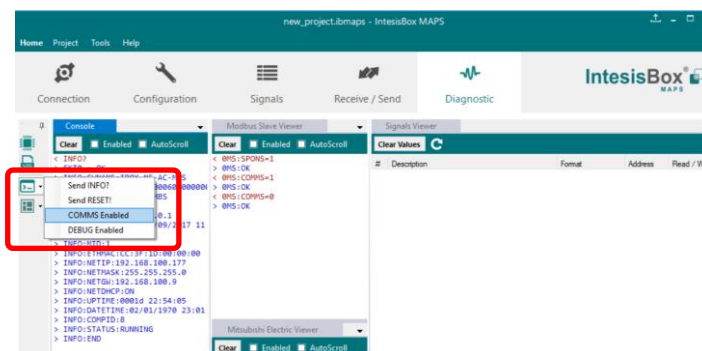


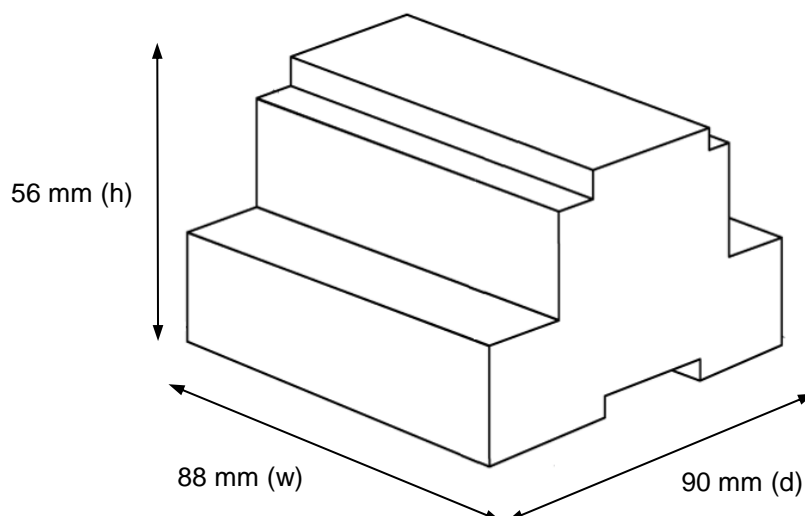
Figure 4.6 Enable COMMS

5 Electrical & Mechanical Features

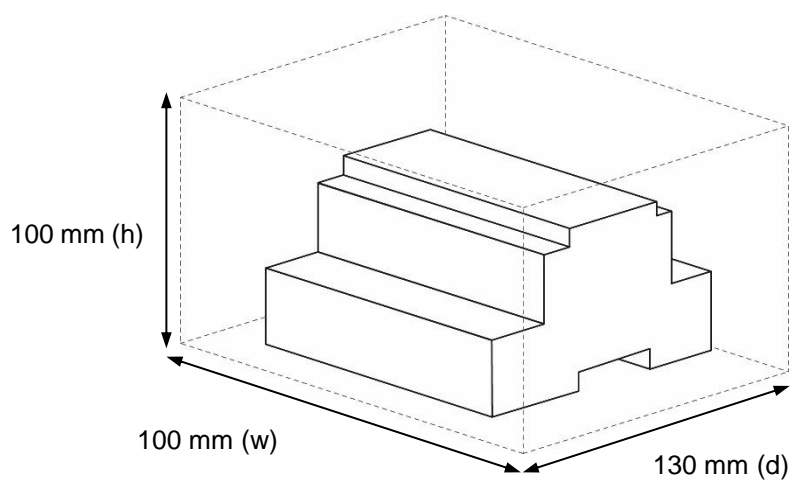


Enclosure	Plastic, type PC (UL 94 V-0) Net dimensions (dxwxh): 90x88x56 mm Recommended space for installation (dxwxh): 130x100x100mm Color: Light Grey. RAL 7035	Battery	Size: Coin 20mm x 3.2mm Capacity: 3V / 225mAh Type: Manganese Dioxide Lithium
Mounting	Wall. DIN rail EN60715 TH35.	Console Port	Mini Type-B USB 2.0 compliant 1500VDC isolation
Terminal Wiring (for power supply and low-voltage signals)	Per terminal: solid wires or stranded wires (twisted or with ferrule) 1 core: 0.5mm ² ... 2.5mm ² 2 cores: 0.5mm ² ... 1.5mm ² 3 cores: not permitted	USB port	Type-A USB 2.0 compliant Only for USB flash storage device (USB pen drive) Power consumption limited to 150mA (HDD connection not allowed)
Power	1 x Plug-in screw terminal block (3 poles) Positive, Negative, Earth 24VDC +/-10%	Push Button	Button A: Check the user manual Button B: Check the user manual
Ethernet	1 x Ethernet 10/100 Mbps RJ45 2 x Ethernet LED: port link and activity	Operation Temperature	0°C to +60°C
Port A	1 x DALI port (Plug-in screw terminal block orange 2 poles) 1500VDC isolation from other ports DALI power consumption: 240mA Voltage rating: 16VDC 1 x Plug-in screw terminal block green (2 poles) Reserved for future use	Operational Humidity	5 to 95%, no condensation
Switch A (SWA)	1 x DIP-Switch for serial EIA485 configuration: Reserved for future use	Protection	IP20 (IEC60529)
PORT B	<i>IBMBSDAL0640000</i> 1 x Serial EIA232 (SUB-D9 male connector) Pinout from a DTE device 1500VDC isolation from other ports (except PORT B: EIA485) 1 x Serial EIA485 Plug-in screw terminal block (3 poles) A, B, SGND (Reference ground or shield) 1500VDC isolation from other ports (except PORT B: EIA232) <i>IBMBSDAL1280000</i> 1 x DALI port (Plug-in screw terminal block green 2 poles) 1500VDC isolation from other ports DALI power consumption: 240mA Voltage rating: 16VDC	LED Indicators	10 x On board LED indicators 1 x Error LED 1 x Power LED 2 x Ethernet Link/Speed 2 x Port A TX/RX 2 x Port B TX/RX 1 x Button A indicator 1 x Button B indicator
Switch B (SWB)	1 x DIP-Switch for serial EIA485 configuration: Position 1: ON: 120 Ω termination active Off: 120 Ω termination inactive Position 2-3: ON: Polarization active Off: Polarization inactive	100 mm	

6 Dimensions



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



Annex A – Quick setup and commissioning of a DALI network

