FirmwareFlasher V2-1 Software Manual

Starting the software …

After installation, the software can be started by clicking on the Startmenu entry at **_Start_ →**
FirmwareFlasher V2.1.x → _FirmwareFlasher V2.1.x_ (where 'x' denotes the Revision Number of the
installed software version).
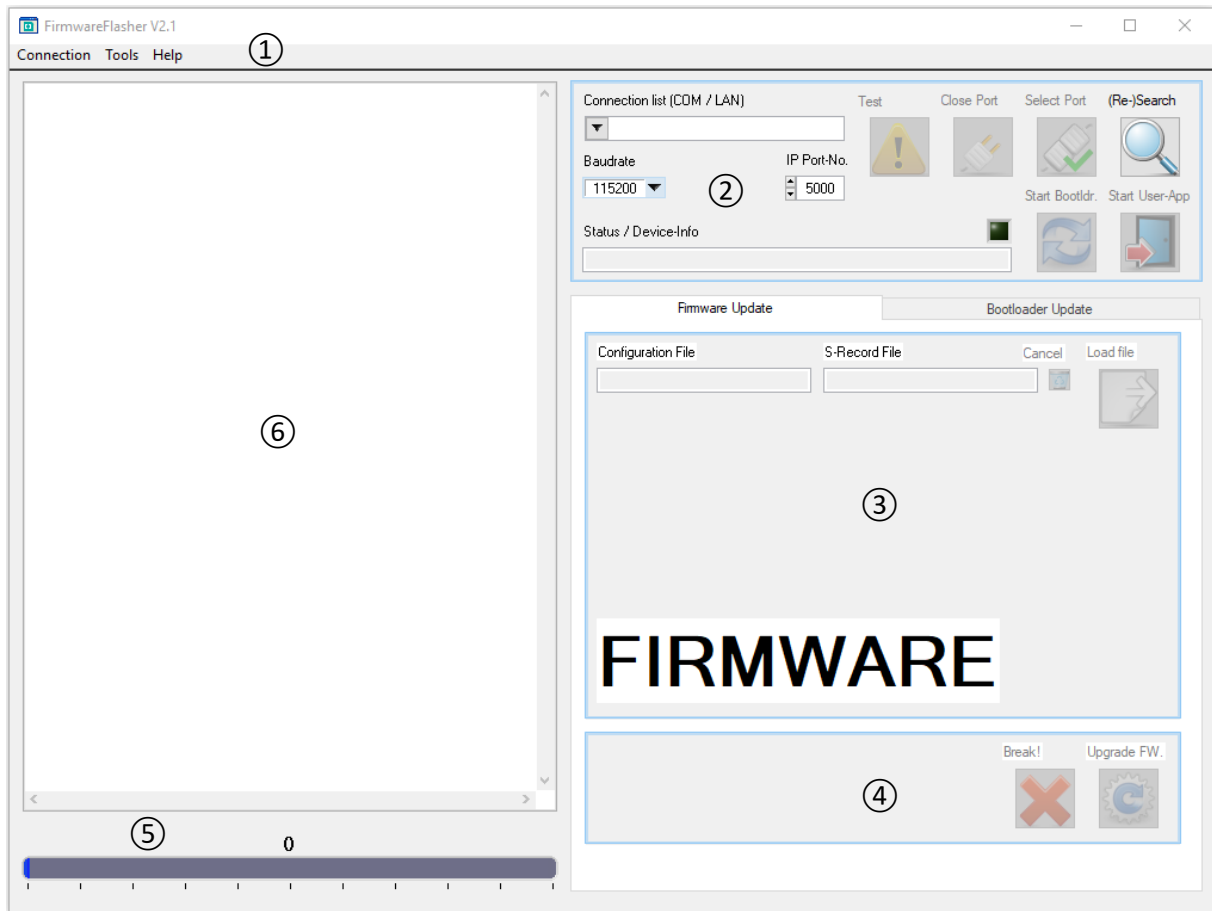
Located at the top is the **menubar** ① offering access – among other functions – to this helpfile.
Going clockwise, below the menubar to the right is the **connection settings block** ② where the
physical connection to the device that is to be upgraded can be set and selected. Below the
connection settings block is the **firmware settings block** ③ where organized in individual tabs for
different purposes, like updating the firmware or updating the devices bootloader, the S-RECORD file
that is to be burned to the device can be selected. The update process itself is started (and aborted)
in the **update control block** ④ in the lower right part of the GUI. Here – after setting the connection
parameter and selecting the firmware to load – the user initiates the download, which proceeds
without further user interaction. The **progress bar** ⑤ and the **console window** ⑥ offer detailed
information about the operation progress while downloading the new firmware. The console window
also lists those devices, that could be identified after running a search for available devices.

Searching and connecting to a device …

The first step in any update procedure consists of setting the communication parameter (port number, IP address, baudrate) to be used in the subsequent download.

