

KK_FirmwareUpload

Version 4.3.6, date 2020-10-16

The program **KK_FirmwareUpload** is used for update and configuration of firmware of K+K devices.

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history

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2014-04-09	Loryn	3.0	created
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1. Requirements

KK_FirmwareUpload is a stand alone program which doesn't need any libraries. It's not needed to be installed. You only have to copy it into a directory where you have write access rights (for INI file and debug log, see chap. 8 and 9).

The K+K device must be connected via USB or network to do any updates.

You don't need administration rights to execute *KK_FirmwareUpload*.

2. Starting

When starting **KK_FirmwareUpload** (Windows: *KK_FirmwareUpload.exe*, Linux: *KK_FirmwareUpload*), it first searches for K+K devices that are connected via USB.

- If no device is connected, you will be asked to enter an IPv4 address. If you confirm this dialog with "Ok", a connection via the network to the K+K device is established (see chap. 4.2).
- If devices are connected, a connection is established via USB to the first named K+K device. You can change the selection by pressing the small switch to the right of the input field and selecting an entry from the list.

If there is a connection, the firmware version and, if applicable, the configuration are read from the device and displayed. The hardware properties named in the firmware version string are displayed in the "*Change Configuration*" area below "*Feature*".

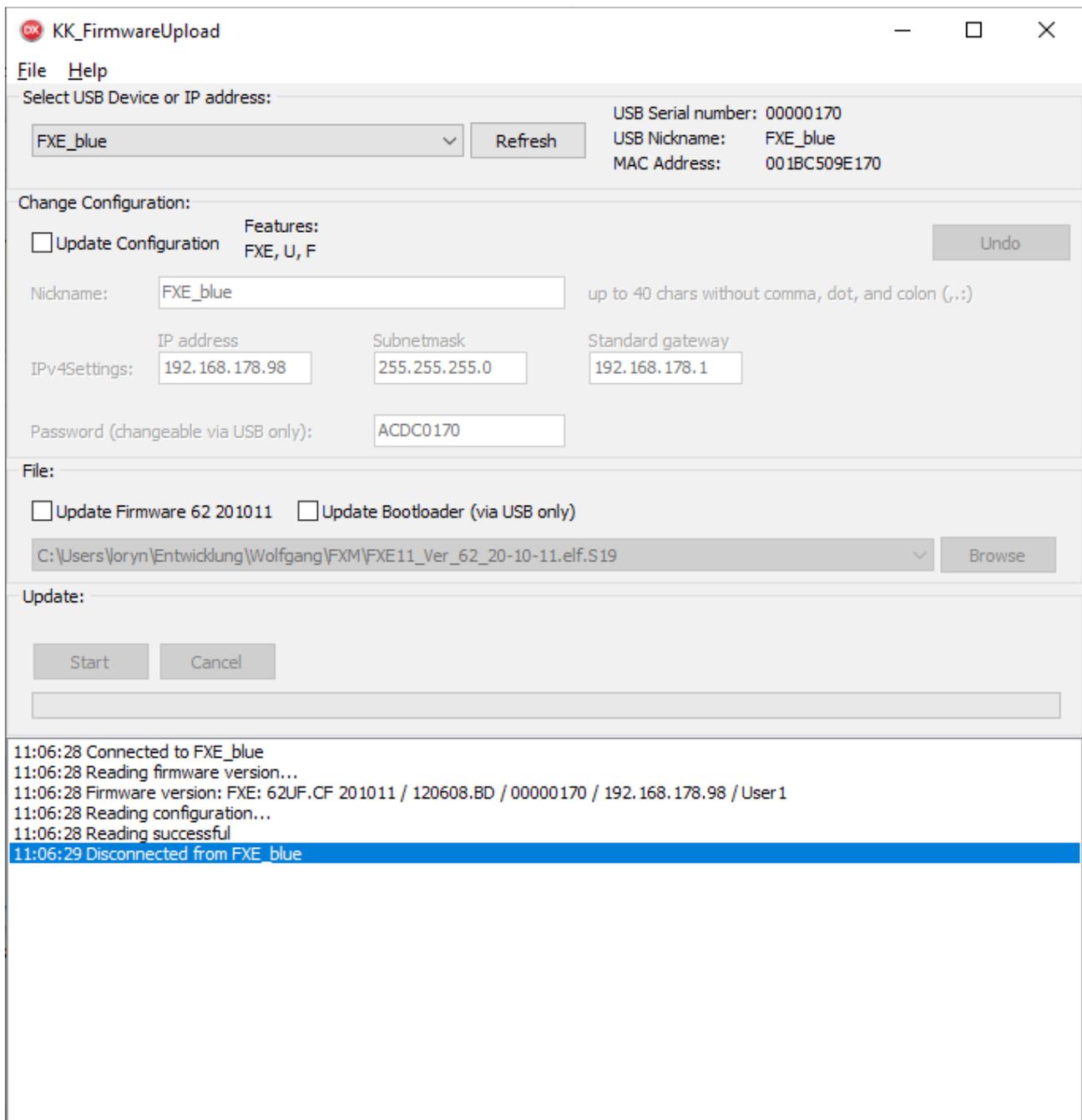
If the firmware version found is at least 19, the configuration is read in automatically, as this can be done without interference.