This section provides a brief summary on commissioning a DALI channel using MAPS software tool. The process of commissioning involves:

- Scanning the existing ballasts (ECGs) in the DALI network
- Identifying their physical location
- Obtaining or setting up ECG short addresses
- Obtaining or editing ECG configuration parameters (preset levels, scenes, groups addressing...)

In that process, using MAPS, two workflows are possible for the commissioning:

1. “ECG declaration first”: First declaring or instantiating in MAPS the envisaged (planned) ballasts in the installation, setting up values for all their configuration parameters, and then scanning the network for existing ballasts. Process finalizes with assignation and download of planned configuration parameters (including short addresses) with existing ballasts in the installation.
2. “Existing ECG scan first”: Alternatively, and more common, it is possible to scan first the DALI network for existing ballasts, obtain their existing configuration (which will be default/factory if the ballasts are new), then change these parameters to match the desired ones (short address, preset levels, scenes...) and load the ballasts with the new configuration.

Typically, “Existing ECG scan first” method will be used when all commissioning is done in the installation itself, as it starts with a DALI bus scan. “ECG declaration first” allows to do some work in advance, defining the configuration parameters for the ballasts before accessing the actual installation. It is possible to understand the “ECG declaration first” as a previous step that can (but not must) be done before effectively scanning the network for ballasts (“Existing ECG scan first”), in order to advance configuration work (definition of preset levels, DALI groups, scene values, ...).

It is perfectly possible to mix the two methods. This is, configure a certain number of ballasts declaring them in MAPS (“ECG declaration first”), and once in the installation, assign their parameters to existing ballasts. Whenever more ballasts are installed, they can be added by scanning them in the network (“Existing ECG scan first”) and changing its configuration parameters to match the desired ones (without previous instantiation of them in MAPS).

6.1 Create project

You will need to create a new project, to do so, select ‘Create New project’ in MAPS start screen, and choose the appropriate template according to your device model (1 or 2 DALI channels / 64 or 128 max DALI devices):