By clicking on the **(Re-)Search** ⑦ button in the **connection settings block** ② the FirmwareFlasher software will attempt to find and identify any devices connected to the PC running the software.
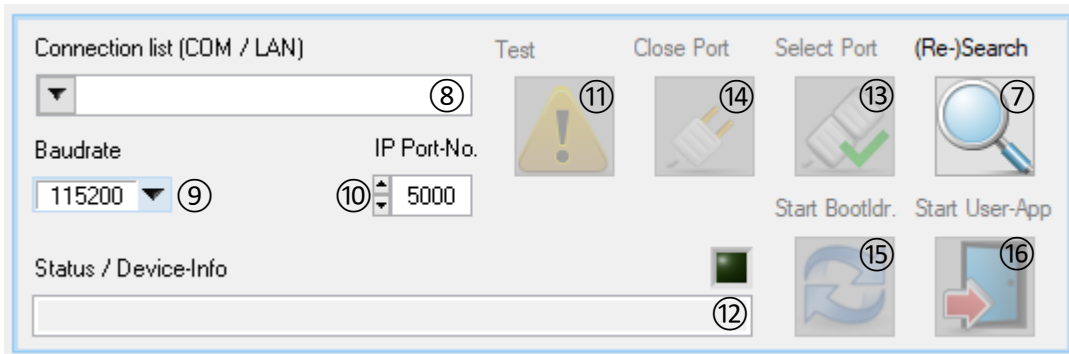
The findings of this search are entered in the **connection list select box** ⑧ as well as the **console window** ⑥. *If* the device that is to be upgraded has been successfully identified, the user may left-click on the entry within the console window. Then the selected device's communication parameters are automatically entered in the connection list select box (its IP address or COM port number), the **baudrate dropdown list** ⑨ and/or the **IP port number field** ⑩.
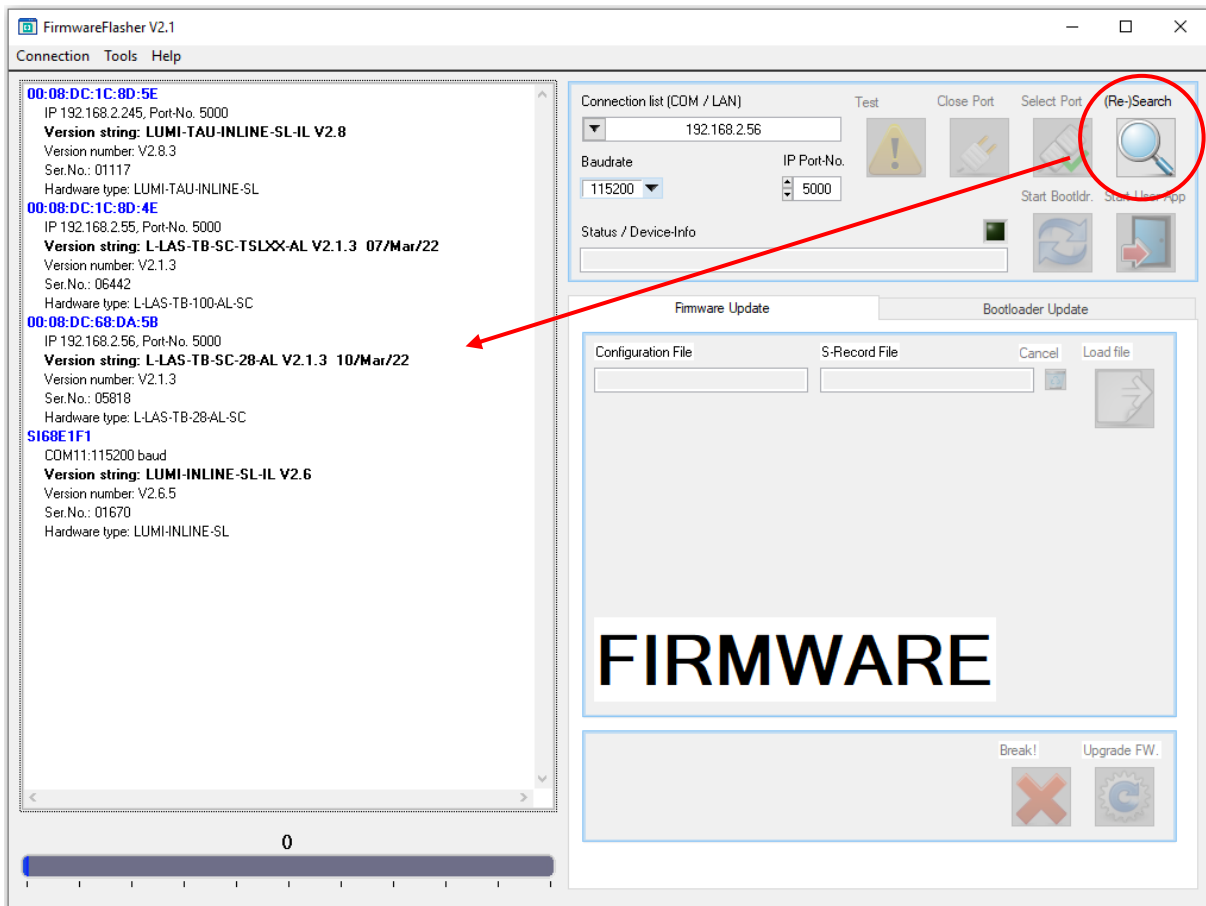
In this example the user left-clicks on the first list-entry in the **console window** ⑥. The list-entry is highlighted and the communication parameters (in this case the device is connected by TCP/IP with IP address '192.168.2.245' and IP port-number '5000' – as can be seen in the first indented line below the list-entry's title) are automatically entered into the **connection list select box** ⑧ and the **IP port number field** ⑩.
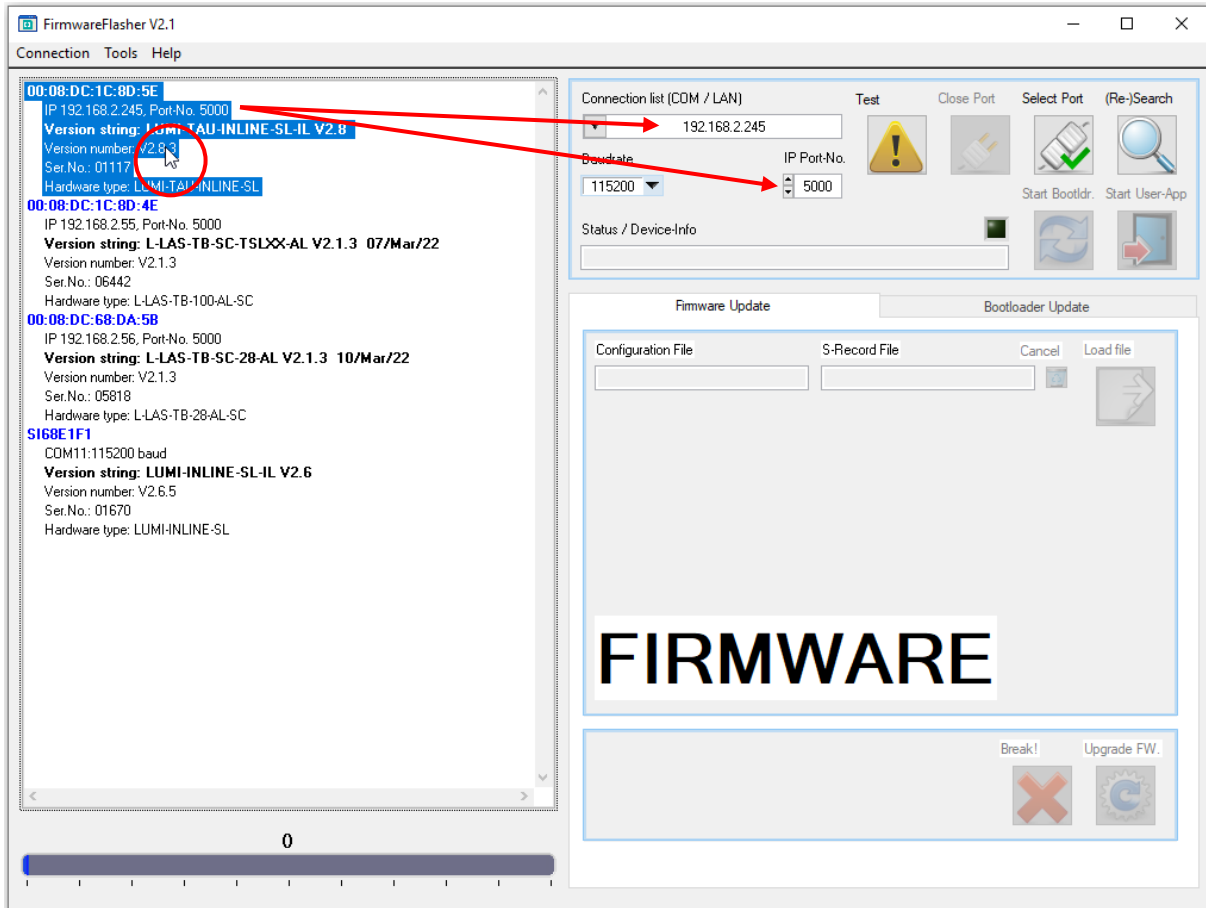

