iSMA-B-FCU

User Manual

FCU Updater

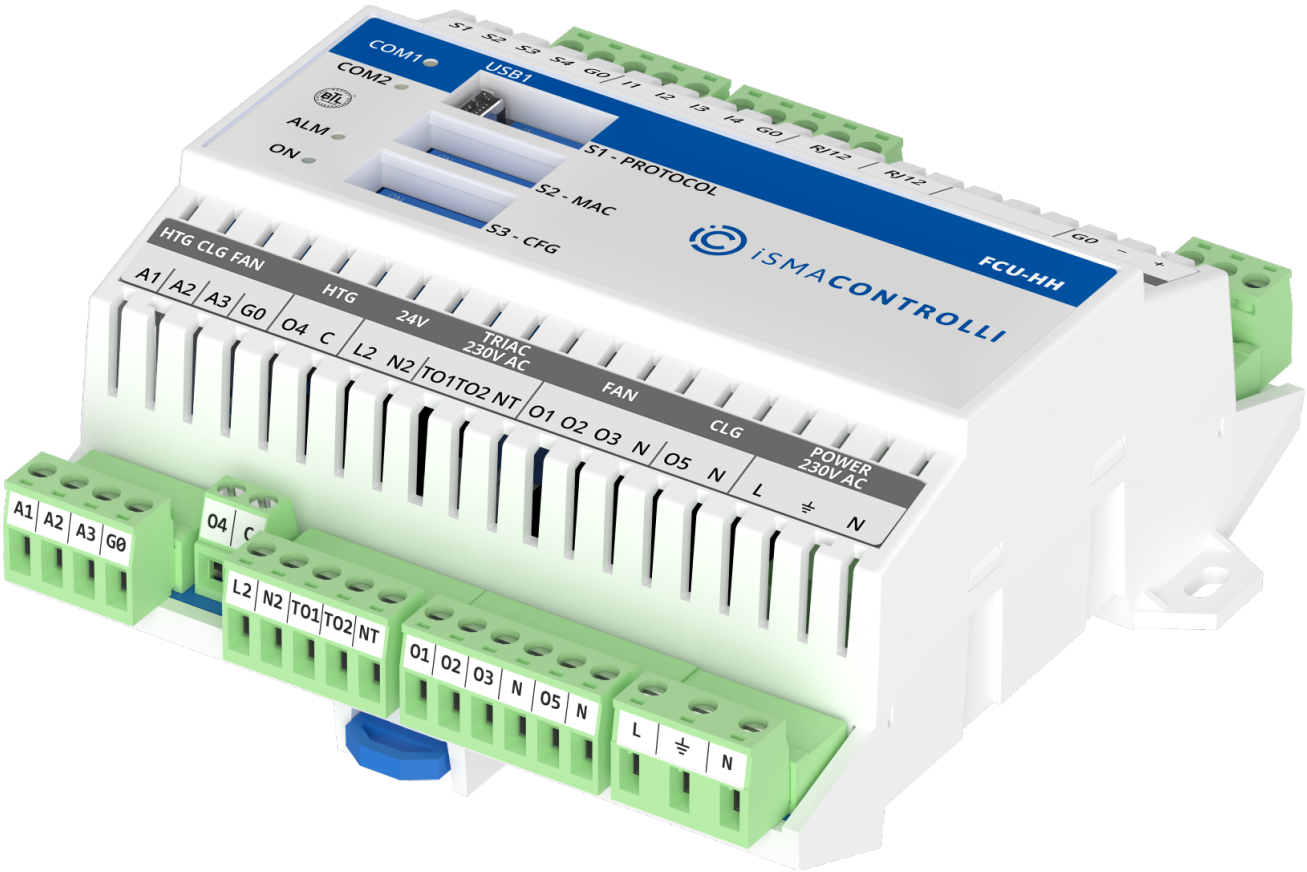

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Table of Contents

1 Introduction

This user manual outlines features of the FCU Updater software.

1.1 Revision History

Rev.	Date	Description
2.5	10 Nov 2023	Updated to FCU Updater V2.6.1 Improved BACnet MS/TP and BACnet IP gateway addressing features
2.4	16 May 2022	Rebranded Updated to FCU Updater V.2.5.1 Added: • Touch Point references; • NV actions.
2.3	9 Mar 2021	Added features: • iSMA Modus Tunnel; • Modbus TCP gateway; • Modbus BACnet IP gateway; • Timeout request in project settings; • Automatic backup disable option in project settings; Allowed to run multiple instances of FCU Updater on a single PC.
2.2	24 Jun 2020	• Company data update • Added information about BACnet File Transfer Speed
2.1	30 Apr 2018	Updated to FCU Updater V.2.1.1
1.2	19 Jul 2017	Updated to FCU Updater V.2.0
1.0	6 Dec 2016	First edition

Table 1. Revision history

2 General Purpose of FCU Updater

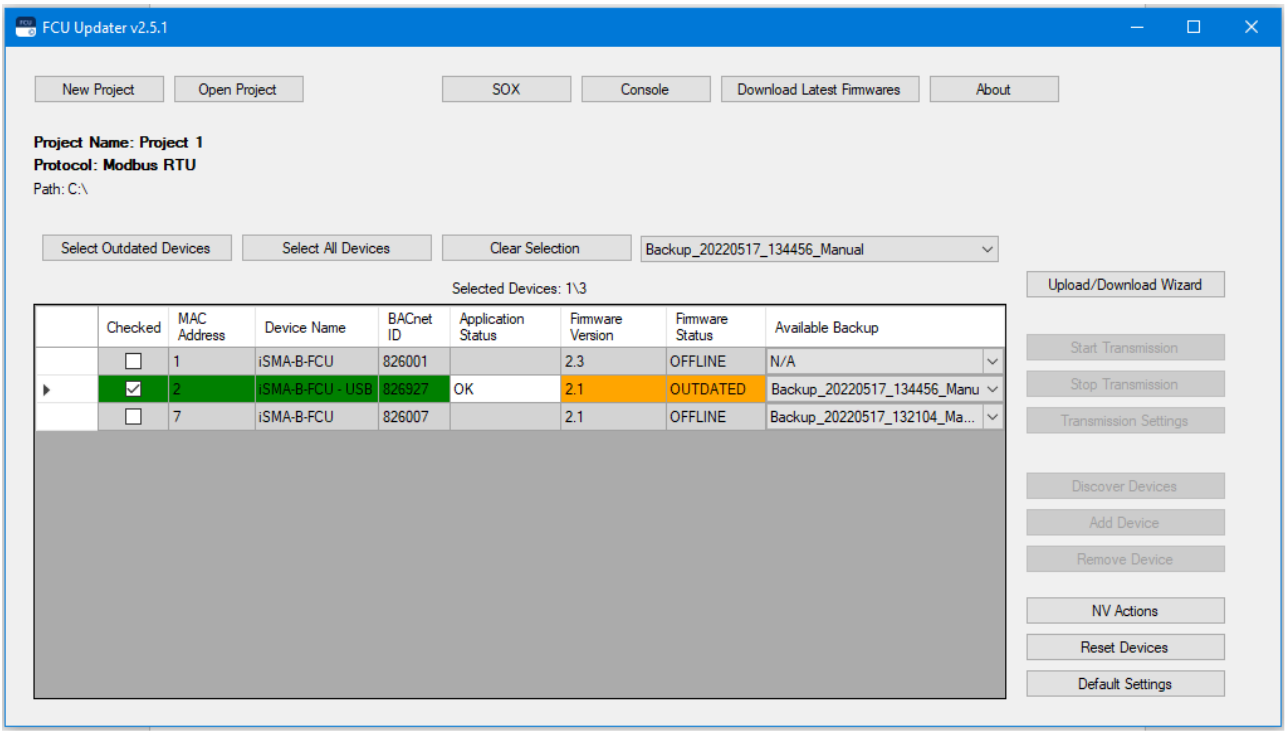


Figure 1. The FCU Updater

The FCU Updater software is designed to perform a start-up and maintenance operations for both a single device or for many devices connected to a communication network on the site. The FCU Updater is ready to communicate with the iSMA-B-FCU controller and iSMA-B-LP/Touch Point panel. The software is free and can be obtained from iSMA distribution partner or downloaded from the support server at ismacontrolli.com

Note: The FCU Updater has been developed in a way to guarantee the highest level of security against the loss of an existing application loaded on the devices before any changes are made. The software allows automatic backups of the application by downloading it to a local PC, where the FCU Updater is running. Moreover, the system always checks compatibility between the firmware and the uploaded application before transferring them to the controller to make sure they can work together on the device, without problems.

For simplicity and time-saving, the FCU Updater allows, e.g., to upload firmware, upload an application, reset a device, or set it to default settings on more than a single device at a time. This function can be beneficial as far as updating the firmware on all devices at once is concerned. Similarly, a backup of the existing applications from all devices can be automatically transferred to a local PC from many controllers at once without operator interactions.

FCU Updater is a project-oriented application, which means that the whole network configuration parameters, iSMA-B-FCU controllers with their application backups and firmware versions, are stored locally inside the project folder for later reuse.

FCU Updater offers the following actions:

- managing projects;
- loading the latest firmware versions from the iSMA CONTROLLI server;
- uploading new firmware on devices;
- uploading default or custom application on devices;

- performing backups of the existing devices application on a local PC;
- restoring earlier saved application to one or more devices;
- managing NV components values with NV actions;
- resetting devices;
- resetting to default settings on many devices;
- starting/stopping SOX protocol to support programming in WorkPlace or iSMA Tool;
- viewing internal logs on Console.

All functions are available and work in the same way for all three communication types:

- Modbus RTU, using the RS485 port or the Modbus TCP gateway;
- BACnet MS/TP, using the RS485 port or the BACnet IP gateway;
- USB, using the direct USB cable connection except for SOX and Console option.

3 Naming and Definitions

The FCU Updater communicates to one or more devices and transfers data in both directions. It is crucial to distinguish the direction of data flow as described below.

- **uploading:** means transferring data from PC to a controller, for example, when a new firmware or custom application flows to the iSMA-B-FCU device;
- **downloading**: means transferring data back from the iSMA-B-FCU controller, for example, when data flows back from the iSMA-B-FCU device to a local PC.

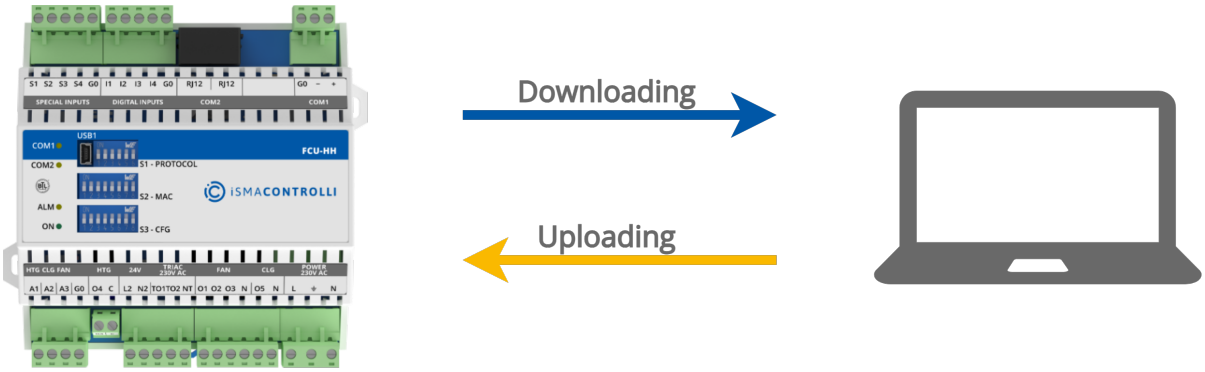


Figure 2. Uploading and downloading to and from the FCU controller

4 Software Requirements

Windows compatibility: the FCU Updater is an application intended for Windows only, which can be run on Windows 7, 8, and 10 series.

Warning!

To use all features of the FCU Updater, the latest Oracle Java 32-bit is required. Please download the latest Java software from the Oracle Download website first.

Note: Multiple instances of the FCU Updater may run on a single PC.

4.1 Checking Software Requirements on Application Start

4.1.1 Java Version

The FCU Updater software requires Oracle Java 32-bit to be installed on the users PC. Each time the FCU Updater starts, the system notifies whether the core version of Java is available.

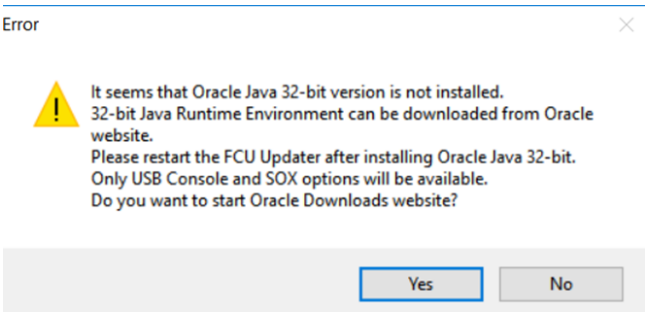


Figure 3. A dialog window if Java is not installed

The user can run the FCU Updater without having correct Java version installed with limited functionality, such as opening the SOX protocol and viewing internal and live logs on the console. The SOX protocol and Console are described in detail in the following sections herein.

Warning!

In case if the required Java version is not installed, it is recommended to close the FCU Updater and download Java SE 32-bit (windows x86) software from the Oracles website.

4.1.2 Internet Access and Firmware Availability

Warning!

If the FCU Updater is run for the first time, it is mandatory to have the Internet access on the local PC. The Internet access allows the application to connect to the iSMA CONTROLLI server and download (in the background) all new firmware files to the local PC automatically. If the FCU Updater finishes downloading, the following information dialog appears.

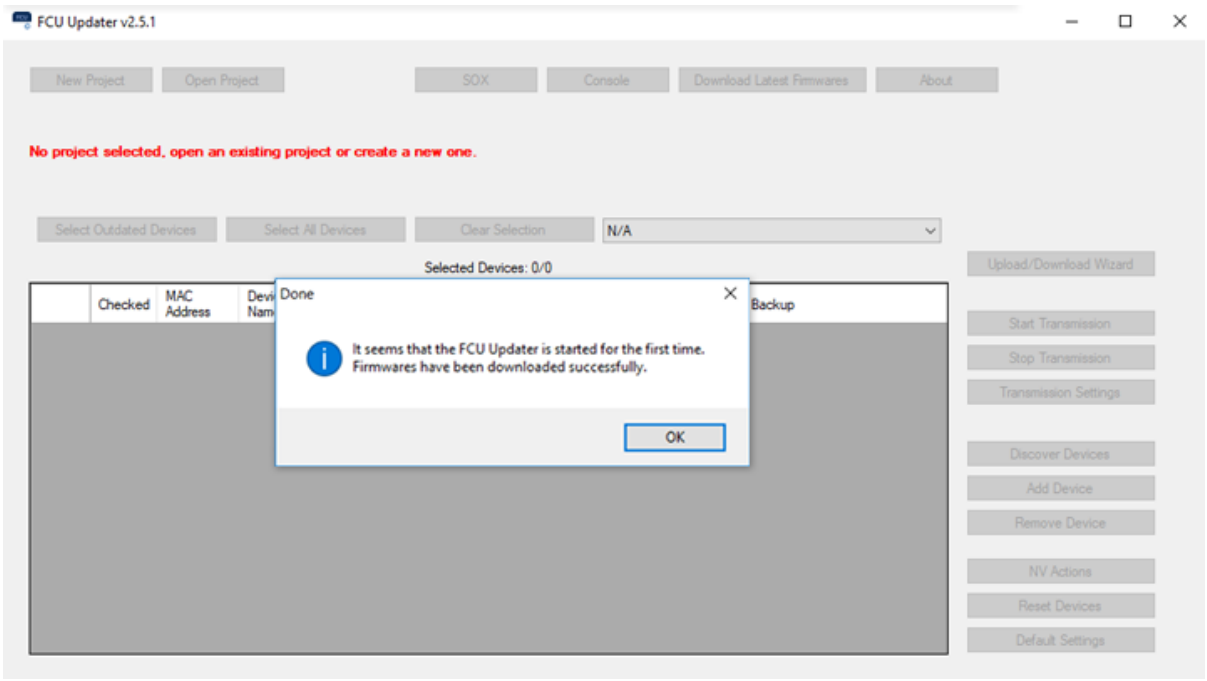


Figure 4. First run of the FCU Updater

Later, after the first start up, each time the FCU Updater is switched on, the system automatically checks (without downloading it automatically) whether a newer firmware version is available on the iSMA CONTROLLI server. It is recommended to download the latest available firmware from the server each time when prompted by the system. The user can check if the newest firmware is available at any time by pressing Download Latest Firmware button.

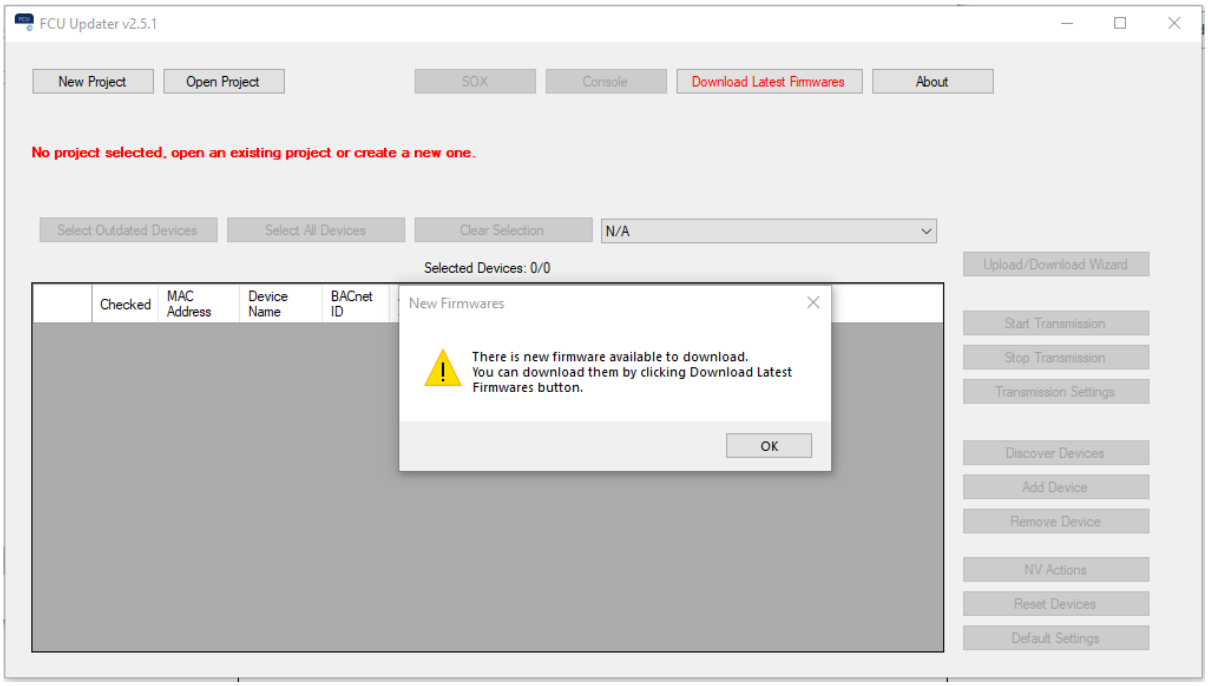


Figure 5. Firmware is checked each time the FCU Updater is run

After the new firmware files are successfully downloaded, the following confirmation dialog window is displayed.

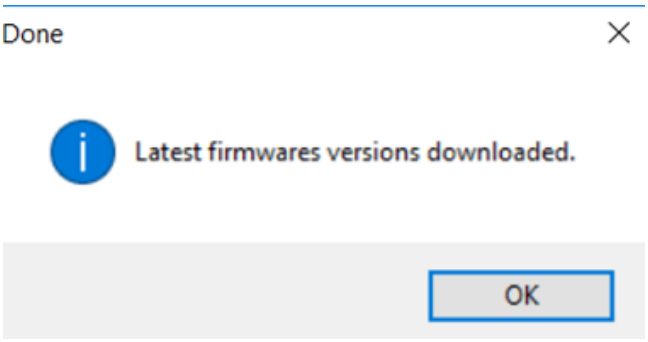


Figure 6. A dialog window for successfully downloaded firmware

In case if no new firmware files are available on the server, the below dialog window appears.