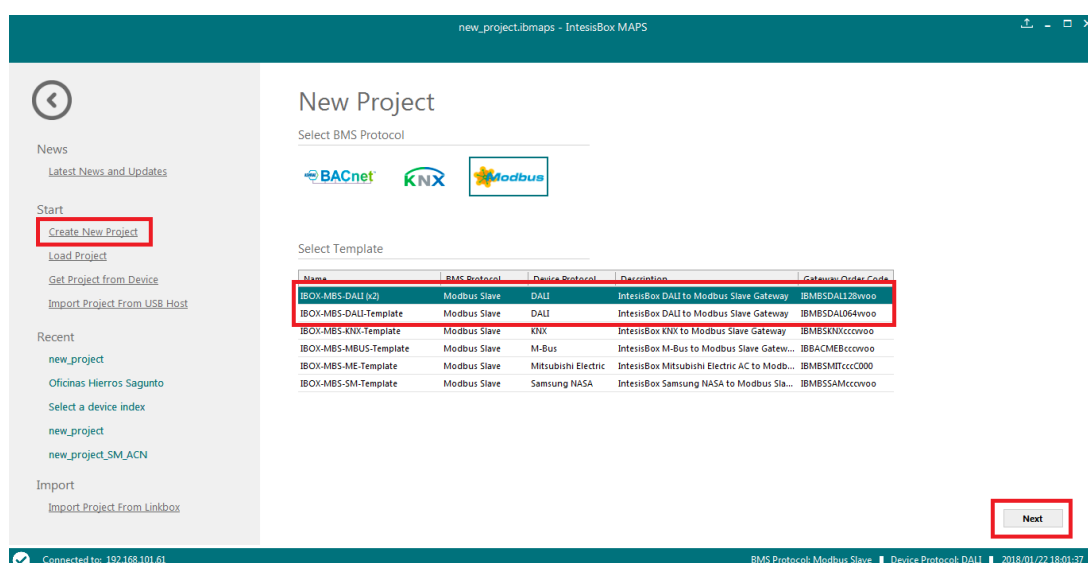


Figure A.1 New project creation

6.2 ECG declaration in project

Once new project has been created, ballasts can be added to the configured project, without the need of scanning them in bus.

As mentioned above, this allows defining its configuration parameters (preset values, groups, scenes, ...) before having actual access to the installation.

To do so, go to the 'Configuration' tab of IntesisBox, and select the 'DALI' section.

In it, choose the channel where you want to instantiate the ballasts (A or B are possible in case of having the product version supporting 2 DALI channels).

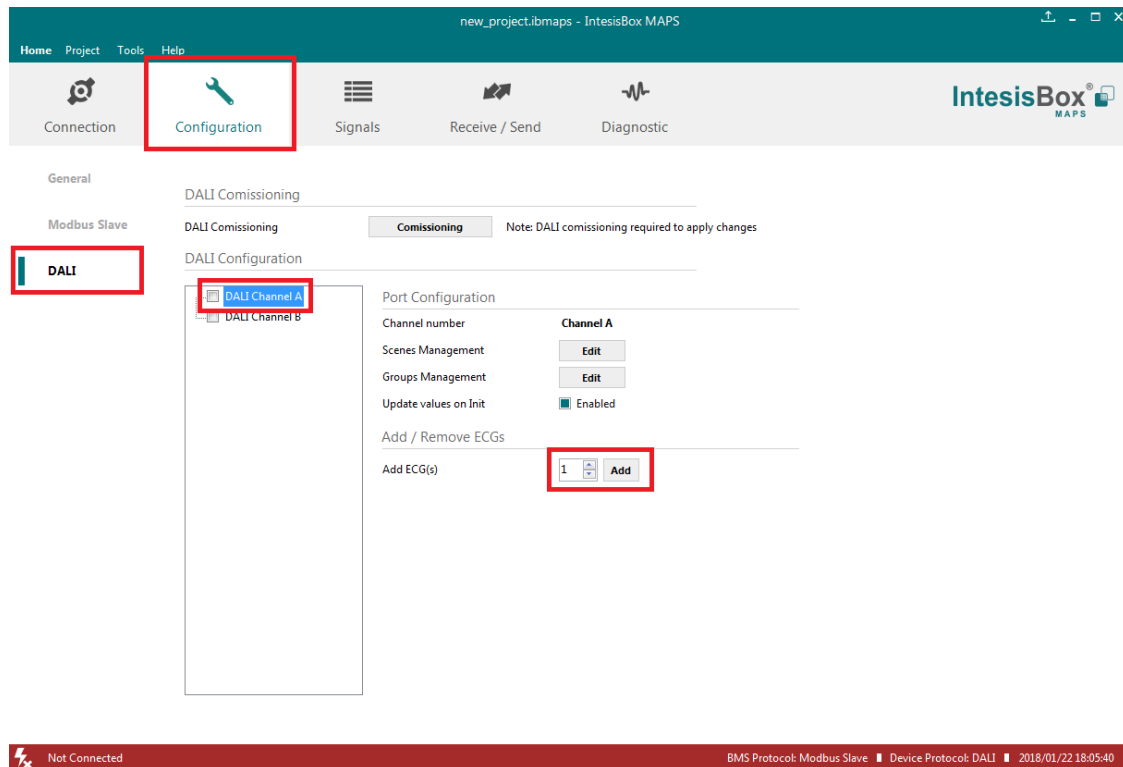


Figure A.2 DALI ECGs instantiation

With suitable DALI channel selected, enter in 'Add ECG(s)' field the number of ballasts/ECGs to instantiate, and click button Add.

