

## Quick Guide – Software update

### Single detector system LB 480

This manual is intended for service technicians who already have experience with software updates using the *FLASH Loader* software and operating *LB 480-PC UserInterface*. The relevant safety regulations must be observed. For SIL devices see operation manual (safety manual “Functional Safety”).

#### Requirements for the software update

Hardware	Software
<ul style="list-style-type: none"> <li>Windows PC</li> <li>Berthold USB/RS485 Service modem</li> <li>USB cable</li> <li>HART® communicator, Field Device Tool / Device Type Manager such as PACTware</li> <li>Connection cable to the RS485 interface of the detector</li> </ul>	<ul style="list-style-type: none"> <li>.bta embedded software update file e.g. 01.01.00 <b>Level, Density or Level Switch</b></li> <li>Berthold USB/RS485 interface driver (BertholdRS485.exe)</li> <li>FLASH Loader (Flashloader_setup.exe)</li> <li>LB 480-PC UserInterface 2.1.1 (LB_480_PC_Control_Setup_2.1.1.exe)</li> </ul>

- 1. Preparation via HART®**
  - Disable write protection or Safety Mode.
- 2. Perform parameter backup and software update**
  - Connect the PC to the detector via USB/RS485 service modem.
  - Perform parameter backup using *LB 480-PC UserInterface (Level, Density or Level Switch)*. Alternatively: Write down the parameters to be able to enter them again manually later.
  - Perform the software update using *FLASH Loader*. Select .bta embedded software update file e.g. 01.01.00 suitable for your application (Level, Density or Level Switch).
  - Perform Factory Reset and then Software Reset (SW-Reset) using *LB 480-PC UserInterface*.
  - Restore the backup to the detector using *LB 480 PC UserInterface*. Alternatively: Transfer the written down parameters manually to the LB 480.
- 3. Putting the system into operation via HART®**
  - Check or simulate measuring range limits using the CPS test program. Deactivate the simulation afterwards!
  - Check that there are no error messages on the detector and that the actual measured value is plausible.
  - If necessary, activate Write Protect or Safety Mode (for SIL devices see safety manual “Functional Safety”).

If you have any questions or need support, please contact our service department at [service@Berthold.com](mailto:service@Berthold.com).

## Detailed instructions – Software update

### Single detector system LB 480

#### NOTICE



##### Qualification of personnel!

Only personnel authorized by Berthold should update the embedded software.

- ▶ If the functional safety requirements (e.g. SIL) apply to the detector or the installation, the update **must** be carried out by authorized service technicians so that functional safety is guaranteed after the software update.

#### WARNING



##### Explosion hazard!

Laptops or PCs without appropriate Ex-approvals may not be operated in a potentially explosive atmosphere.

### Non-intrinsically safe detectors and installations

For non-intrinsically safe detectors and installations, the software update of the embedded software can be performed onsite at the permanently installed detector.

### Intrinsically safe detectors and installations

#### WARNING



##### Explosion hazard!

Risk of losing intrinsic safety, by grounding the RS485.

Do not use laptops or PCs that are connected to the mains.

Only battery-powered laptops or PCs may be connected to the RS485.

Do not power the service modem with a power supply unit.

For intrinsically safe detectors and installations (Class I Zone 1 / Zone 21 for Class I, II, III Division 1 ATEX / IECEx / NEC / CEC), updating the embedded software onsite is only permitted under the following conditions:

- no explosive atmosphere
- software update via battery-operated laptop (no mains operation, in order to avoid grounding the RS485)
- no power supply for the service modem (in order to avoid grounding the RS485)

### Requirements for the software update

Hardware	Software
<ul style="list-style-type: none"> <li>• Windows PC</li> <li>• Berthold USB/RS485 Service modem</li> <li>• USB cable</li> <li>• HART® communicator, Field Device Tool / Device Type Manager such as PACTware</li> <li>• Connection cable to the RS485 interface of the detector</li> </ul>	<ul style="list-style-type: none"> <li>• .bta embedded software update file e.g. 01.01.00 <b>Level, Density or Level Switch</b></li> <li>• Berthold USB/RS485 interface driver (BertholdRS485.exe)</li> <li>• FLASH Loader (Flashloader_setup.exe)</li> <li>• LB 480-PC UserInterface 2.1.1 (LB_480_PC_Control_Setup_2.1.1.exe)</li> </ul>

## 1 Install interface driver, FLASH Loader and LB 480-PC software

To operate the service modem, the interface driver “BertholdRS485.exe” must be installed. Likewise, the installation of the *FLASH Loader* is necessary to upload and install the new software version on the LB 480 detector. To be able to make a reliable data backup before the software update, we also recommend the installation of *LB 480-PC UserInterface*, a Berthold specific software for the RS485 interface.