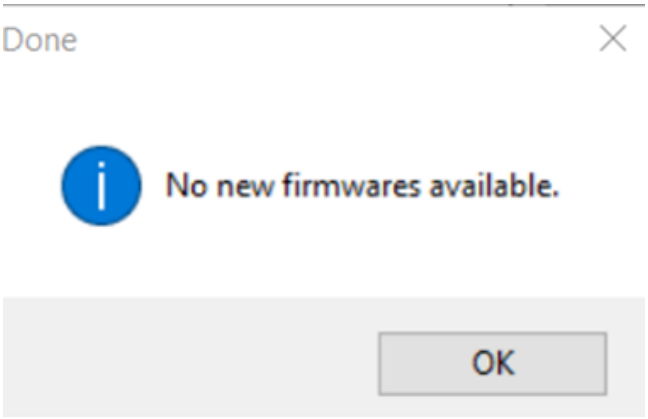


Figure 7. A dialog window for no new firmware available

4.1.3 After First Run

Each time the FCU Updater is running (except for the first start up as described above), a below FCU Updater window displays.

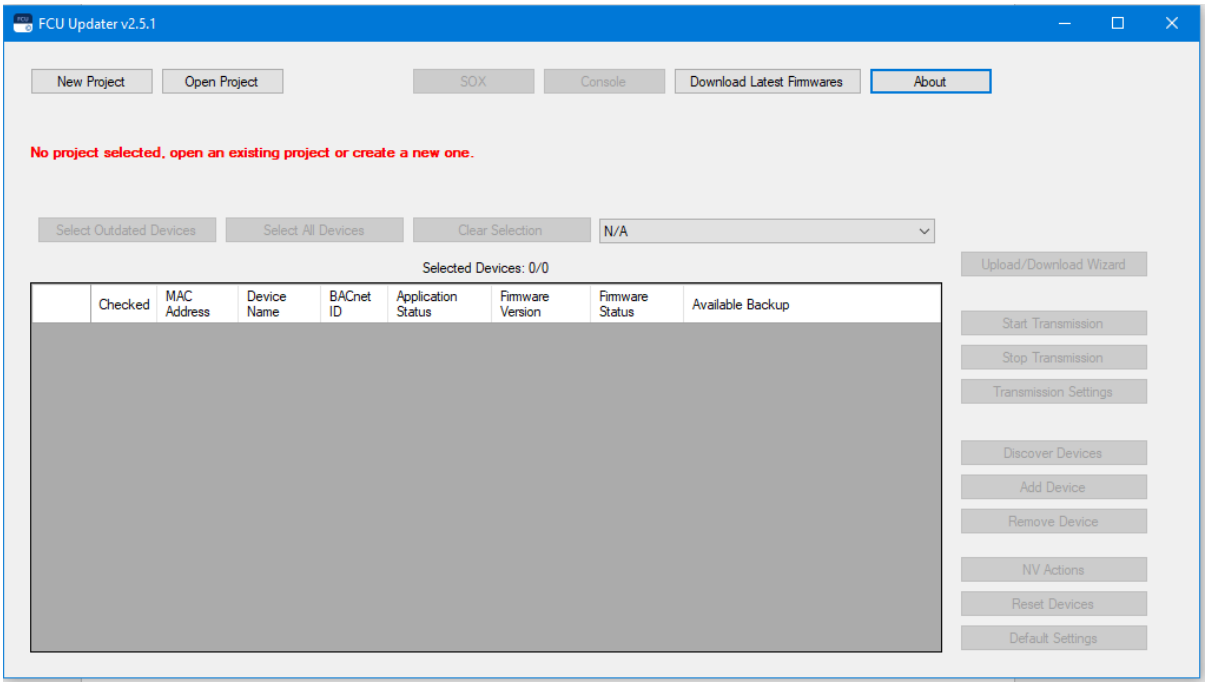


Figure 8. The FCU Updater after a first run

Note: The FCU Updater has almost all options disabled at this moment. The user has two choices depending on what is expected:

- If the user wants to work with external software, e.g., the iSMA Tool, before running the SOX protocol it is essential to configure the connection of the iSMA-B-FCU controller directly to the USB port on the local PC. For more details, please refer to a relevant section herein.

If the user wants to use any impaired functions of the FCU Updater software, it is required to open or create the project first. Please follow next section for more details.

5 Working with Projects

The FCU Updater is designed to be more consistent and portable through the introduction of a project orientation. Working with projects allows the user to keep all information in regards to the huge number of devices from different sites scored and organised in folders and subfolders. Operating with projects also allows the system to automatically update project folders with any newly discovered devices or backup, and other features.

Note: At first, it is essential to create a new project or open an existing one by selecting the New Project or Open Project buttons.

5.1 Creating New Project

After clicking the New Project button, the new project is created and stored in a selected location, usually on a local PC drive.

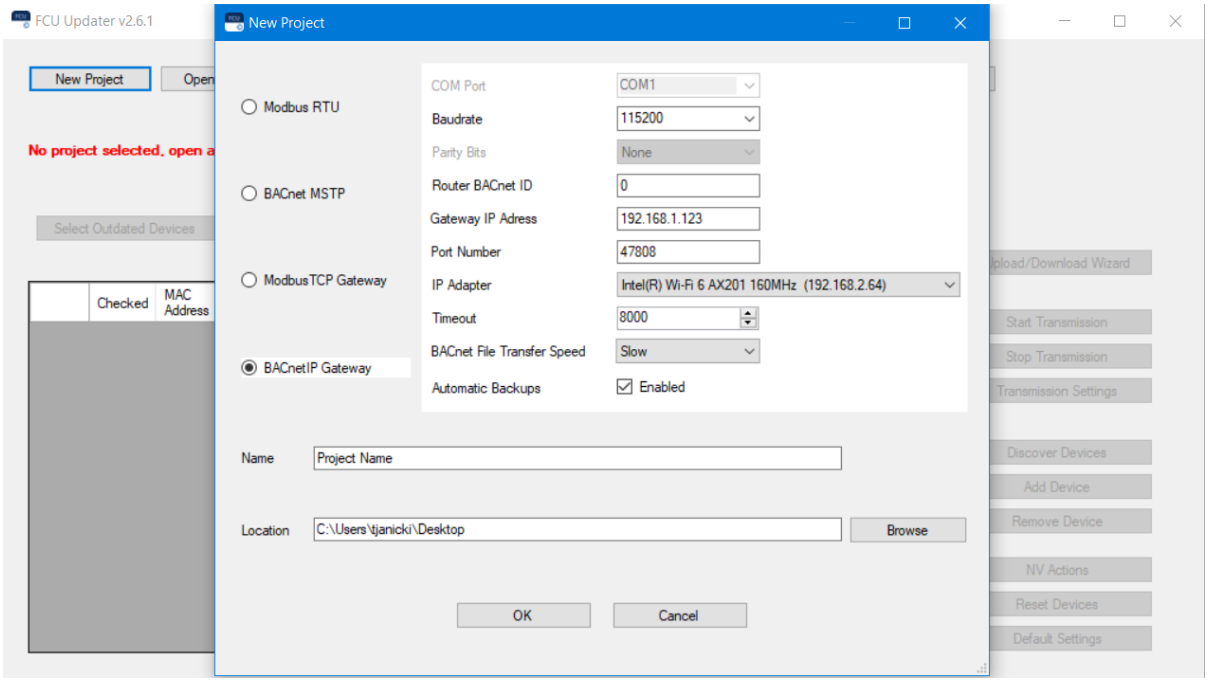


Figure 9. Creating a new project

The window with transmission settings and specification of the location appears. Select the protocol type, Modbus RTU or BACnet MS/TP with all required communication settings for a chosen protocol. Alternatively, the project may also be created to communicate with FCU devices with Modbus TCP or BACnet IP gateways. For more details of transmission settings, please refer to relevant chapters describing how to set up Modbus RTU and BACnet MS/TP protocols, or Modbus TCP and BACnet IP gateways.

If at this point the exact protocol type is not known, the user can change protocol type and its setting later at any time.

Note: It is recommended to connect PC to the required Modbus or BACnet network first, which guarantees that the new COM port (other than the built-in COM1) appears in the COM Port field, for example, COM3. If it is required to make a direct connection (via USB on local PC port) to only one device: iSMA-B-FCU or iSMA-B-LP/Touch Point panel, please select the built-in COM1 in the COM Port field, and leave default values for other settings.

Using the Modbus TCP (either with the iSMA Modbus Tunnel or not) or BACnet IP gateways is possible only with the COM1 port.

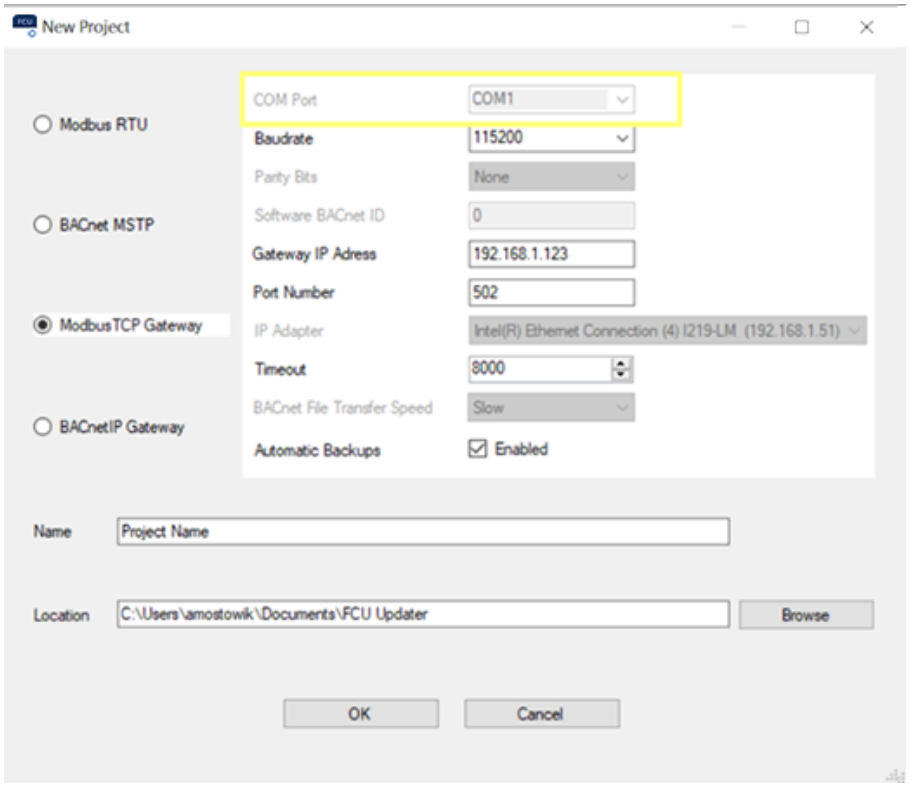


Figure 10. The COM1 Port field setting for Modbus TCP or BACnet IP gateways

The Timeout field allows the user to set the maximum device response time for communication with the FCU Updater.

Note: In case the timeout value is too low, it may cause to fail FCU Updater operations with device timeout log. Increasing the timeout solves the issue.

While creating the new project, it is possible to enable or disable automatic backups before and after each of the FCU Updater's operation, for the whole project. This setting may positively impact the speed of operations, however, the Upload firmware and keep application operation still requires to perform backup before, therefore, it is performed regardless of the setting. By default, the options is set to enable automatic backups.

The second part of the dialog window asks for a project name and its location on the local PC.

Pressing the OK button verifies the typed data and creates a new folder in the indicated location. The folder name is the same as the one chosen for the Project Name. Thus the user can easily copy and move the folder to any other location or e-mail, or even rename it. Before performing any operations with the folder, close the FCU Updater first.

5.1.1 Creating New Project with Modbus TCP Gateway

The Modbus TCP gateway is a feature allowing to establish the communication between the FCU Updater software with FCU devices on the Modbus network with the gateway device (for example, the I/O module or the master controller with the iSMA Modbus Tunnel), which enables to pass the Modbus data packets between TCP and RTU Modbus networks.

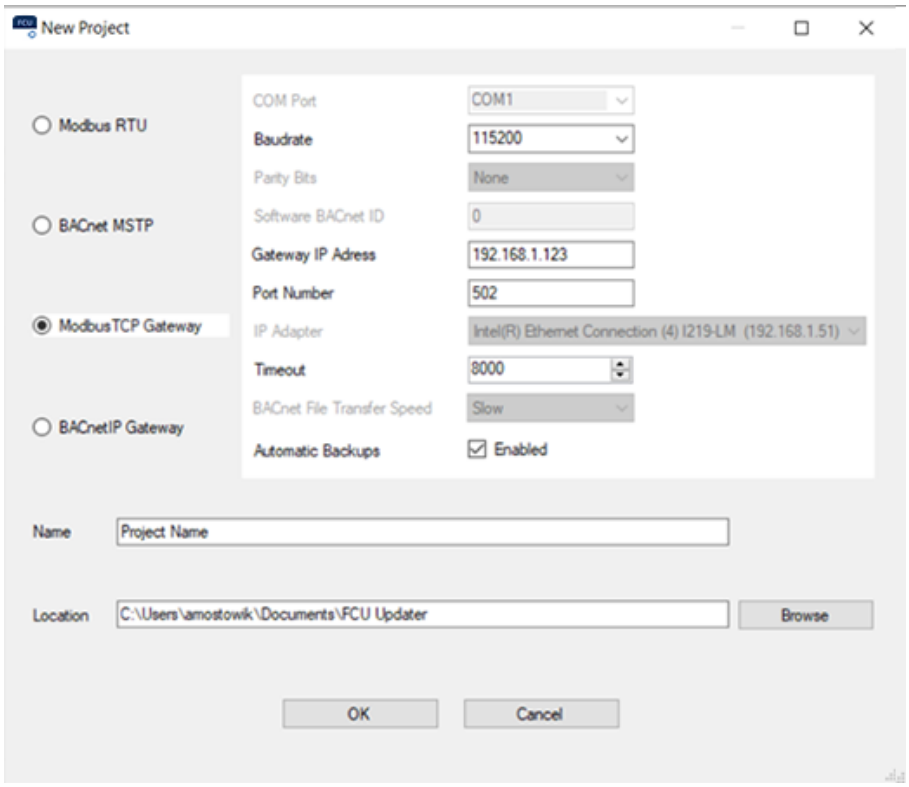


Figure 11. Creating a new project with a Modbus TCP gateway

Creating the new project to communicate with FCU devices with the Modbus TCP gateway requires to set the following parameters:

- Baud rate: corresponding to the gateway device setting;
- Gateway IP Address: gateway IPv4 address in standard format xxx.xxx.xxx.xxx;
- Port Number: port at which the gateway device supports the Modbus communication (Modbus default: 502);
- Timeout: the maximum device response time on the network.

5.1.2 Creating New Project with BACnet IP Gateway

The BACnet IP gateway is a feature allowing to establish the communication between the FCU Updater software with FCU devices on the BACnet network with the gateway device (for example, the iSMA-B-MAC36NL master controller), which enables to pass the BACnet data packets between IP and MS/TP BACnet networks.

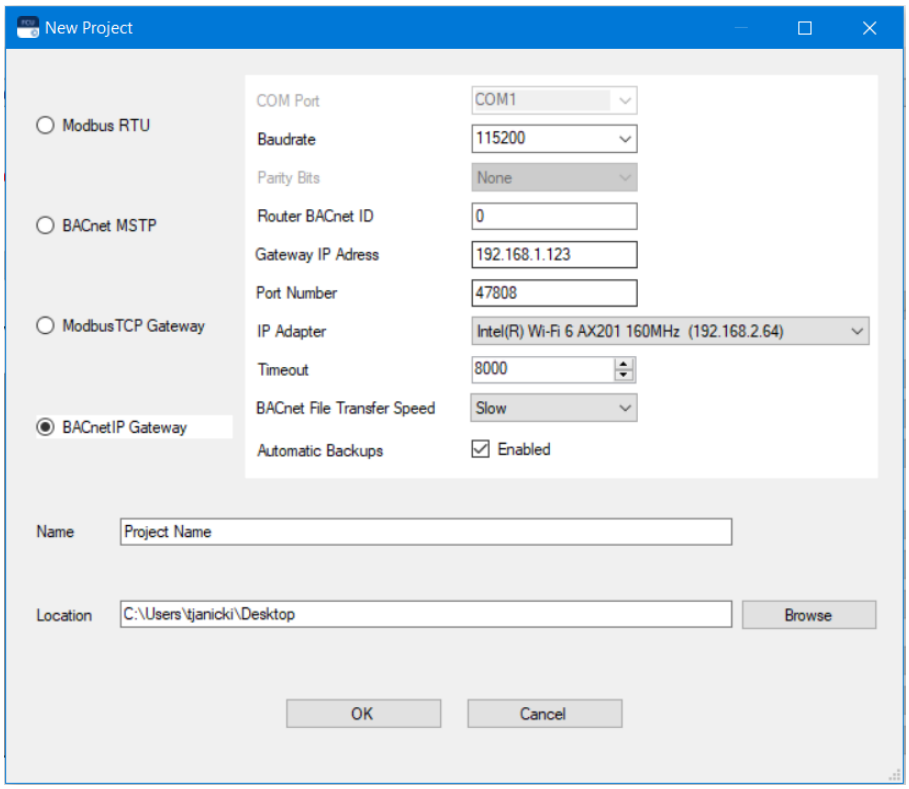


Figure 12. Creating a new project with a BACnet IP gateway

Creating the new project to communicate with FCU devices with the BACnet IP gateway requires to set the following parameters:

- Baudrate: corresponding to the gateway device setting;
- Router BACnet ID: the BACnet object ID assigned to the BACnet gateway device–the setting can be found in the Object IP field of the Local Device component set for the gateway device;

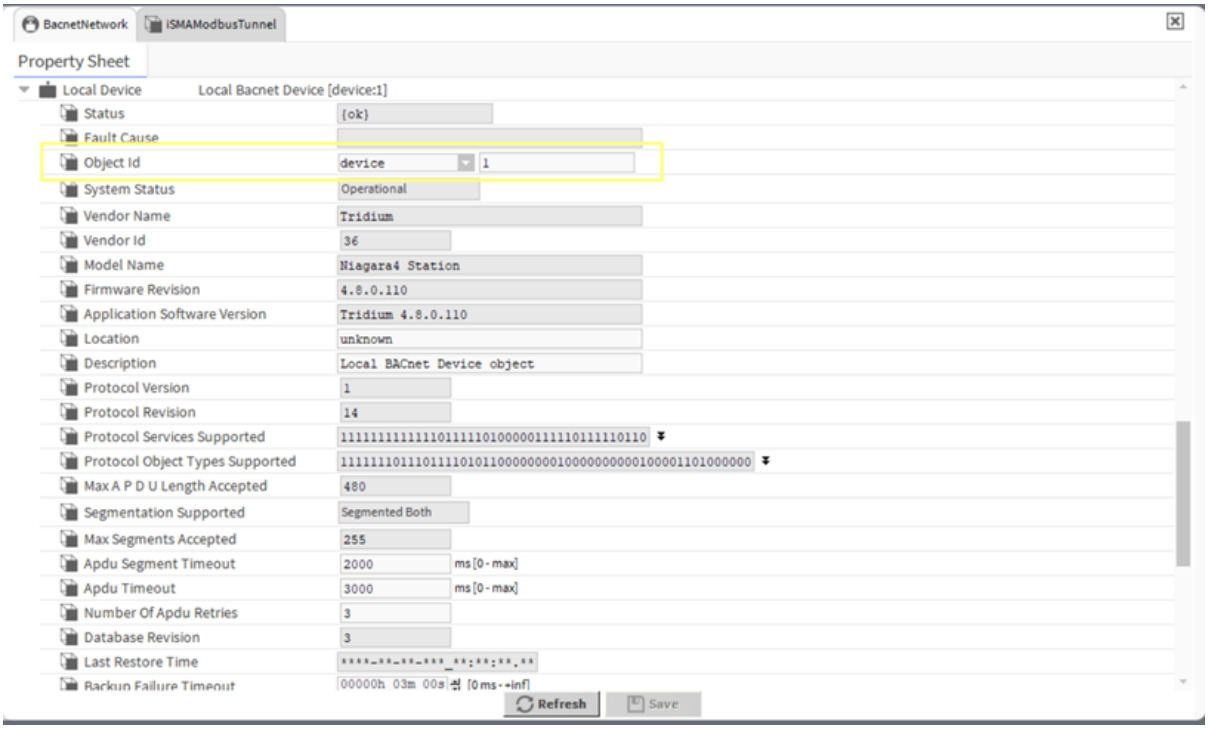


Figure 13. The Object ID field in the Local Device component set for the gateway device

- Port Number: port at which the gateway device supports the BACnet communication (BACnet default: 47808);
- IP Adapter: the IP adapter connected to the gateway device (list of available adapters is filled automatically);
- Timeout: the maximum device response time on the network;
- BACnet File Transfer Speed.

