Exiway DALI

Integration of Ordinary and Emergency DALI Luminaires for remote monitoring, automatic test and report management

System configuration and commissioning

Rev. N 1.6

Schneider Electric

Legal Information

Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Revision History

Rev number	Date of the release	Release note
1.4	May 2021	First release
1.5	May 2022	• Change of license activation procedure • Bug correction for battery status • Report for loss of mains power shows wrong values • Report should show that there is no communication with the EL • Next date of tests and interval should be read only parameters in Bacnet
1.6	June 2021	• Remapping of BACnet variables • ETS Prototype project • Battery info in KNX set as Update • Automatic activation of all export towards bacnet • Elimination of csv file necessity • Simplification of Create Variable script

Introduction

This application note describes how to integrate the management of ordinary lighting and of emergency lighting inside the automation asset of the building. The advantage of this solution is, firstly, that ordinary lighting and emergency lighting luminaires are installed in the same bus DALI. In addition, all the lighting assets are included in the total asset of the building through the KNX bus. Thanks to the SpaceLYnk, the Emergency lighting system realizes a full automatic system able to execute the necessary automatic tests and reporting of the status according to the standards specific for Emergency Lighting installation.

The architecture is flexible and scalable up to Ecostruxure Building Operation (EBO).

NOTICE: To have the proper execution, SpaceLYnk must have access to internet to get current date and time after each restart. Otherwise, a dedicated KNX module must be used to provide the correct time to the system using a dedicated script to update the date and time of the SpaceLYnk.

The application note can be used for the following references Schneider-Electric Dicube:

Product Codes

Protection rating	Operation	Auton. (h)	Emergency flux (lm)*	Maintained flux (lm)	Model	Type	Description	Reference
Dicube								
	NM	1	210		SL200	LiFePO4	Exiway Smartled IP65 Dic 210lm NM 1h	OVA48504
	NM	1	300		SL300	LiFePO4	Exiway Smartled IP65 Dic 300lm NM 1h	OVA48507
	NM	1	650		SL600	LiFePO4	Exiway Smartled IP65 Dic 650lm NM 1h	OVA48510
	NM	1	820		SL800	LiFePO4	Exiway Smartled IP65 Dic 820lm NM 1h	OVA48512
	NM	1	1000		SL1000	LiFePO4	Exiway Smartled IP65 Dic 1000lm NM 1h	OVA48521
IP65	NM	2	120		SL100	LiFePO4	Exiway Smartled IP65 Dic 120lm NM 2h	OVA48500
	NM	2	235		SL200	LiFePO4	Exiway Smartled IP65 Dic 235lm NM 2h	OVA48506
	NM	2	550		SL600	LiFePO4	Exiway Smartled IP65 Dic 550lm NM 2h	OVA48508
	NM	2	800		SL800	LiFePO4	Exiway Smartled IP65 Dic 800lm NM 2h	OVA48520
	NM	3	180		SL200	LiFePO4	Exiway Smartled IP65 Dic 180lm NM 3h	OVA48502
	NM	3	600		SL600	LiFePO4	Exiway Smartled IP65 Dic 600lm NM 3h	OVA48522
	M - NM	1	210	180	SL200	LiFePO4	Exiway Smartled IP65 Dic 210lm NM 180lm M 1h	OVA48505
	M - NM	1	650	300	SL600	LiFePO4	Exiway Smartled IP65 Dic 650lm NM 300lm M 1h	OVA48511
IP65	M - NM	2	120	180	SL100	LiFePO4	Exiway Smartled IP65 Dic 120lm NM 180lm M 2h	OVA48501
	M - NM	2	550	300	SL600	LiFePO4	Exiway Smartled IP65 Dic 550lm NM 300lm M 2h	OVA48509
	M - NM	3	180	180	SL200	LiFePO4	Exiway Smartled IP65 Dic 180lm NM 180lm M 3h	OVA48503
-25°C Activa/Dicube**								
IP65	M - NM	1	400	180	SL400	LiFePO4	Exiway Smartled -25°C IP65 Act/Dic 400lm NM 180lm	OVA48523

Product Codes RECESSED Exiway Smartbeam

Protection rating	Operation	Auton. (h)	Installation	Flux NM (lm)*	Maintained flux (lm)	Description	Reference
Activa/Dicube							
IP42	M - NM	1.5	Escape routes	220	220	Exw Smartbeam Recessed IP42 Act/Dic 220lm M/NM 1.5h Escape routes	OVA48952
	M - NM	1.5	Anti-panic areas	220	220	Exw Smartbeam Recessed IP42 Act/Dic 220lm M/NM 1.5h Anti-panic areas	OVA48953
	M - NM	3	Escape routes	220	220	Exw Smartbeam Recessed IP42 Act/Dic 220lm M/NM 3h Escape routes	OVA48954
	M - NM	3	Anti-panic areas	220	220	Exw Smartbeam Recessed IP42 Act/Dic 220lm M/NM 3h Anti-panic areas	OVA48955
	M - NM	3	5 lux	220	220	Exw Smartbeam Recessed IP42 Act/Dic 220lm M/NM 3h 5lux	OVA48956

Surface product codes Exiway Smartbeam

Protection rating	Operation	Auton. (h)	Installation	Flux NM (lm)*	Maintained flux (lm)	Description	Reference
Dicube							
IP65	M-NM	3	Escape routes	190	190	Exw Smartbeam Surface IP65 Dic 190lm M/NM 3h Escape routes	OVA48946
	M-NM	3	Anti-panic areas	220	220	Exw Smartbeam Surface IP65 Dic 220lm M/NM 3h Anti-panic	OVA48947

Product Codes Exiway Smartduo

Protection rating	Operation	Auton. (h)	Flux NM (lm)*	Battery type	Description	Reference
Dicube						
IP65	NM	1	2400	LiFePO4	Exiway Smartduo IP65 Dic 2X1200lm 1h	OVA48060

Product Codes Exiway Smartexit

Protection rating	Operation	Autonomy (h)	Visibility distance (m)	Battery	Description	Reference
Dicube						
IP40	M-NM	1.5	26	LiFePO4	Exiway Smartexit Dic M-NM 26m 1.5h	OVA48604
	M-NM	1.5	32	LiFePO4	Exiway Smartexit Dic M-NM 32m 1.5h	OVA48606
	M-NM	3	26	LiFePO4	Exiway Smartexit Dic M-NM 26m 3h	OVA48605
	M-NM	3	32	LiFePO4	Exiway Smartexit Dic M-NM 32m 3h	OVA48607

Exiway **Kitled**

DiCube/Dali	Dimensions		Output voltage		Output Pow.	LiFePO4 battery		Description	Code
Duration	circuit	accumulator	Min	Max	Max	V	Ah		
3h	177x30xh21,5	200x19x19	12 V	55 V	3 W	3,2	4,5	Exiway Kitled DiCube/Dali 12-55VDC 3 W / 3 LFP	**OVA43700**
3h	177x30xh21,5	200x19x19	20 V	105 V	3 W	3,2	4,5	Exiway Kitled DiCube/Dali 20-105VDC 3 W / 3 LFP	**OVA43701**

Competencies

This document is intended for readers who have been certified on KNX and have experience on SpaceLYnk, Exiway Power and, optionally, Ecostruxure Building Operation (EBO) products.

The integration MUST not be attempted by someone who is new to the installation of each product. In addition, we recommend a basic knowledge of:

- Concepts of KNX technology
- BACnet, LUA scripting
- EBO product if part of the installation

System pre-requisites

This application note has been tested and validated with the following list of Hardware/Software. Before you begin, ensure you have the proper software/hardware.

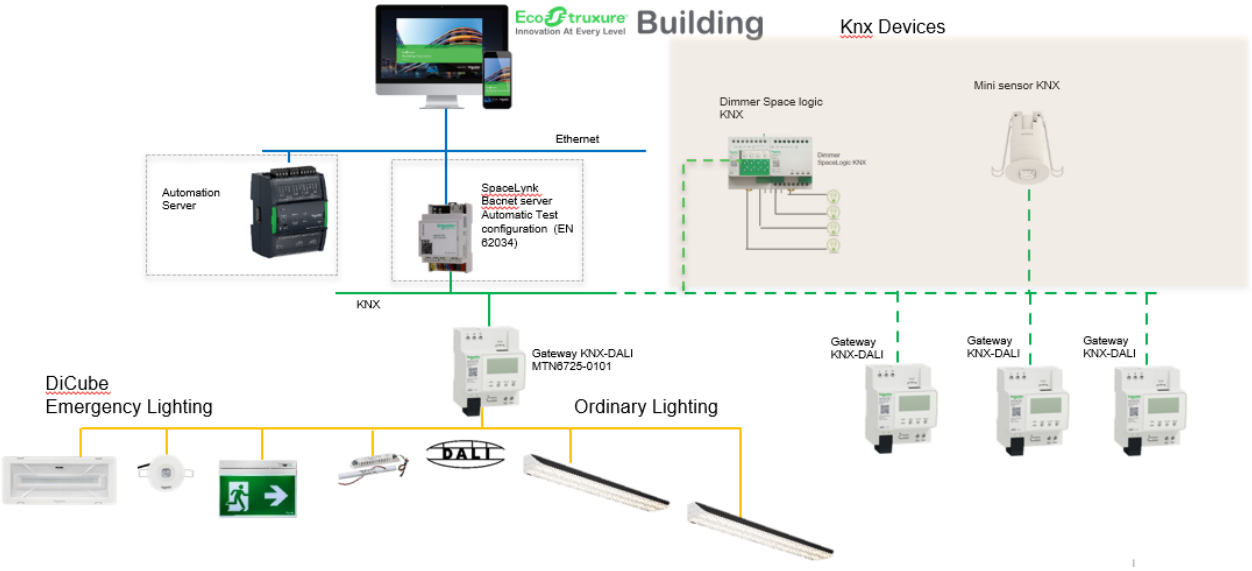
Software/Hardware	Version
ETS	5.7.4
Spacelynk Cod. LSS100200	2.7
FileZilla Client	3.42.1

Table of Contents

Architecture Design

The system is based on Exiway Dicube luminaires. The gateway KNX/DALI is the translator between DALI and KNW environments. SpaceLYnk is the controller of the system, managing the automatic tests and the reporting. EBO can be optionally added to the system to integrate and monitor emergency Lighting installation at upper level.