Number of desired devices will appear:

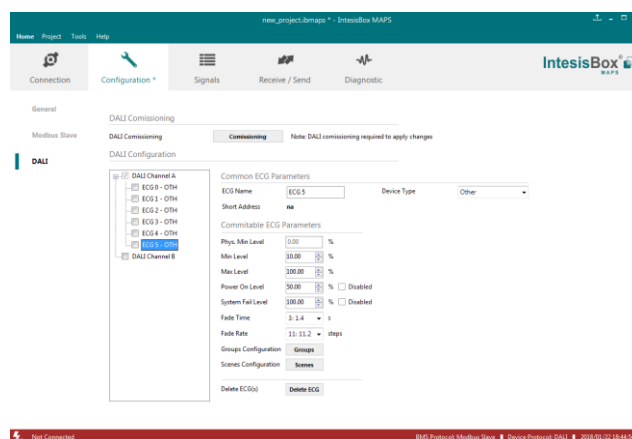


Figure A.3 Instantiation of DALI ECGs

If too many ECGs have been instantiated, they can be deleted by selecting them, and pressing button 'Delete ECG(s)'. Multiple selection is also possible.

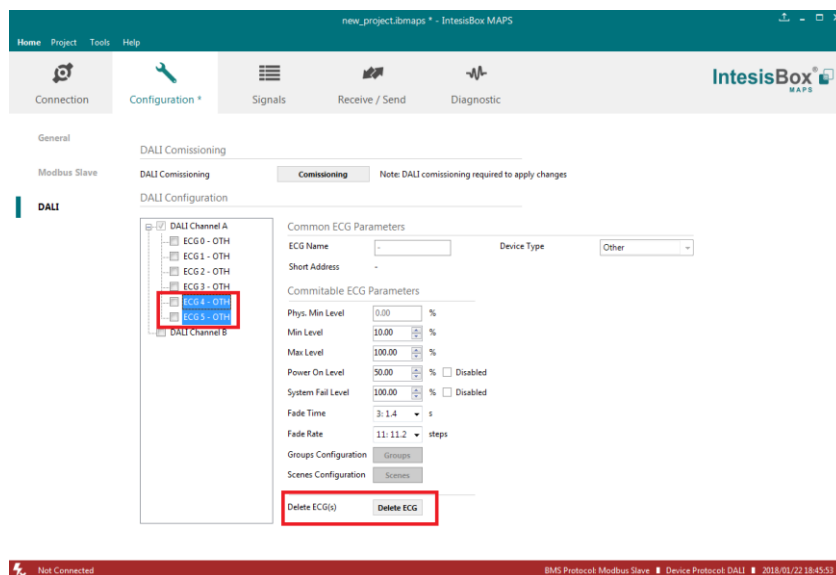


Figure A.4 Deleting DALI ECGs

Finally, for all ballasts in configuration, you will need to define:

- **ECG Name** (optional): Name to ease its identification in the network
- **Device type**: It's important that this field is suitably chosen and according to existing ballast in the network (device type 0: Fluorescent Light, device type 1: Emergency Light, device type 6: LED module or 'Other' (default) if none of the above matches the device type).
- **Commitable ECG Parameters**: This includes all preset values for the ballasts (min level, max level, power on level, etc), as well as group assignation and scene configuration.

6.3 Scan and commissioning of ECGs

First you need to get MAPS connected to the IntesisBox device. To do so, go to 'Connection' tab of MAPS. There, select appropriate connection mode (IP or USB). Select your device from the list of scanned devices (IP) or suitable COM port (USB).