Note: In order for the BACnet IP gateway feature to function properly, it is required to set the routing parameters in the BACnet Network component configured for the gateway device.

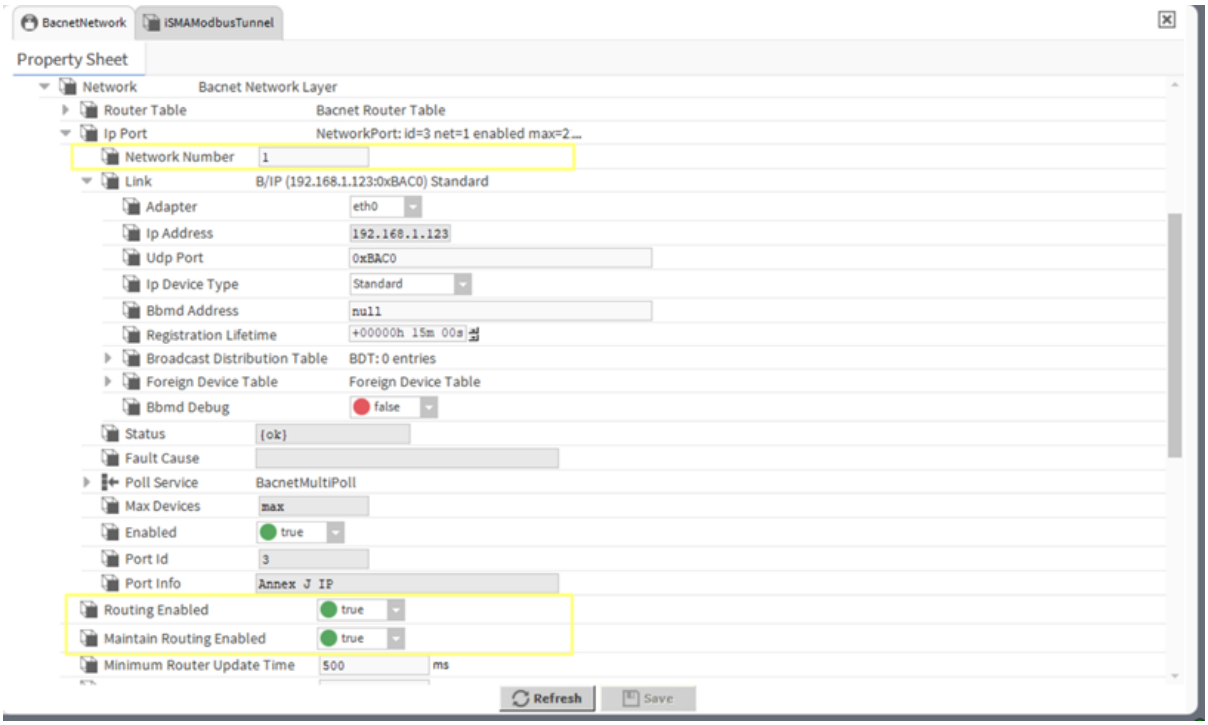


Figure 14. BACnet network settings required for the BACnet IP gateway to operate properly

Both Routing Enabled and Maintain Routing Enabled slots have to be set to true. Make also sure to:

- correctly identify the network number;
- enable the IP port;
- enable the MS/TP port and set the network number for the MS/TP communication with FCU devices.

Once all settings in the New Project dialog window are properly established, creating new project have to be confirmed with the OK button.

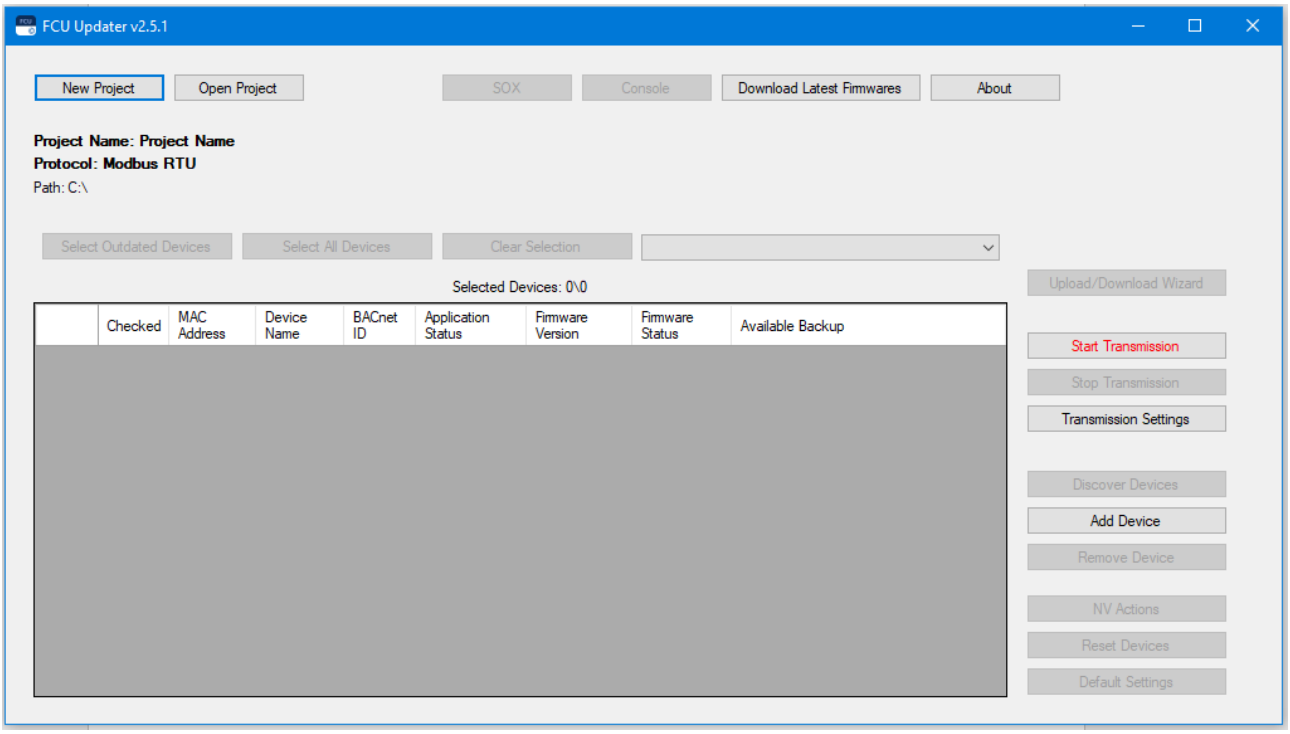


Figure 15. New project created

Now, the project is created and opened. The FCU Updater displays the current context by showing the information line about the opened project: its name, location, and setup transmission protocol. All that information appears on labels located under the New Project and Open Project buttons. Some of the previously disabled functions are now enabled, including Start Transmission and Transmission Settings.

The next step is to start transmission on the selected protocol.

5.2 Opening Existing Project

Pressing the Open Project button opens an existing project stored on given location, usually locally on a PC.

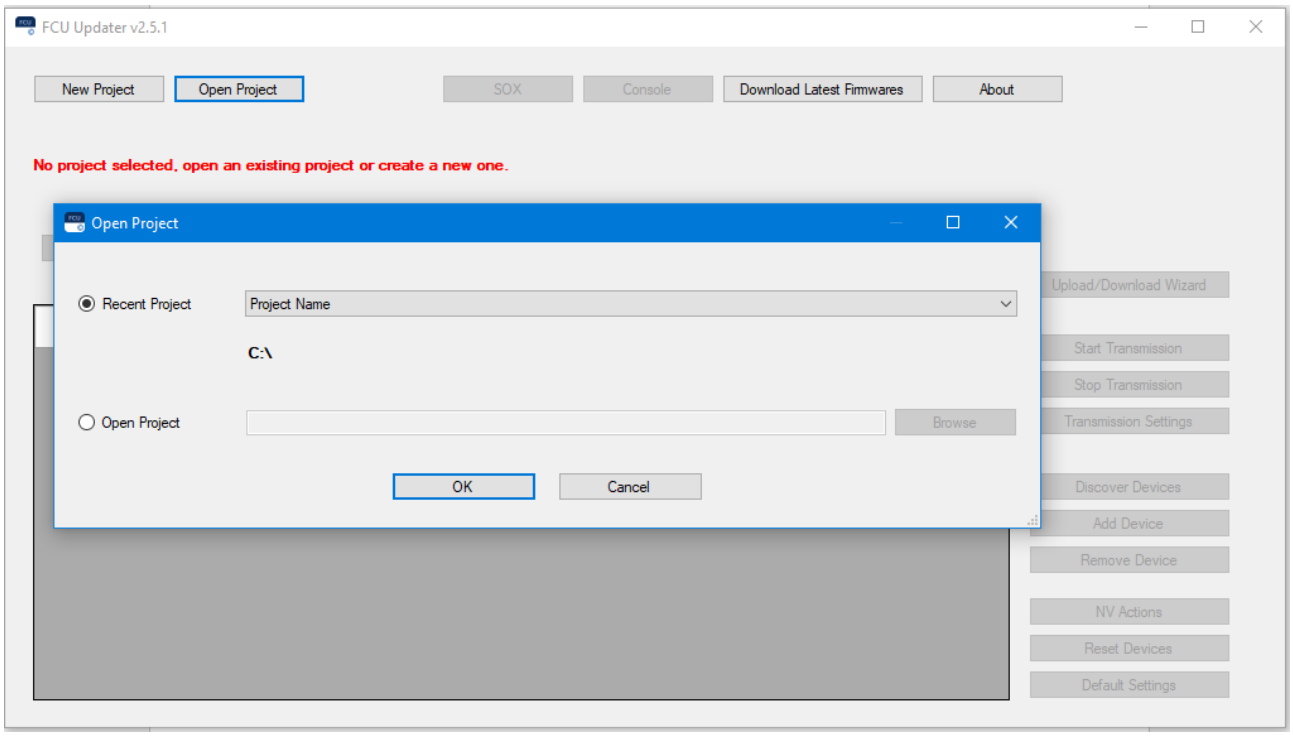


Figure 16. Opening an existing project

To open the existing project, the user has two options available:

- selecting the project name directly from the drop-down list in the Recent Project field;
- browsing and finding a folder of the existing project, then pointing out a projects configuration file config.iSMA in the project folder.

After pressing the OK button, the existing project opens depending whether the system can localize the configuration file.

Now, the project is opened. The FCU Updater displays the current context by showing a confirmation of the opened project: its name, location, and setup transmission protocol. All that information appears on labels located under New Project and Open Project buttons. Also, all the information about devices name, type, versions, backups previously saved in the project folder appears in the main table on the application screen.

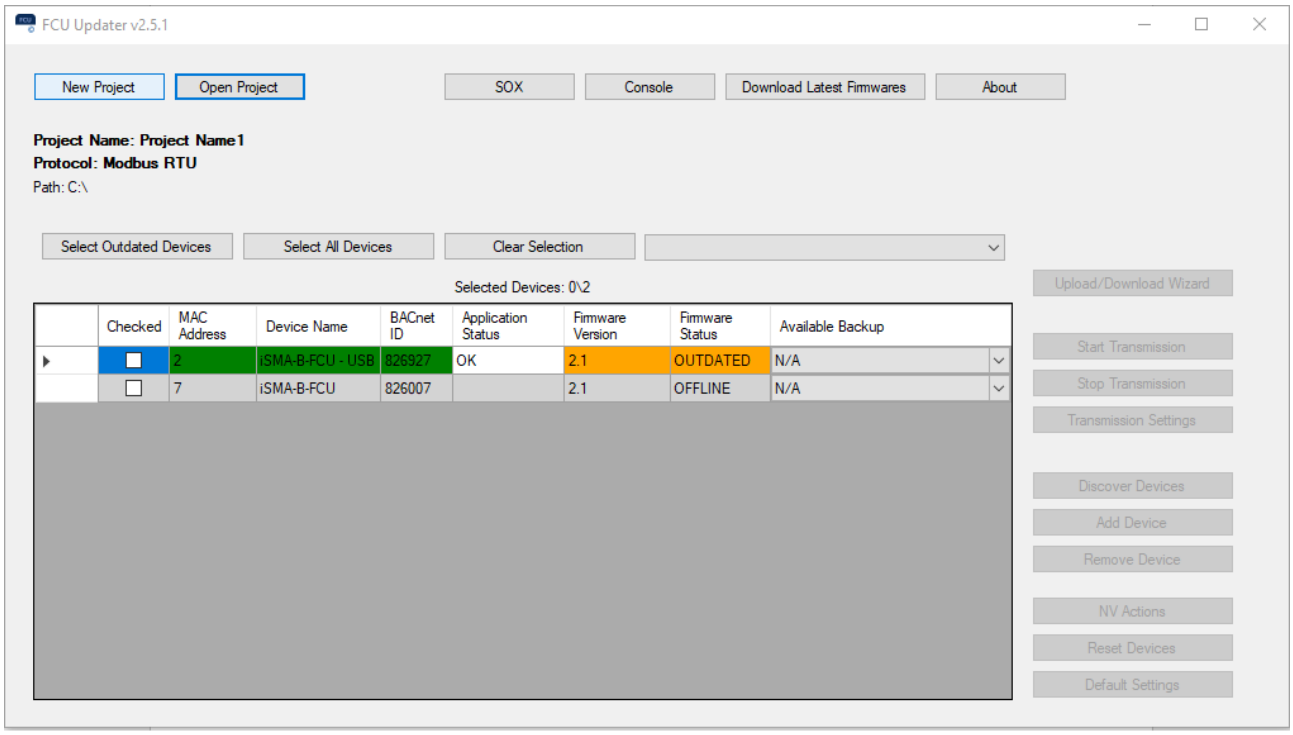


Figure 17. Existing project opened

Some of the previously disabled functions are now enabled, including the Start Transmission and Transmission Settings. The next step is to start transmission with the selected protocol, which is described in the following part of this manual.

The next step is to start communication with the controllers listed in the project. After pressing the Start Transmission button, the system rechecks the current status of devices and begins working with them online.

6 Start and Stop Transmission

After opening the new project or the existing one and connecting to the network (Modbus or BACnet), it is recommended to switch to online mode, starting data transmission. Press the Start Transmission button and wait until the Start Transmission button becomes disabled to indicate that the communication port COM was opened successfully.

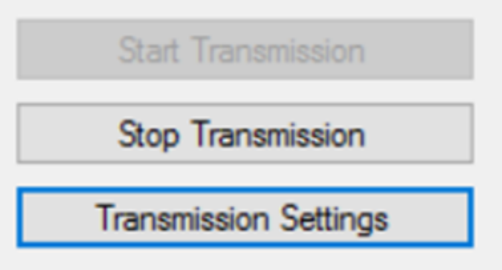


Figure 18. Transmission started successfully

If the system cannot open the COM port (set in transmission settings), a warning dialog window appears. In this case, please reopen protocol settings by pressing Transmission Settings and adjust them accordingly.

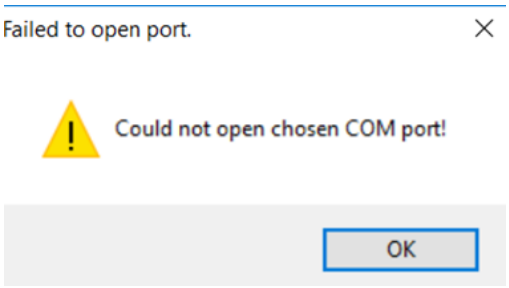


Figure 19. The COM port could not be opened

Note: Remember to start transmission again after changing the communication settings.

If the FCU Updater opens the COM port successfully, statuses for all devices in the table update automatically on a periodic basis. Depending on how many devices are shown in the table, the speed of rechecking the status of each device varies. The rate drops, even more, if some of the devices are not physically connected to the network, but they are present in the table. In this case, the user can always manually check the status of the selected device by right-clicking it and choosing the Ping device option. In the below image, the selected controller is still offline even though the transmission is running. In this situation, it is recommended to ping the device manually, and if this operation does not help, it may indicate a communication issue, or that the device is offline, transmission settings are wrong, or protocol type is not adequate.

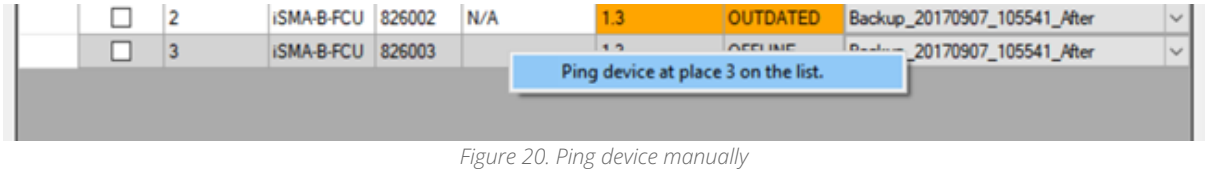


Figure 20. Ping device manually

Note: Remember that after changing some of the transmission settings the COM port is automatically closed. To open the COM port again and to start transmission data, please press the Start Transmission button again.

The user can stop transmission at any point by pressing the Stop Transmission button although it is not necessary because the FCU Updater performs it automatically as needed, for example, if the user opens other project or closes the software.

Note: The transmission must operate properly if the user wants to work with devices connected to the Modbus or BACnet network.

Only with the successful connection setup the user can:

- discover new devices on the network
- upload/download firmware and application
- perform backup/restore of application
- ping devices
- reset devices
- set devices to default settings

All these functions are described in the following parts of this manual.

7 Discover Devices

If the connection to Modbus or BACnet network is set up properly, it is possible to discover all the devices physically connected on the bus. The discovering process means recognition of device type together with its address in the network. Each found device is automatically added to the table of the current project, so the user does not need to know the type, address, and number of devices connected on the bus. The discovering process is fast, and it is recommended to run it at the beginning to have an overview of the whole network. It is also advisable to run it whenever a new physical device is added on the site.

Note: Before starting the discovering process, makes sure that the right project is opened by checking the project name and its path is shown under New Project, Open Project buttons.

To start the discovering process press the Discover Devices button to open a supporting dialog with some settings. The discovering process requires some individual settings depending on a protocol type.

7.1 Discovering Devices for Modbus

For the Modbus protocol, regardless whether devices are connected directly to the Modbus RTU network or discovered with the Modbus TCP gateway, it is required to set up the Modbus addresses range. The FCU Updater starts searching for the first device with the given address in the Start Address field until reaching the last device with the address specified in the Stop Address field. The time spent for discovering varies based on the devices range and networks baud rate. To reduce the discovering time, it is recommended to adjust the range accordingly.

Press the Find button to run identification process. During the process, all already detected devices are listed at the bottom of the dialog box. It is possible to abort this process without adding any devices to the table in the project by pressing the Cancel button. If the number of already identified devices is satisfactory, the user can stop the further process and add just the found devices to the table by pressing the Finish button.