1. Install the Berthold USB/RS485 interface driver by running the file “BertholdRS485.exe”. Install the driver before connecting the detector service modem to the PC.
2. Connect the service modem to the PC with a USB cable.
  - ▶ The service modem is installed.
3. Install the software “Flashloader\_setup.exe”. If this software is already installed, make sure that you use version 2.1.0.0 or 2.1.1.0.
4. Install the software *LB 480-PC 2.1.1 UserInterface* “LB\_480\_PC\_Control\_Setup\_2.1.1.exe”.

### NOTICE



#### Perform data backup!

Calibration parameters and settings are deleted during the software update.

- ▶ Therefore, perform a data backup before updating the software (see page 5).

## 2 Preparation via HART®

5. Use one of the following hosts to operate the LB 480:
  - HART® Communicator Model 375/475
  - Siemens Simatic PDM
  - AMS DeltaV, Emerson Process
  - PACTware
6. If necessary, open the menu path **Device Config ▶ Access** to unlock Write Protect and deactivate Safety Mode: **Write Protect = NO / Safety Mode = OFF**.

#### Condition 1: Write Protect NO / Safety Mode OFF

O.K., the software update can be performed.

#### Condition 2: Write Protect YES / Safety Mode OFF

Enter the password to unlock Write Protect. Write Protect is automatically set from **YES** to **NO**.

#### Condition 3: Write Protect YES / Safety Mode ON

Select Safety Mode **OFF**. Enter the password. Then Safety Mode is automatically set to **OFF** and Write Protect is automatically set to **NO**.

### IMPORTANT



Please contact Berthold if access is blocked and the password is no longer known or available.

- ▶ The detector is unlocked.
- ▶ The HART® communicator or host for operation is only required again in the last step (chapter **Fehler! Verweisquelle konnte nicht gefunden werden**. Putting the system into operation via HART®).