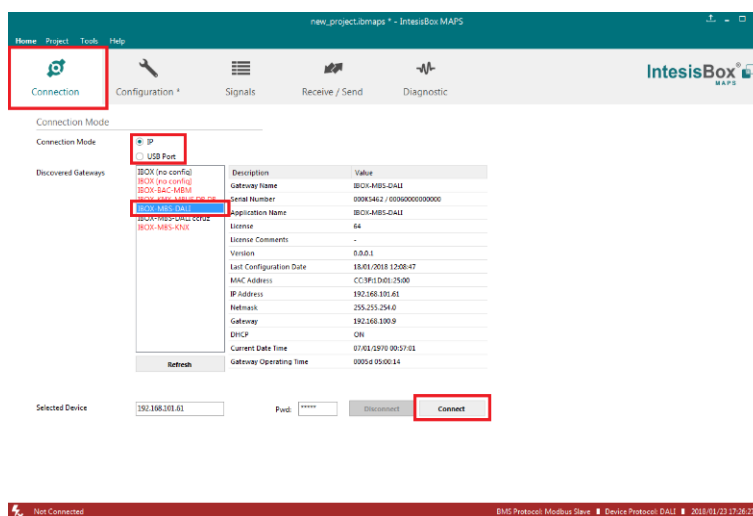


Figure A.5 Connecting MAPS to the IntesisBox

Finally, click on button 'Connect' in order to establish connection. Bar at the bottom in MAPS main window will become green, switching from 'Not Connected' to 'Connected'.

Now go back to 'Configuration' tab of MAPS, and click on button 'Commissioning':

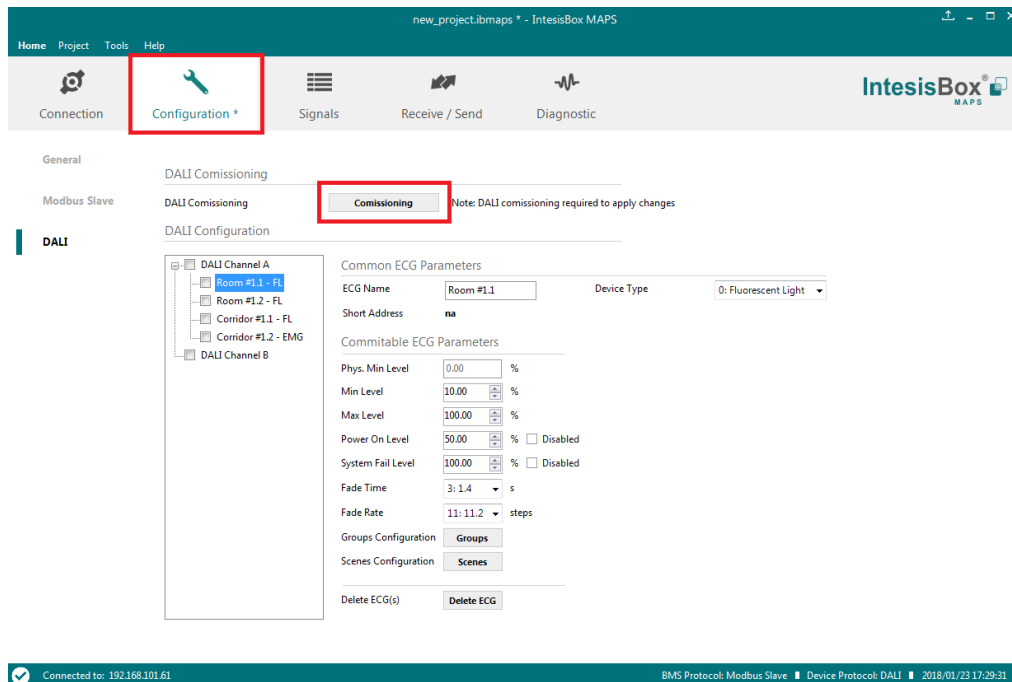


Figure A.6 DALI commissioning button

Commissioning window will appear:

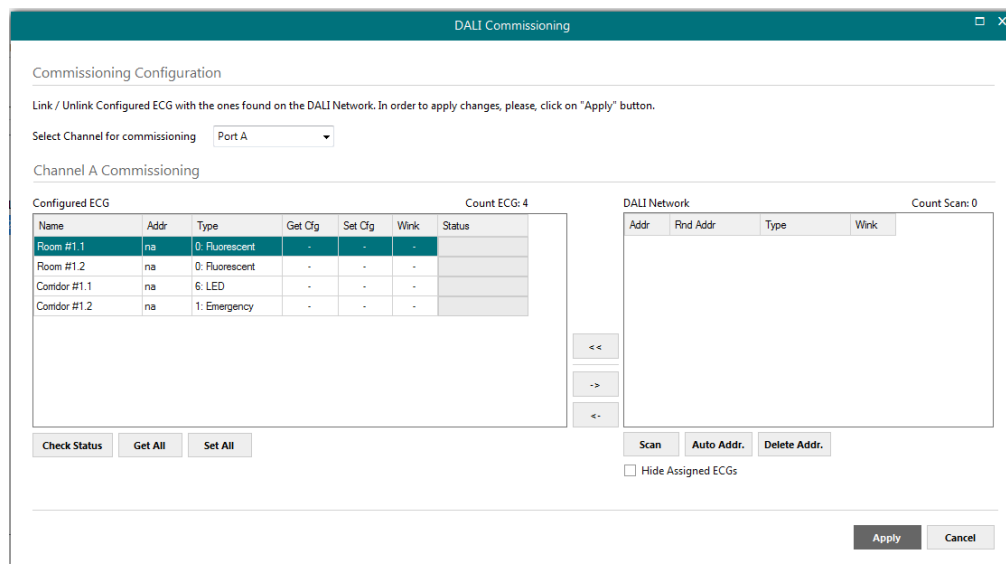


Figure A.7 DALI commissioning window

If having product version / template project supporting 2 DALI channels, channel to commission must be selected between 'Port A' (top of the device) or 'Port B' (bottom of the device). In case of version supporting single DALI channel, no selection is possible.

Also, if ballasts have been added to the configuration (see previous section 'ECG declaration in project') a list of ballasts will appear in Configured ECG.

There is also a 'DALI network' area that will show DALI scan results, empty by now.

In order to start a DALI network scan, select suitable DALI channel (if applicable) and then click on button 'Scan':

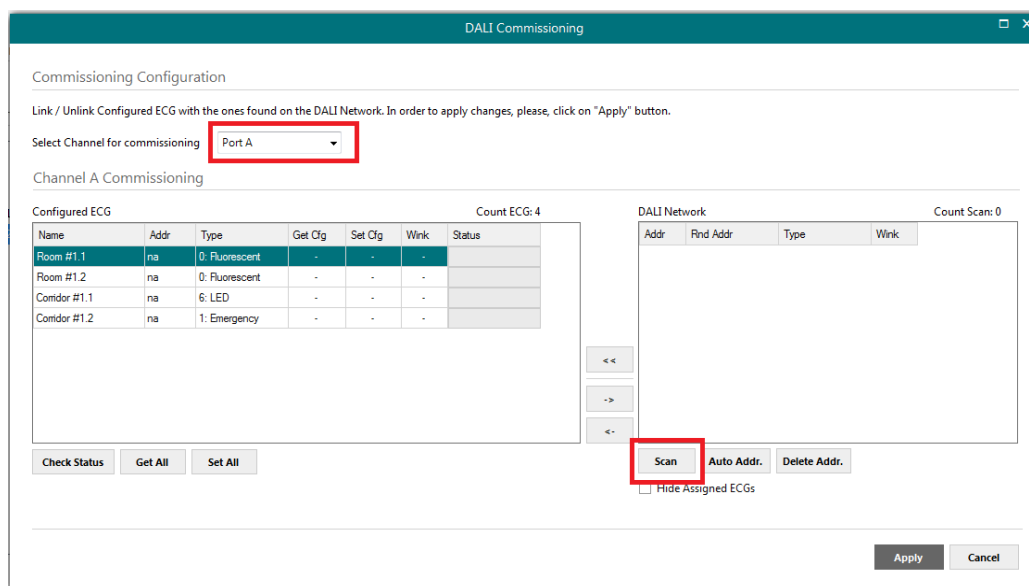


Figure A.8 Starting DALI scan process

New ballasts will appear in the 'DALI Network' area, as soon as they are scanned. Network scan might take from several seconds up to a few minutes, depending on number of ballasts to scan.

Field 'Addr' in list of 'DALI Network' will indicate 'na' if ballast has no associated group address (typical for new ballasts/factory settings) or a 0..63 value for its short address if device has already been given a short address.