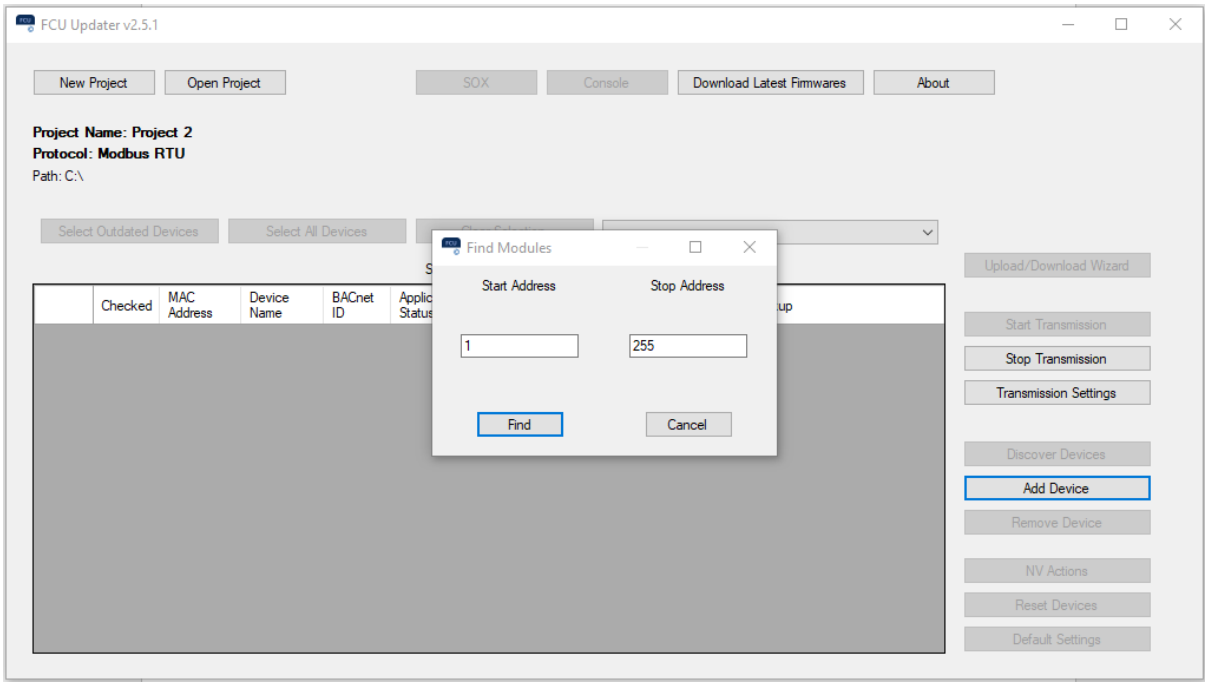


Figure 21. Discovering devices in the Modbus protocol

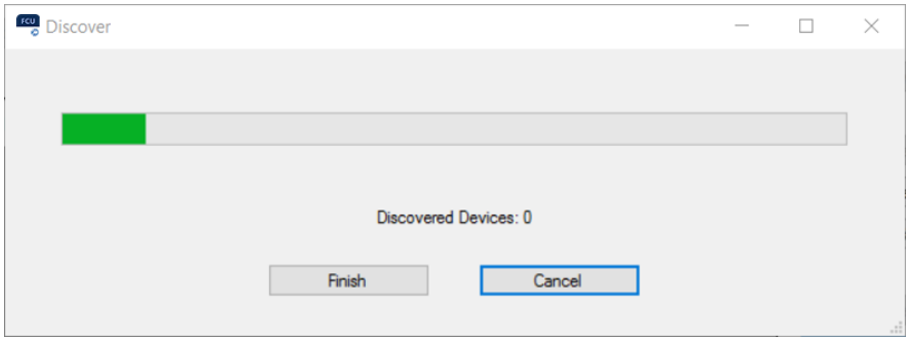


Figure 22. Discovering process

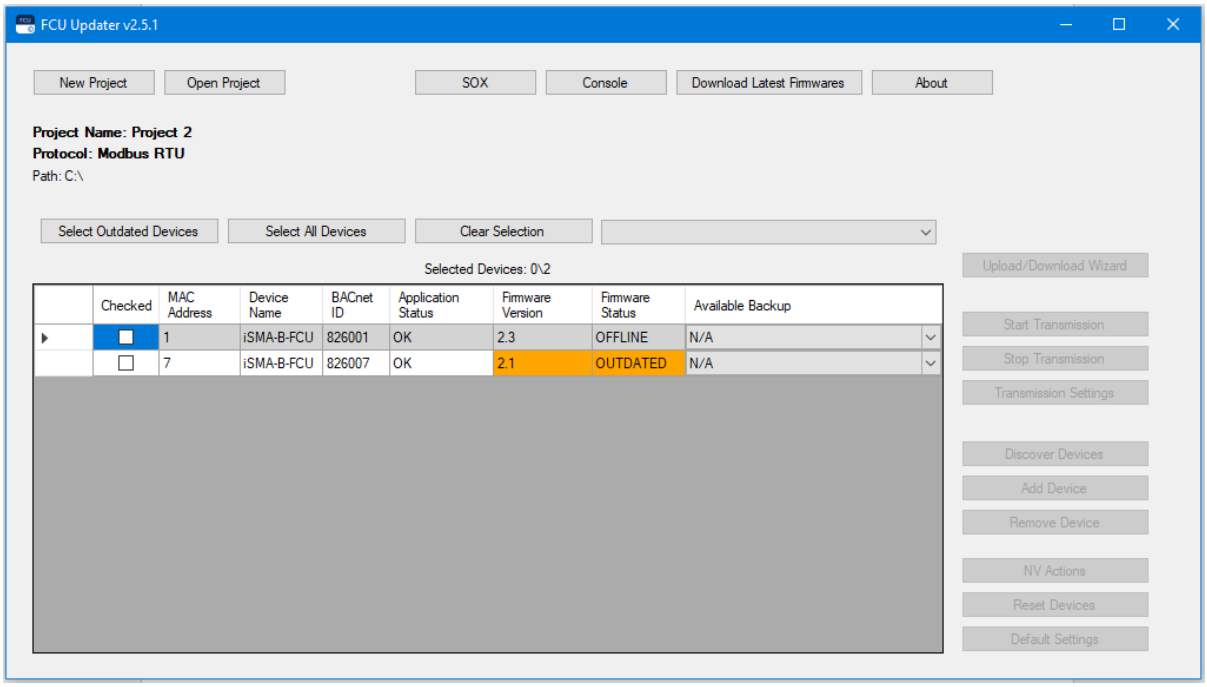


Figure 23. Discovered devices in the Modbus protocol

7.2 Discovering Devices for BACnet

In the discovering process for the BACnet protocol, regardless whether devices are connected directly to the MS/TP network or discovered with the BACnet IP gateway, it is required to define the timeout value. The user is asked to set the timeout in the Timeout field in seconds to guarantee enough time to find all devices on the BACnet bus. Choosing the correct value depends on the networks baud rate (inversely proportionally) and the number of devices (proportionally) connected to the BACnet bus.

Press the OK button to run the identification process. During this process, the number of already detected devices is shown at the bottom of the dialog box. It is possible to abort this process without adding any devices to the table in the project by pressing the Cancel button. If the number of already identified devices is satisfactory, the user can stop the further process and add the found devices only to the table by pressing the Finish button.

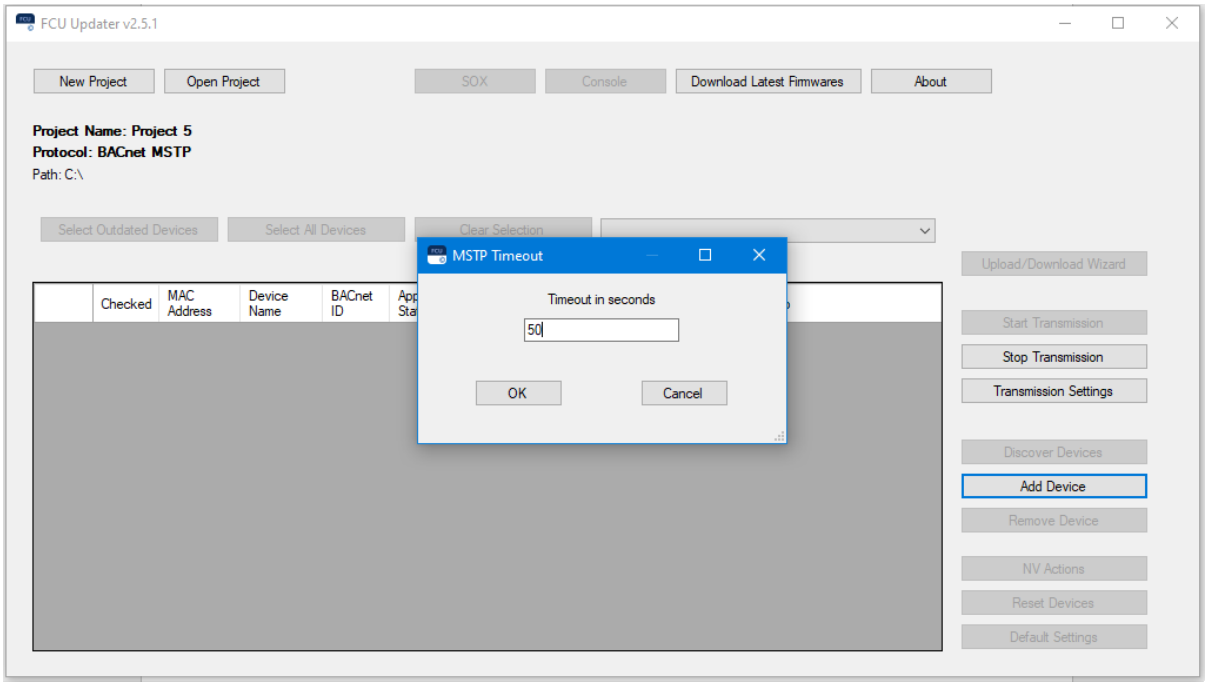


Figure 24. Discovering devices in the BACnet protocol

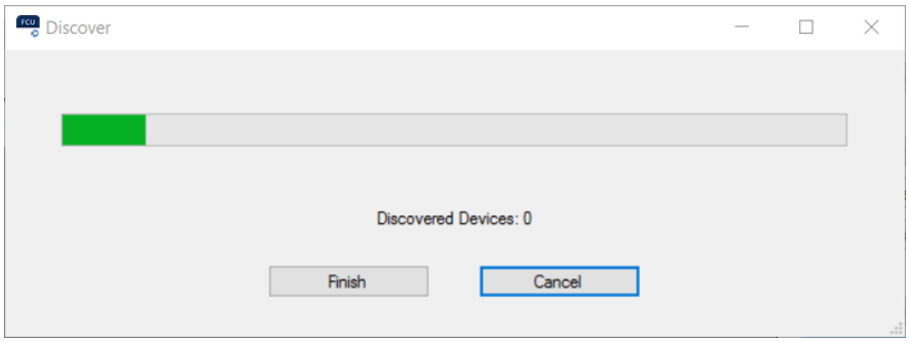


Figure 25. Discovering process

Note: If all devices are not found after the first scanning process is complete, increase the timeout value. If some missing controllers are still found, add the missing devices manually by pressing the Add Device button. The procedure of adding the devices manually is described in section Adding and removing devices manually.

7.3 Adding and Removing Devices Manually

Adding the device to the table or removing it allows a manual manipulation. Both functions (adding and removing) can be used either online or offline even without starting the transmission. This approach allows the user to edit the list of devices on any project before arriving on the site.

The discovering devices function together with adding and removing option helps the user to build a virtual list of all physical devices installed on the Modbus or BACnet network.

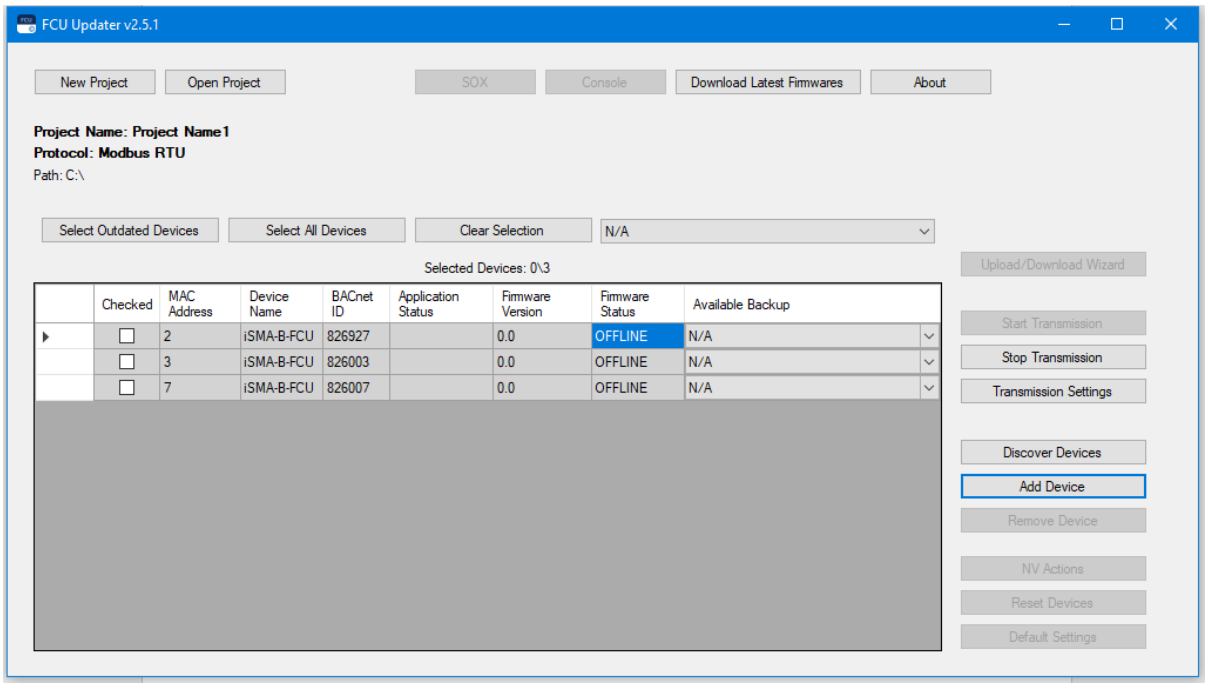


Figure 26. Adding a device manually

Adding new device varies depending on the type of connection chosen for the project. Both protocol types ask for unique device identification on the bus. In the case of Modbus, the Modbus address (MAC address filed) is required but in BACnet, the BACnet ID is needed. To simplify the process, the system automatically calculates and gives proposition of the BACnet ID based on the typed MAC Address assuming that BACnet net is built with the default 82600 subnet (provided by the BACnet organisation to all iSMA CONTROLLI. devices).

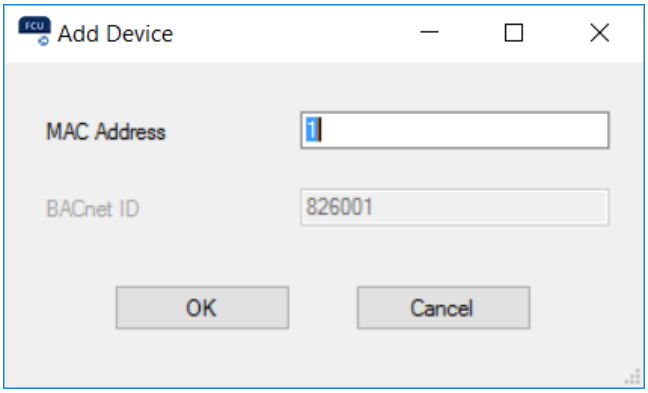


Figure 27. Adding a Modbus device manually

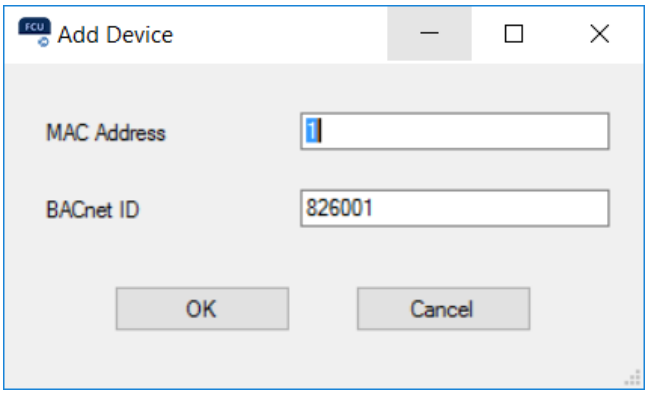


Figure 28. Adding a BACnet device manually

Removing devices from the project allows to select one or more devices and remove them by pressing the Remove Device button. The FCU Updater requires confirmation before removing anything.

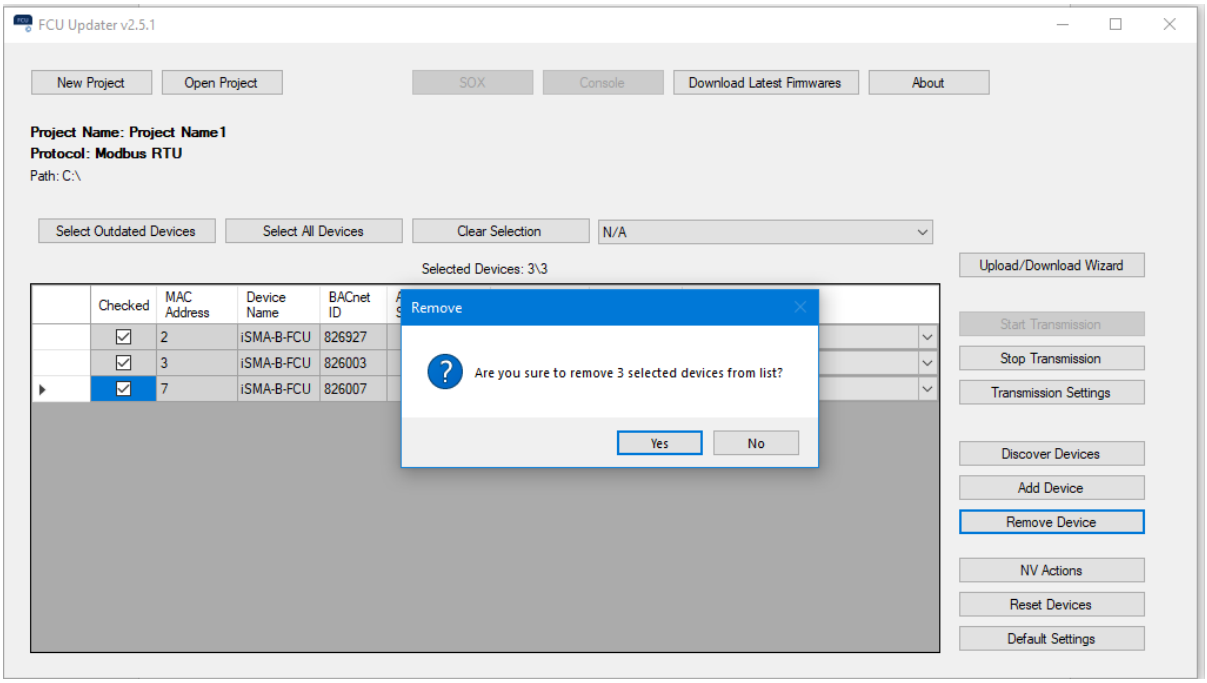


Figure 29. Removing a device manually

It is possible to add the device to the list automatically (extend the list of devices) as soon as the physical unit is connected to the FCU Updater directly by the cable. This feature is convenient if there is the controller that is not yet attached to the bus, but the user can easily connect USB cable to it. The next chapter describes this process in more detail.

8 iSMA Modbus Tunnel

The iSMA Modbus Tunnel module, designed for Niagara driven controllers, enables establishing communication between the FCU Updater and iSMA-B-FCU devices on the Modbus network through a master controller, e.g., the iSMA-B-MAC36NL controller. The master controller acts as a gateway, and enables to establish all FCU Updater operations on iSMA-B-FCU devices, which are not directly connected to the PC. The communication with the gateway device is established with TCP connection, and the iSMA Modbus Tunnel enables to transfer data to iSMA-B-FCU devices with RS485 connection.