### 3 Data backup and software update

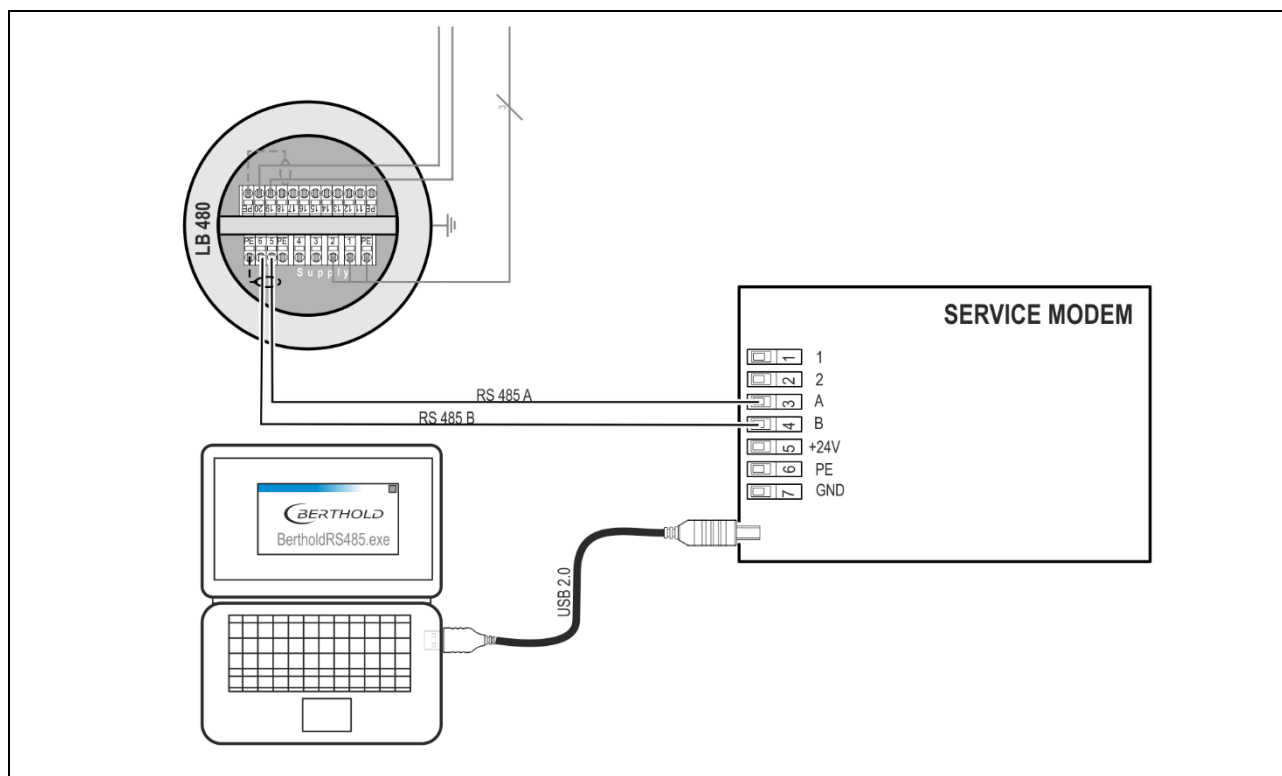


Fig. 1 Connection diagram Detector – Service modem – PC

**NOTICE**

**Install the RS485 connection cable professionally!**

To store the calibration data and update the embedded software, a connection to the RS485 interface of the detector is required. For this purpose, the wiring compartment of the detector must be opened, and the appropriate cable must be laid.

- ▶ Observe the regulations in the safety manual / explosion protection manual and the operating instructions of the detector.
- ▶ The software update must be performed with the power supply switched on.

7. Connect the detector to the service modem via this RS485 interface, see connection diagram Fig. 1 and the table below. The power supply of the detector must not be interrupted during the software update.

Terminal detector		Terminal service modem
5	RS485 A	3
6	RS485 B	4

- ▶ The detector is correctly connected to the PC via the service modem. Data backup can be performed, and the embedded software of the detector can be updated.

## Perform data backup

A data backup of the calibration data and settings must be performed. For this purpose, the Berthold software *LB 480-PC UserInterface* (Level, Density or Level Switch) is required. Alternatively, you can write down all the calibration data and settings and then enter them again manually after updating.