If the desired device to be upgraded is not listed in the **console window** ⑥ (i.e. could not be identified successfully) the user may force certain connection parameter manually. To that purpose either *IP address and IP port number* or *COM port number and baudrate* need to be entered correctly into the corresponding GUI elements.

It is advisable to initiate a search for connected devices via clicking on the **(Re-)Search** ⑦ button before setting the communication parameters. The search operation finds and lists all physical COM ports, virtual COM ports (as provided by RS232-to-USB converters) and TCP/IP server ports (as provided by RS232-to-Ethernet adapters) – irrespective of whether the connected device at this port is successfully identified or not. That way whichever connection is selected is confirmed to be physically present and actually available. All findings are entered in the **connection list select box** ⑧. To select one of those, left-click on the select box to open it and subsequently select one entry by left clicking on it.
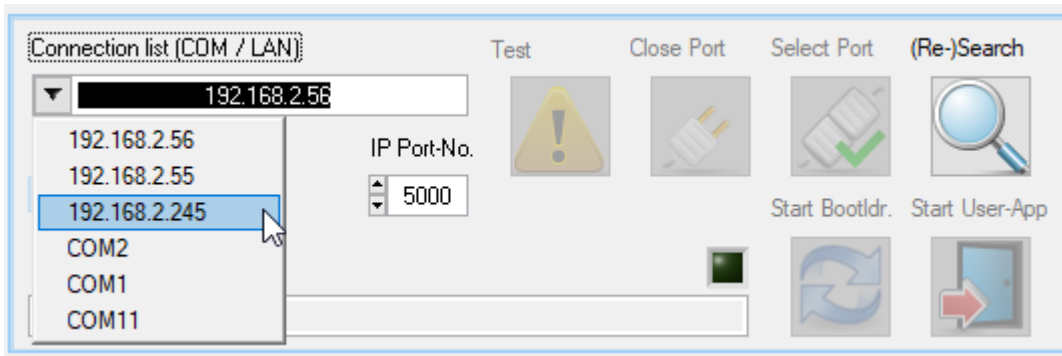
Enter the desired baudrate (for connections via physical or virtual COM ports) by left-clicking on the **baudrate dropdown list** ⑨ and selecting the desired baudrate with the mouse. For TCP/IP based connections, enter the IP port number by left-clicking on the **IP port number field** ⑩ and typing the port number with the keyboard.
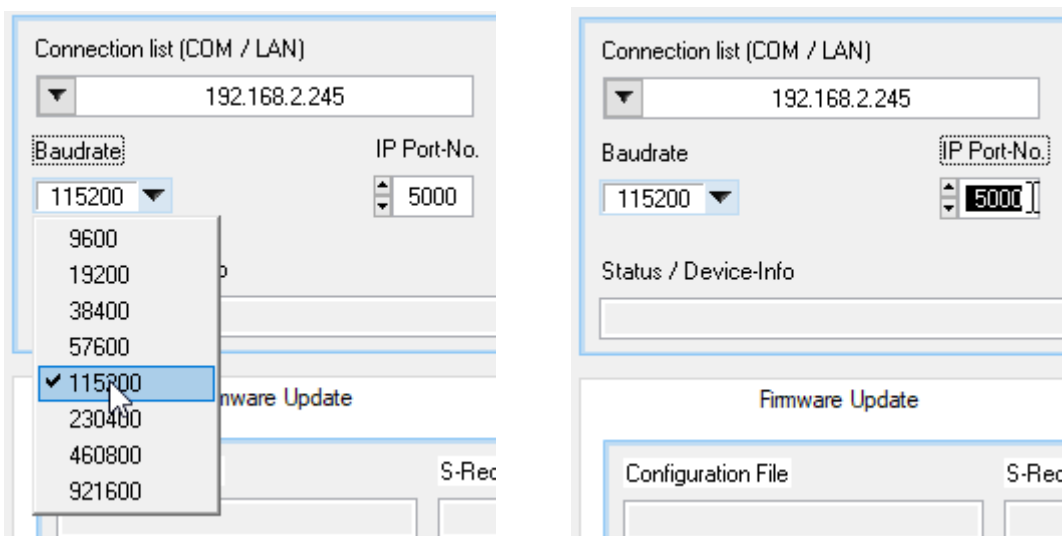
In rare and unusual cases where the desired connection is known and *not listed* in the **connection list select box** ⑧ at all, the user may enter a new IP address or COM port number to the list manually. To that purpose left-click on the select box and select the current entry with the mouse or by