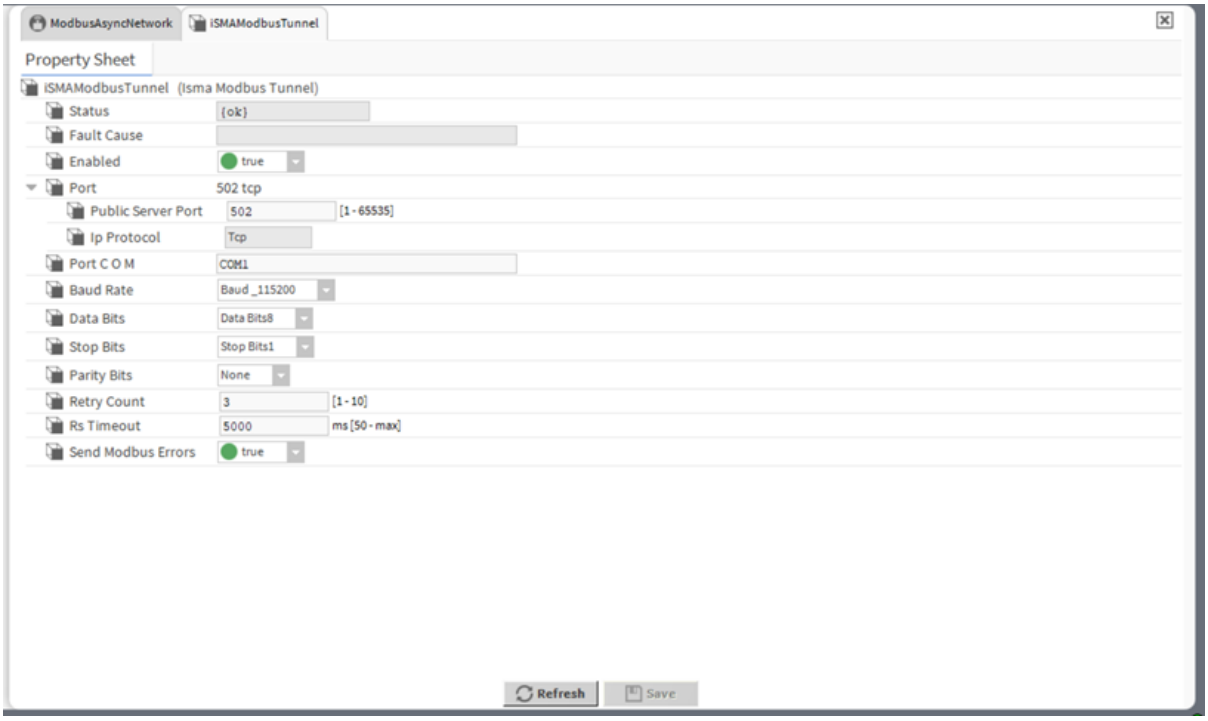


Figure 30. The iSMA Modbus Tunnel module

8.1 iSMA Modbus Tunnel Configuration

Firstly, the iSMA Modbus Tunnel module has to be added to the Services in the station configured for the master controller.

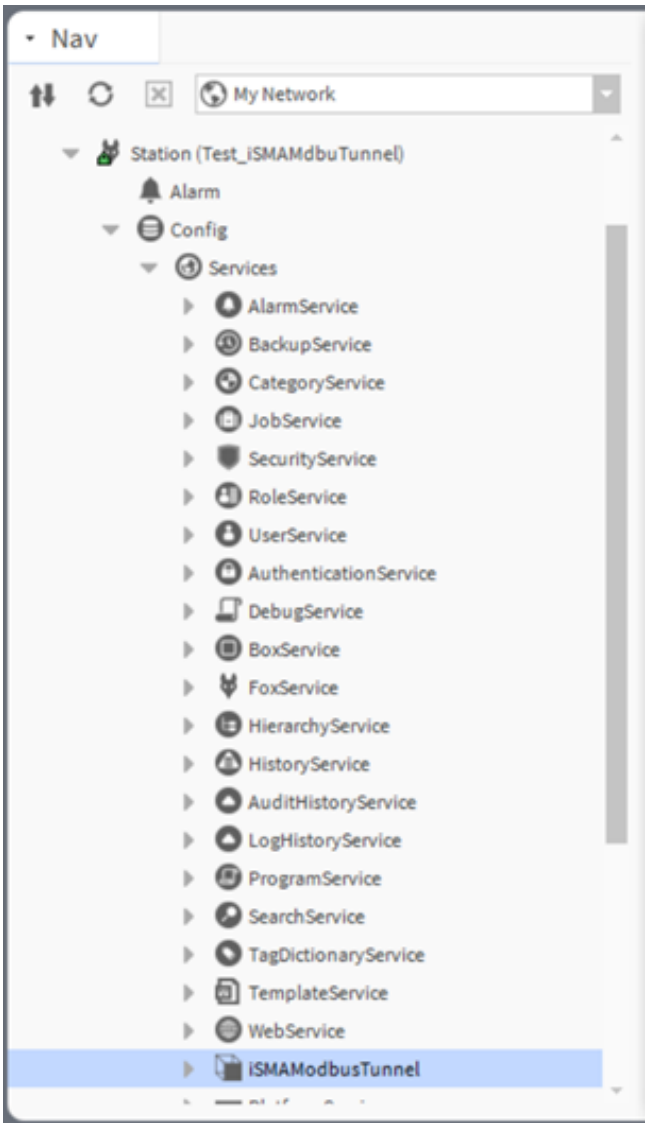


Figure 31. The iSMA Modbus Tunnel added to a station

In order to start the FCU Updater communication with the FCU device(s), using the iSMA Modbus Tunnel, follow the below configuration steps:

Step 1: The iSMA Modbus Tunnel establishes communication with FCU devices connection to the Modbus network with the COM1 port. In order to set up an uninterrupted communication, any Modbus network enabled on the master controller's station has to be switched off. The COM1 port cannot combine two communication channels at once.

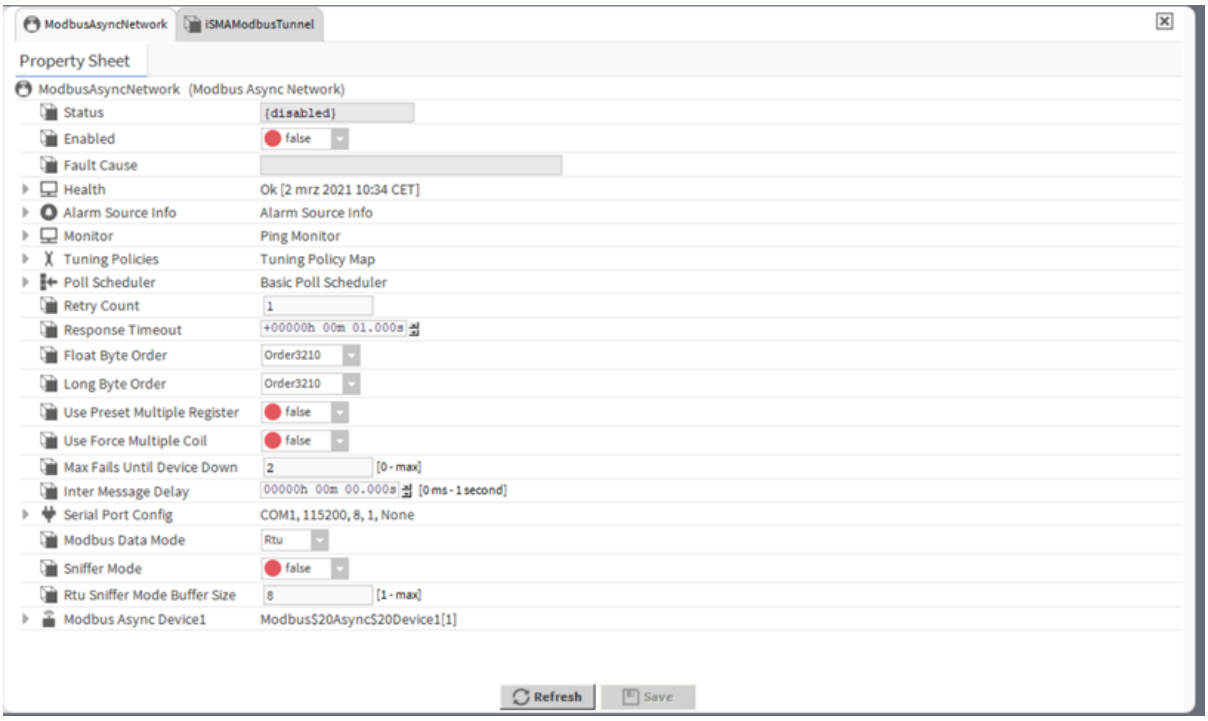


Figure 32. The ModbusAsyncNetwork disabled on the iSMA-B-MAC39NL controller

Step 2: Go to the iSMA Modbus Tunnel property sheet, and enable the module. In case the Modbus network (or any other network operating on the COM1 port) has not been switched off, as indicated in the step 1, the iSMA Modbus Tunnel shows the Fault status and the Fault Cause indicates the COM1 port is busy.

Step 3: Set the communication parameters for the iSMA Modbus Tunnel:

- Port: check the TCP port number;
- Baud Rate: check the baud rate value;
- Data Bits, Stop Bits, Parity Bits: check the settings for Modbus frame.

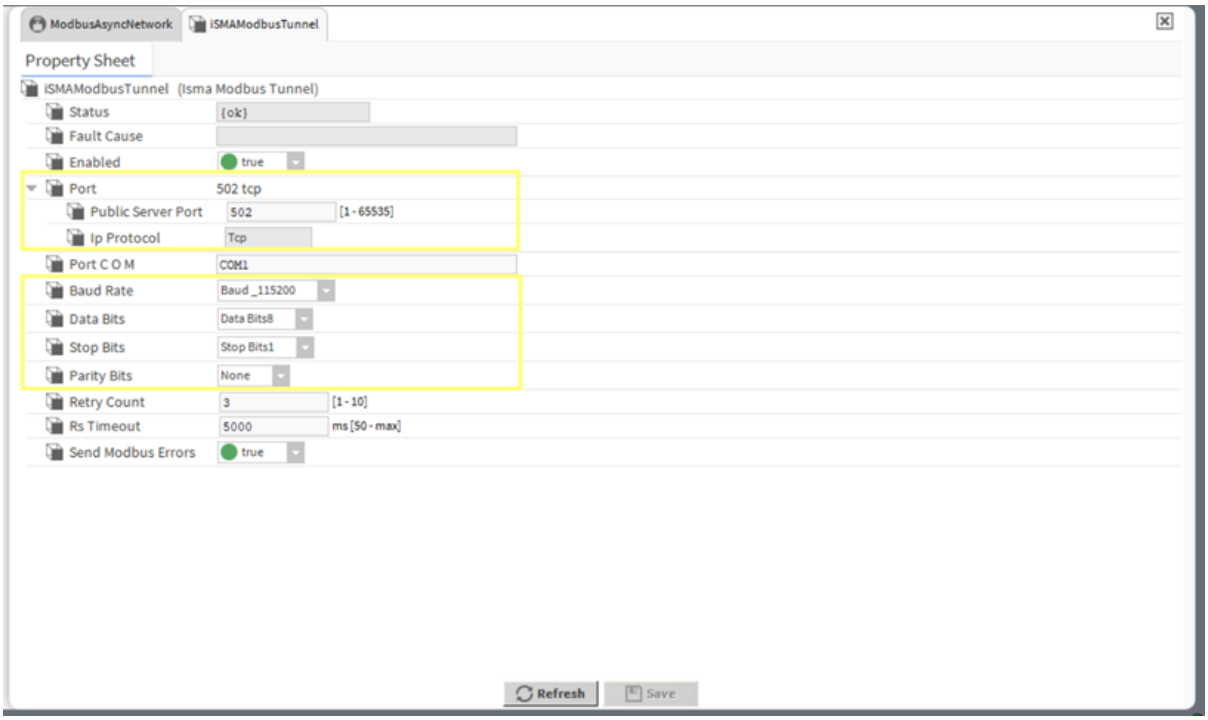


Figure 33. Communication parameters for the iSMA Modbus Tunnel

8.2 Using FCU Updater with iSMA Modbus Tunnel

Once the iSMA Modbus Tunnel is properly configured, it is ready to handle communication between the FCU Updater software and the FCU devices on the Modbus network. In order to establish the communication, follow the below steps:

Step 1: Open the FCU Updater software.

Step 2: Create a new project (or open the existing one if the iSMA Modbus Tunnel has been already used).

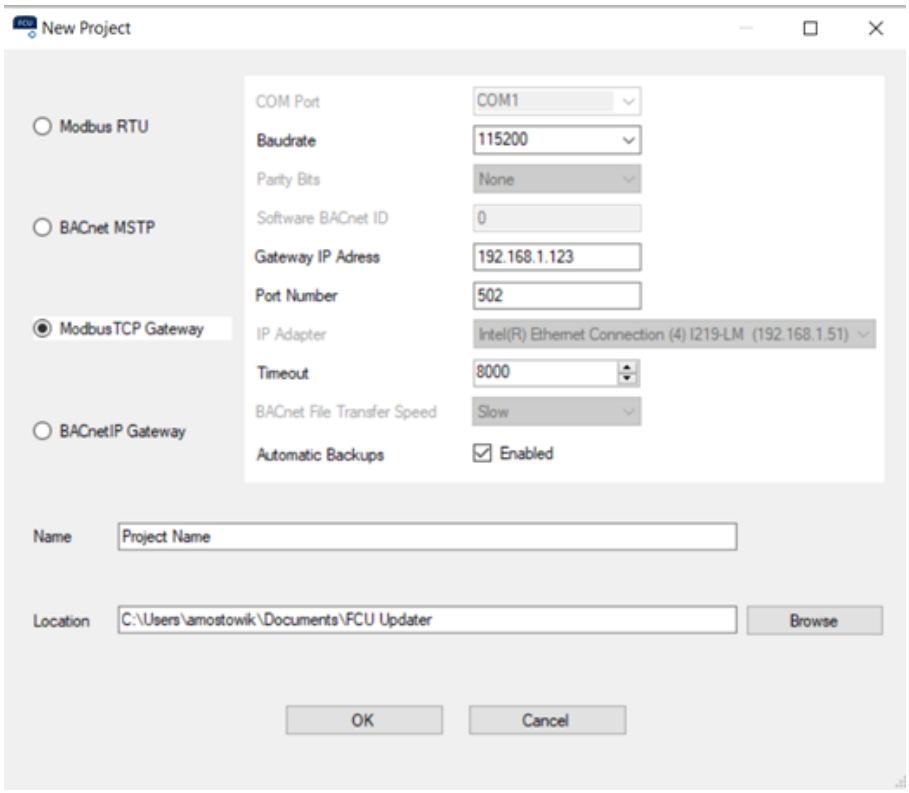


Figure 34. Creating a new project for the iSMA Modbus Tunnel

- Select the Modbus TCP Gateway option;
- Make sure that the communication parameters correspond to the parameters set in the iSMA Modbus Tunnel module:
  - Baud rate;
  - Gateway IP Address: insert the IP address of the master controller;
  - Port number.
- Insert the project name and file location as appropriate.

These settings may also be altered later in the Transmission Settings dialog window.

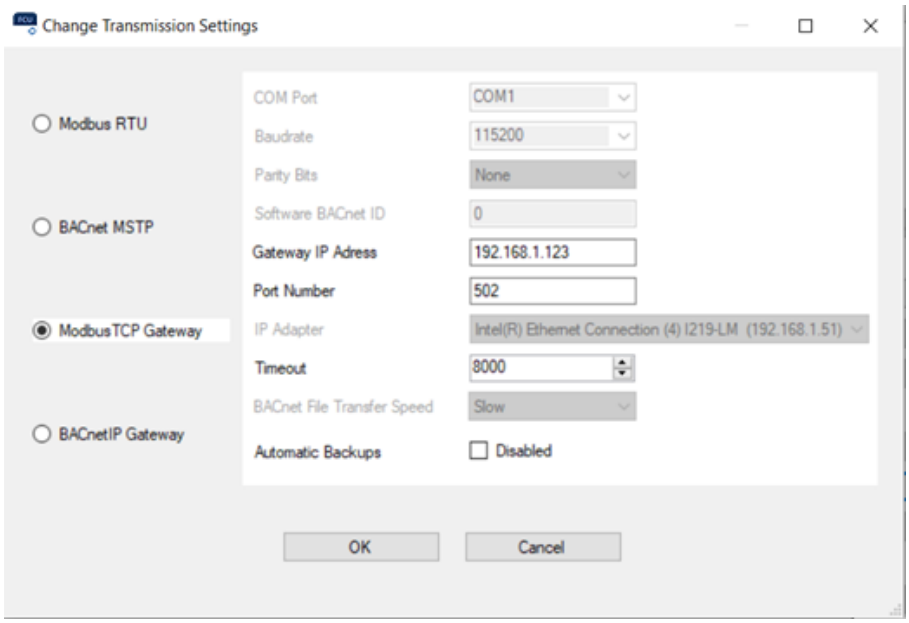


Figure 35. The Transmission Setting dialog window

Step 3: Click the Start Transmission option.

Step 4: Select the Add Device or Discover Devices option. In the Add Device option, set the exact MAC address of the FCU device on the Modbus network (this option allows to add devices one by one). In the Discover Devices option, set the Modbus addresses range of the FCU devices on the Modbus network (this option allows to discover all devices on the network at once).

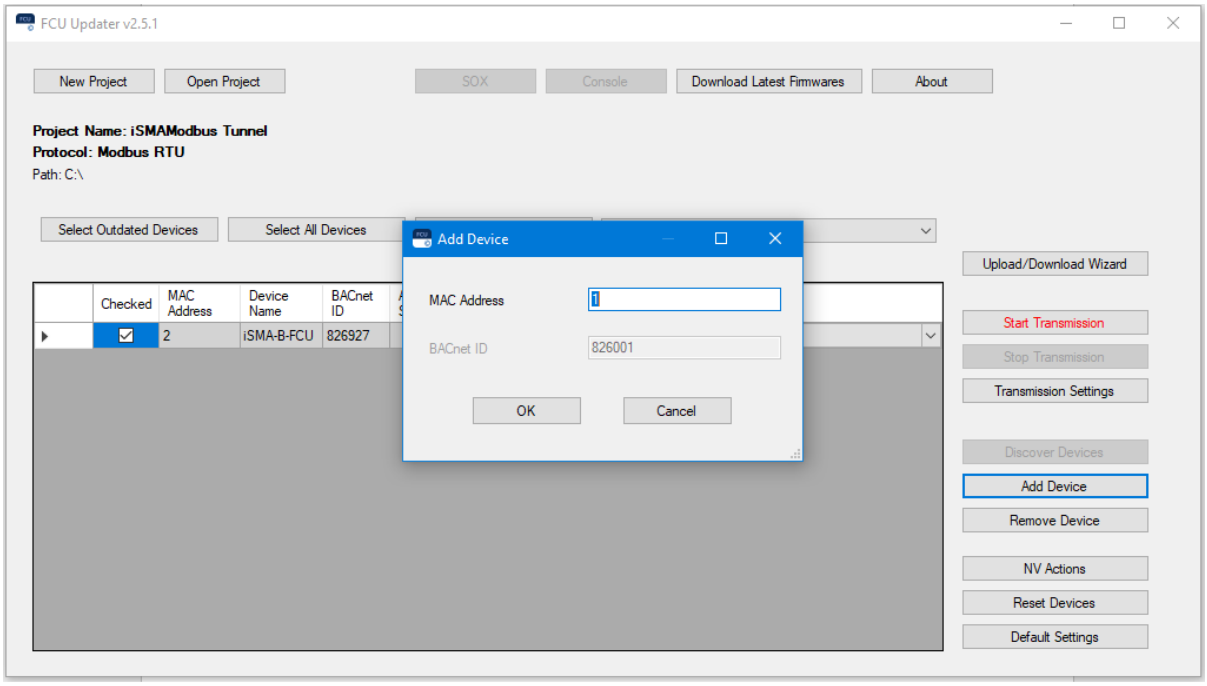


Figure 36. The Add Device dialog window

Step 5: Once the devices on the Modbus network are added in the FCU Updater and in the online status, the communication with iSMA Modbus Tunnel is set properly, and all FCU Updater's operations are available to be established on checked devices.