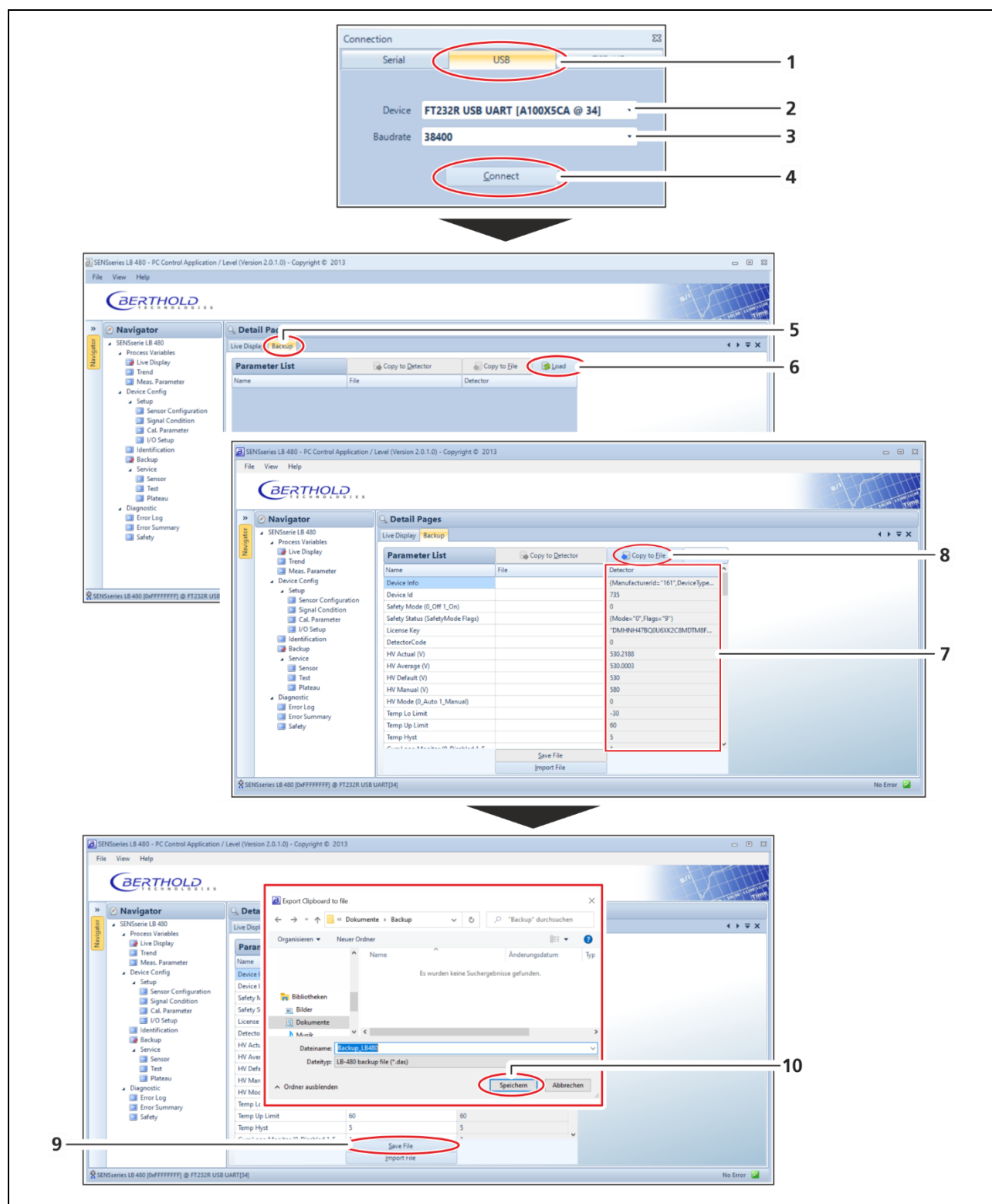


Fig. 2 Data backup using LB 480-PC UserInterface

8. Start the software *LB 480-PC UserInterface* (Level, Density or LevelSwitch) and click on the tab "USB" (Fig. 2, Pos.1).
9. Select the service modem under "Device" (Fig. 2, Pos.2).
10. Select 38400 Baud under "Baudrate" (Fig. 2, Pos.3).

11. Click on <Connect> (Fig. 2, Pos.4).
  - ▶ Connection to the service modem is established and *LB 480-PC UserInterface* starts.
12. In the menu tree **Device Config ▶ Backup** (Fig. 2, Pos.5) click on <Load> (Fig. 2, Pos.6).
  - ▶ All parameters are displayed in the column “Detector” (Fig. 2, Pos.7).
13. Click on the button <Copy to File> (Fig. 2, Pos.8).
  - ▶ All parameters are copied to the column “File”.
14. Click on the button <Save File> (Fig. 2, Pos.9).
15. Select a location for the backup file and click on the button <Save> (Fig. 2, Pos.10).
  - ▶ The calibration data and settings are saved and can be restored after the software update.
16. Now close the software *LB 480-PC UserInterface* to access the interface with *FLASH Loader* in the following steps.