SpaceLYnk and the gateway KNX/DALI are mandatory part of system to be compliant with the regulation, while EBO is not mandatory but it is recommended to provide higher level of supervision



The implementation of this application note is divided in steps. the correct completion of a step is necessary before moving to the next one.

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Calculation of Bacnet variables per installation

Configuration is based on Bacnet object that contain system information System and its changes during the time. It is possible to create up to 2000 Bacnet objects that guarantee a complete system description and and optimal operational efficiency, that is quantifies in the reactivity of the system to follow the changes. Overall quantity of objects (standard and virtual) should be within the limit of 2000 for each SpaceLYnk. In case of more bacnet oobject more SpaceLYnks should be considered.

Object	Bacnet Variables need	KNX Variables needed
Widget	60	77
Gateway Knx/DALI	3	4
Emergency Lighting DALI	4	7
Gruppo DALI	4	4

Cybersecurity Notices

It is strongly recommended that only the following ports are activated for the communication between the installed components and other communication is blocked.

KNX/ DALI gateway

For the KNX/ DALI Gateway that must be connected to the LAN, the ports that will be used are presented.

Function	Connection type	Protocol (Default state)	Default port (TCP or UPD)	Configurable Port	Can be Disabled	Usage when enabled	Internet needed	Optional settings
Client to server comm.	IT	HTTP	80 (TCP)	No		On demand	No	-
Client to server comm.	IT	HTTPS	443 (TCP)	Yes	-	On demand	No	-
Server to Server comm		KNX	-	-	-	Persistent	No	-

Necessary ports of communication for this application note for KNX/ DALI Gateway

SpaceLYnk

SpaceLYnk, as control device, needs to be connected to the LAN. In the next table show the required port configuration

Function	Connection type	Protocol (Default state)	Default port (TCP or UPD)	Configurable Port	Can be Disabled	Usage when enabled	Internet needed	Optional settings
Client to server comm.	IT	HTTP	80 (TCP)	No		On demand	No	-
Client to server comm.	IT	HTTPS	443 (TCP)	Yes	-	On demand	No	-
Server to Server comm.	IT	FTPS	21	Yes	-	Persistent	No	-
Server to Server comm		KNX	-	-	-	Persistent	No	-
Server to Server comm	IT	BACnet		No	Yes	Persistent	No	-

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Necessary ports of communication for this application note for SpaceLYnk

EBO

Finally, in case of EBO integration, the following ports are used

Function	Connection type	Protocol (Default state)	Default port (TCP or UPD)	Configurable Port	Can be Disabled	Usage when enabled	Internet needed	Optional settings
Client to server comm.	IT	HTTP	80 (TCP)	No		On demand	No	-
Client to server comm.	IT	HTTPS	443 (TCP)	Yes	-	On demand	No	-
Server to Server comm.	IT	BACnet		No	Yes	Persistent	No	-

Necessary ports of communication for this application note for EBO

Best practice for cybersecurity

For cybersecurity reasons it is suggested that:

- Default password of admin is changed in KNX DALI gateway after its activation
- If the web access to the gateway is not required, disable it.
- Strong password policy to be inserted is EBO

For further information on the cybersecurity of SpaceLYnk, please refer to: “AN002_107 System Hardening Guideline”

DALI bus specification

The solution support only DALI - DT1 Emergency lighting that have batteries on board. There is no constraint in term of DALI Ordinary lighting device type.

Device Type	Device/Application	Standard
DT0	Fluorescent lamps	IEC 62386-201
DT1	Emergency lighting	IEC 62386-202
DT2	Discharge lamps	IEC 62386-203
DT3	Low voltage halogen lamps	IEC 62386-204
DT4	Supply voltage controller for incandescent lamps	IEC 62386-205
DT5	Conversion from digital signal into d.c. voltage	IEC 62386-206
DT6	LED Modules	IEC 62386-207
DT7	Switching function	IEC 62386-208
DT8	Colour control	IEC 62386-209
DT9	Sequencer	IEC 62386-210
DT15	Load referencing	IEC 62386-216
DT16	Thermal gear protection	IEC 62386-217
DT17	Dimming curve selection	IEC 62386-218
DT19	Centrally supplied DC Emergency Operation	IEC 62386-220
DT20	Demand Response	IEC 62386-221
DT21	Thermal lamp protection	IEC 62386-222
DT22	*Light-output compensation over lifetime (Draft)*	IEC 62386-223
DT23	Integrated light source	IEC 62386-224
DT24	*Colour Tc (Draft)*	IEC 62386-225
DT25	*Colour x,y (Draft)*	IEC 62386-226

ETS configuration

The current solution is based on KNX and DALI products. For this reason, ETS is required to perform the configuration of the parameters and the commissioning of the devices used for the emergency lighting.
This application note provides a “champion” project where all the parameters are configured for 8 Gateways full of Emergency Lights.
KNX Expert should import the project and:

1) Remove the GWs not necessary by deleting them.
2) On the remaining GWs, change from Emergency Lights to normal lights the ECGs that are not used for Emergency lights or not used at all. You can perform this, by selecting the ECGs that will not be EL and change the ECG Type to another one. With this change many groups will be unlinked, since the ECGs are no longer Emergency Lights. (Figure 1)
3) Delete all the KNX groups that are not used so that they are not imported later in SpaceLYnk.

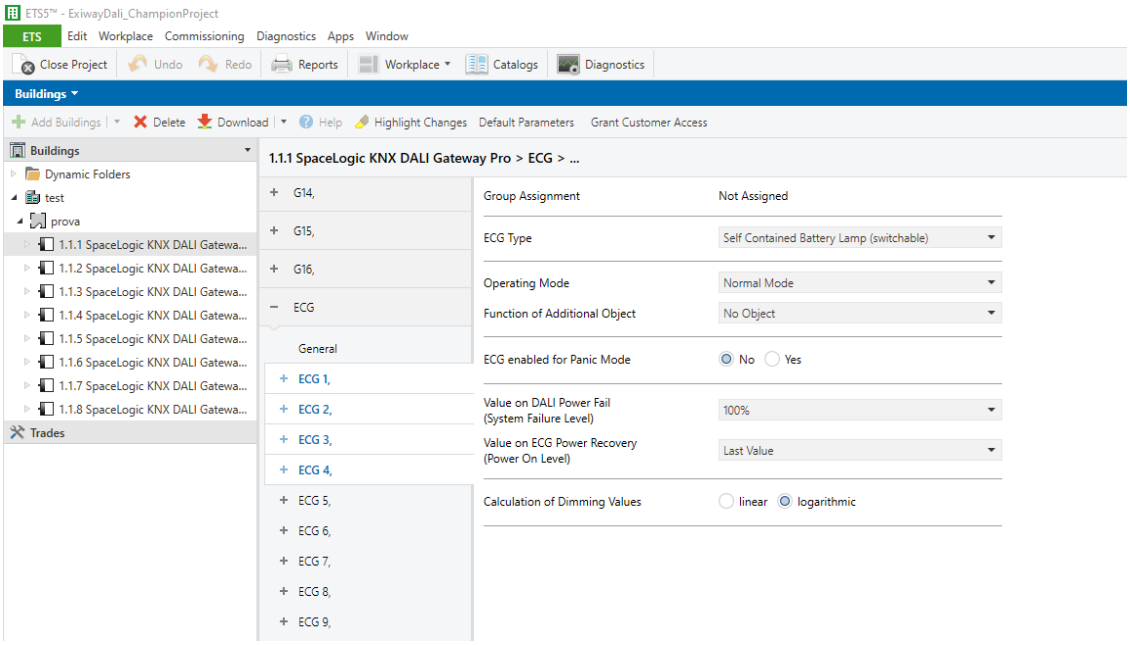


Figure 1: Select with CTRL multiple ECG and change the ECG type to other then Self-contained Battery Lamp

Important notes:

- For each ECG a dedicated KNX group (variable) for the error has been created. This is necessary for the Emergency lights. For the normal lights, if this selection creates any issues the KNX operator in ETS can select to cancel them and handle the errors as they want.
- Furthermore, the ordinary lamps if they are not used can also be deleted to avoid confusion since they will not be used.
- In case an emergency light is added later, the KNX operator in ETS needs to select the specific type and perform the group creation and linking as described in Annex 2

In case someone wants to create the project from start, although it is not suggested, the parameters for the configuration are presented in Annex 2.