pressing ⎇Ctrl + Ⓐ. Then type the IP address using the keyboard subdividing each octet using a 'dot' for a TCP/IP type connection. For a physical or virtual COM port type the COM port number either as a number (no letters), or as a lower-case or uppercase version of 'COMnnn' where 'nnn' is the COM port number without leading zeros.
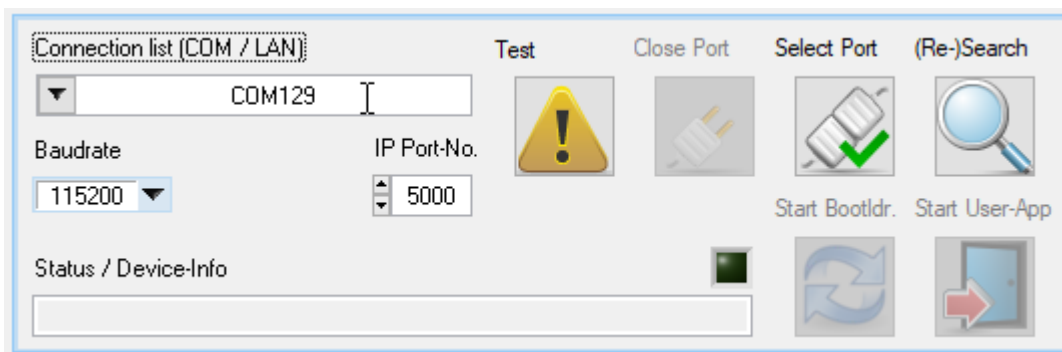
After setting the connections, the user can either confirm using these setting right away by clicking on the **Select Port** ⑬ button or test the settings beforehand by clicking the **Test** ⑪. If the latter is carried out, the FirmwareFlasher software will attempt to connect to the device, read firmware-version, firmware-type and serial number and display all in the **Status / Device Info box** ⑫.
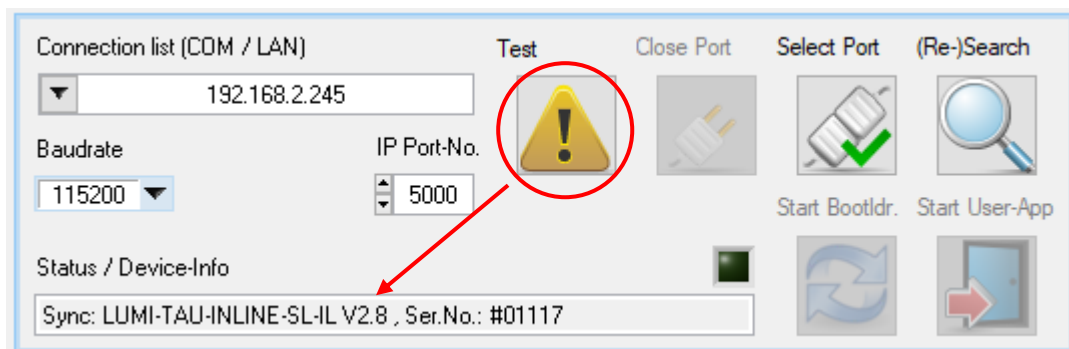
The buttons **Start Bootldr.** ⑮ and **Start User-App** ⑯ are only available once the communication settings are confirmed by clicking the **Select Port** ⑬ button. Their purpose is to switch between the user-app and the bootloader-app running on the device.

Close Port ⑭ is equally only available if the communication settings have previously been confirmed and allow the user to select another connection.

Note:

The current version V2.1 of the FirmwareFlasher requires the baudrate configured within the user-app to be the <u>same</u> (!) as the baudrate configured within the bootloader-app. Since the baudrate of the bootloader-app can currently not be changed, the user is required to change the user-app baudrate to match that of the bootloader-app <u>before attempting to enact a firmware download</u>. If not otherwise specified, the bootloader-app's baudrate is set to 115200 baud.

Please consult the device manual on how to change the device's baudrate.

Loading new user-app firmware …

Once the communication settings to the device have been confirmed, the **firmware settings block** ③ becomes available and allows the user to select the firmware-file to be downloaded.

Firmware files will be provided by the devices distributor and are usually compressed files in *.zip format. Those *.zip files usually consist of one S-RECORD file (*.s) that is the actual firmware and one configuration file (*.ini) that contains device specific settings for the FirmwareFlasher software. The complete content of the *.zip file needs to be extracted to the same directory before attempting to enact a firmware download.

Once the firmware-files are prepared, click **Load file** ⑰ and navigate in the file-select popup window to the directory containing the provided firmware files.

