★★☆

Basic / Advanced / Expert

Application note

Exiway Smart Control connected to spaceLYnk via Modbus TCP/IP



Schneider Electric

Safety Information

Important Information

Read these instructions carefully before trying to install, configure, or operate this software. The following special messages may appear throughout this bulletin 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 an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING
WARNING indicates a potentially hazardous situation which, if not avoided, can result in death or serious injury.

⚠CAUTION
CAUTION indicates a potentially hazardous situation which, if not avoided, can result in minor or moderate injury.

NOTICE
NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this signal word.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Safety Precautions

⚠WARNING

HAZARD OF INCORRECT INFORMATION

- Do not incorrectly configure the software, as this can lead to incorrect reports and/or data results.
- Do not base your maintenance or service actions solely on messages and information displayed by the software.
- Do not rely solely on software messages and reports to determine if the system is functioning correctly or meeting all applicable standards and requirements.
- Consider the implications of unanticipated transmission delays or failures of communications links.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information that is contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

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1 Introduction

This document describes how to connect Exiway Smart Control unit to a BMS (Building Managment System) through Modbus TCP/IP.

Skills

This document is addressed to readers skilled in:

- Dicube and Exiway Smart Control system
- Modbus TCP/IP
- spaceLYnk
- System prerequisites
- Before you begin, ensure you have the proper software. You can download the latest versions here:

Software	Version	Download
Exiway Smart Control	Latest version	http://www.schneider-electric.com
spaceLYnk	Latest version	http://www.schneider-electric.com

- Table 1: software versions of used software

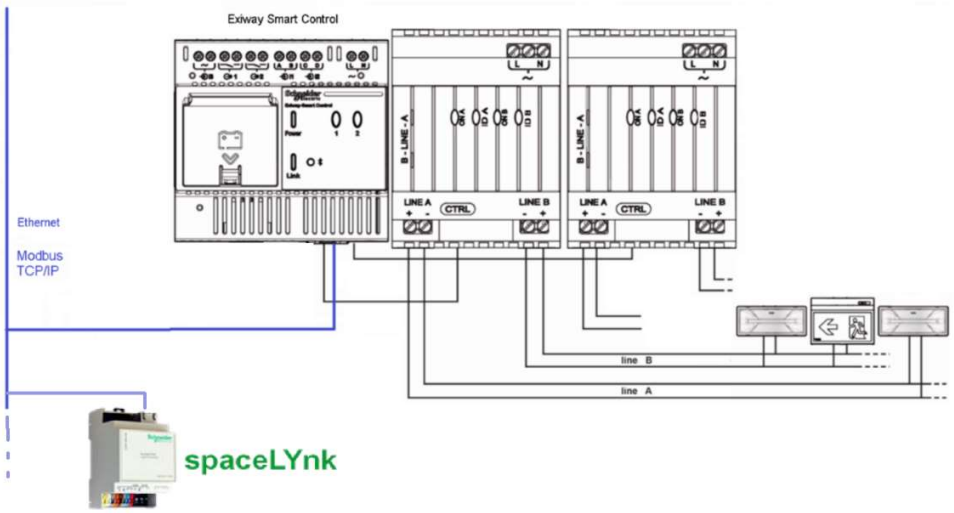
2 Design

- Connect Emergency Lighting Lamps to the Exiway Line Controller (see the Exiway Smart Control manual and Exiway SmartLed / Exiway SmartExit lamp manuals)

- Initialize the Exiway Smart Control Control Unit (see the Exiway Smart Control manual)

- Connect the Ethernet port of the Exiway Smart Control to the Ethernet network (see the Exiway Smart Control manual)

- Connect spaceLYnk to the Ethernet network (see the spaceLYnk manual)



3 Configuration

3.1 Exiway Smart Control network settings

To connect Modbus TCP/IP from spaceLynk to Exiway Smart Control you should:

- Know the IP address associate to Exiway Smart Control (see the instruction manual of the control unit to change the IP address)
- Use port 502
- Handle Exiway Smart Control as Slave Device 1

3.2 spaceLYnk network settings

3.2.1 Opening Home page

- The default IP address of the spaceLYnk device is 192.168.0.10. Change the computer's IP address within the same range, eg. 192.168.0.9, mask 255.255.255.0.