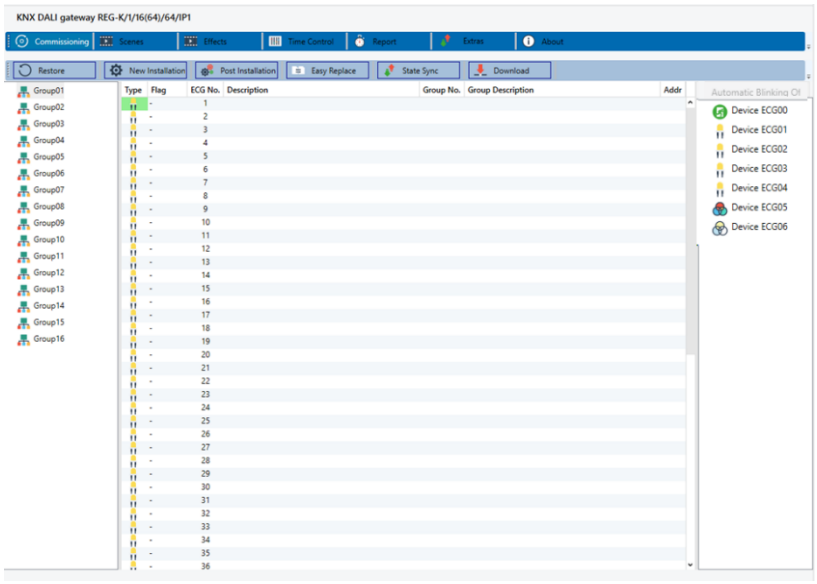
Offline preparation of DALI commissioning in ETS

For the offline preparation it is expected from the KNX system integrator to:

1) Add on description information that will help lamp identification
2) Link normal ECG lamps with necessary groups for a unique control

DALI commissioning

DALI commissioning is performed using the DCA tool of ETS5. Commissioning of the DALI lamps is performed after the offline preparation with the identification of the DALI lamps by the gateway and their assignment in the ECGs selected during the offline preparation. For more information about how to commission DALI lights with DCA read the: “KNX DALI-Gateway REG-K/1/16(64)/64/IP1 - Application



During the commissioning of DALI luminaires, the system integrator should separate the Emergency lights considering the following points:

- According to the EN 62034 regulation 2 Emergency lights close to each other should not perform the autonomy test together, for this reason we have the separation in 2 groups (NOT DALI GROUPS) using the scripts in SpaceLYnk.
- The scripts in SpaceLYnk assign group 1 (NOT DALI GROUP) to the first found emergency light and the group 2 (NOT DALI GROUP) to the next one. This alternation between group 1 and group 2 is applied for all the Emergency lights found in all KNX/ DALI GWs.
- After the identification of DALI Emergency lights using DCA the allocation in specific ECGs should be performed considering the 2 points above.

After the end of DALI commissioning, it is expected that the application of the Gateway is downloaded to the device.

Export of KNX project

The project after commissioned should be exported in *.esf format to be imported in SpaceLYnk. *.knxProj file format is not currently supported.

SpaceLYnk integration

Passwords

For Cybersecurity reasons, it is strongly proposed to use different passwords for different objects

FTP import

The SpaceLYnk file contains 2 folders:

Under ftp folder:

- SystemComposition.xlsx
- Custom_Report_image.png

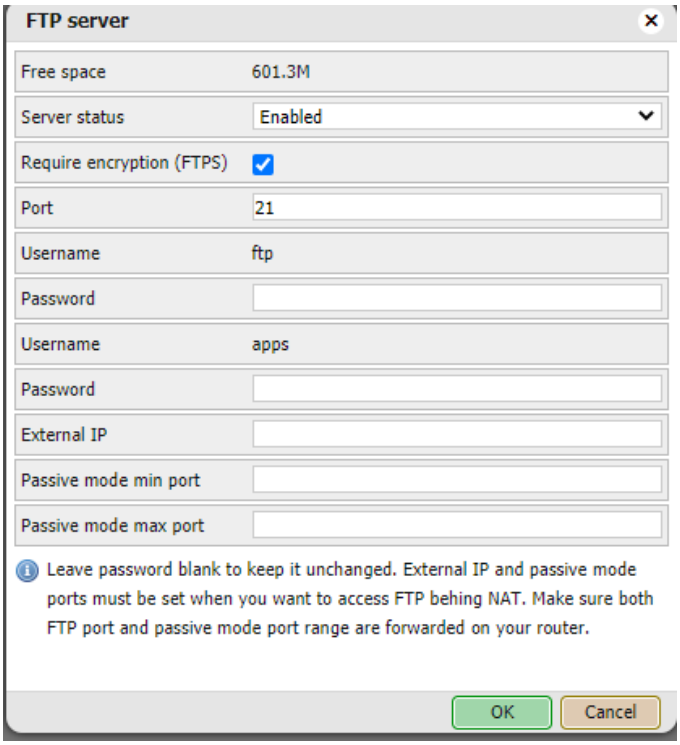
Under scripts folder:

- Scripting-DicubeDali.tar.gz

For configuration of FTP access, following the path:

Configurator → System → Services → FTP Server

The following figure is available:



FTP server configuration

On FTP server configuration the user must enable: Server status as well Require encryption (FTPS). Finally, 2 different passwords need to be inserted for accessing user ftp and apps respectively.

Configuring the FTP server, the system integrator must load the necessary files under user ftp for the execution of automatic test and report creation.

Using FileZilla, the connection to the ftp server is established after having ftp server activated. Using username: ftp and relative password. The following files must be uploaded to SpaceLYnk:

- SystemComposition.xlsx
- Custom_Report_image.png

NOTICE1: The SystemComposition.xlsx file should be filled up with the site information BEFORE it is uploaded in the ftp server of SpaceLYnk
On the same ftp connection after the commissioning of the system the ftp logs will be available for download. System integrator can change the Custom_Report_image.png with a custom one but it needs to replace the original one with the same name and same dimensions.

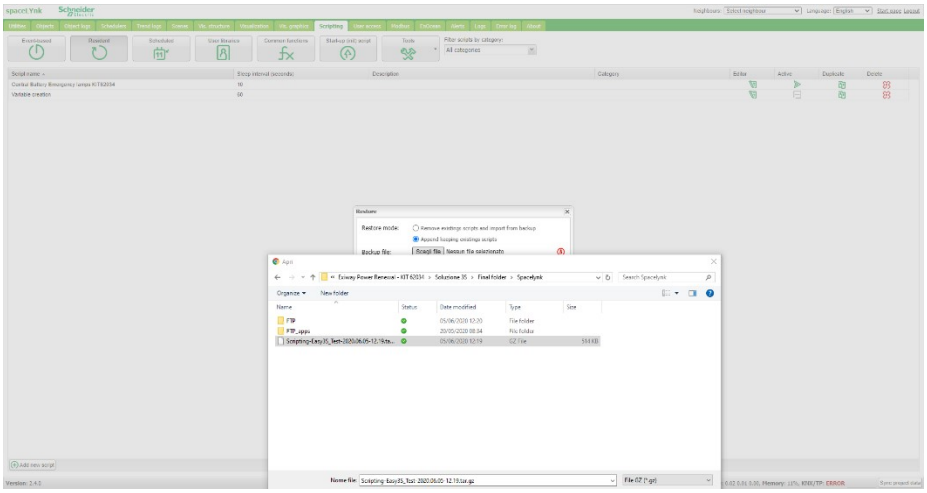
NOTICE2: If the above files are not loaded correctly in the ftp server of SpaceLYnk, the necessary scripts cannot run correctly.

Import of KNX objects and scripts

The esf file created from the export of the KNX project needs to be imported in SpaceLYnk.
Note: The discarded groups from Import about the Emergency lights are automatically created from the scripts
After the import of KNX objects the pre-configured scripts need to be imported. This is done using the following path:

Configurator → Scripting → Tools → Restore Scripts

Then, select the proper back up of scripts from the download folder.



Import of necessary scripts

NOTICE: This procedure will restore only 2 resident scripts, 7 event scripts and a user script without visual content.

As seen during import of esf file in SpaceLYnk, some knx variables (*.TestResults) are not imported. These will be created automatically using the

"Variable Creation" script. For script to operate correctly, use the "Champion" ETS project or follow in detail what is written in Annex 2

Variable creation script

After the load of the scripts, the "variable creation" script needs to be activated. From the logs of the system the progress of the configuration can be seen. Furthermore, on the "Variable Creation" script, the user needs to define from which address and forward the script can create the variables. The addresses after this value should be free for usage

NOTE:
The first time of the execution the script will look for the parameters related the name of the site (*ReportNomeImpianto*) and a reference e-mail (*ReportMailImpianto*). By default, these variables are created blank and for this reason the procedure cannot be completed successfully and an error message will appear. System integrator should fill this information and activate again the "Variable Creation" resident script.

NOTE 2:
In case the system integrator needs to add in the script a new Emergency light, after doing the necessary work in ETS they need to stop the main script and reactivate the Variable creation script. This script will create the necessary objects and consider the new Emergency lights in the automatic test procedure.

License Activation

Only for the activation of the license, during application note start up (Variable Creation), SpaceLYnk MUST have access to the internet. Access to internet is required to browse necessary web pages and be able to send an email with the configuration. If internet access is not available, the application note cannot start. This means that:

- the necessary automatic tests will not run
- read of Emergency lights status and faults will not be possible

Before the activation of the script "Variable Creation", the System Integrator must compile correctly and upload to the ftp server with username ftp the file named "SystemComposition.xlsx", which will be sent, as attachment, automatically with the mail.
Attention: If the attachment is not added or the name is altered, the mail will not be sent, and the activation will not go ahead.

When the script "Variable Creation" the script will try to connect to the internet to verify the internet access and an e-mail will be sent automatically from the SpaceLYnk to El.tech-support@se.com containing:

- the attached excel file,
- the MAC address of the device
- the name of the installation

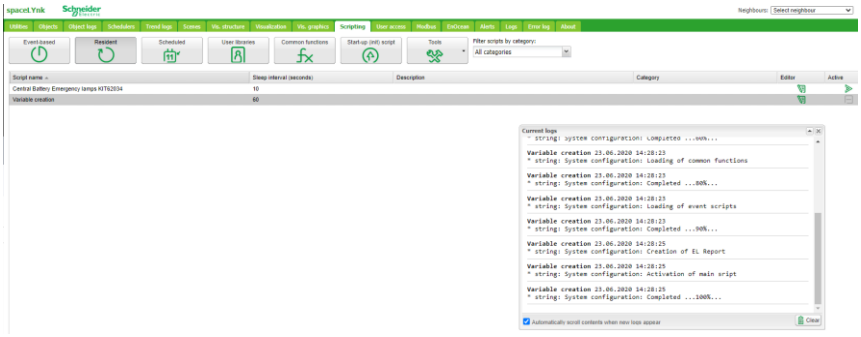
This information is necessary in case of request of support to our technical team

When the procedure is completed a dedicated file named “License_eval.txt” will be created and filled up inside with some characters, which are necessary for the validation that the information have been sent. This file must not be manually altered. If altered, the Variable Creation script must be activated again with Internet access for the SpaceLYnk.
After the creation of the file the main script will start automatically.