If the device does not produce any measurement data (e.g. because there is no reference signal), "*Hardware fault: Reading firmware version NOT possible*" appears in the message box. The configuration is not read in automatically and the hardware properties are unknown.

With older firmware versions (<19), reading the configuration interrupts the generation and transfer of measurement data to other applications. In this case, the "*Read Configuration from device*" button must be activated to read in the configuration.

3. Main Window

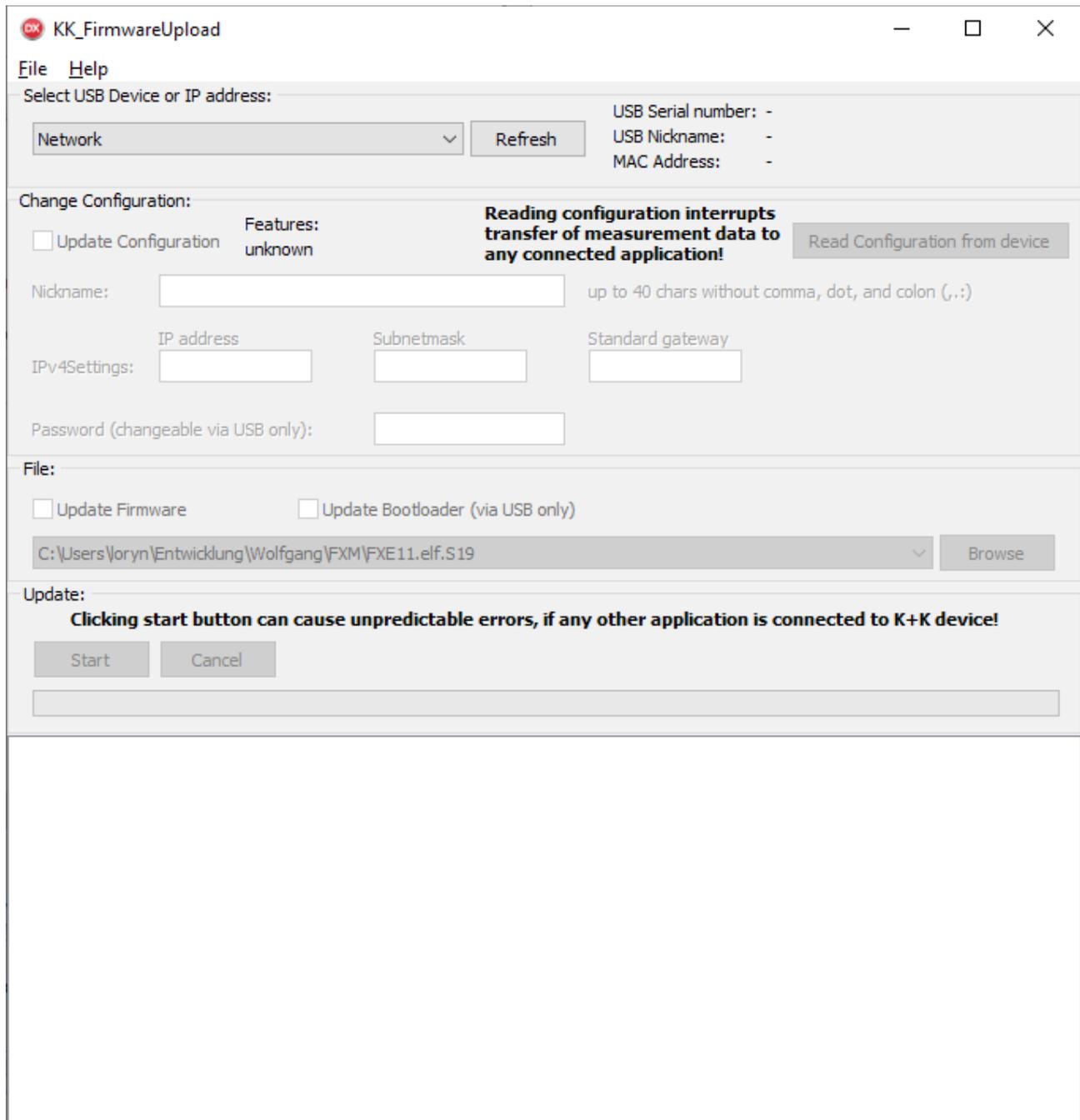
At start KK_FirmwareUpload displays the main window:



Picture 3.1: main window with connected K+K device via USB and firmware version 62

Here the main window shows a device connected via USB with firmware version 62 and the hardware properties FXE, U, F and read-in configuration.

The next figure shows the state of the main window without a connection:



picture 3.2: main window without connection

The main window is divided into six groups:

1. menu
2. select K+K device
3. firmware configuration
4. select firmware or bootloader file
5. update
6. message display

3.1 Menu

The menu offers items **File** and **Help** with submenu items.

File - Exit: Close the program - same action as close button in window title.

Help - Debug log: Switch on/off debug log (see chap. 9).

Help - About: Displays version informationen about KK_FirmwareUpload

3.2 Messages

Messages are displayed at the bottom of the main window.

For example reading firmware configuration displays the following messages:

```
11:06:28 Connected to FXE_blue
11:06:28 Reading firmware version...
11:06:28 Firmware version: FXE: 62UF.CF 201011 / 120608.BD / 00000170 / 192.168.178.98 / User 1
11:06:28 Reading configuration...
11:06:28 Reading successful
11:06:29 Disconnected from FXE_blue
```

picture 3.3: messages about reading firmware version and configuration

4. Select K+K device

At program start all via USB connected K+K devices are enumerated and displayed in the combo box. An entry "network" is also added. This is used to select a network connection.

4.1 USB connection

If USB devices were found, the first named is selected and the connection is established. Firmware version and possibly configuration are read in and displayed. The fields "USB Serial number" and "USB Nickname" show the corresponding information from the USB enumeration. If the "USB Nickname" field remains empty, no nickname has yet been configured (see chap. 5.2). The "MAC Address" field shows the MAC address calculated from the serial number.

If no USB device was found, the entry "Network" is selected. See chap. 4.2.

You can change the selection by pressing the small switch to the right of the input field and selecting another entry from the list.

If you connect another USB device or remove an existing device, press the "Refresh" button. The enumeration of USB devices is repeated and the new K+K device should now appear in the selection box.

4.2 Network connection

Select the entry "Network" in the selection box. A dialog for entering an IPv4 network address appears. Enter the network address of the K+K device here.



picture 4.1: Enter a IPv4 network address

An IPv4 network address consists of four decimal numbers between 0 and 255 separated by periods, e.g. 192.168.178.10.

If you have already entered an IP address and confirmed it with "Ok", the last IP address entered is displayed in the dialog.

If the IP dialog is confirmed with "Ok", a network connection to the K+K device is

established and the IP address is added to the selection box.

To connect another K+K device via network, select the entry "*Network*" in the selection box and enter a different IP address.

Please note:

With a network connection it is not possible to change the password (see chap. 5.4). The bootloader cannot be updated either, the corresponding option is grayed out.