- Open Google Chrome or Mozilla Firefox (for Windows operating systems), Safari (for OS X), and go to 192.168.0.10.

- Click on the Configurator icon:



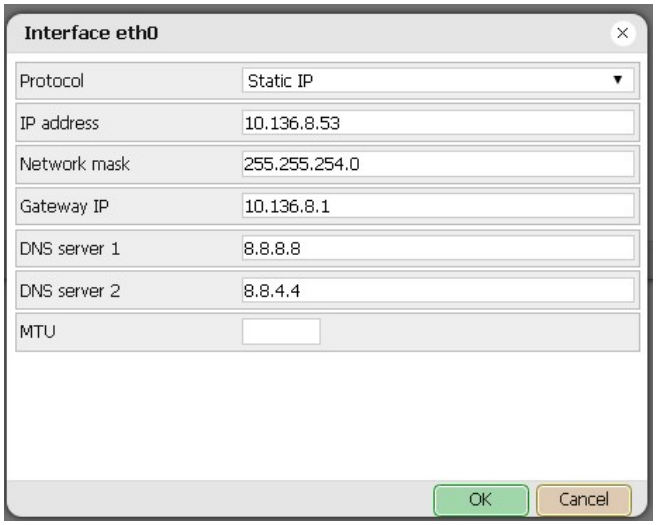
Default spaceYnk device login credentials are:

Username: *admin*

Password: *admin*

3.2.2 Modify the IP settings

- Choose *Configurator* → *Utilities* → *System* → *Network* → *Interfaces* and click the interface you want to change the IP settings.



- *Protocol* - Specific protocol used for addressing:
- *IP Address* - Static IP Address (the default is **192.168.0.10**).
- *DHCP* - The DHCP protocol used to retrieve the IP configuration. The IP address is that received by the DHCP server. This field appears only if you have assigned the IP address.
- *Network Mask* - Network Mask (the default setting is 255.255.255.0 (/ 24)).
- *Gateway IP* - Gateway IP address.
- *DNS Server 1* - Primary DNS server IP address.
- *DNS Server 2* - Secondary DNS server IP address.
- **MTU** - Maximum transmission unit, that is, the maximum size allowed by the communication protocol (the default is 150).

When you make changes, the "Apply Changes" icon appears in the upper right corner. To make the changes effective, you must apply them.

spaceLYnk restarts automatically after applying the changes.

4 Integrating Exiway Smart Control with spaceLYnk

To integrate Exiway Smart Control with spaceLYnk you can:

import a backup file that came with the Application Note to see a modbus device (Exiway Smart Control) configured with 256 luminaires
or
Add a modbus device (Exiway Smart Control Unit) using a profile file provided with the Application Note.

4.1 Import backup file

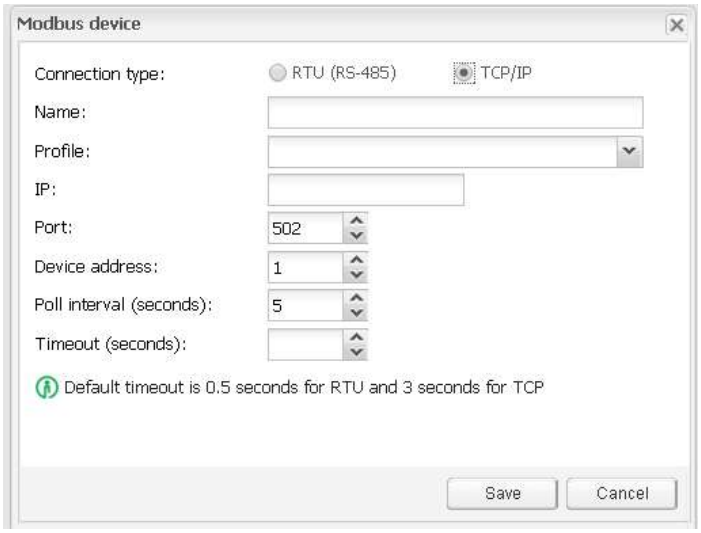
- Click Utilities (1)
- Click Restore (2)