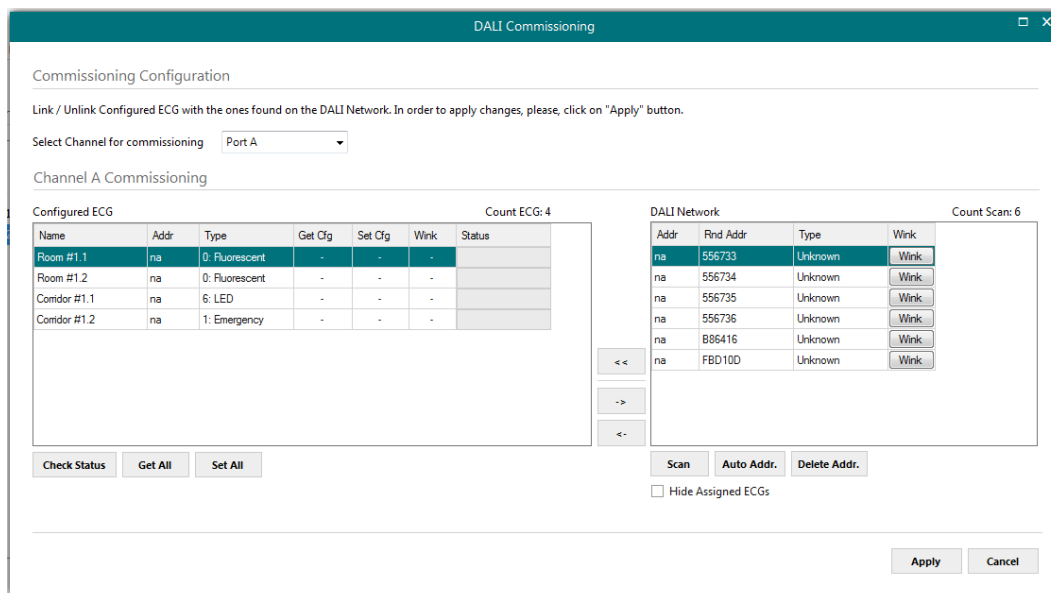


Figure A.9 Example of scan results

After scan is done, total number of found ballasts will be shown in 'Scanned ECGs:' label, below the 'DALI Network' section, at the right.

Next step is associating a short address between 0 to 63 to each found ballast. To do so, following options are possible:

1. Identify the ballast in the installation with the Wink button (it will set it to MAX level for a while), and then double click in short address field of the ballast in DALI Network window, and assign it an address 0..63.

2. Use the Auto Addr. Button to automatically assign a correlative address to each ballast.

Address of each ballast can be deleted at any time, using button Delete Addr. Multiple selection is possible (using Shift and Control keys together with mouse-clicks).

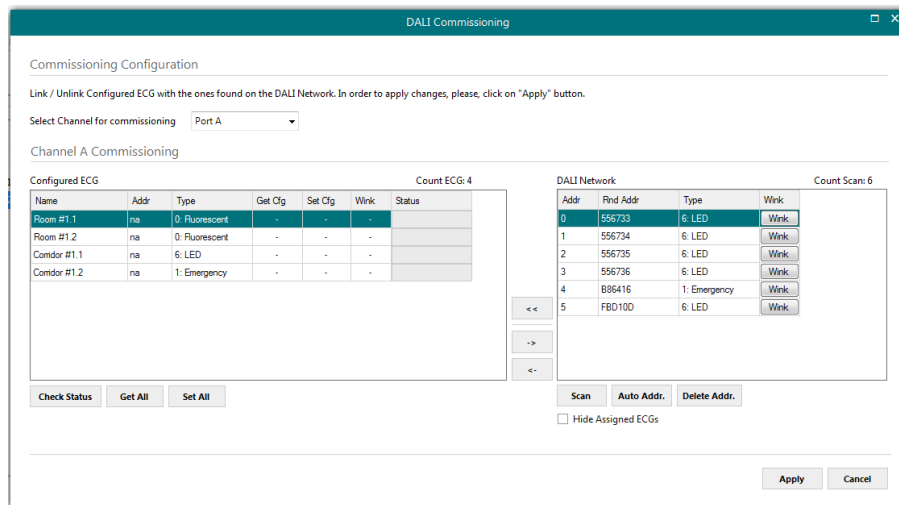


Figure A.10 Shot address association

Once each ballast has a short address, 'Wink' functionality in "DALI Network" window is available for each ballast. Wink functionality sets the ballast at maximum and minum level during a certain timeout, allowing to identify the physical location of the ballast in the installation. After identifying it in the installation, change in short address might be desired. It can be done again by using button 'Chg Addr.'.

After address association, ballasts can be added in config. There is two ways for doing that:

- Button '<<': Selected ballast or ballasts in 'DALI Network' window will be added as a new ballast in 'Configured ECG' window. It allows multiple selection of ballasts from DALI Network window (using 'shift' or 'control' keys).
- Button '<-': Selected ballast in 'DALI Network' window will be associated to existing/configured ballast in 'Configured ECG' window.