In case of failure in license activation is strongly suggested to check the following points:

1. Attachment uploaded correctly with the correct name: “SystemComposition.xlsx”
2. SpaceLYnk has access to the internet not only local intranet. To verify that internet is active try to access Marketplace page in the initial IP address of SpaceLYnk.
3. The imported csv file on ftp server should not have the default name of site and email address.

After finishing the automatic progress, the “Variable creation” script will be automatically disabled and “KIT 62034 Self battery” will be automatically enabled.



Verification of proper execution of variable creation script.

Automatic test execution

The selection of virtual group 1 and Group 2 for the test execution is performed automatically for each EL found in the ETS loaded file. The system integrator can change the pre-selected group by changing the tag of **GWXX.ECGYY.TestStart** from *Group01* to *Group02* and vice versa.
The location of the tag can be seen in the image bellow

GW01.ECG01.TestStart				05. 1 byte unsigned…	2			Group01
GW01.ECG01.TestResults				245.600 6 byte DAL…	LTRF 0; LTRD 1; LT…			Emergency lights, elTestResult
GW01.ECG01.CS				07. 2 byte unsigned…	4177			Emergency lights, elCS
GW01.ECG01.Battery				07. 2 byte unsigned…	105			Emergency lights, elBattery

The change of group can be performed after the successful finish of “Variable Creation”

Test Report in SpaceLYnk

For the correct report presentation, system integrator must update the variables related to the report as presented in the image bellow:

ReportNomeImpianto		250 byte string			Emergency lights, Report
ReportID_Spacelynk		250 byte string			Emergency lights, Report
ReportBrand		250 byte string			Emergency lights, Report
ReportUbicazione		250 byte string			Emergency lights, Report
ReportTotaleAppDALIinstallati		250 byte string	458		Emergency lights, Report
ReportDALIInDurationFailed		250 byte string	none		Emergency lights, Report
ReportDALIInFunctionalFailed		250 byte string	none		Emergency lights, Report
ReportDALIInDurationPending		250 byte string	none		Emergency lights, Report
ReportDALIInFunctionalPending		250 byte string	none		Emergency lights, Report
ReportDALIInMissingPower		250 byte string	none		Emergency lights, Report
ReportDALIGeneralFailure		250 byte string	n 369: , GW01: EC...		Emergency lights, Report
ReportMailImpianto		250 byte string			Emergency lights, Report

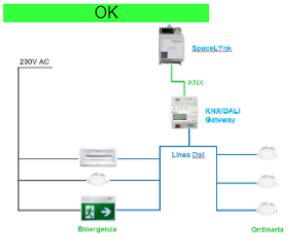
To load the Test Report in SpaceLYnk in English, type the IP address of the SpaceLYnk followed by: “/user/Dicube_EL_report.lp”. In full, the link for access the report is:

https://[IP-address]/user/Dicube_EL_report.lp

Report of Emergency Lights of plant	Info
Plant name	Pieve di Centos
IP Spacelynk	192.168.1.2
Brand	Schneider Electric
Installation	Test zone
Total EL installed	3
Total EL with duration test failed	none
Total EL with functional test failed	none
Total EL without mains power	
Total EL waiting to perform duration test	none
Total EL waiting to perform functional test	none
Total EL with general failure or no communication	none
Datetime of last functional test Group 1	Not performed yet
Datetime of last duration test Group 1	Not performed yet
Datetime of last functional test Group 2	Not performed yet
Datetime of last duration test Group 2	Not performed yet

Print

OK



Life Is On Schneider Electric

Name and Surname: _____

Signature and Date: _____

Figure 2: Report of status in SpaceLYnk level

At the end of the procedure, the user should check the error logs of SpaceLYnk.

FTP Logging of changes of status

SpaceLYnk supports FTP logs which are saved on the internal database. Using these ftp logs the user can monitor the historical operation of the

whole system to understand when and where problems have appeared. The logs are saved in daily files which are saved in monthly folders respectively. The information available are saved in csv format. Local timestamp is written and then the information that is reported. The available information is:

- Autonomy test has been requested/Functionality test has been requested
- Effort to start an autonomy test/ Effort to start a functional test
- Starting autonomy test/ Starting function test
- test command: true /test command: false
- test stopped and postponed
- Lamps returned to original state
- Automatic autonomy test failed/ completed successfully/ needs to be postponed
- Manual autonomy test failed/ completed successfully/ needs to be postponed
- Automatic functionality test failed/ completed successfully/ needs to be postponed
- Manual functionality test failed/ completed successfully/ needs to be postponed

The files are located under ftp server using username ftp and the appropriate password.

How to cancel installation of application note

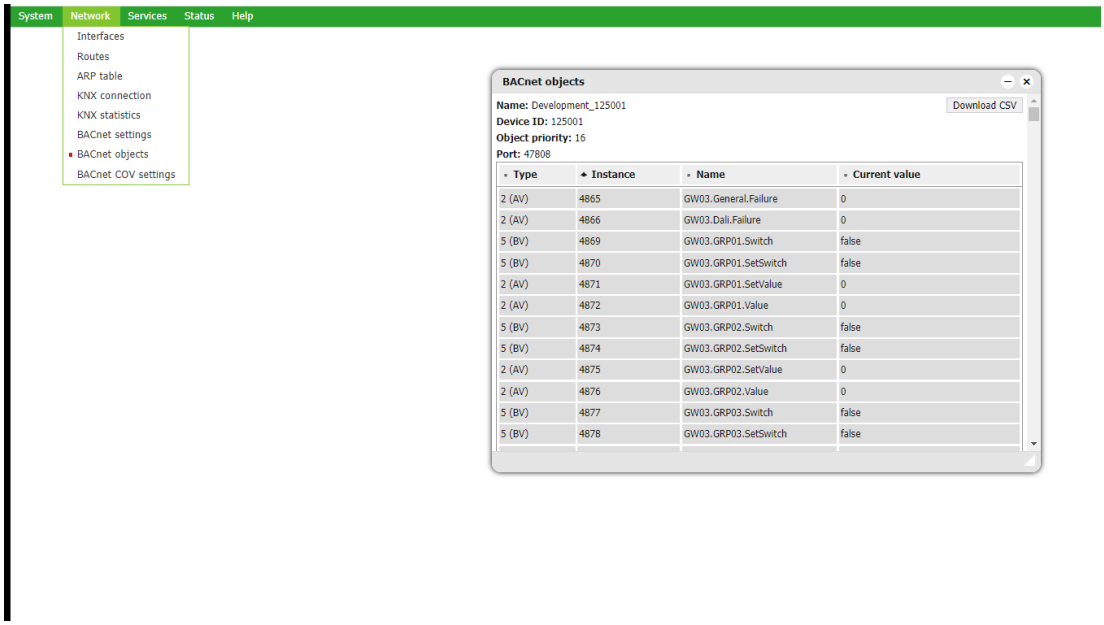
To cancel the installation of this application note, a user with administration credentials need to perform the following steps:

1. Stop the execution of resident script in SpaceLYnk “KIT 62034 Self battery”
2. Delete the 2 resident scripts of SpaceLYnk (Variable Creation and “KIT 62034 Self battery” under Configurator/Scripts/Resident
3. Delete the 7 event scripts of SpaceLYnk under Configurator/Scripts/Event Based
    a. elGeneral.Failure
    b. elBatteryScript
    c. elCSScript
    d. elFailureScript
    e. elGroup01CMScript
    f. elGroup01TestStart
    g. elGroup02CMScript
    h. elGroup02TestStart
    i. testResultScript
    j. elTime_ExcScript
4. Delete the user library “elFunctions_v2” under Configurator/Scripts/User-libraries
5. Delete all objects which are related to the application note
6. Connect to ftp server using “ftp” username and password and delete:
7. ftp logs folders and files
    a. SystemComposition.xlsx
    b. Custom_Report_image.png
    c. License_eval.txt
8. Connect to ftp server using “apps” username and password and delete under folder “user”:
    a. Dicube_EL_report.lp

BACnet server preparation

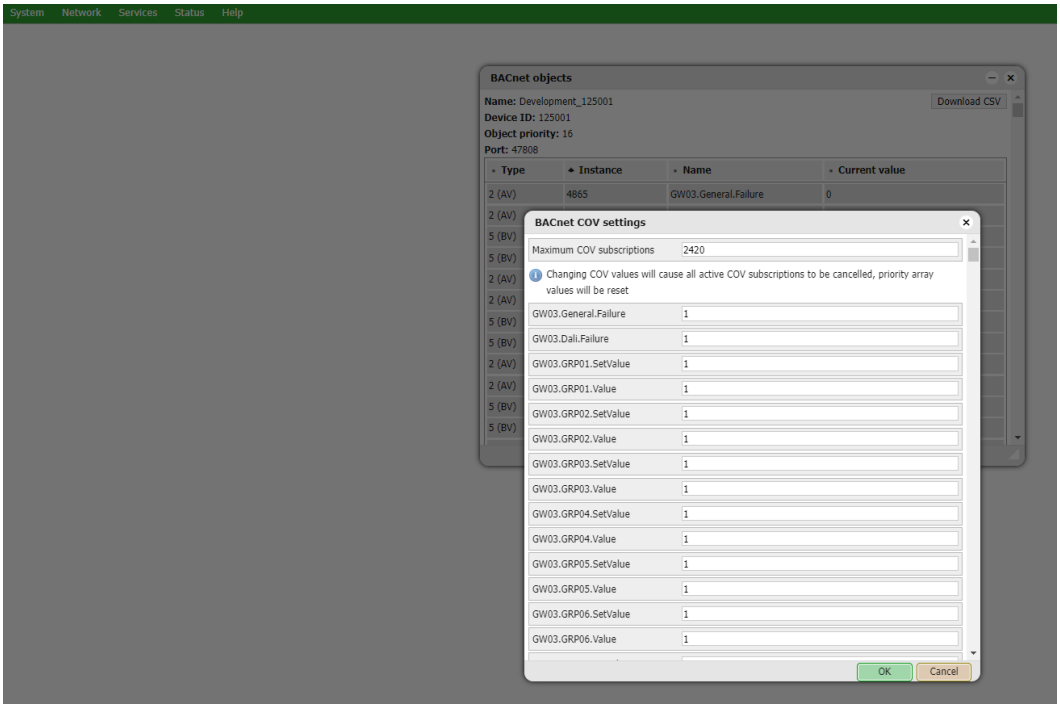
Using:

Configurator → System → Network → BACNet objects
Download csv to verify the number of BACnet objects available.