- Click Browse and select the xxxxxxx.tar.gz file that came with the Application Note
- The backup removes and replaces all the information in spaceLYnk. Make a backup if you need to keep the information contained in spaceLYnk
- Click on the save button
- spaceLYnk will restart
- In the Modbus menu, update the IP of the sample device to the one actually used
- In the objects menu you can see the list of variables associated with the registers of each lamp (see the chapter about the registers)

4.2 Add a modbus device

- Add the profile file provided with the Application Note xxxxx.json (Modbus Menu -> Profile -> Add Profile)
- Click Add Device



Connection type

[RTU (RS-485), TCP / IP]

Select TCP / IP as the Modbus connection type.

Name - Specifies the name of the Modbus device.

Profile - Select the Modbus profile of the device. Choose the previously added profile

Device address - Select the slave address of the Modbus device. Use 1

Polling Interval - Selects the polling frequency of the Modbus slave device values. Value 5 indicates that the new values are read every 5 seconds.

Timeout - If a connection error occurs, the device waits for the set time, then sends an error message to the error log.

IP - You must enter the IP of the Exiway Smart Control

Port - Sets the port for Modbus TCP communication. The default value for the Modbus standard is 502.

4.2.1 Modbus mapping

After you have added the Modbus device, you must set up the mapping of the registers. In other words, you must associate Modbus logs with objects in spaceLYnk.

Open the **Modbus** tab of the **Configurator** tool in spaceLYnk.

Next to the device there is a green mapping icon on the right side. To open the mapping settings, press the icon.

Each row in the mapping table represents one of the Modbus logs (defined in the device profile).

Click the desired line, for example. Input Register to open the mapping window.
Link to Object - Sets the spaceLYnk object where the value read from the Modbus log will be saved. You can select an existing object in the drop-down menu or click the icon and create a new object directly from this dialog box.

5 Modbus Registers used

To read the status of the emergency luminaires connected to the control unit use the following registers of Exiway Smart Control called"Input Register".

To send a command to a single luminaire, to even luminaires, odd luminaires or directly to all luminaires, use the "Holding Register".

The luminaires that can be connected to an Exiway Smart Control are: 64 for each Line

The max number of lines for Exiway Smart Control is: 4

When using Modbus communication consider the addresses of the single luminaires as a whole: from 0 to 255 (i.e. line 1 will associate addresses from 0 to 63, line 2 from 64 to 128 etc.)

5.1 Input Registers

To each luminaires 15 registers are associated starting from register 30001 and only the first 4 registers are used.

The luminaire associated with address 0 will have the range of available registers between 30001 and 30015, used from 30001 to 30004.

The luminaire associated with address 1 will have the range of available registers between 30016 and 30029, used from 30016 to 30019.

The luminaire associated with address 255 will have the range of available registers between 33826 e 33839, used from 33826 to 33829

Each registers provides a byte that must be converted in binary to interpret the status of the luminaire.