## Update detector

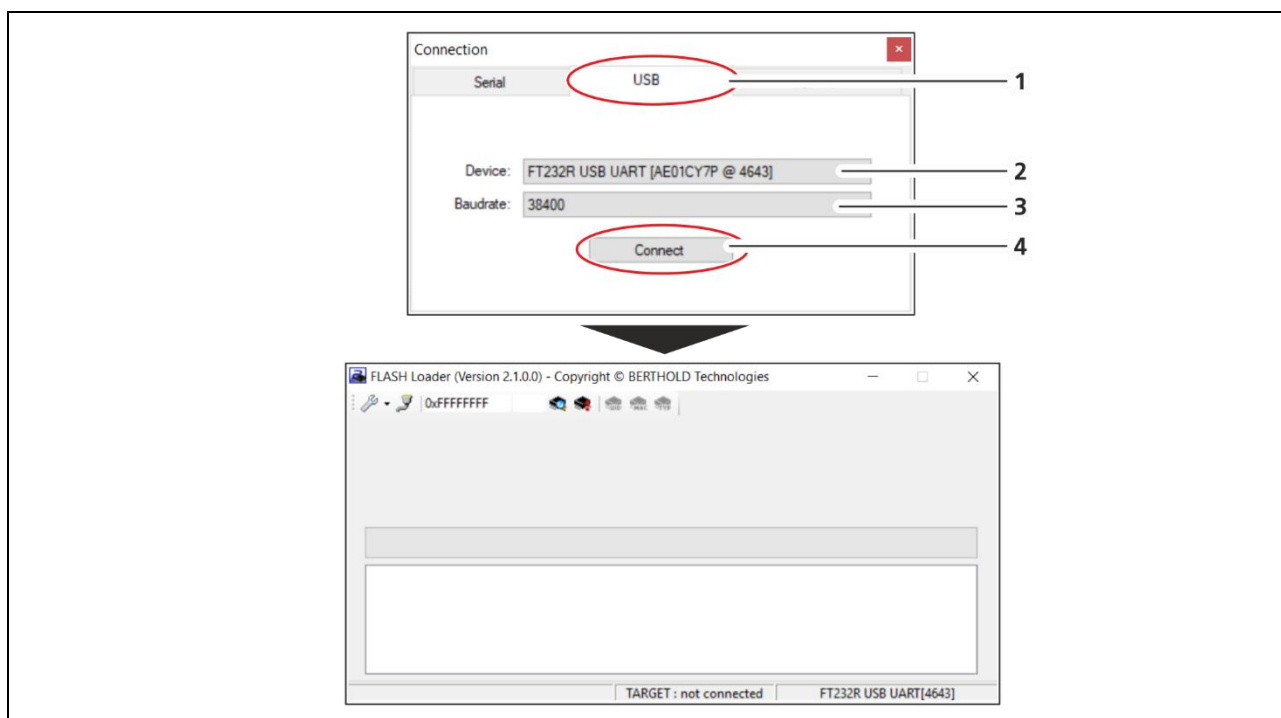


Fig. 3 Set up the connection PC – Service modem

17. Start the “FLASH Loader” software and click on the tab “USB” (Fig. 3, Pos.1).
18. Select the service modem under “Device” (Fig. 3, Pos.2).
19. Select 38400 Baud under “Baudrate” (Fig. 3, Pos.3).
20. Click on <Connect> (Fig. 3, Pos.4).
  - ▶ The connection to the service modem is established and a new window “FLASH Loader” opens.