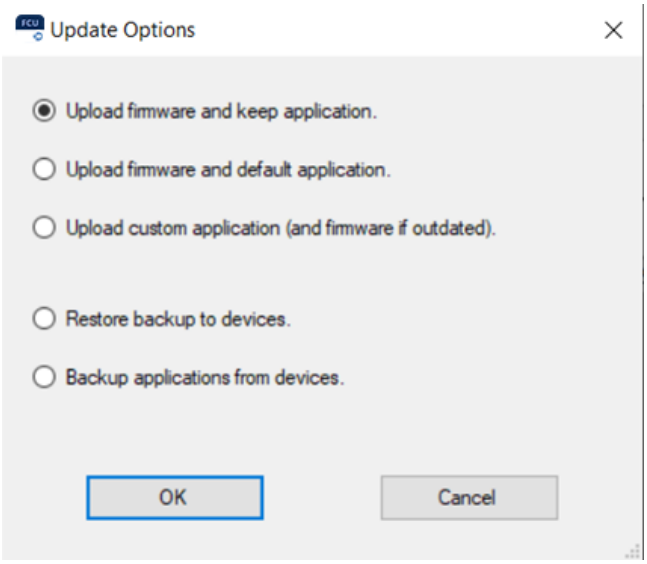


Figure 37. Option available in the Upload/Download Wizard

Step 6: In order to finish the communication with the iSMA Modbus Tunnel, stop the transmission in the FCU Updater, disable the iSMA Modbus Tunnel module in the master controllers station, and enable any network previously switched off on the COM1 port.

9 List of Devices with List of Errors

The main window of the FCU Updater shows the table with lists of devices. The list represents the physical devices collected either by using the discovery function or manually by adding device option in an opened project. Each row in the table represents one physical device.

The table shows the following information for each instrument:

- MAC address: address set inside the device;
- Device Name: type of device;
- BACnet ID: BACnet ID address for BACnet network;
- Application Status: current status of running application on the controller (the following are available: ANY ERROR (see explanation bellow), N/A, OK);
- Firmware Version: firmware version running on the device;
- Firmware Status: firmware status (the following are available: offline, online, outdated, not compatible, bootloader, USB);
- Available Backup: backup files already stored in the project.

ANY ERROR: The FCU Updater from version 2.1.1 can read the Application Status from ithe SMA-B-FCU controller starting from firmware version 1.4.

From now, it is possible to see if the application (app) in the controller is running without any issue even though the controller is online. The Application State shows the current state of SVM (Sedona Virtual Machine) including details information related to bootstrap, image, system, application, component and runtime errors.

Below, there is a full list of possible errors (ANY ERROR) getting from Modbus register 99 or BACnet device property 5002:

Group	Type	Code
iC	INIT	65535
Ok	OK	0
Non-recoverable: Bootstrap	MALLOC IMAGE	1
	MALLOC STACK	2
	MALLOC STATIC DATA	3
	INPUT FILE NOT FOUND	4
	CANNOT READ INPUT FILE	5
Non-recoverable: Bad Image	BAD IMAGE MAGIC	6
	BAD IMAGE VERSION	7
	BAD IMAGE BLOCK SIZE	8
	BAD IMAGE REF SIZE	9
	BAD IMAGE CODE SIZE	10

Non-recoverable: Runtime Errors	UNKNOWN OPCODE	11
	MISSING NATIVE	12
Non-recoverable: Sys	INVALID ARGS	40
	CANNOT INIT APP	41
Non-recoverable: App	CANNOT OPEN FILE	42
	INVALID MAGIC	43
	INVALID VERSION	44
	INVALID SCHEMA	45
	UNEXPECTED EOF	46
	INVALID KIT ID	47
	INVALID TYPE ID	48
	CANNOT MALLOC	49
	CANNOT INSERT	50
	CANNOT LOAD LINK	51
	INVALID APP END MARKER	52
	NO PLATFORM SERVICE	53
	BAD PLATFORM SERVICE	54
Non-recoverable: Component	INVALID COMP END MARKER	60
	NAME TOO LONG	61
Recoverable: Runtime Errors	NULL_POINTER	100
	STACK_OVERFLOW	101
	INVALID_METHOD_PARAMS	102
Special Codes	YIELD	253
	RESTART	254
	HIBERNATE	255
	Max. input frequency	100 Hz

Table 2. List of errors

For better visualization, each row in the table changes its background color following the controllers application status, firmware status and connection type. The colors meanings are:

- gray–offline,

- white–online,
- orange–outdated,
- yellow–not compatible,
- red–bootloader or any error,
- green–USB direct connection.

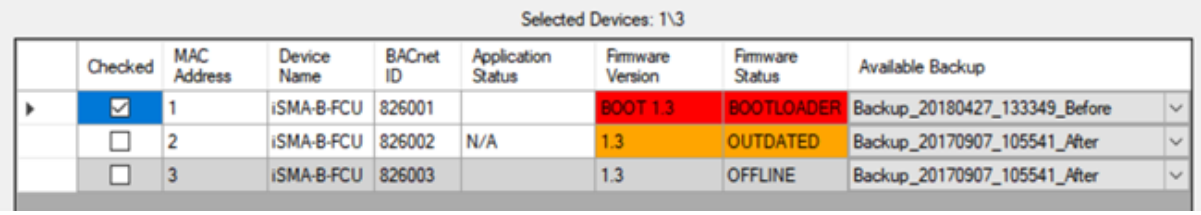


Figure 38. List of devices

10 Direct USB Connection to Device

Each iSMA-B-FCU controller and iSMA-B-LP/Touch Point panel has one mini USB type B available on its board, which allows direct connection to a PC with the FCU Updater running. This USB connection automatically configures the communication COM port on the PC and enables adequate functions on the FCU Updater.

Note: With USB cable connected to mini USB slot on the device it is not possible to operate on any other device from the list except for the one automatically recognized as connected to the PC and marked with green color (see the image below).

After selecting a marked device, available functions are as follows:

- upload/download,
- reset,
- set to default,
- open console,
- run SOX driver.

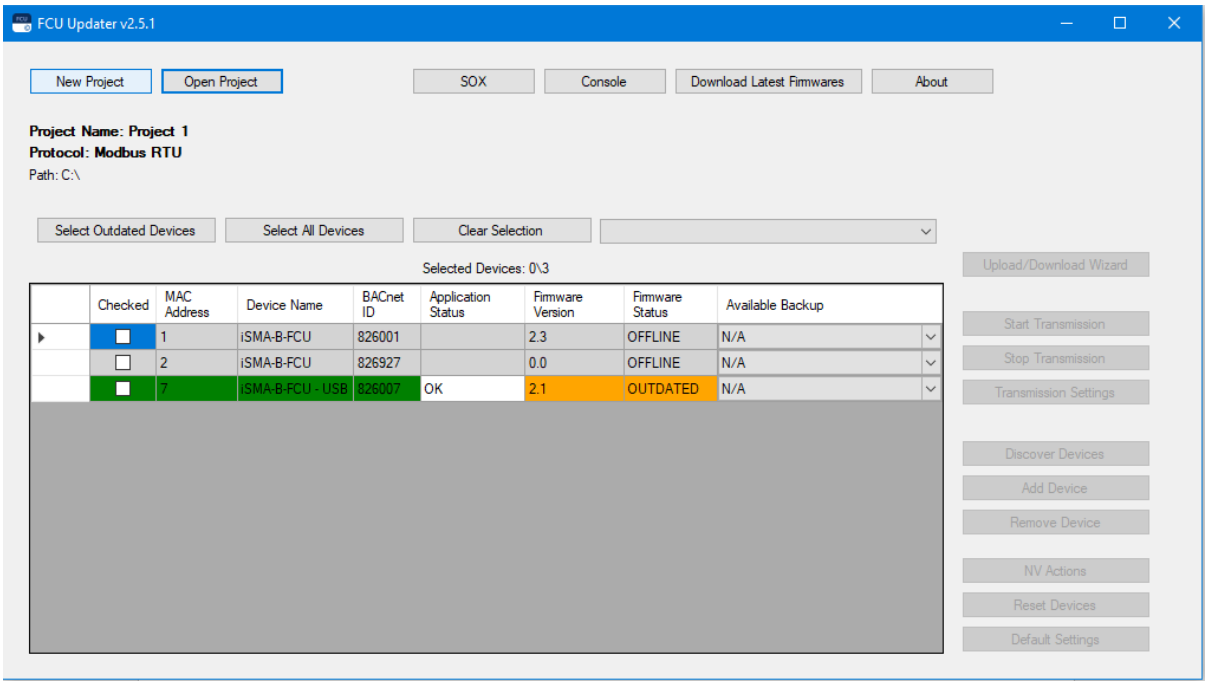


Figure 39. List with direct connections to devices with a USB cable

All mentioned functions are described in detail in the following parts of this manual.

Note: Direct connection of the device by USB cable adds this controller automatically to the projects list for the future use, see the picture above with added iSMA-B-FCU controller. Please note that, after disconnecting the USB cable, it is necessary to restart the connection with the bus by pressing the Start Transmission button.

Note: Only the device with the unique address can be added to the list. Before connecting any devices by USB, please check that there is no object on the list with the same address as the unit to be connected.

11 Non-volatile Actions

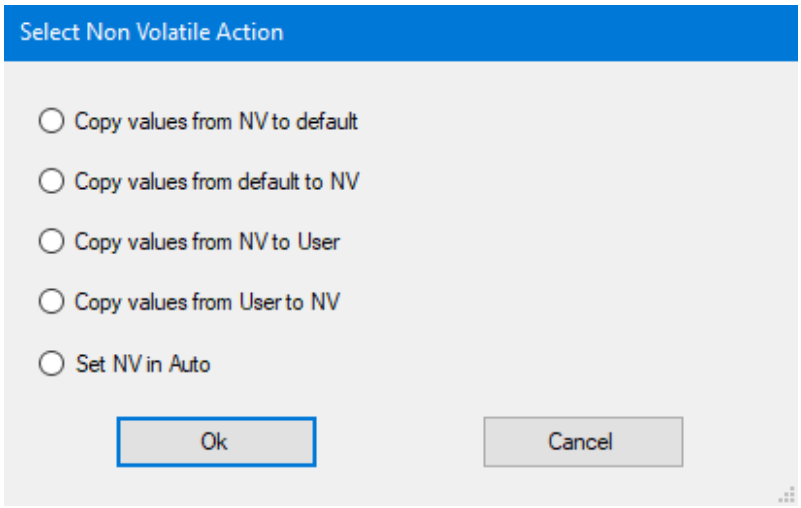
Warning!

Available from the 2.3 FCU firmware version and 2.5.1 FCU Updater version.

The FCU Updater allows to perform actions to manage the NV (non-volatile) values of components. The NV components are components, which value can be recorded in the device's EEPROM non-volatile memory. Whenever the device is restarted or the power is down, the values of NV components remain saved.

Since the values of components are not stored in a Sedona application itself, but in the non-volatile memory of the device, when the application is copied between two devices, output values are not saved and will assume the values stored in the local EEPROM memory. To copy NV components to another device along with their values (e.g., setpoint), use non-volatile actions, which allow for:

- copying values of NV components as default values in the FCU default application;
- copying values from default values in the FCU default application to NV components;
- copying values from NV components to User slot values;
- copying values from the User slot to NV components;
- setting NV components in the auto mode.



In particular, the NV actions in the FCU Updater perform the following operations:

- **Copy values from NV to default:** copies values from the Out slot to the Default slot in all NV components;
- **Copy values from default to NV:** copies values from the Default slot to the Out slot in all NV components;
- **Copy values from NV to User:** copies values from the Out slot to the User slot in all NV components;
- **Copy values from User to NV:** copies values from the User slot to the Out slot in all NV components;
- **Set NV in Auto:** sets all NV components in the auto mode.

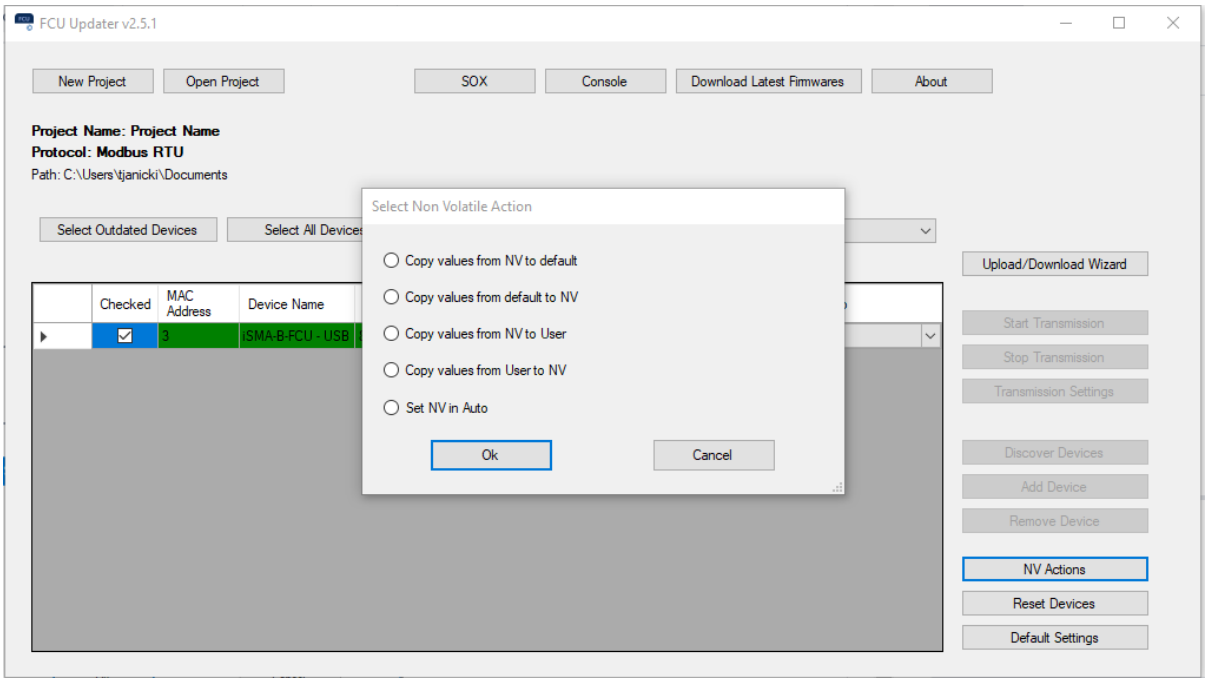


Figure 40. Using the NV action in the FCU Updater

12 Upload and Download

The Upload and Download functions are available under Upload/Download Wizard. Before pressing this button, it is necessary to start transmission and to select device or devices. The selection can be done by checking the box at the beginning of each tables row or by using filter buttons (Select Outdated, Select All Devices, Clear Selection) at the top of the table.

Upload/Download Wizard offers the following options:

- Upload firmware and keep application,
- Upload firmware and default application,
- Upload custom application and firmware (if outdated),
- Restore backup to devices,
- Backup application from devices.

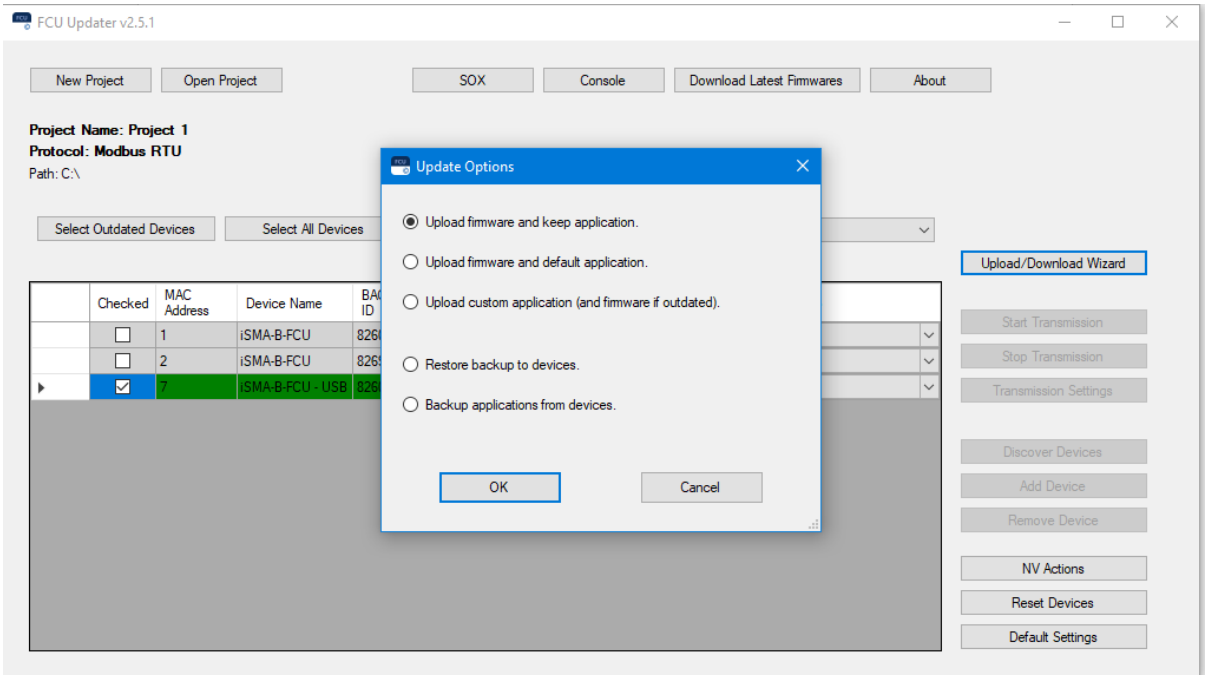


Figure 41. Upload and download options

All upload options are sensitive because they transfer data from a local PC to the external device, and some of them override firmware and application on the controller. Therefore, the FCU updater always does a safety backup of the existing application in the controller before and after the uploading process. Moreover, it recompiles the application with dedicated firmware locally on the PC before uploading to the controller. This approach guarantees that in the case of a failure the user can restore the old program with its firmware and run the previous version of the application on the controller smoothly.

The upload option has three variations:

- Upload firmware and keep application: only the firmware and kits are uploaded, the application remains the same and is not overridden. This option updates the firmware to the latest firmware version downloaded from the iSMA CONTROLLI server only after a successful recompilation. It takes the existing application from the controller and recompiles it with the newest manifests before replacing the old firmware on the controller. This approach guarantees smooth operation of the current application with the newest firmware.

- Upload firmware and default application: firmware, kits and default application are uploaded. The present application on the device is overridden. This option uploads the newest version of the default application together with the newest firmware (*) available on the iSMA CONTROLLI It is recommended to use this option if the user does not have the custom application. System recompiles the downloaded application with the newest firmware, and if successful, it uploads the firmware and the default application to the device.

Warning!

This option clears the existing application.

- Upload custom application, and firmware (if outdated): firmware, kits and custom application are uploaded. The system asks for the custom application to upload to the device. The current application on the controller is overridden. If the firmware on the device is outdated, this option downloads (*) the latest firmware version from the iSMA CONTROLLI server. If the firmware on the controller is not outdated, this option keeps the current firmware version. In both cases, after verification of the firmware, the system recompiles the firmware with the custom application. If the recompilation finishes successfully, the FCU Updater uploads the custom application to the device followed by the firmware.

Warning!

This option clears the existing application.

(*) - During any upload, the system will not check what is available on the server. The FCU Updater transfers the latest and compatible firmware that is stored locally on the PC. The user must manually download the latest firmware version from the iSMA CONTROLLI server by pressing the Download Latest Firmware button after the FCU Updater is run.