If the provided firmware-files contain a configuration file, search for the *.ini file and click on in. Click *Load* to select the file.
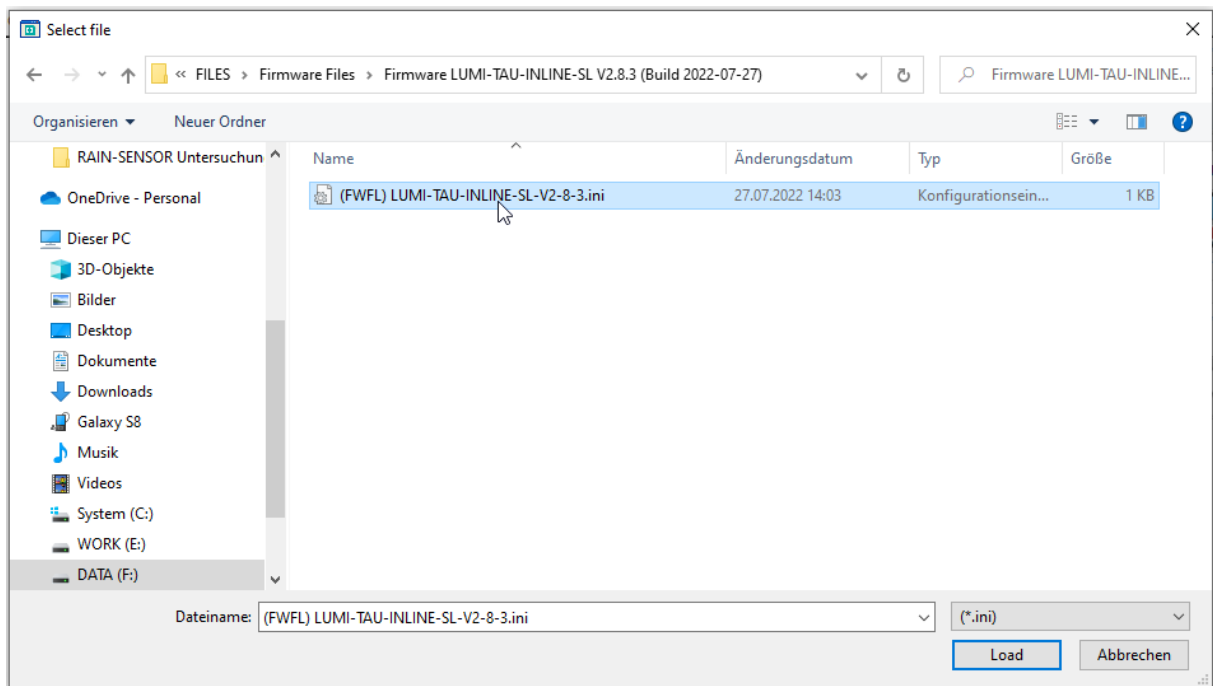
If the provided firmware-files *do not contain a configuration file*, left-click on the file type filter in the lower right corner and select "*.s" to display the S-RECORD type files within the folder.
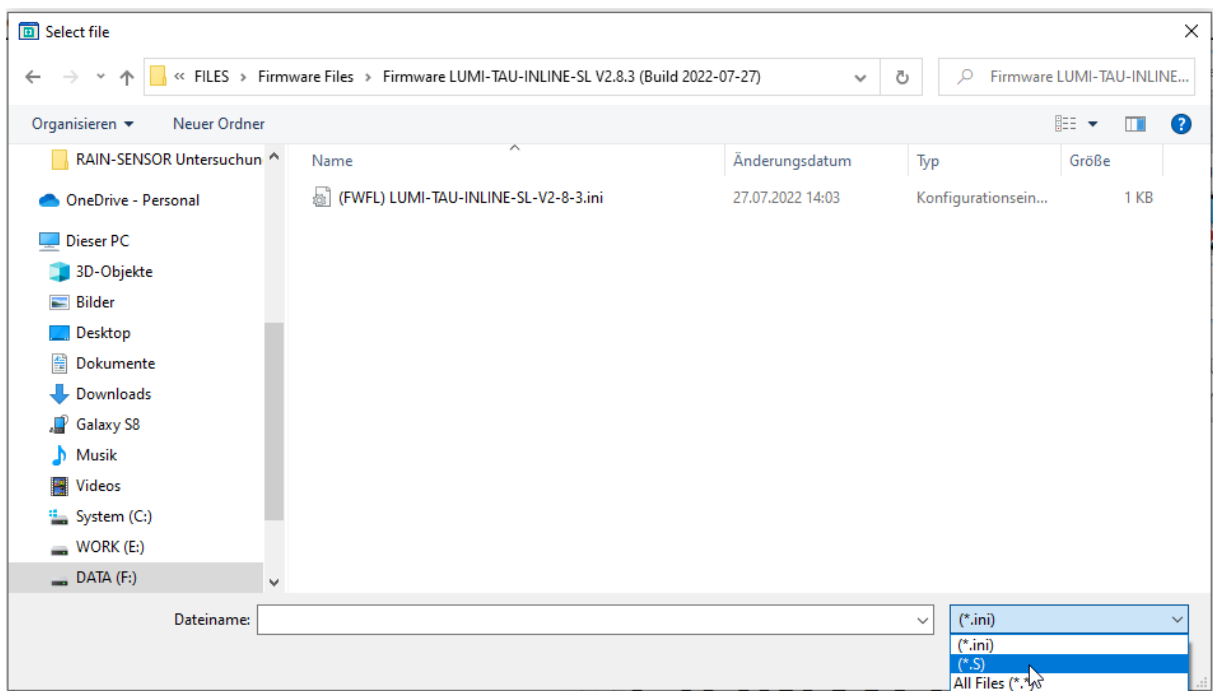
Then select the S-RECORD file and click *Load* to choose the firmware-file directly.