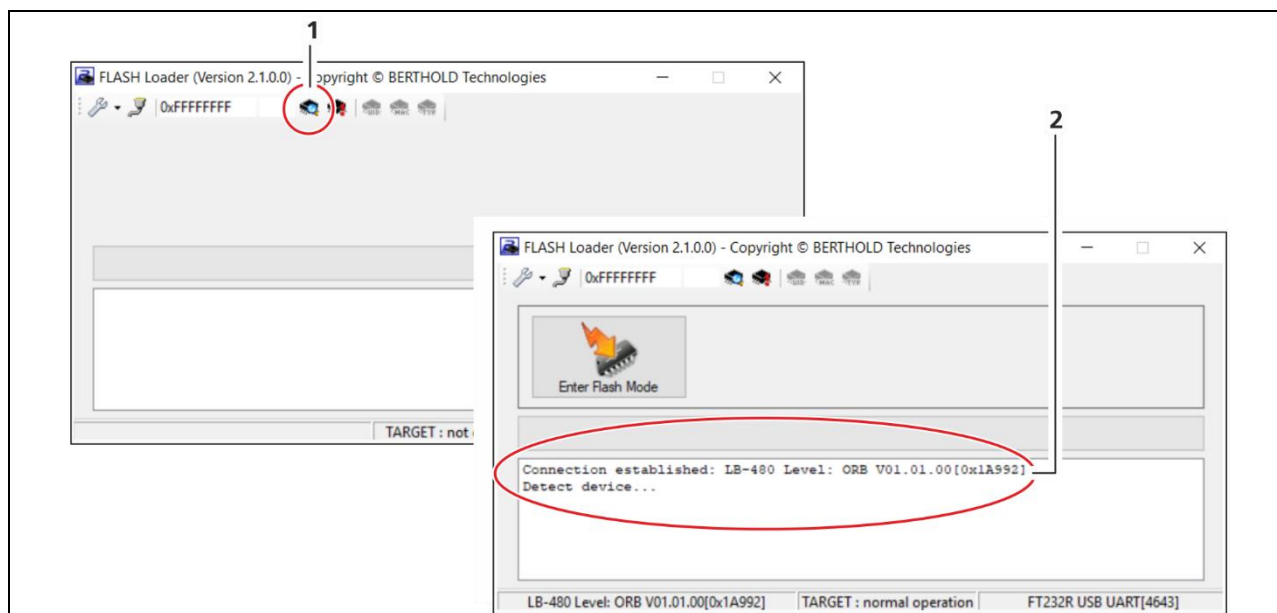



Fig. 4 Set up the connection to the detector

21. Click on the “Detect Device” button  (Fig. 4, Pos.1) to establish the connection to the detector.

- ▶ The detector has been found and the connection is established. The button <Enter Flash Mode> is displayed and the message “Connection established: ...” (Fig. 4, Pos.2) appears.

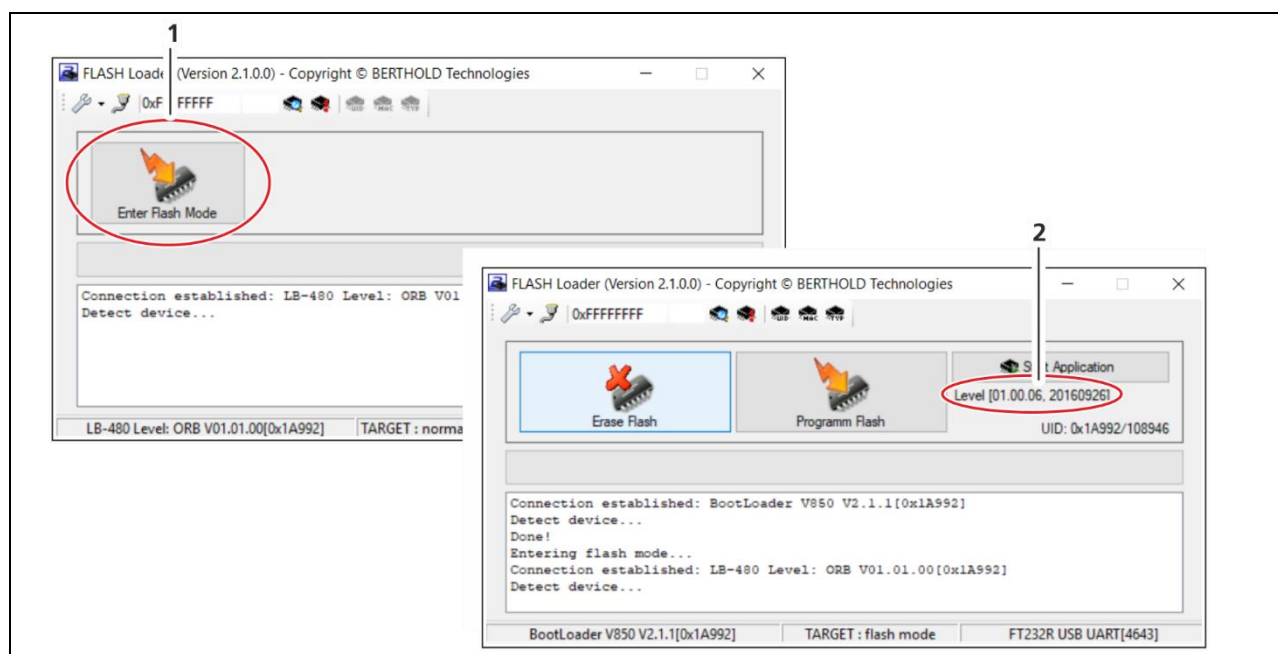



Fig. 5 “Flash Mode” and installed embedded software

22. Click on the button <Enter Flash Mode> to open the programming function (Flash Mode) (Fig. 5, Pos.1).

- ▶ The Flash Mode is started, and the version of the installed embedded software is displayed (Fig. 5, Pos.2).