5. Firmware Configuration

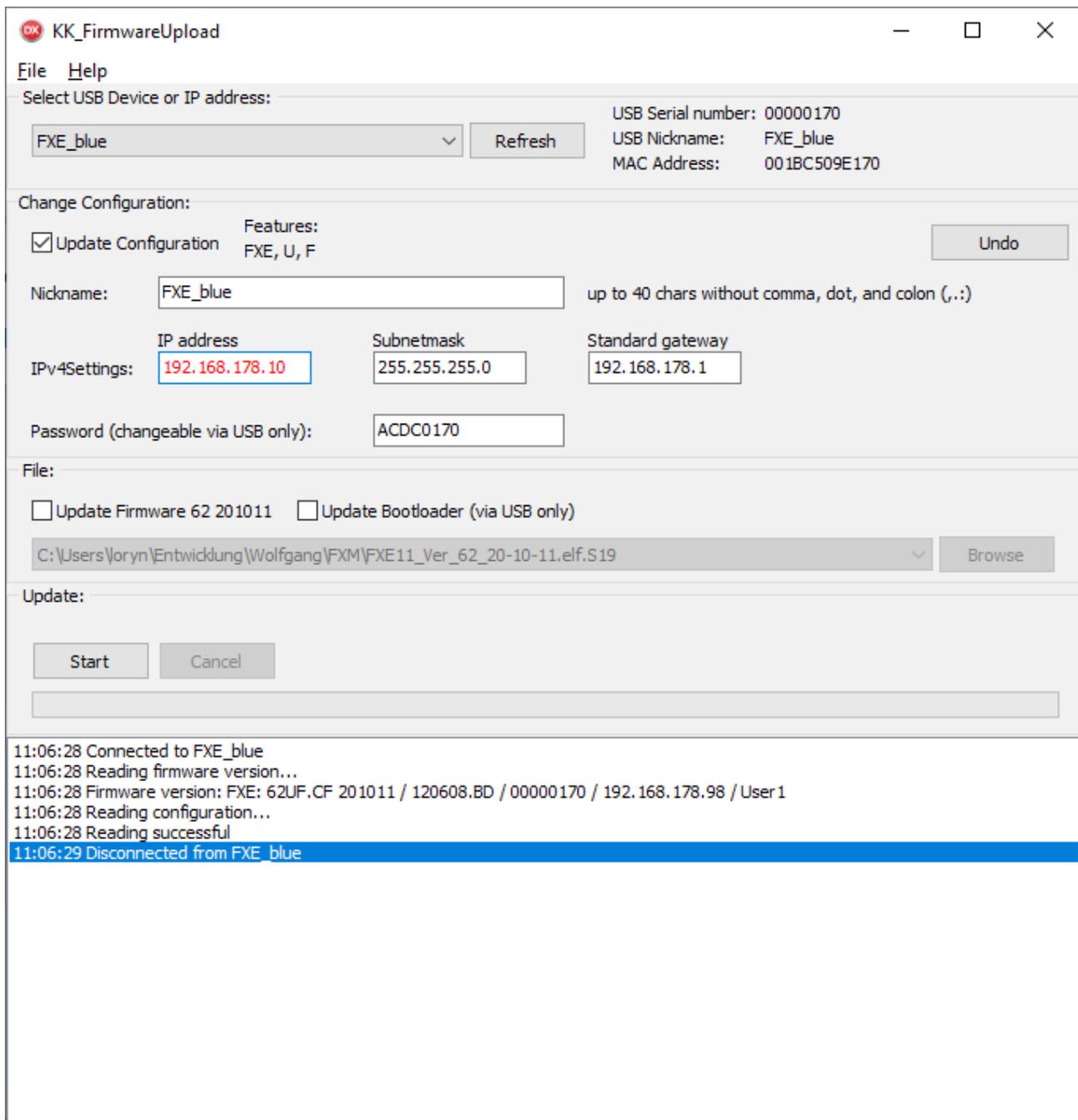
The configuration of the firmware is either read in and displayed automatically when the connection is established or after pressing the "*Read Configuration from device*" button.

Please note that with firmware versions older than 19, the configuration cannot be read in without interference. This means that the reading process interrupts the generation of the measurement data. Any applications connected to this K+K device will be disrupted. The transmission of the measurement data is interrupted and resumed at the end of the reading process, but the data stream contains a gap because no measurement data has been generated in the device in the meantime.

The configuration read in is displayed in the "*Change configuration*" area and can be changed if "*Update Configuration*" is set.

Changed information is displayed in red font. They can be cancelled using the "*Undo*" button. A changed configuration is only transferred to the device when "*Update Configuration*" is set and the "*Start*" button is pressed.

The configuration options are described in more detail below.



Picture 5.1: main window with changed firmware configuration

5.1 Hardware features

If a firmware version string has been read in, the reported hardware properties are displayed under "*Feature*":

- FXE: Device reports FXE measurement data
- NSZ: Device reports NSZ measurement data only
- U: The device also reports NSZ measurement data
- S: The device works as a software clock
- F: Device has F-RAM memory

Hardware properties cannot be changed.

5.2 Nickname

For easy identification of your K+K device, you can give it a nickname.

Activate the option "*Update Nickname*" und enter a name in the corresponding input field. The name may be up to 40 characters long; all characters without comma ",", dot ".", and colon ":" are allowed. The nickname may be cleared (input field "Nickname" is empty), but must be committed, as soon as "*Start*" button is clicked.

In group "*Select USB device or IP address*" the nickname remains unchanged.