Configurator → System → Network → BACNet COV settings

Set Maximum COV subscriptions to a number equal or higher to the BACnet objects.



For our solution COV of 1 is ok for all objects.

Annex1: list of Variables

N.	Name	Type	Default value	BACNET Exported	Explanation	Comment
1	elAutonomyTestRepetition	2 byte unsigned integer	26	Yes	Repetition interval of autonomy tests in weeks	Do not change manually in order to respect the 62034 normative
2	elFunctionalityTestRepetition	2 byte unsigned integer	14	Yes	Repetition interval of functionality tests in days	Do not change manually in order to respect the 62034 normative
3	elGroup01_AutonomyTestDay	2 byte unsigned integer	0-31	No	Day of month of next autonomy test for group 1	Do not change manually in order to respect the 62034 normative
4	elGroup01_AutonomyTestMonth	2 byte unsigned integer	0-12	No	Month of year of next autonomy test for group 1	Do not change manually in order to respect the 62034 normative
5	elGroup01_AutonomyTestYear	2 byte unsigned integer	20xx	No	Year of next autonomy test for group 1	Do not change manually in order to respect the 62034 normative
6	elGroup01_AutonomyTestHour	2 byte unsigned integer	0-24	No	Hour of next autonomy test for group 1	Do not change manually in order to respect the 62034 normative
7	elGroup01_AutonomyTestMinute	2 byte unsigned integer	0-60	No	Minute of next autonomy test for group 1	Do not change manually in order to respect the 62034 normative
8	elGroup01_AutonomyTestDay_R	2 byte unsigned integer	0-31	Yes	Day of month of next autonomy test for group 1	Read only value available on BACNET level
9	elGroup01_AutonomyTestMonth_R	2 byte unsigned integer	0-12	Yes	Month of year of next autonomy test for group 1	Read only value available on BACNET level
10	elGroup01_AutonomyTestYear_R	2 byte unsigned integer	20xx	Yes	Year of next autonomy test for group 1	Read only value available on BACNET level
11	elGroup01_AutonomyTestHour_R	2 byte unsigned integer	0-24	Yes	Hour of next autonomy test for group 1	Read only value available on BACNET level
12	elGroup01_AutonomyTestMinute_R	2 byte unsigned integer	0-60	Yes	Minute of next autonomy test for group 1	Read only value available on BACNET level
13	elGroup01_nextDurationTestDate	250 bytes string		No	Full timestamp of next autonomy test for group 1	
14	elGroup01_LastDurationTestDate	250 bytes string		No	Full timestamp of last autonomy test for group 1	
15	elGroup01_AutonomyStarted	boolean		No	Indication that the autonomy test for group 1 has started	Do not change manually. It is a variable for showing the status of tests
16	elGroup01_FunctionalityTestDay	2 byte unsigned integer	0-31	No	Day of month of next autonomy test for group 1	Do not change manually in order to respect the 62034 normative
17	elGroup01_FunctionalityTestMonth	2 byte unsigned integer	0-12	No	Month of year of next autonomy test for group 1	Do not change manually in order to respect the 62034 normative
18	elGroup01_FunctionalityTestYear	2 byte unsigned integer	20xx	No	Year of next autonomy test for group 1	Do not change manually in order to respect the 62034 normative
19	elGroup01_FunctionalityTestHour	2 byte unsigned integer	0-24	No	Hour of next autonomy test for group 1	Do not change manually in order to respect the 62034 normative
20	elGroup01_FunctionalityTestMinute	2 byte unsigned integer	0-60	No	Minute of next autonomy test for group 1	Do not change manually in order to respect the 62034 normative
21	elGroup01_FunctionalityTestDay_R	2 byte unsigned integer	0-31	Yes	Day of month of next autonomy test for group 1	Read only value available on BACNET level
22	elGroup01_FunctionalityTestMonth_R	2 byte unsigned integer	0-12	Yes	Month of year of next autonomy test for group 1	Read only value available on BACNET level
23	elGroup01_FunctionalityTestYear_R	2 byte unsigned integer	20xx	Yes	Year of next autonomy test for group 1	Read only value available on BACNET level
24	elGroup01_FunctionalityTestHour_R	2 byte unsigned integer	0-24	Yes	Hour of next autonomy test for group 1	Read only value available on BACNET level
25	elGroup01_FunctionalityTestMinute_R	2 byte unsigned integer	0-60	Yes	Minute of next autonomy test for group 1	Read only value available on BACNET level
21	elGroup01_nextFunctionTestDate	250 bytes string		No	Full timestamp of next autonomy test for group 1	
22	elGroup01_LastFunctionTestDate	250 bytes string		No	Full timestamp of last autonomy test for group 1	
23	elGroup01_FunctionalStarted	boolean		No	Indication that the functional test for group 1 has started	Do not change manually. It is a variable for showing the status of tests

24	elGroup01_SafePeriodHourStart	2 byte unsigned integer	0-23	Yes	Hour for starting period of test execution for group 1	
25	elGroup01_SafePeriodHourStop	2 byte unsigned integer	0-23	Yes	Hour for ending period of test execution for group 1	
26	elGroup01_SafePeriodMinuteStart	2 byte unsigned integer	0-59	Yes	Minute for starting period of test execution for group 1	
27	elGroup01_SafePeriodMinuteStop	2 byte unsigned integer	0-59	Yes	Minute for ending period of test execution for group 1	
28	elGroup01_DurationTestCentrallyPostponed	boolean		Yes	Indication that a duration test of group 1 has been postponed due to safe hour	
29	elGroup01_DurationTestCentrallyPostponeStop	boolean		Yes	Indication that a postponed duration test of group 1 will now run	
30	elGroup01_FunctionalTestCentrallyPostponed	boolean		Yes	Indication that a functional test of group 1 has been postponed due to safe hour	
31	elGroup01_FunctionalTestCentrallyPostponeStop	boolean		Yes	Indication that a postponed functional test of group 1 will now run	
32	elGroup01_TestStart	2 byte unsigned integer		No	Group 1 command to start a test	Do not change manually
33	elGroup01_StopTestManualy	boolean		No	Group 1 command to stop a test	Do not change manually
34	elGroup01_TypeOfTest	boolean		No	Internal variable to understand type of test	Do not change manually
35	elGroup01_CmdStartTestAutonomy	boolean		Yes	Manual command for Duration test in Group 1	
36	elGroup01_CmdStartTestFunctionality	boolean		Yes	Manual command for Functional test in Group 1	
37	elGroup01_LastTestRequestWasManual	boolean		No	Internal variable to understand if last test was manual	Do not change manually
38	elGroup02_AutonomyTestDay	2 byte unsigned integer	0-31	No	Day of month of next Autonomy test for group 2	Do not change manually in order to respect the 62034 normative
39	elGroup02_AutonomyTestMonth	2 byte unsigned integer	0-12	No	Month of year of next Autonomy test for group 2	Do not change manually in order to respect the 62034 normative
40	elGroup02_AutonomyTestYear	2 byte unsigned integer	20xx	No	Year of next autonomy test for group 2	Do not change manually in order to respect the 62034 normative
41	elGroup02_AutonomyTestHour	2 byte unsigned integer	0-24	No	Hour of next autonomy test for group 2	Do not change manually in order to respect the 62034 normative
42	elGroup02_AutonomyTestMinute	2 byte unsigned integer	0-60	No	Minute of next autonomy test for group 2	Do not change manually in order to respect the 62034 normative
43	elGroup02_AutonomyTestDay_R	2 byte unsigned integer	0-31	Yes	Day of month of next Autonomy test for group 2	Read only value available on BACNET level
44	elGroup02_AutonomyTestMonth_R	2 byte unsigned integer	0-12	Yes	Month of year of next Autonomy test for group 2	Read only value available on BACNET level
45	elGroup02_AutonomyTestYear_R	2 byte unsigned integer	20xx	Yes	Year of next autonomy test for group 2	Read only value available on BACNET level
46	elGroup02_AutonomyTestHour_R	2 byte unsigned integer	0-24	Yes	Hour of next autonomy test for group 2	Read only value available on BACNET level
47	elGroup02_AutonomyTestMinute_R	2 byte unsigned integer	0-60	Yes	Minute of next autonomy test for group 2	Read only value available on BACNET level
43	elGroup02_nextDurationTestDate	250 bytes string		No	Full timestamp of next autonomy test for group 2	
44	elGroup02_LastDurationTestDate	250 bytes string		No	Full timestamp of last autonomy test for group 2	
45	elGroup02_AutonomyStarted	boolean		No	Indication that the autonomy test for group 2 has started	Do not change manually. It is a variable for showing the status of tests
46	elGroup02_FunctionalityTestDay	2 byte unsigned integer	0-31	No	Day of month of next autonomy test for group 2	Do not change manually in order to respect the 62034 normative
47	elGroup02_FunctionalityTestMonth	2 byte unsigned integer	0-12	No	Month of year of next autonomy test for group 2	Do not change manually in order to respect the 62034 normative
48	elGroup02_FunctionalityTestYear	2 byte unsigned integer	20xx	No	Year of next autonomy test for group 2	Do not change manually in order to respect the 62034 normative
49	elGroup02_FunctionalityTestHour	2 byte unsigned integer	0-24	No	Hour of next autonomy test for group 2	Do not change manually in order to respect the 62034 normative
50	elGroup02_FunctionalityTestMinute	2 byte unsigned integer	0-60	No	Minute of next autonomy test for group 2	Do not change manually in order to respect the 62034 normative
51	elGroup02_FunctionalityTestDay_R	2 byte unsigned integer	0-31	Yes	Day of month of next autonomy test for group 2	Read only value available on BACNET level
52	elGroup02_FunctionalityTestMonth_R	2 byte unsigned integer	0-12	Yes	Month of year of next autonomy test for group 2	Read only value available on BACNET level
53	elGroup02_FunctionalityTestYear_R	2 byte unsigned integer	20xx	Yes	Year of next autonomy test for group 2	Read only value available on BACNET level