### IMPORTANT



If the “Enter Flash Mode” command does not execute, the detector can be reset with the “Force Flash” button  to open the programming functions.

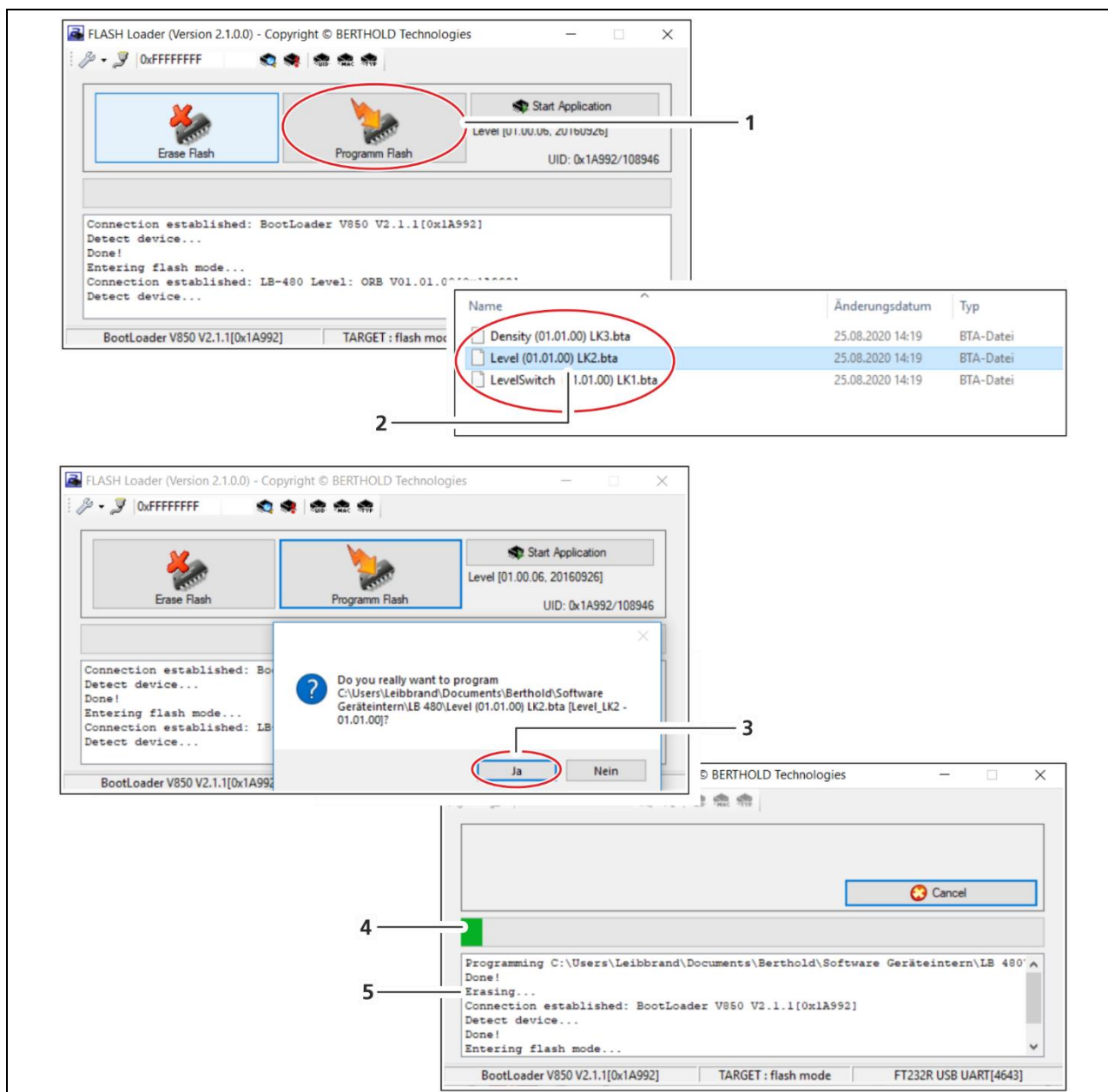


Fig. 6 Select new software in "Flash Mode"