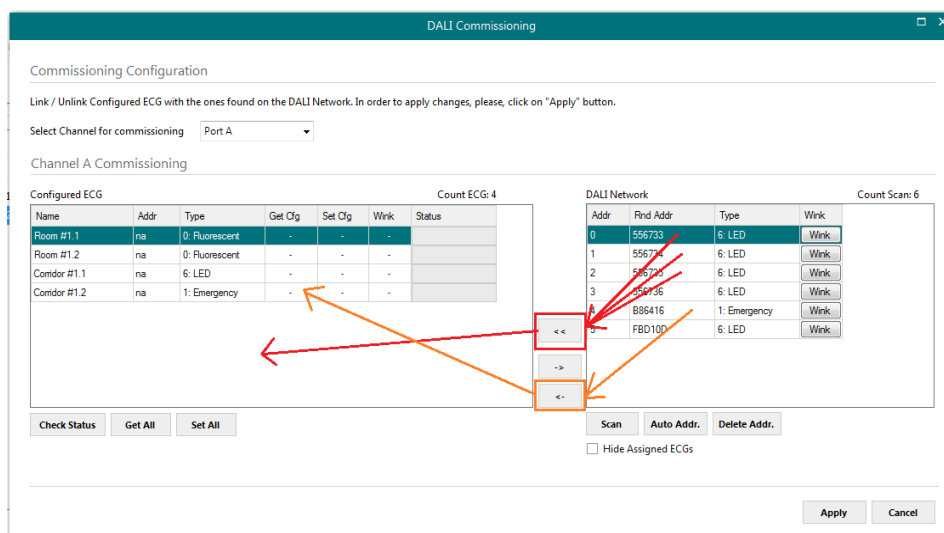


Figure A.11 Functionality of '<<' and '<-' buttons

In Figure's example, we'll associate LED ballasts with short addresses 0, 1 and 2 and Emergency light with short address 5 to existing ballasts (with '<-' button), and add ballasts from short addresses 3 and 4 as new ballasts in the configuration.

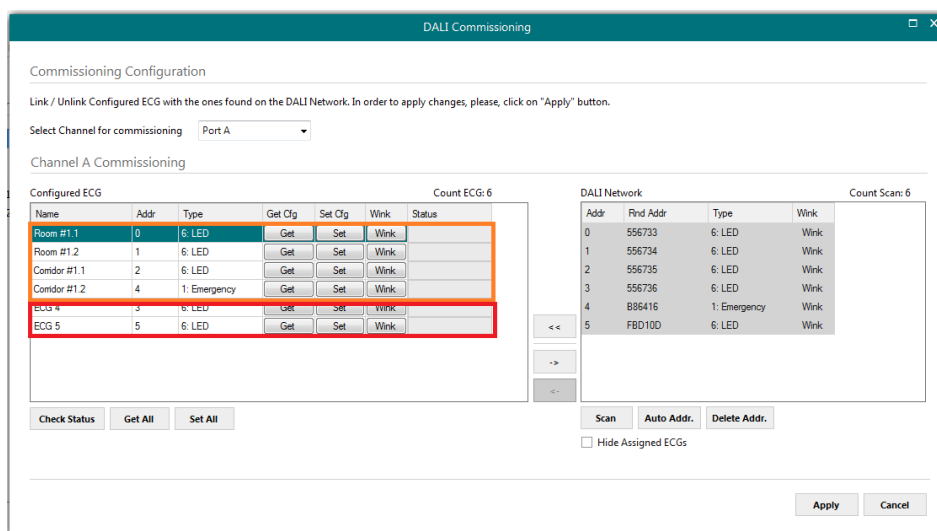


Figure A.12 Result after moving scanned ballasts to 'Configured ECG window'

Figure above shows the result. Now configured ECG's contains actual ballasts in the installation, each with its own short address. At this point, it's possible to:

- **Remove the ballast from configuration** (button '->'). This will move them back to 'DALI Network' area.
- **Wink the ballast to identify it in the installation** (button 'Wink', on each ECG).
- **Get the ballast configuration parameters** (button 'Get' on each ECG, or 'Get All' below the window). Warning, getting the configuration of a ballast will overwrite all configured parameters in MAPS config for that ballast (preset levels, group addressing, scenes, ...)
- **Set the ballast configuration parameters for each ballast** (button 'Set' on each ECG, or 'Set All' below the window).
- **Check status** for each ballast (if it's online, if it reports failure, etc).

Finally, pressing button 'Apply' will apply all changes to actual configuration in MAPS, and close the window.

Keep in mind that process done at window DALI commissioning changes configuration of parameters in DALI network, but it's still necessary to configure further parameters in IntesisBox and sending configuration file to IntesisBox using 'Send/Receive' tab of configuration section.