54	elGroup02_FunctionalityTestHour_R	2 byte unsigned integer	0-24	Yes	Hour of next autonomy test for group 2	Read only value available on BACNET level
55	elGroup02_FunctionalityTestMinute_R	2 byte unsigned integer	0-60	Yes	Minute of next autonomy test for group 2	Read only value available on BACNET level
51	elGroup02_nextFunctionTestDate	250 bytes string		No	Full timestamp of next autonomy test for group 2	
52	elGroup02_LastFunctionTestDate	250 bytes string		No	Full timestamp of last autonomy test for group 2	
53	elGroup02_FunctionalStarted			No	Indication that the functional test for group 2 has started	Do not change manually. It is a variable for showing the status of tests
54	elGroup02_SafePeriodHourStart	2 byte unsigned integer	0-23	Yes	Hour for starting period of test execution for group 2	
55	elGroup02_SafePeriodHourStop	2 byte unsigned integer	0-23	Yes	Hour for ending period of test execution for group 2	
56	elGroup02_SafePeriodMinuteStart	2 byte unsigned integer	0-59	Yes	Minute for starting period of test execution for group 2	
57	elGroup02_SafePeriodMinuteStop	2 byte unsigned integer	0-59	Yes	Minute for ending period of test execution for group 2	
58	elGroup02_DurationTestCentrallyPostponed	boolean		No	Indication that a duration test of group 2 has been postponed due to safe hour	
59	elGroup01_DurationTestCentrallyPostponeStop	boolean		No	Indication that a postponed duration test of group 2 will now run	
60	elGroup02_FunctionalTestCentrallyPostponed	boolean		No	Indication that a functional test of group 2 has been postponed due to safe hour	
61	elGroup02_FunctionalTestCentrallyPostponeStop	boolean		No	Indication that a postponed functional test of group 2 will now run	
62	elGroup02_TestStart	2 byte unsigned integer		No	Group 1 command to start a test	Do not change manually
63	elGroup02_StopTestManualy	boolean		Yes	Group 1 command to stop a test	Do not change manually
64	elGroup02_TypeOfTest	boolean		No	Internal variable to understand type of test	Do not change manually
65	elGroup02_CmdStartTestAutonomy	boolean		Yes	Manual command for Duration test in Group 2	
66	elGroup02_CmdStartTestFunctionality	boolean		Yes	Manual command for Functional test in Group 2	
67	elGroup02_LastTestRequestWasManual	boolean		No	Internal variable to understand if last test was manual	Do not change manually
68	ReportNomeImpianto	250 bytes string		No	Report parameters.	Do not change manually
69	ReportID_Spacelynk	250 bytes string		No	Report parameters.	Do not change manually
70	ReportBrand	250 bytes string		No	Report parameters.	Do not change manually
71	ReportUbicazione	250 bytes string		No	Report parameters.	Do not change manually
72	ReportTotaleAppDALIinstallati	250 bytes string		No	Report parameters.	Do not change manually
73	ReportDALIInDurationFailed	250 bytes string		No	Report parameters.	Do not change manually
74	ReportDALIInFunctionalFailed	250 bytes string		No	Report parameters.	Do not change manually
75	ReportDALIInDurationPending	250 bytes string		No	Report parameters.	Do not change manually
76	ReportDALIInFunctionalPending	250 bytes string		No	Report parameters.	Do not change manually
77	ReportDALIInMissingPower	250 bytes string		No	Report parameters.	Do not change manually
78	GWXX.ECGYY.Time_Exc	boolean		No	See gateway user guide for more information	
79	GWXX.ECGYY.TestStart	1 byte unsigned integer		No	See gateway user guide for more information	
80	GWXX.ECGYY.TestResults	250 bytes string		No	See gateway user guide for more information	
81	GWXX.ECGYY.CS	2 byte unsigned integer		No	See gateway user guide for more information	
82	GWXX.ECGYY.Battery	2 byte unsigned integer		No	See gateway user guide for more information	
83	GWXX.ECGYY.Failure	1 byte unsigned integer		No	See gateway user guide for more information	
84	GWXX.ECGYY.HoursReset	boolean		No	See gateway user guide for more information	
85	GWXX.ECGYY.EmergencyMode	2 byte unsigned integer		Yes	**Bit 0:** Rest, **Bit 1:** Normal, **Bit 2:** Emergency, **Bit 3:** Extended Emergency, **Bit 4:** Function Test in progress, **Bit 5:** Duration test in progress, **Bit 6:** Hardwired inhibit is active, **Bit 7:** Hardwaire switch is on, **Bit 8:** Light exceeded hours of operation	
86	GWXX.ECGYY.EmergencyFailure	2 byte unsigned integer		Yes	**Bit 0:** Circuit failure, **Bit 1:** Battery duration failure, **Bit 2:** Battery failure, **Bit 3:** Emergency lamp failure, **Bit 4:** Function Test max delay, **Bit 5:** Duration test max delay, **Bit 6:** Function test dailed, **Bit 7:** Duration test failed	
87	GWXX.ECGYY.EmergencyStatus	2 byte unsigned integer		Yes	**Bit 0:** Inhibit Mode, **Bit 1:** Function test pass, **Bit 2:** Duration test pass, **Bit 3:** Battery fully charged, **Bit 4:** Function	

					test pending, **Bit 5:** Duration test pending	
88	GWXX.ECGYY.EmergencyCommand	2 byte unsigned integer		Yes	**0:** No Command, **1,2,3:** Reserved, **4:** Start functional test, **5:** Start duration test, **6:** Stop test, **7,8,9,10:** Reserved, **11:** Reset light hours	
89	GWXX.General.Failure			Yes	See gateway user guide for more information	
90	GWXX.Dali.Failure			Yes	See gateway user guide for more information	
91	GWXX.GRPYY.SetSwitch			Yes	See gateway user guide for more information	
92	GWXX.GRPYY.Switch			Yes	See gateway user guide for more information	
93	GWXX.GRPYY.SetValue			Yes	See gateway user guide for more information	
94	GWXX.GRPYY.Value			Yes	See gateway user guide for more information	

Annex2: ETS configuration

This ANNEX focuses only on the required objects of Emergency lights. In case of presence of other devices, refer to the proper datasheets.
KNX integrator needs to take proper actions for the implementation and organisation of necessary KNX groups.

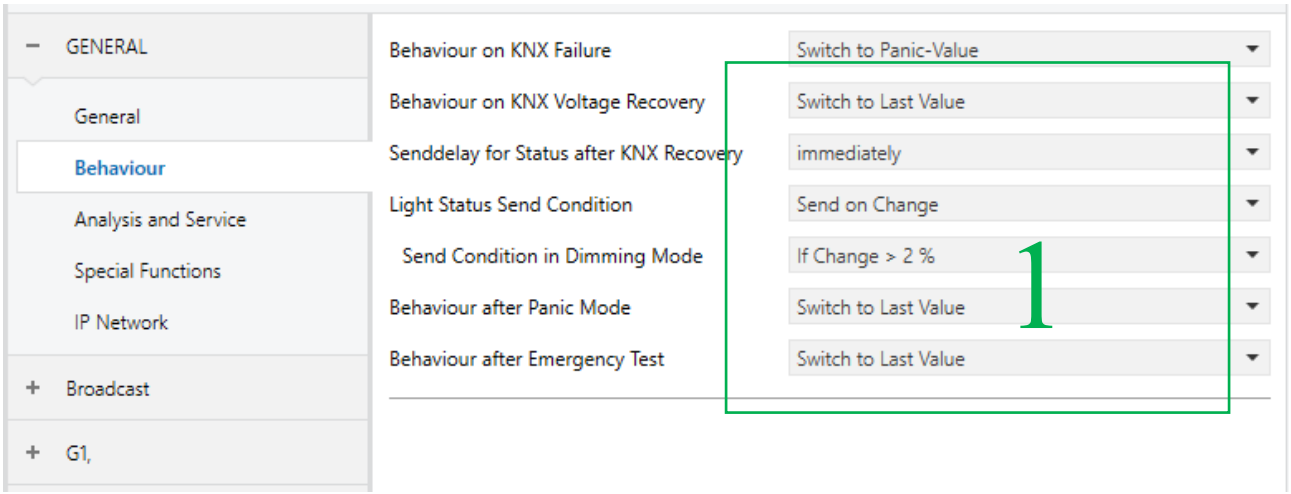
KNX DALI Devices

The supported KNX DALI gateway is MTN6725-0101. For each gateway, specific DALI and KNX parameters need to be adjusted. These parameters will affect the information available in SpaceLYnk and/or EBO level.