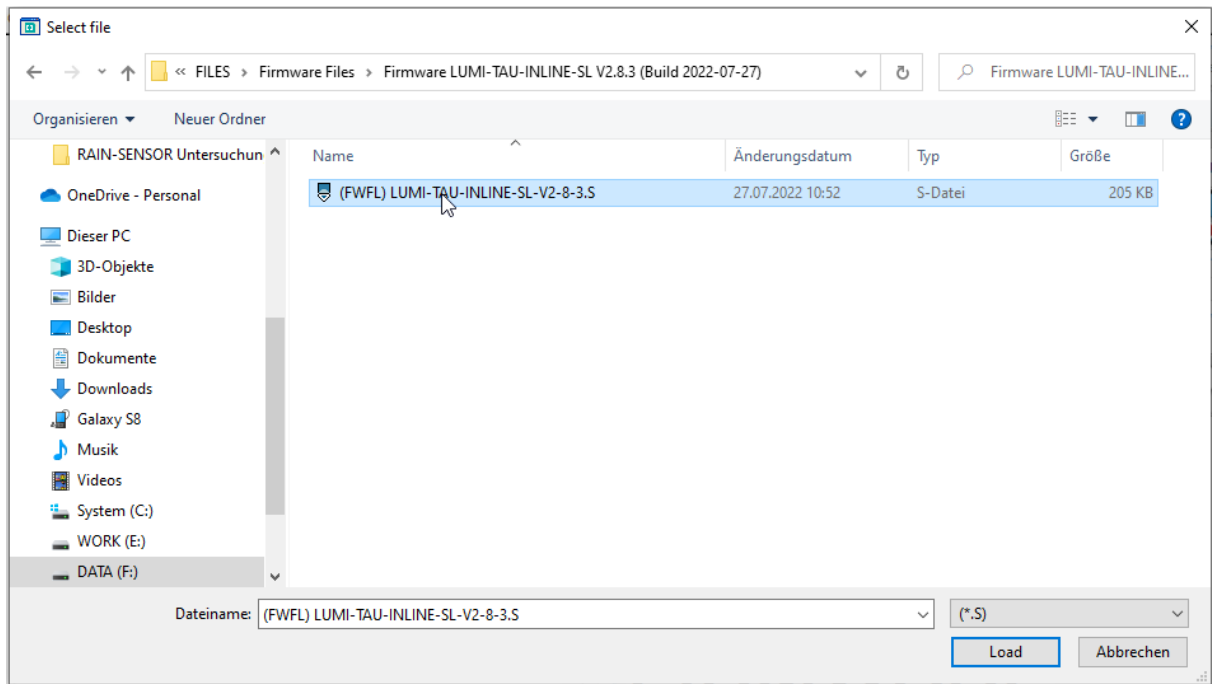
The FirmwareFlasher software tests the selected S-RECORD file for errors and – if successful – displays a confirmation within the **console window** ⑥. The button **Upgrade FW.** is subsequently enabled.
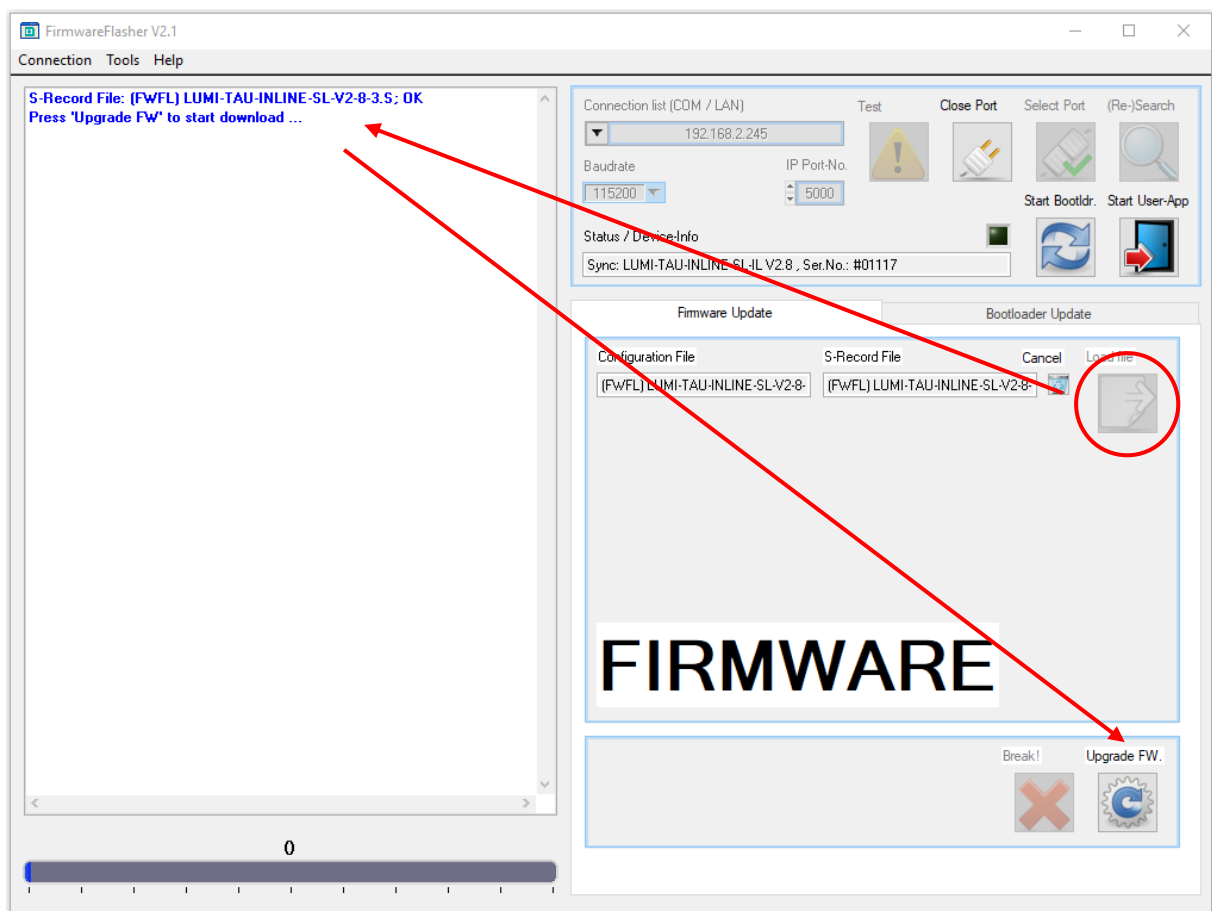
In case the selected firmware is incorrect or was not selected on purpose, click on **Cancel** ⑳ to clear the selection of **Configuration File** ⑱ and/or **S-Record File** ⑲ and repeat the selection process.