Last two options are related to backup operations:

- Restore backup to devices: restores the older backup (application with its firmware) to the controller. The stored data for restoring process is chosen from the available backups for each device individually by selecting the backup from the drop-down list in the table. If the system makes the backup, either automatically or by the user, the FCU Updater creates a new folder in the project folder and names it as Backup_xxxxxxxxxxx, where xx xxxxxxxxxxx represents the timestamp. This folder contains the backups taken at the same time for all the selected devices. The FCU Updater explores all backup folders within the project to find out all backups available for each controller. Results are sorted and presented in the drop-down list for each device individually. Before proceeding to the restore option, the user has to select not only the devices but also choose the backup from the drop-down list for each device individually. There is a general choice (in the table column named: Available Backup) to simplify the selection of backup for all devices. If the controller has no backup made at the time selected by general form, the user should choose any other backup from the devices drop-down list to specify which backup should be used for the restoring process.

Warning!

Before restoring a backup, it is necessary to perform the Copy values from NV to default or Copy values from NV to User action. See Non-volatile Actions.

- Backup applications from devices: transfers the application from selected devices to the local PC. First, the FCU Updater creates a backup folder and names it, e.g., as Backup_xxxxxxxxxxx_manual, where xxxxxxxxxxx is the current timestamp and postfix manual describes that the user requests it manually. If the system performs the backup automatically, the postfixes are before or after depending on whether the backups have been made before or after the whole process. When the backup process starts out, the system creates a new backup folder to which the applications from each selected devices are transferred. Finally, the FCU Updater updates the drop down lists in the table according to the latest backup.

Warning!

Before creating a backup, it is necessary to perform the Copy values from default to NV or Copy values from User to NV action. See Non-volatile Actions.

After running one of the above-mentioned functions, the progress bar window appears on the screen. Additionally, it shows the status of the phase the FCU Updater is performing (backup, upload or restore) and the device number, on which it is being executed. The information varies depending on the protocol and function being performed as shown in the pictures below.

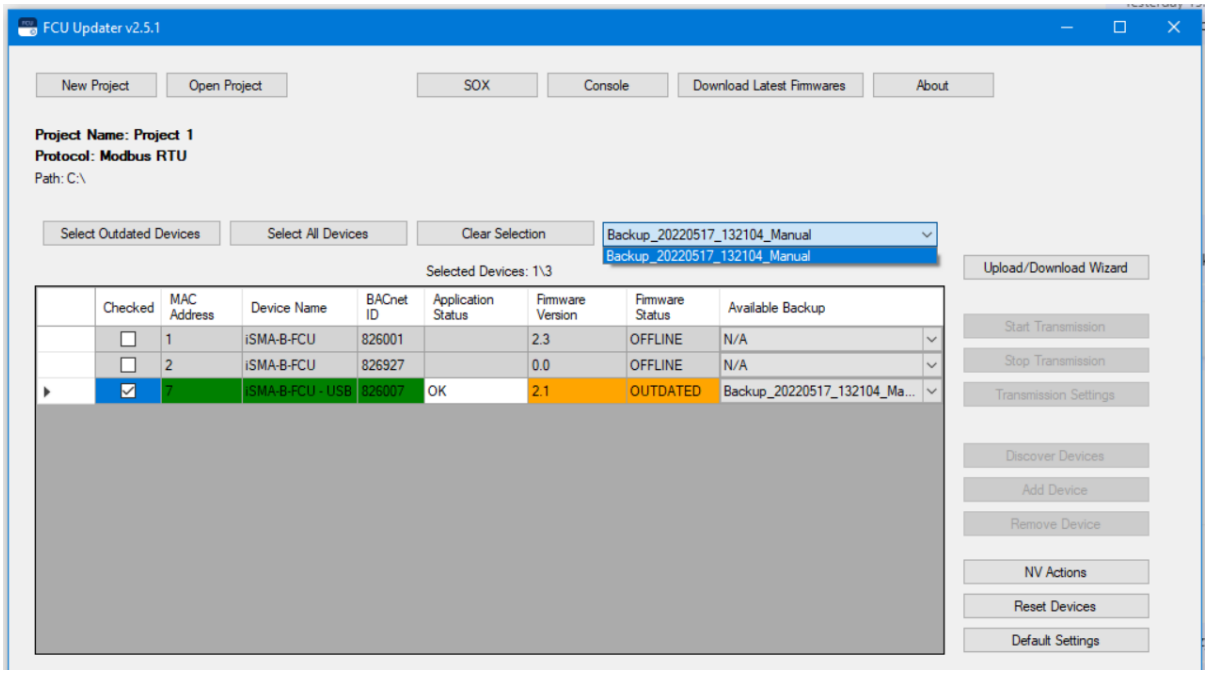


Figure 42. Defining backups for restore process

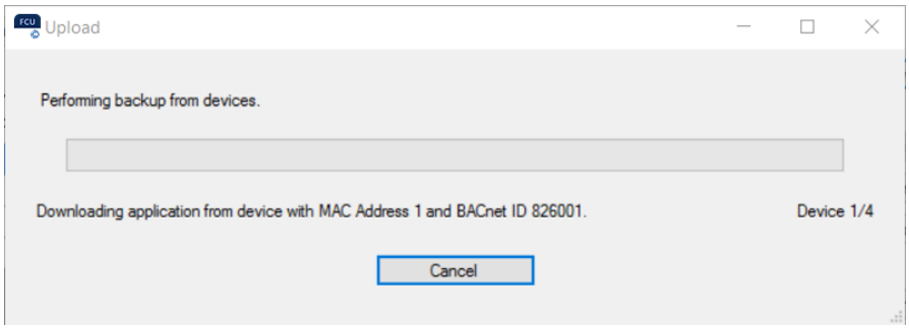


Figure 43. Performing backup on upload

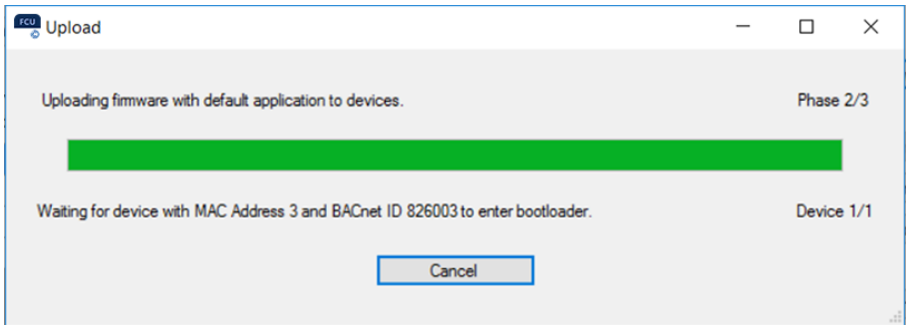


Figure 44. Uploading firmware

When the process finishes, the confirmation box pops up showing all phases and devices. The user can view the log to verify if the required job has been executed on all selected devices successfully.

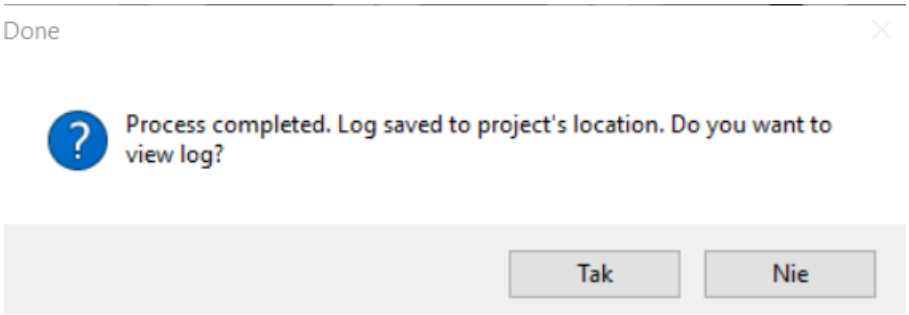


Figure 45. Confirmation dialog window upon upload/download

13 Restarting Devices

Restarting the device should be the first action that user does in case of problems with the controller or application functionality in general. The restarting procedure forces the application to start execution of the program from the beginning and initiates reading raw values for inputs.

Note: It is recommended to restart the application before contacting technical support.

Restarting the selected device or multiple devices by pressing the Reset Devices button sends a special request by the Modbus or BACnet network or by USB (if the controller is connected directly). If the device receives the request, it processes the restart, and the FCU Updater shows the driver status as offline for a moment.

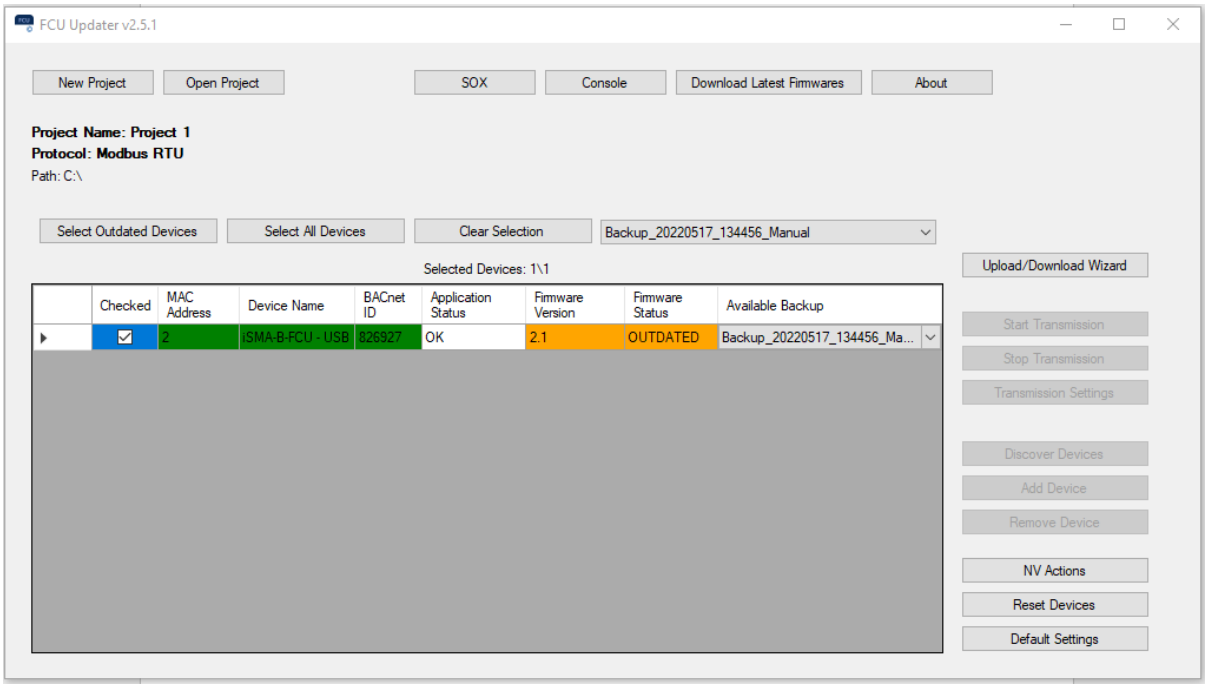


Figure 46. Restarting devices

14 Default Settings

The Default Settings button sets all selected controllers parameters to their initial (default) values. In application, all NV parameters are set to their default values. All communication settings that are not configured by DIP switches are set to their default values as well. For example, RS485 communication parameters are set to the following parameters:

- for the iSMA-B-FCU controller, the COM1 is set to data bits - 8, parity bits - 0, stop bits - 1;
- for the iSMA-B-FCU controller, the COM2 is set to data bits - 8, parity bits - 0, stop bits - 1, baud rate - 115200, Modbus protocol type - 0.

Note: It is recommended to restore the default settings in following cases:

- the controlled physical object has been replaced,
- the role of controller in the network has been changed in regards to the master-slave configuration,
- the application does not work as presumed and restarting the application with its default parameters could help.

To perform the set to default action, select one device or multiple devices and press the Default Settings button. The FCU Updater sends a special request by the Modbus or BACnet network or by USB (if the controller is connected directly). When the device receives the request, it processes it, and the FCU Updater shows the device status as offline for a moment.

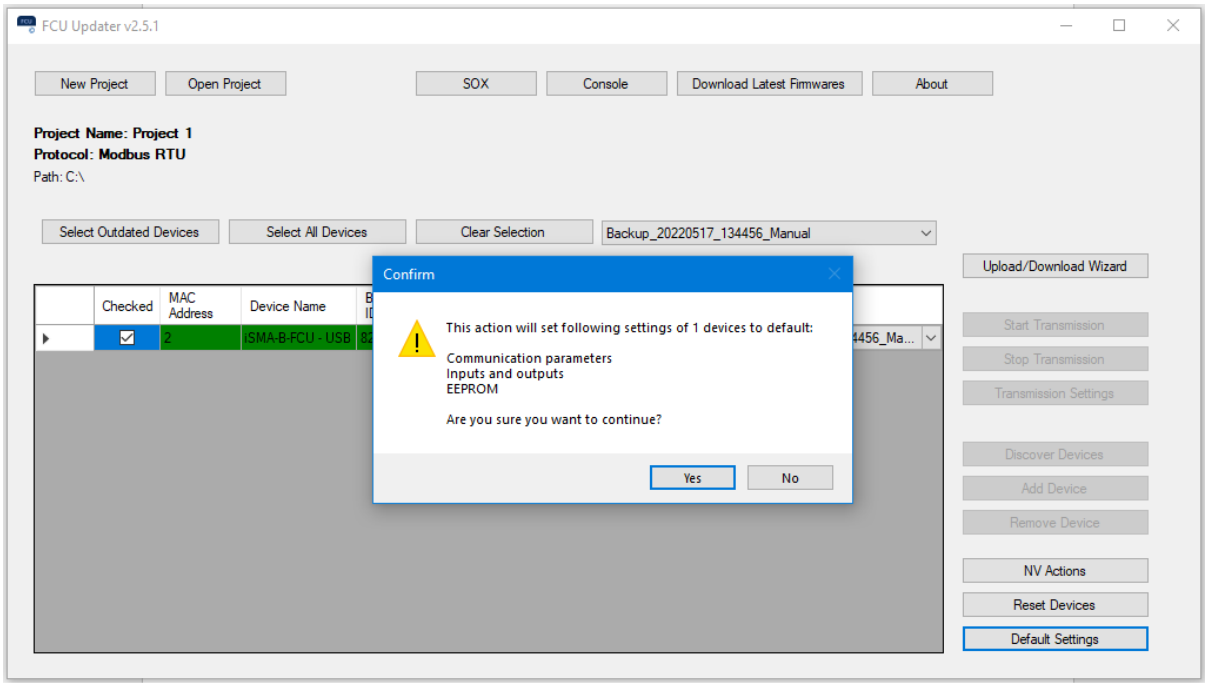


Figure 47. Default settings

15 Connecting FCU Updater to Physical Device or Bus

The FCU Updater is a software that runs under Windows operating system and transmits data to iSMA-B-FCU controllers or iSMA-B-LP/Touch Point panel. In both cases, the FCU Updater uses a COM port for communication. There are two ways of connecting to the device/s: the direct way by USB cable to only one device or the whole RS485 bus network to multiple devices.

Note: The FCU Updater allows for only one type of connection at a time. The user can setup the direct connection by USB cable or make the RS485 connection to the whole network. Parallel connections through the direct USB cable and by the RS485 bus are not allowed.

Note: It is not allowed to interrupt any process performed by the FCU Updater, like transferring data to/from device/s by connecting or disconnecting communication cable.

15.1 Direct Connection with USB Cable

Both iSMA-B-FCU controller and the iSMA-B-LP/Touch Point panel have a mini USB slot on the housing. The mini USB slot can be connected to the PC with the FCU Updater software running by the mini USB-USB cable.

After directly connecting the controller or the panel to the PC, the system automatically recognizes the attached device and shows it in the main table assuming a project is already opened. No particular communication settings are required for setting transmission parameters or starting the transmission. The system marked the device in the list with the green background in its line.

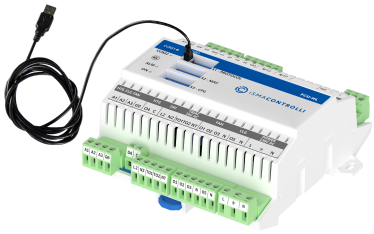


Figure 48. FCU controller panel USB connection

Figure 49. iSMA-B-LP panel USB connection

Figure 50. Touch Point panel USB connection

Note: All available operations included in this manual such as upload, backup, restore, reset and set to default, are only to be executed by the connected device. The user cannot select another controller from the table as long as a direct connection setup is being performed.

Note: The direct connection by USB cable can only be setup to one device at the time.To end the direct link simply disconnect the cable. The device being disconnected is automatically added to the list of devices.

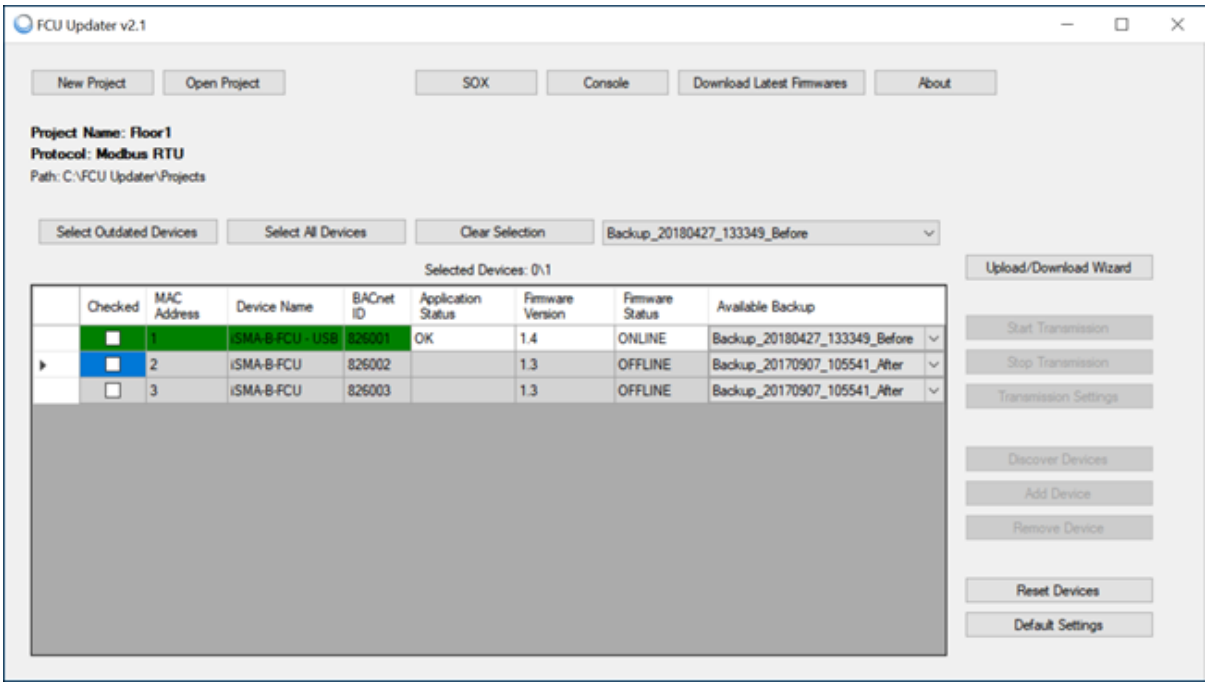


Figure 51. Directly USB connected device (green background)

15.2 Connection to RS485 Bus

Connecting the FCU Updater to the RS485 bus is recommended on a site where all devices are linked together. The RS485 network needs to be connected to the PC with the FCU Updater software running. If the PC is not equipped with the RS485 communication port, a converter is required. iSMA CONTROLLI recommends using iSMA-B-CVT-RS485, sold separately.

Figure 52. An RS485 converter

Note: Before connecting the PC to the FCU Updater running on the RS485 network, it is recommended to disconnect a master controller. The next step is to connect the PC via the RS485 converter (if required) and run the FCU Updater. After this, the new project needs to be opened or created. When done, set up all required transmission settings, and the transmission will start. The transmission settings for the Modbus and BACnet protocols are described below.

Note: Once operation with the FCU Updater is finished, please remember to disconnect the PC from the RS485 network and reconnect the master unit.