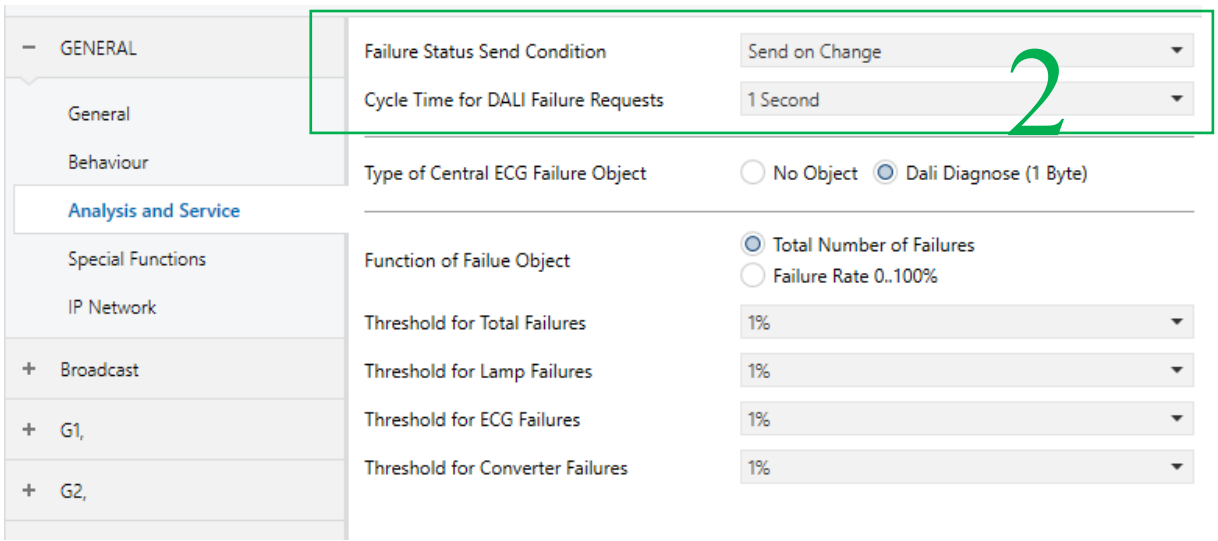
NOTICE: The groups addresses can be changed if required. However, the names of the group addresses should not be changed, because they are read by the scripts of SpaceLYnk

Gateway level

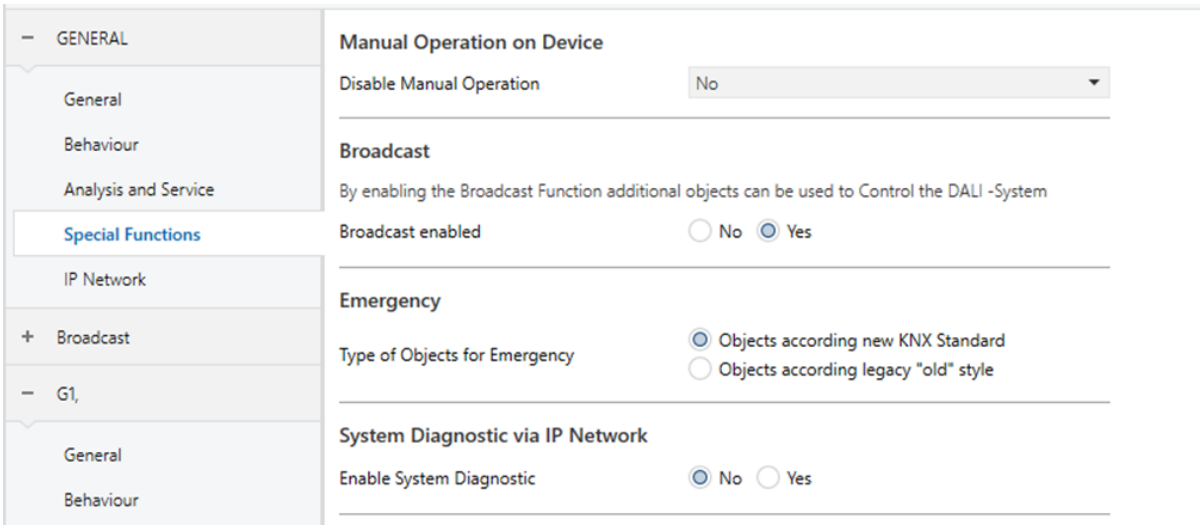
On MTN6725 – 0101 gateway level the following adjustments are required:



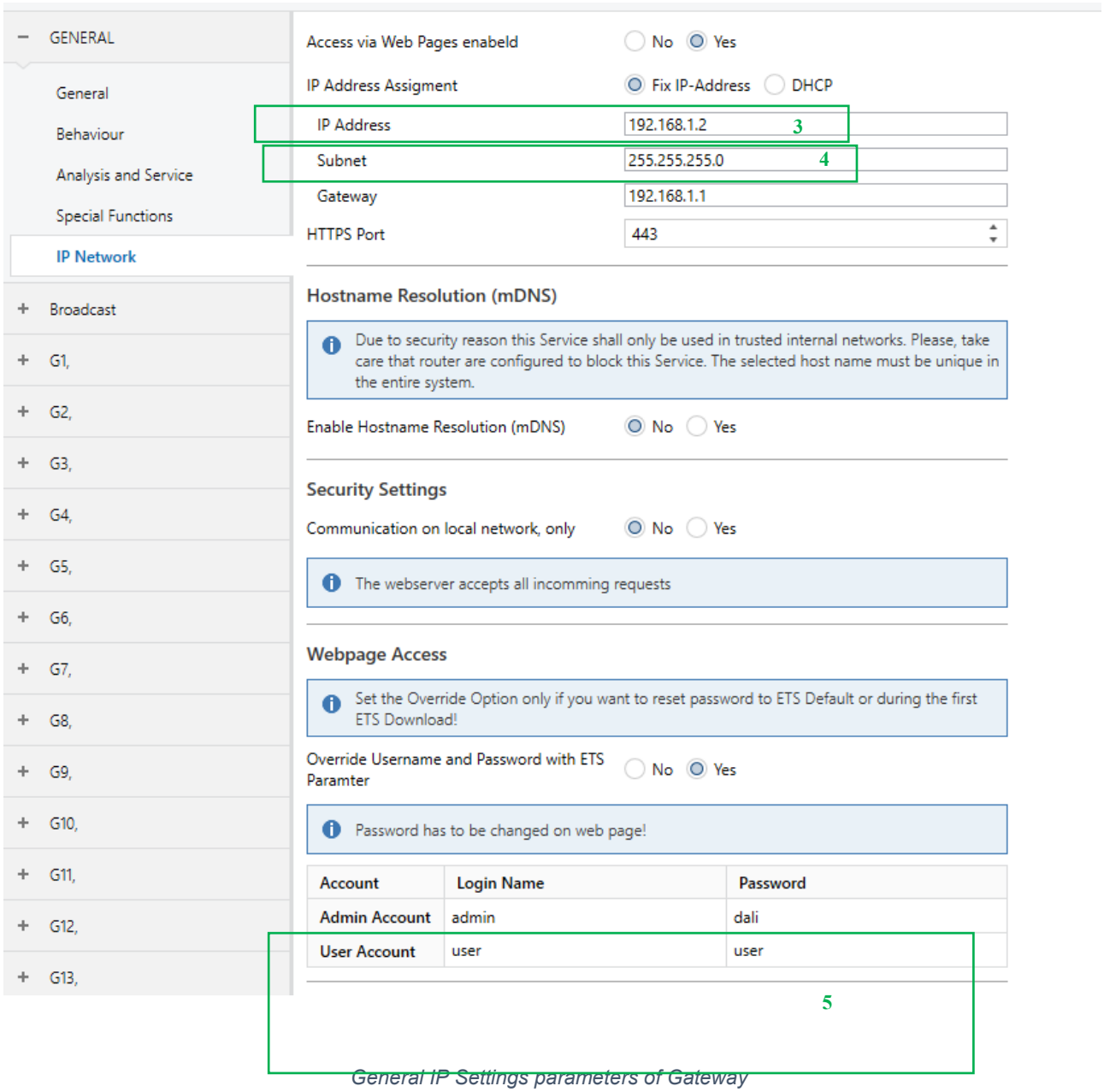
General Behaviour parameters of Gateway



General Analysis and Service parameters of Gateway



General Special functions parameters of Gateway



General IP Settings parameters of Gateway

1. System needs to write in previous status after a test or after an emergency.
2. Failures should be sent every time there is changes on status
3. In case of Cyber-security request, the access to the Webpages can be disabled
4. IP address of Gateway can be in DHCP or Fix IP-Address
5. In case of Cyber-security request, the access to the Webpages can be under password

Group level

For each gateway the following, KNX objects will be available:

- General Failure
- DALI Failure
- Time

- Date

These parameters need to be linked to KNX Groups that will be used for transferring the information to SpaceLYnk through KNX /TP. The name of the KNX Groups can be selected by KNX System integrator but it is strongly suggested to use a specific template which then can help the integration in EBO.