Input Register Table

The list of Input Register used and the meaning of each bit for luminaire with address 0 is as shown below:

Register	Description	Meaning of the single bits used
30001	Luminaire Status	Bit 0 Luminaire supply: "0" =OK Bit 1 Faulty luminaire: "0" = Luminaire not faulty Bit 6 Lack of luminaire's address: "1" =the luminaire had been commissioned but it does not respond (the communication line between Exiway Smart Control and the luminaire might be disconnected)
30002	Emergency Status	**Bit 0 Inhibition: "0" = "No"** **Bit 1 Functional Test done: "0" = "No"** **Bit 2 Duration Test done: "0" = "No"** **Bit 3 Battery fully charged: "0" = "Charging"** **Bit 4 Functional Test required: "0" = "No"** **Bit 5 Duration Test required "0" = "No"** **Bit 6 Identification active: "0" = "No"**
30003	Fault status	Bit 0 Faulty PCB: "0" = "No" Bit 1 Battery Duration Fault: "0" = "No" Bit 2 Battery Fault: "0" = "No" Bit 3 Luminaire's Emergency Fault: "0" = "No" Bit 4 Functional Test not done for over a month: "0" = "No" Bit 5 Duration Test not done for over 6 months: "0" = "No" Bit 6 Functional Test failed: "0" = "No" Bit 7 Duration Test failed: "0" = "No"
30004	Emergency Mode	Bit 0 Rest Mode active: "0" = "No" bit 1 Luminaire with mains available: "0" = "No"

		bit 2	Luminaire in emergency:	"0" = "No"
		bit 4	Functional Test running :	"0" = "No"
		bit 5	Duration Test running:	"0" = "No"

5.2 Holding Registers

To send a command to a single luminaire, use the register starting from **40001** applying the following rule.

The luminaire associated with address **0** has as available register n. **40001**.

The luminaire associated with address **1** has as available register n. **40006**.

The luminaire associated with address **255** has as available register n. **41276**.

To send a command directly to all luminaires, use the register n. **41365**

To send a command only to luminaires associated with odd addresses, use register n. **41375**

To send a command only to luminaires associated with even addresses, use register n **41370**

Code Table for Holding Register

To send a command, write the code corresponding to the type of command in the desired register. The list of the available commands is shown below.

Decimal Code	Description
34016	**Rest Mod**: If the luminaire is switched on in emergency following to a mains failure, the command switches it off. When mains is back, the command is cancelled and to the following emergency the luminaire will be ready to be switched on.

34017	**Inhibition**: The command keeps the luminaire switched off in case of emergency, the function does not cancel as it occurs with Rest Mode after mains is back. Tests are not done if luminaires are in this status.
34018	**Re-light / Inhibition reset**: the command relights the luminaire switched off during an emergency following to a Rest Mode command or cancels the inhibition command.
34019	**Functional Test:** once the command is sent to the luminaire, it will carry out a short functional test, when it ends, the registers for Luminaire Status and Fault Status will be updated.
34020	**Duration Test**: once the command is sent to the luminaire, it will continue the test for the nominal duration time, when the test ends, the registers for Luminaire Status and Fault Status will be updated
34021	**Stop Test** the running test is forced to end before its nominal duration
34032	**Identification**: the luminaire switches on and off for a few seconds so to be identified.
32773	**Maintained Luminaire Switching on:** this command is dedicated to maintained luminaires if they are not supplied on the maintained input and if supply is available at recharge input. In case of mains failure at the recharge input, the luminaire switches anyhow on.
32768	**Maintained Luminaire Switching off**: this command is dedicated to maintained luminaires if they are not supplied on the maintained input and if supply is available at recharge input. In case of mains failure at the recharge input, the luminaire switches anyhow on.

6 Delays to respect

To receive the updated status of all Input Register following to a command sent to the luminaires, wait at least for **6 min.**

To receive the updated status of the registers for **Luminaire Status** and **Fault Status tato** in case of Duration Test, wait for **6 min. after the end of the functional or duration test** which will last as long as the nominal duration of the luminaire.

Between two consecutive commands to write the Holding Register, enter a delay of at least **20msec**.

7 Conclusion

Procedures contained in this application note describe integration of Exiway Smart Control with spaceLYnk via Modbus TCP/IP. Exiway Smart Control functionality described in this application note brings benefits to system integrator to create robust automation system complying with international standards.

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