Depending on the chosen protocol, the following transmission settings are required:

For BACnet communication protocol

- COM Port: select the COM port used for the BACnet MS/TP communication, which the RS485 bus is attached to;
- Baud rate: select baud rate for communication;
- Software Device ID: set the BACnet ID of the local PC–it must be different from ones for the other devices connected to BACnet bus;
- BACnet File Transfer Speed: select the file transfer speed; three modes are available: slow, normal, and fast. Depending on the number of the device on the bus and the quality of communication it is possible to select the most appropriate transfer speed to avoid errors during file transfer.

For Modbus communication protocol

- COM Port**:** select the COM port used for the Modbus RTU communication, which the RS485 bus is attached to;
- Baud rate: select the baud rate for communication;
- Parity Bits: define parity bits; available options: None, Even, Odd.

Note: In order to improve the Modbus RTU or BACnet MS/TP communication, which is especially important for the 9600 baud rate, the following settings should be changed in the converter driver (accessed: Device Manager -> USB Serial Port -> Settings - > Advanced):

- Serial enumerator: set to off;
- Delay time: set to 1 ms.

16 Manage Bootloader State on Controller

In some circumstances, the controller can get to the state of bootloader. This state can happen if the firmware has not been transferred successfully to the device due to any interruption, like disconnecting transmission cable or power failure. In the bootloader state, the controller can not operate properly, and its application is not executed either. To return the controller to normal operation, the FCU Updater needs to upload the latest firmware without touching the existing application. This process can be achieved by the Modbus or BACnet network or directly by the USB cable. In both cases, the newest firmware will be transferred to the controller in the bootloader state.

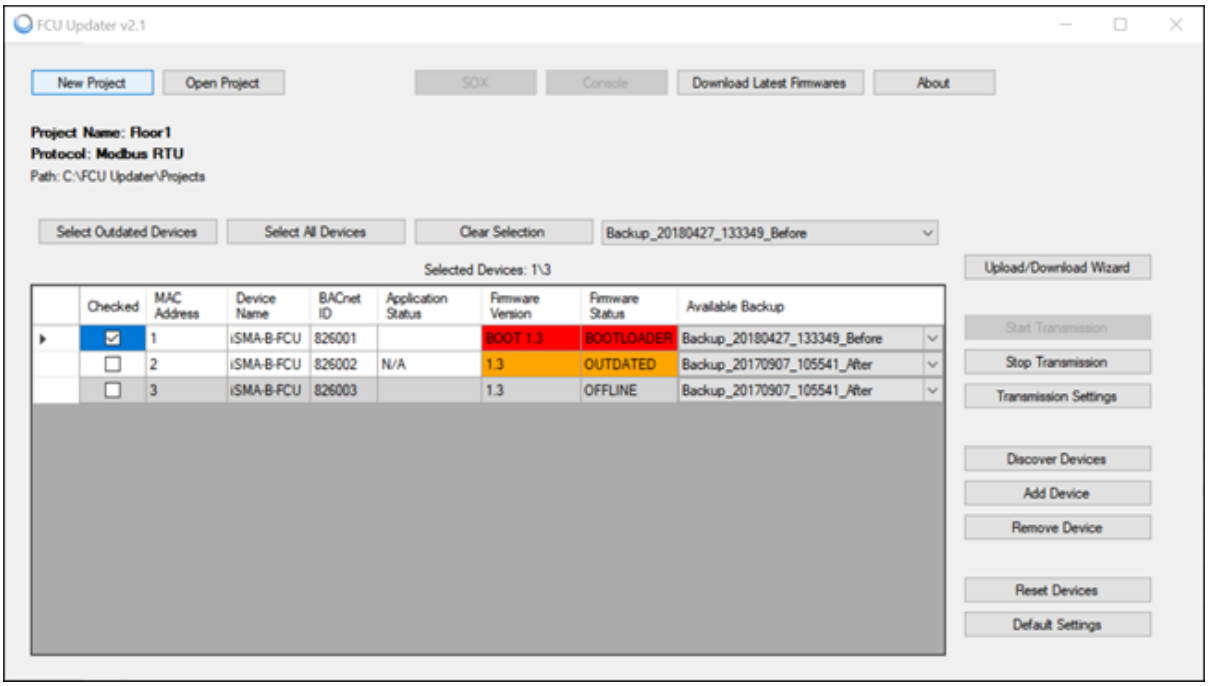


Figure 53. One of controllers in a bootloader state

If the iSMA-B-FCU controller is connected directly by USB cable, and the FCU Updater recognizes its bootloader state, then the following dialog window appears.

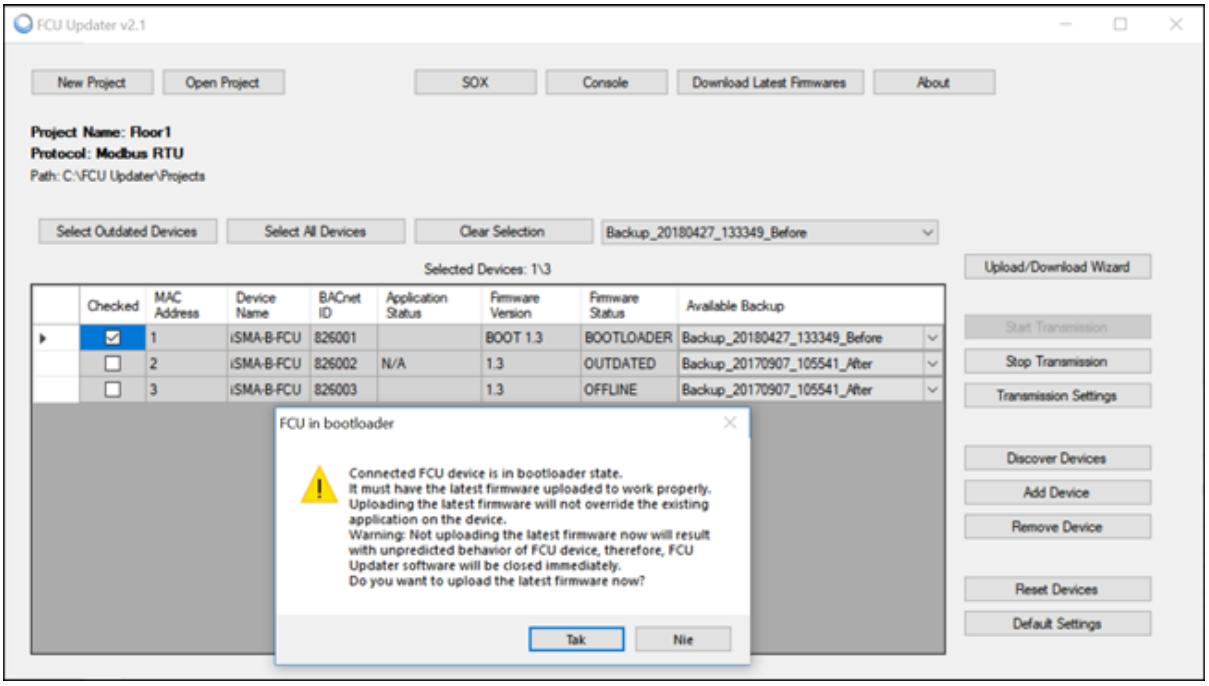


Figure 54. The FCU Updater recognizes a bootloader state in one controller

Pressing the Yes button starts upload of the latest firmware to the controller to return the controller to normal operation.

Choosing the No button closes the FCU Updater because further work with the controller in the bootloader state will result in unpredicted behaviors, which cannot be properly controlled by the FCU Updater.

17 SOX Protocol

The SOX function allows programming of the iSMA-B-FCU controller online (real-time). The controller must be connected directly via the USB cable as described above. The SOX button is always enabled each time the USB cable is connected directly to the iSMA-B-FCU controller, and, moreover, opening of any project is not required.

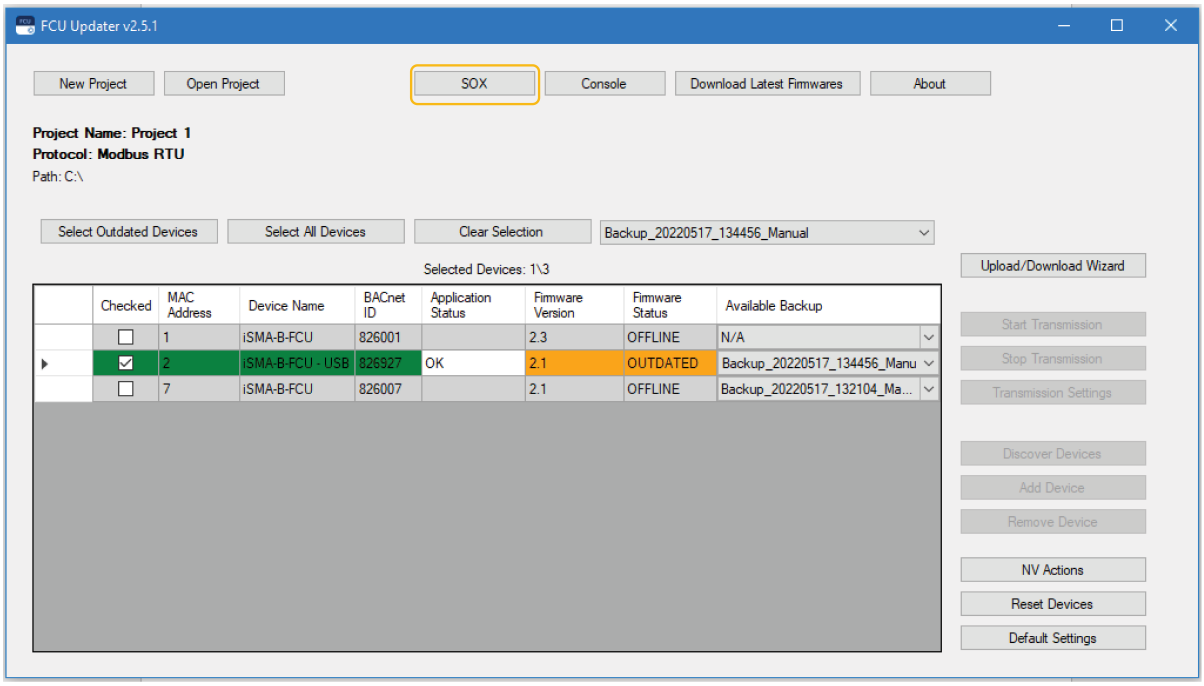


Figure 55. Opening the SOX protocol

The SOX button guides the user to the next window, where the SOX protocol can be started by pressing the Begin Communication button. After starting the communication to the connected controller, the user can edit or build the application inside the iSMA-B-FCU controller by using the iSMA Tool software.

The SOX window has the following communication parameters:

- Port: port number (usually 1876) used by SOX protocol;
- Begin Communication button: start SOX communication. It is recommended to open SOX communication with the iSMA-B_FCU controller before running the WorkPlace software.

Stop Communication button: stop SOX communication.

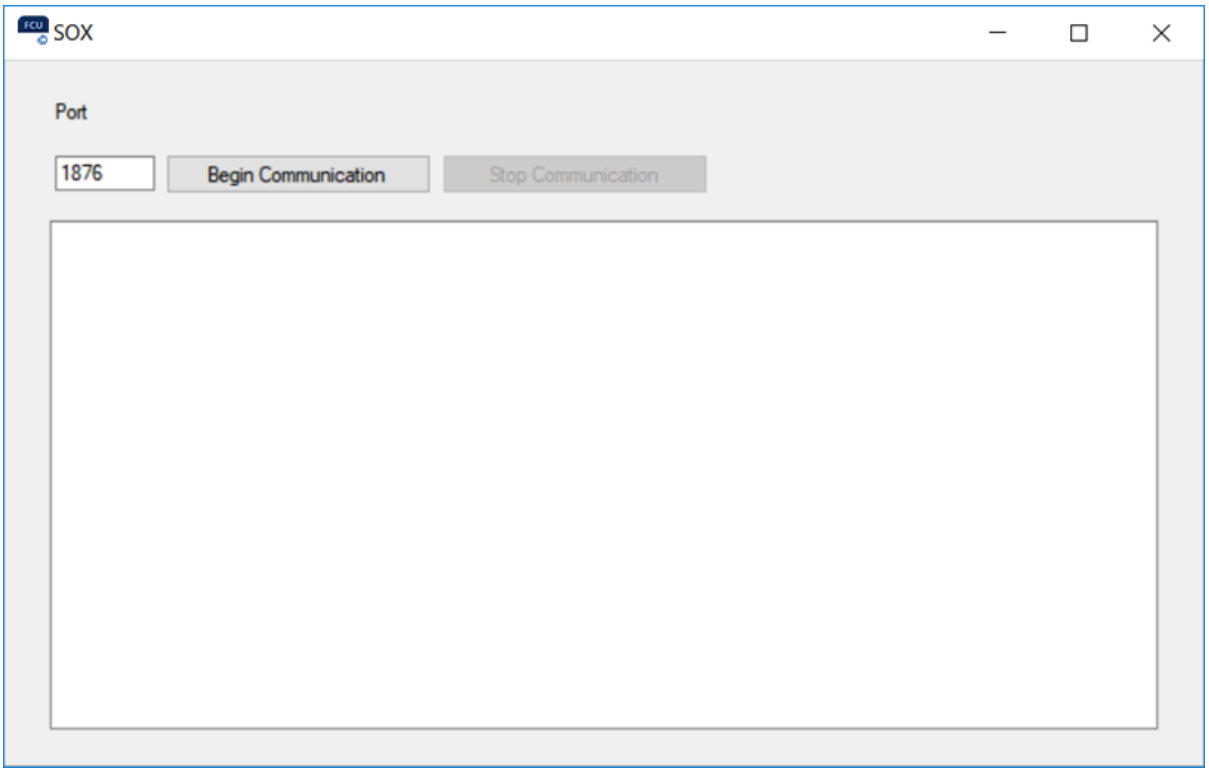


Figure 56. The SOX protocol console

Note: Only one instance of the SOX Protocol console can be opened at a time. If the SOX button in the main application window is disabled, the SOX Protocol console has been already opened, and probably it is hidden somewhere under other windows on the user's screen.

18 Console

The console allows viewing internal system logs of the directly connected iSMA-B-FCU device. The console can only be used, if the device is connected to the PC directly by the USB cable even without opening any project.

To open the console, connect the iSMA-B-FCU device to the PC using the USB cable as shown above, and press the Console button. The new console window appears listing the iSMA-B-FCU controllers internal logs.

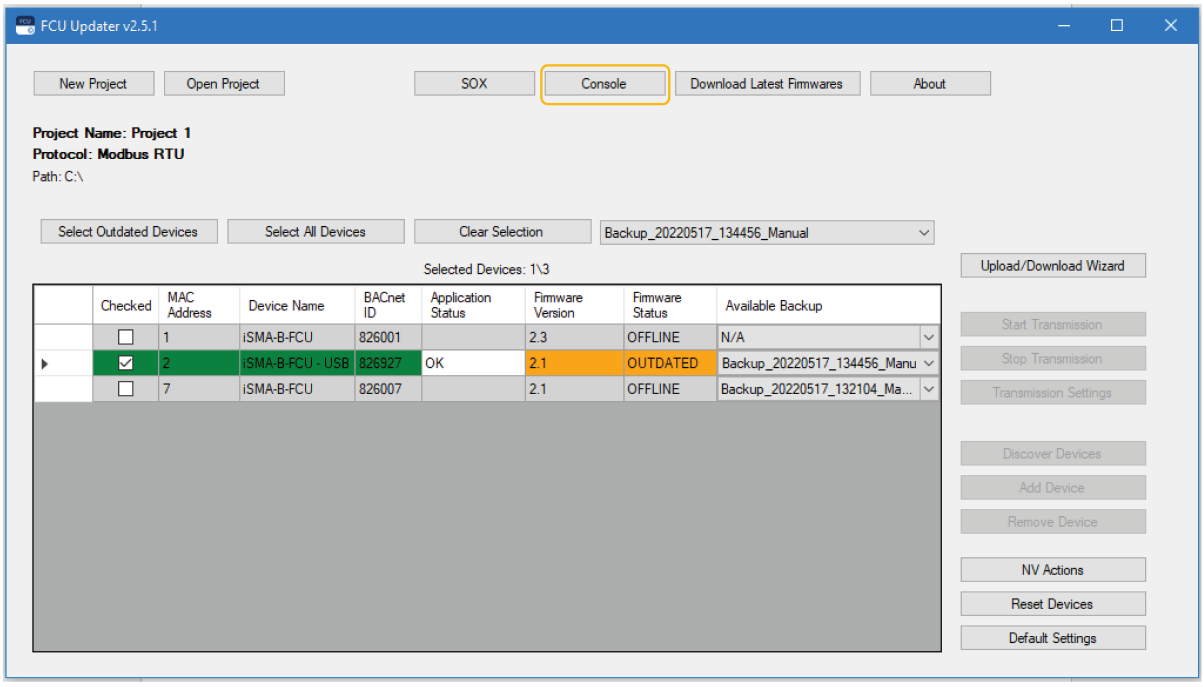


Figure 57. Opening the console logs

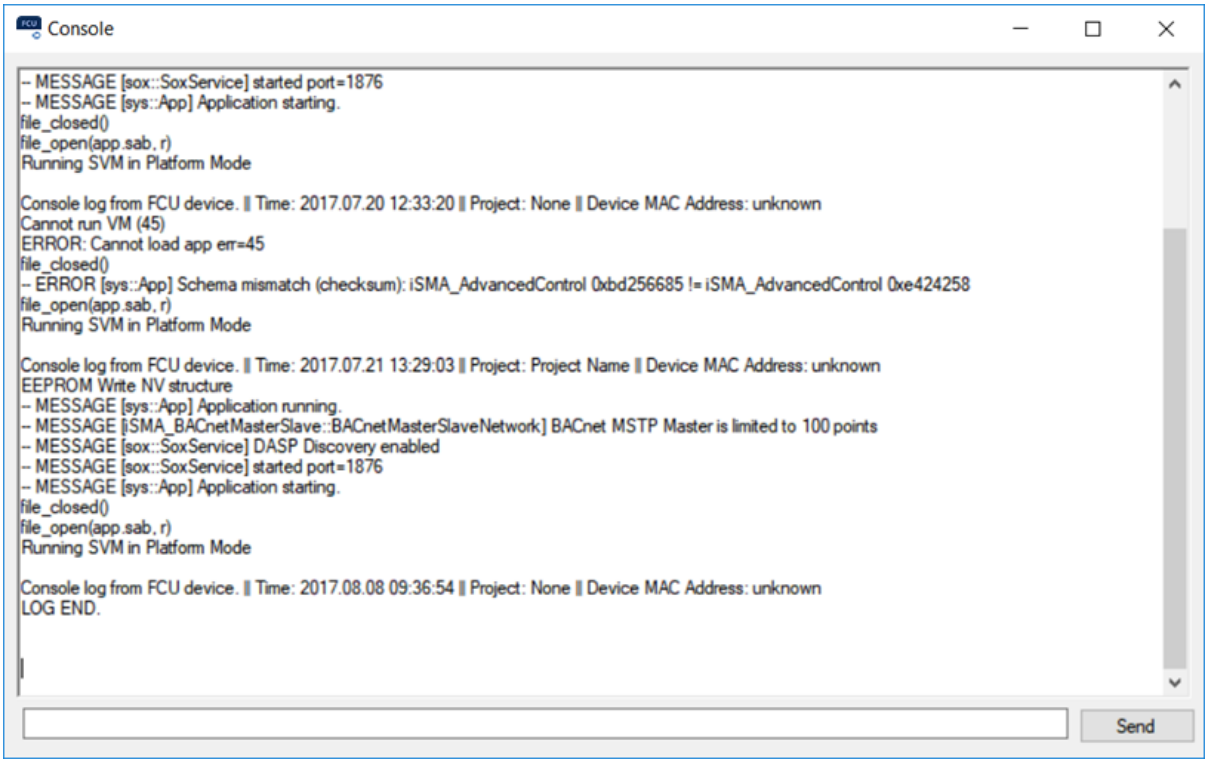


Figure 58. The console with internal logs

Note: Only one instance of the console can be opened at a time. If the Console button on main application window is disabled, it is because the console has been already opened and probably it is hidden somewhere under other windows on the user's screen.