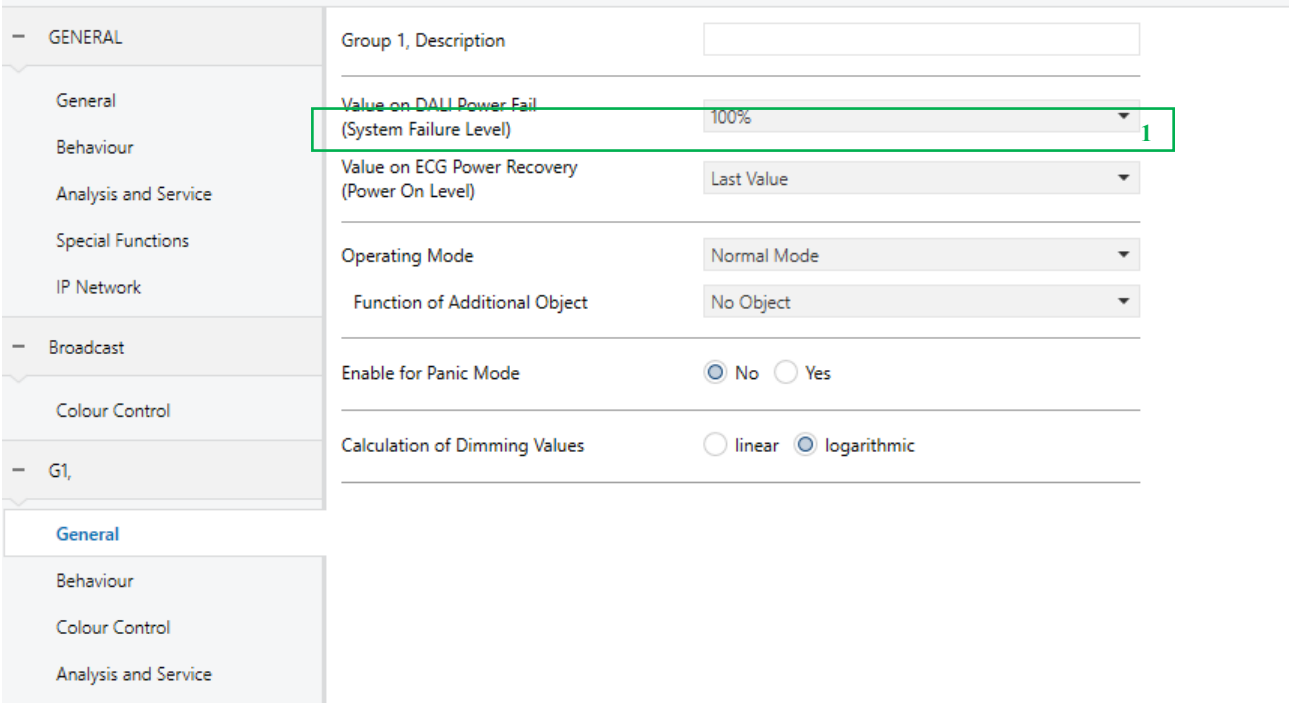
Warning: In case the default template is not selected the automatic widget of SpaceLYnk will not work.

Specific template of KNX Group names:

N.	KNX Parameter	KNX Group name
1	General Failure	GWXX.General.Failure
2	DALI Failure	GWXX.Dali.Failure
3	Time	Time
4	Date	Date

- **XX**: Number of gateway (ex. 01, 02, … 99)

For each group of DALI components, we need to adjust the following information:



Parameters of each group to be adjusted

In parallel for each group the following KNX objects will be available:

- Switching
- Status, On-Off
- Status, Value
- Set Value

These parameters need to be linked to KNX Groups that will be used for transferring the information to SpaceLYnk through KNX /TP. The name of the KNX Groups can be selected by KNX System integrator but it is strongly suggested to use a specific template which then can help the integration in EBO.

Warning: In case the default template is not selected the automatic widget of EBO will not work.

Specific template of KNX Group names:

N.	KNX Parameter	KNX Group name
1	Switching	GWXX.GRPYY.SetSwitch
2	Status, On – Off	GWXX.GRPYY.Switch
3	Set Value	GWXX.GRPYY.SetValue
4	Status, Value	GWXX.GRPYY.Value

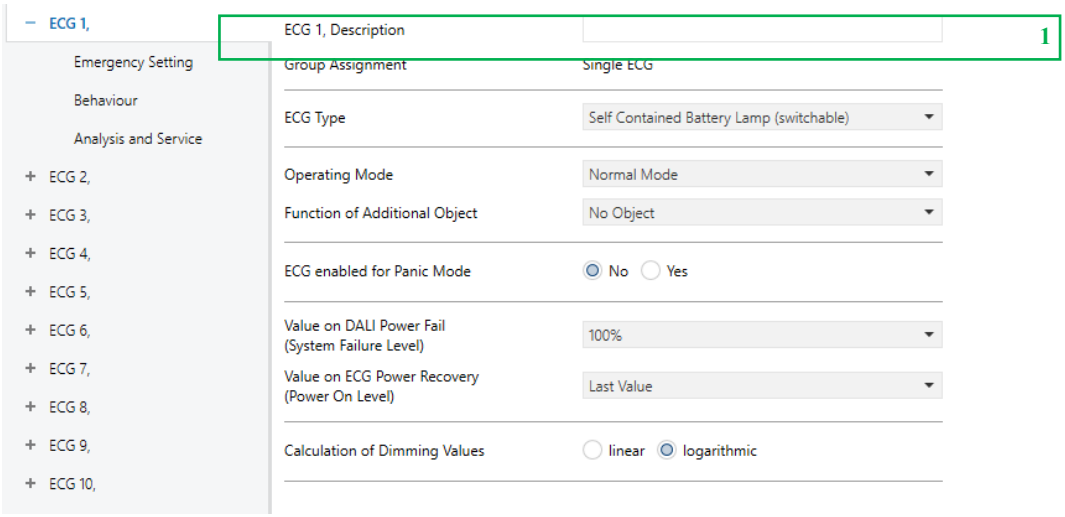
- **XX**: Number of gateway (ex. 01, 02, … 99)
- **YY**: Number of GROUP (ex. 01, 02, … 16)

ECG Level

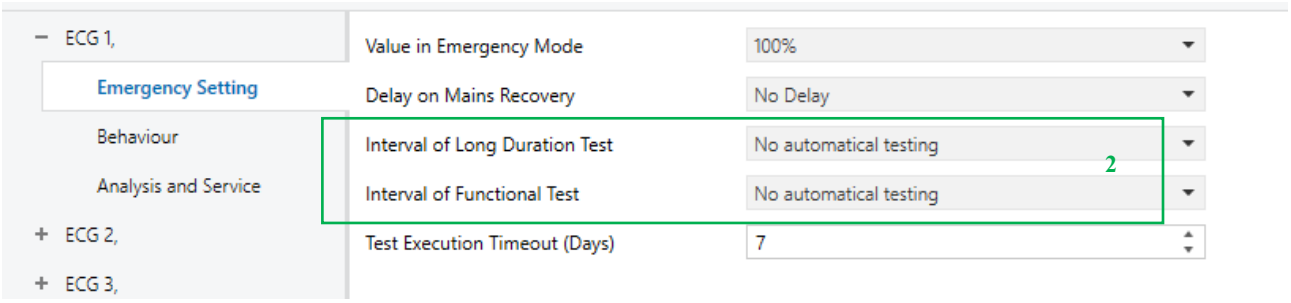
For management of the DALI lamps we need to know for each lamp if it is in fault (Failure status) and whether it has exceeded the operation hours (Life time exceeded). Also, in case it has exceeded the operating hours, and someone has replaced the lamp, a dedicated reset alarm command exists. Apart from this information, since it is an emergency luminaire with a battery on board, extra information are required such as:

- Converter Status
- Battery info
- Test results
- Commands to be sent

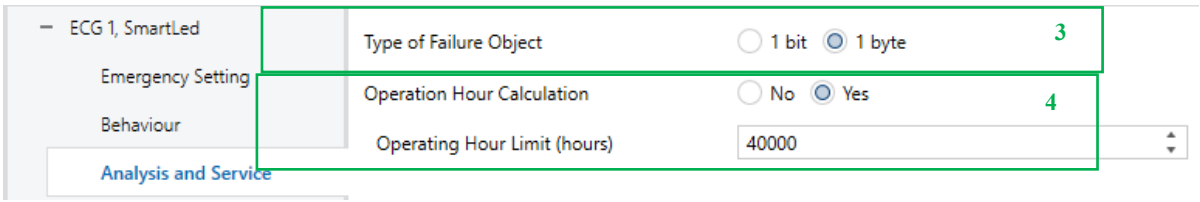
To have this information the following configuration is required for each ECG that will be used to have the following status.



Parameters of each ECG to be adjusted



Emergency setting of EL Dicube



- Parameter written to identify our ECG during commissioning of system
- Test execution is managed by the SpaceLYnk scripts
- Failure information for EL should be passed in SpaceLYnk.
- Failure Object needs to be 1 byte to have multiple information per type of failure

By activating these parameters, the following KNX objects will be available for each ECG:

- Lifetime exceeded (bit)
- Failure status (byte)
- Hours Reset (bit)
- Test Start (byte)
- Converter Status (byte)
- Battery info (2 bytes)
- Test Results (6 bytes)

These parameters need to be linked to KNX Groups that will be used for transferring the information to SpaceLYnk through KNX /TP. The name of the KNX Groups can be selected by KNX System integrator but it is strongly suggested to use a specific template which then can help the integration in EBO.

Warning: In case the default template is not selected the automatic widget of EBO and SpaceLYnk will not work.

Specific template of KNX Group names:

N.	KNX Parameter	KNX Group name
1	Life time exceeded	GWXX.ECGYY.Time_Exc
2	Failure status	GWXX.ECGYY.Failure
3	Hours Reset	GWXX.ECGYY.HoursReset
4	Test Start	GWXX.ECGYY.TestStart
5	Test Results	GWXX.ECGYY.TestResults
6	Converter Status	GWXX.ECGYY.CS
7	Battery info	GWXX.ECGYY.Battery

XX: Number of gateway (ex. 01, 02, … 99)

YY: Number of ECG (ex. 01, 02, … 64)

Warning: GWXX.ECGYY.TestResults group address should be the next after **GWXX.ECGYY.TestStart, for the widget to work correctly**

Furthermore, it is expected that the KNX system integrator takes a note of the KNX ECG name and their group of the EL for each gateway. This information is necessary for the configuration of SpaceLYnk in further steps.

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