Loading new bootloader firmware …

The designation "bootloader" is used for a special kind of firmware running on the devices micro-controller whose purpose is the replacement of the user-app – the actual programming of the device, carrying out the device's main operation – by newer versions thereof. The bootloader normally resides inactive in a special memory segment separated from the user-apps memory. If required the user-app hands over control of the micro-controller to the bootloader app, which then communicates with a special PC software – the FirmwareFlasher software – to load and replace the user-app firmware with a newer one.

With continues development and care for the bootloader app it may become necessary to replace the bootloader-firmware itself, since new features may have been implemented or bug-fixes carried out. To do that, within the user-app certain commands have been implemented (a small subset of the features of the bootloader itself) which enables the user-app to replace the bootloader-firmware.

The process of upgrading the bootloader within a device is identical to the procedure of upgrading the firmware. In case of a bootloader upgrade, the firmware is provided as a S-RECORD file only (no configuration file). The latest version of the bootloader can be found within the installation directory of the FirmwareFlasher software on the PC.

Note:

Please consult with the distributor of device to determine whether or not a bootloader upgrade is necessary and which bootloader firmware to use!
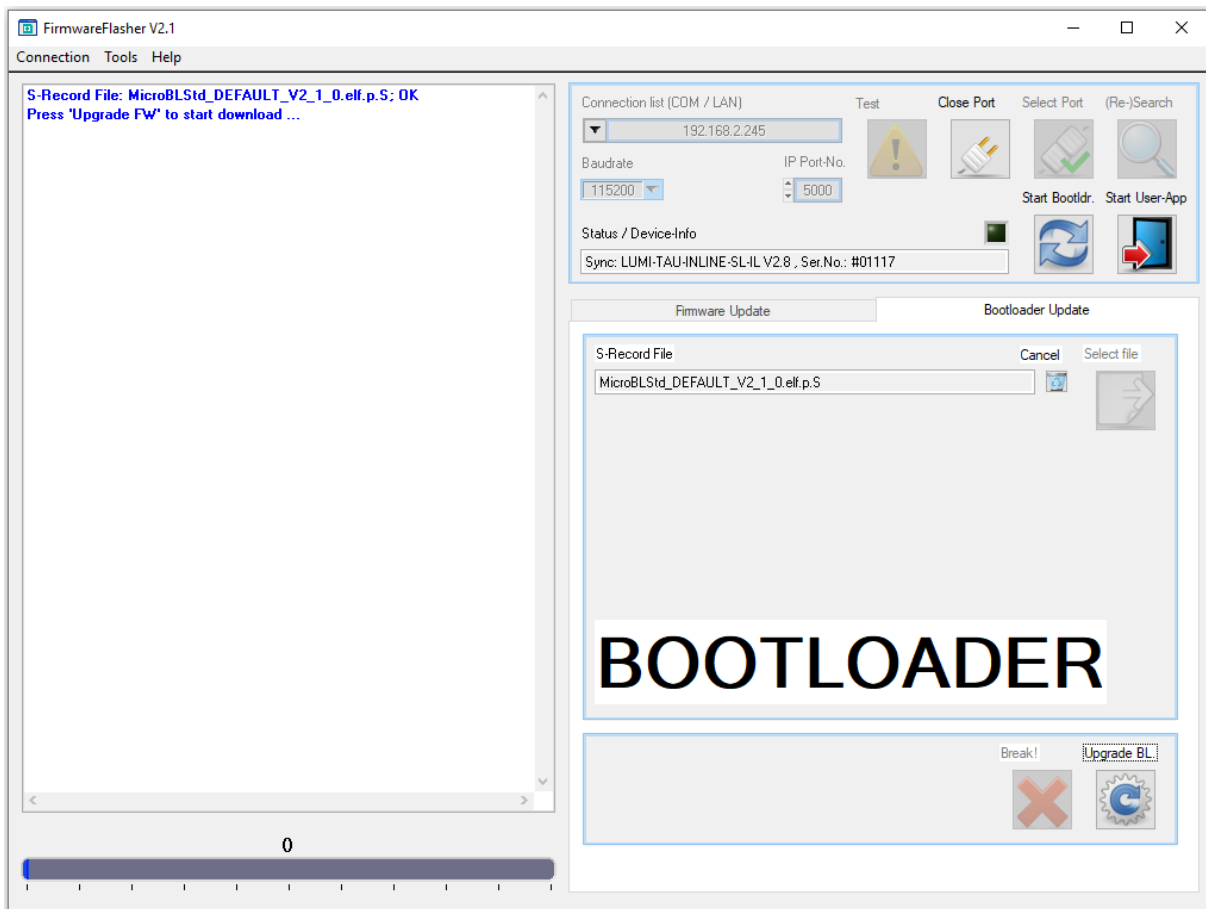
Performing the download …

The button **Upgrade FW.** (or **Upgrade BL.** for the update of the bootloader-app) is available only in the last stage of the process (after connection to the device is configured and the file to be downloaded is selected). To start the download, left-click on the button. The **console window** ⑥ continuously updates and shows information about the current download, while the **progress bar** ⑤ shows an estimate of how much data has already been transferred.
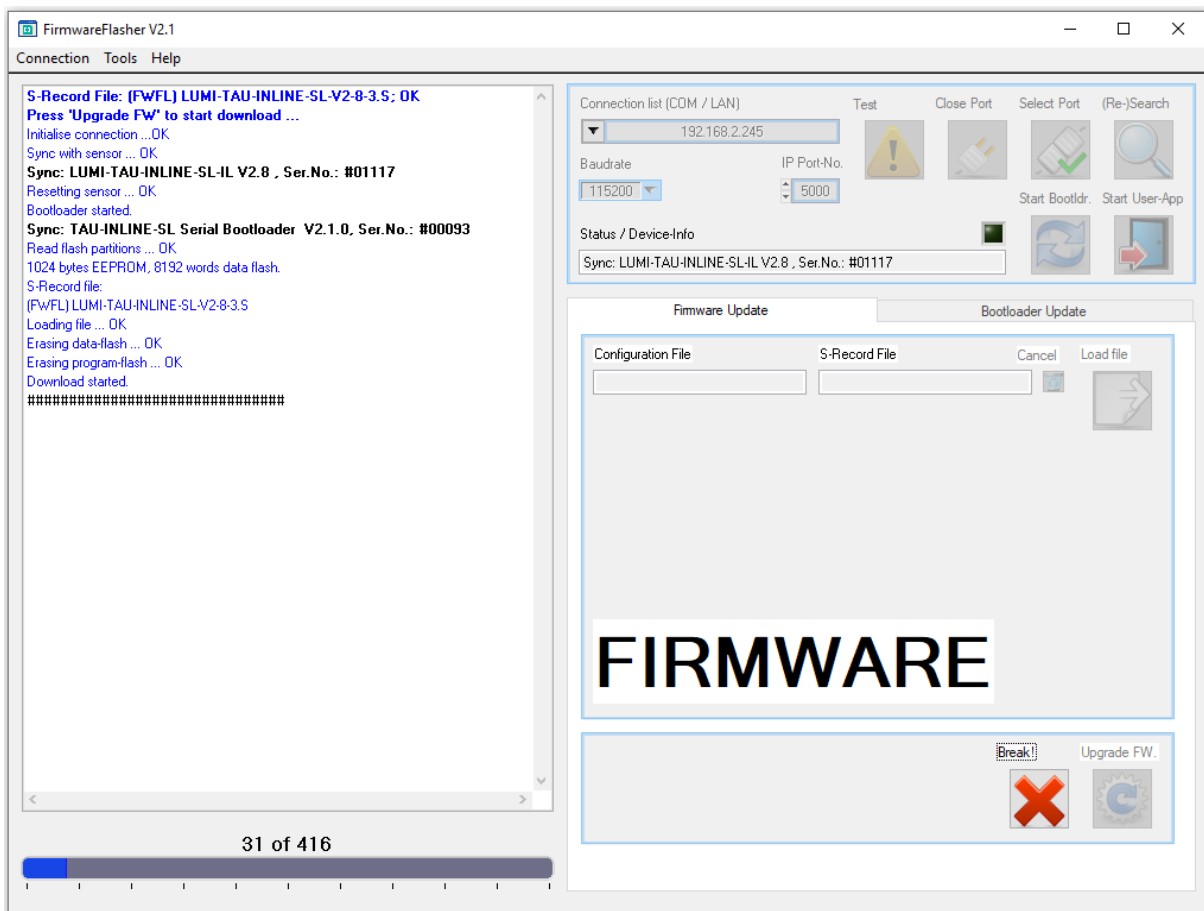
After the download is complete, a message **Download complete.** is printed, followed by checksum evaluations of the newly written firmware code. If no error occurred, all checksums should be **green** and the evaluation should read **OK**. Please contact your device's distributor if an error occurred.