The nickname is part of the USB serial number string. Changing the nickname, means changing the USB serial number string and the K+K device has to be installed again in the Windows System. This is done automatically, after the update procedure has finished (see chap. 7).

5.3 IPv4 Settings

The K+K device may be integrated into your local network. IP protocol version 4 is used.

The device has no facility, to get a dynamical IPv4 configuration from DHCP. Therefore you have to configure IP address, subnetmask, and gateway in your K+K device.

Ask your network administrator for an IP address for the K+K device. Subnetmask and gateway have to correspond with the values used in your local network.

All inputs have to be done in quad-dotted-decimal notation: four decimal numbers respectively in range 0 to 255 separated by a dot.

For example:

IP address	192.168.178.98
Subnetmask	255.255.255.0
Gateway	192.168.178.1

Table 1: Example of an IPv4 configuration

5.4 Password

Changing firmware or configuration via the network is password-protected. This must be entered for network connections when the "Start" button is pressed.

The password is a 32-bit integer that is entered in the "Password" field in HEX notation.

Please note:

The password is not read and displayed by the device with network connections and can only be changed with a USB connection.

If you have forgotten the password, you must establish a USB connection to the device in order to read the password.

6. Select firmware/bootloader file

Both the firmware and the bootloader of the K+K device can be updated. To do this, you need an S19 file with the firmware or bootloader content. The current firmware version (with date) of the K+K device is displayed in the "Update Firmware" option.

The bootloader can only be updated if the device is addressed via USB.

In the "File" area, activate the "Update Firmware" or "Update Bootloader" option and use the "Browse" button to select the relevant S19 file. The file name is displayed in the input field of the main window. You can also select a previously entered file name by pressing the small switch to the right of the input field and selecting an entry from the list.

The file content is only transferred to the device when the "Update Firmware" or "Update Bootloader" option is selected and the "Start" button is pressed.

Please make sure that the file content and the selected option match. Otherwise the update will be cancelled with an error message (e.g. "Transmit cancelled: Not a bootloader file").

Please note:

If the bootloader is updated, the existing firmware is deleted. I.e. after the bootloader has been updated, the device reports itself in the bootloader status (recognizable by an appended "(Bootloader Ver. xxx)" in the device selection box) and the firmware must be updated.

6.1 Force bootloader status

If a K+K device can no longer be addressed - neither via USB nor via network - the device can be switched to the bootloader status.

This requires a short-circuit plug for the serial interface, with which lines 2 and 3 (RXD and TXD) are connected to one another.

Switch off the device and plug the short-circuit plug into the serial interface. Connect the device to the PC via USB (bootloader does **not** support network connections) and switch it on again. If necessary, the USB driver is reinstalled in Windows systems, press the "Refresh" button: the device reports in the bootloader state.

Now carry out a firmware update (see chap. 7); the device reports again in bootloader status. Switch off the device, remove the short-circuit plug from the serial interface and switch the device on again.

7. Update procedure

Warning:

You should only transfer new firmware or change the configuration if no other applications are connected to the device. This causes data loss and unpredictable errors. From firmware version 45, KK_FirmwareUpload can determine itself whether other applications are connected to the device. You have to take care of older firmware versions yourself.

When "Start" button is clicked, the inputs are checked first. If an error occurs, the update procedure will be cancelled.

In the case of a network connection, you will now be asked for the password, which must be entered in the following dialog:



picture 7.1: password input for network connection

The password is sent to the device and checked there. If the transferred password and the password in the device do not match, the update process is aborted with the error message "Login failed: invalid password".

Subsequently the selected actions are executed, depending on which of the options are activated. The firmware configuration will be transmitted first, afterwards the firmware file. From firmware version 45 onwards, a check is made whether other applications are connected to the device and the update process is cancelled if necessary.

To complete the update procedure the device will be restarted. If USB serial number string has been changed, the USB device will be installed again into the Windows System.

"Start" button is disabled, if no option is activated.

"Cancel" button cancels update procedure.

8. INI file

The settings for debug log and firmware file are read at program start from file **KK_FirmwareUpload.ini** and written to it at program end. The INI file is created in the same directory where the program file *KK_FirmwareUpload* is located.

9. Debug log

The debug log serves for error detection and is switched off by default. It can be switched on/off by use of menu item "*Help - Debug log*".

If debug log is on a file "**KK_FirmwareUpload.txt**" in sub folder "**Debug**" is created in the same directory where the program file *KK_FirmwareUpload* is located.