Please do not try to use the device until this error has been resolved!

FirmwareFlasher V2.1

Connection Tools Help

```
S-Record File: (FWFL) LUMI-TAU-INLINE-SL-V2-8-3.S; OK
Press 'Upgrade FW' to start download ...
Initialise connection ...OK
Sync with sensor ... OK
Sync: LUMI-TAU-INLINE-SL-IL V2.8 , Ser.No.: #01117
Resetting sensor ... OK
Bootloader started.
Sync: TAU-INLINE-SL Serial Bootloader  V2.1.0, Ser.No.: #00093
Read flash partitions ... OK
1024 bytes EEPROM, 8192 words data flash.
S-Record file:
(FWFL) LUMI-TAU-INLINE-SL-V2-8-3.S
Loading file ... OK
Erasing data-flash ... OK
Erasing program-flash ... OK
Download started.
##################################################
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######
End of file.
Download complete.
Compare checksums ... OK
Program-Flash Checksum: OK
Data-Flash Checksum: OK
Program-Flash Checksum: OK
Starting user application ... OK
Waiting for user application to boot ... OK
Sync: LUMI-TAU-INLINE-SL-IL V2.8 , Ser.No.: #01117
Upgrade finished!
```

100%

Connection list (COM / LAN) Test Close Port Select Port (Re-)Search

192.168.2.245

Baudrate   IP Port-No.

115200   5000

Start Bootldr. Start User-App

Status / Device-Info

Sync: LUMI-TAU-INLINE-SL-IL V2.8 , Ser.No.: #01117

Firmware Update   Bootloader Update

Configuration File   S-Record File   Cancel Load file

FIRMWARE

Break! Upgrade FW.

If for some reason the download process is interrupted (e.g. if the communication breaks down because of a faulty cable) the FirmwareFlasher me become stuck in a loop (waiting for interaction with the devices bootloader, that is no longer possible). In that case (and that case only!) use the **Break!** button to quit the download process and release the connection to the device.

Note:

Breaking the download mid-process is very likely to render the device inoperable. Please contact your devices distributor for help resolving this issue. Please do not try to use the device until this error has been resolved!

Comments and troubleshooting …

1. **Always ensure a stable power supply for the device to be upgraded!** A power failure mid-download may render the device inoperable.

2. If available **always prefer updating firmware using RS232 or RS232-to-USB connections** (by using according adapters), since those connections are **likely to be significantly more stable!** If it is not possible to use one of those connection types and an update through a RS232-to-Ethernet adapter is the only option, please ensure data traffic on the LAN the device is connected to is light to moderate, to ensure **latency is within reasonable limits**.

3. If the RS232-to-Ethernet adapter, the device is connected to, cannot be found by FirmwareFlasher software, the reason may be that multiple network interfaces are present at the PC the FirmwareFlasher is installed on and the correct one is currently not selected. To fix this, select **Connection** → **Set host network interface …** from the **menubar** ①.
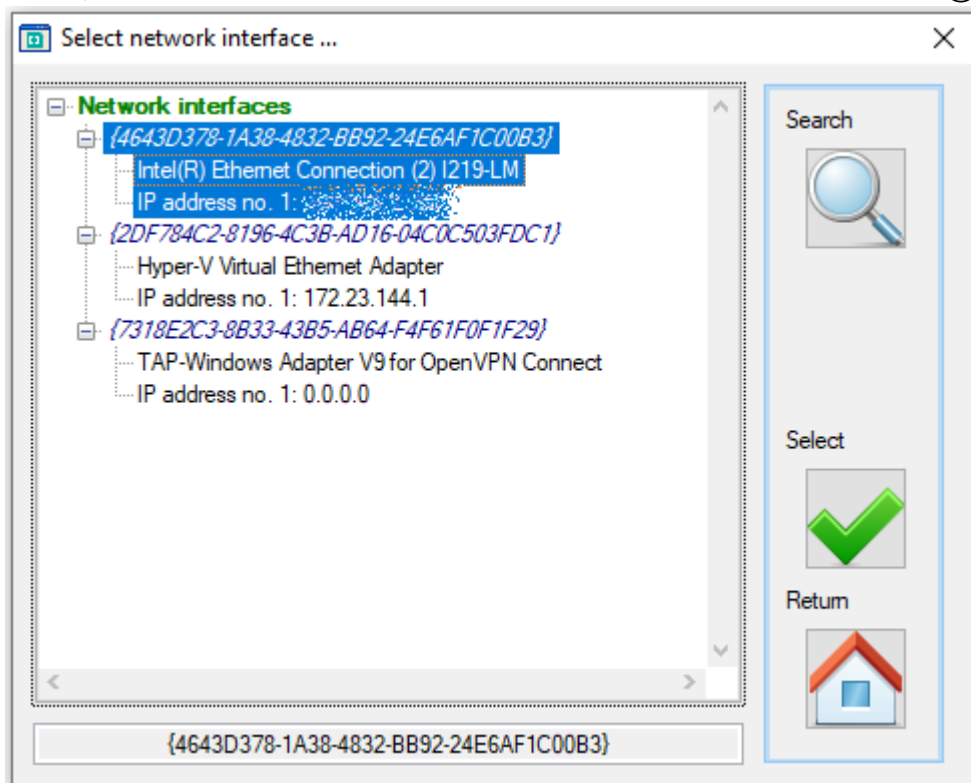
Click on **Search** to list all available network interfaces and left-click on the interface to be used in the left list. Confirm your selection by clicking on the **Select** button. To leave the current setting unchanged, click on **Return**.

4. On unexpected behavior of the FirmwareFlasher software (e.g. if a previously identified sensor does not show in the console window) please **try restarting the software** and retry performing the operation.