23. Click on the button <Programm Flash> (Fig. 6, Pos.1).
  - ▶ The window "Open file" appears.
24. Select the software file suitable for your application (.bta) e.g. "01.01.00." (Fig. 6, Pos.2) and click <Open>.
25. Confirm with <Yes> (Fig. 6, Pos.3).
  - ▶ The old installation is deleted (Fig. 6, Pos.5) and the new embedded software is installed.

#### NOTICE



#### Do not click <Cancel>!

The installation process can take up to one hour if the transfer rate is low. Only interrupt the installation if the process bar (Fig. 6, Pos.4) does not change for a long time.

- ▶ In the case of an interruption, check all connections and restart the installation.



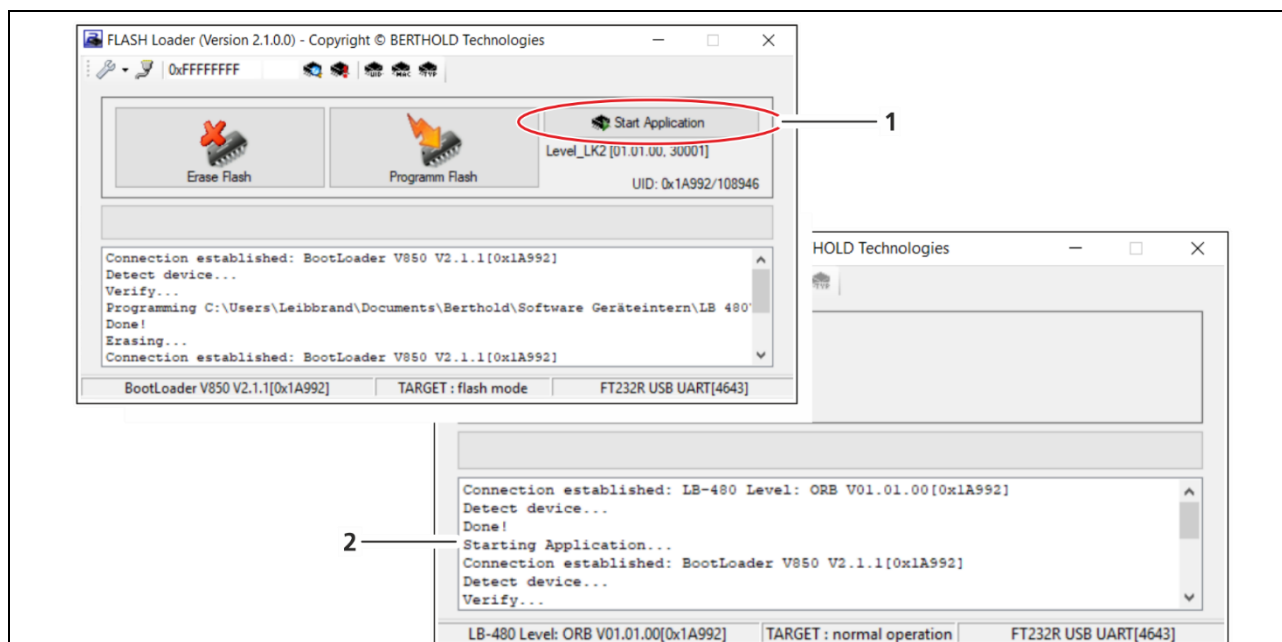


Fig. 7 Start embedded software

26. After successful installation, click the button <Start Application> (Fig. 7, Pos.1).

- ▶ The new embedded software has been installed correctly (Fig. 7, Pos.2) and the required resets (Factory Reset and Software Reset) can be performed.

27. Now close the *FLASH Loader* to access the interface with *LB 480-PC UserInterface* in the following steps.

## Reset Detector

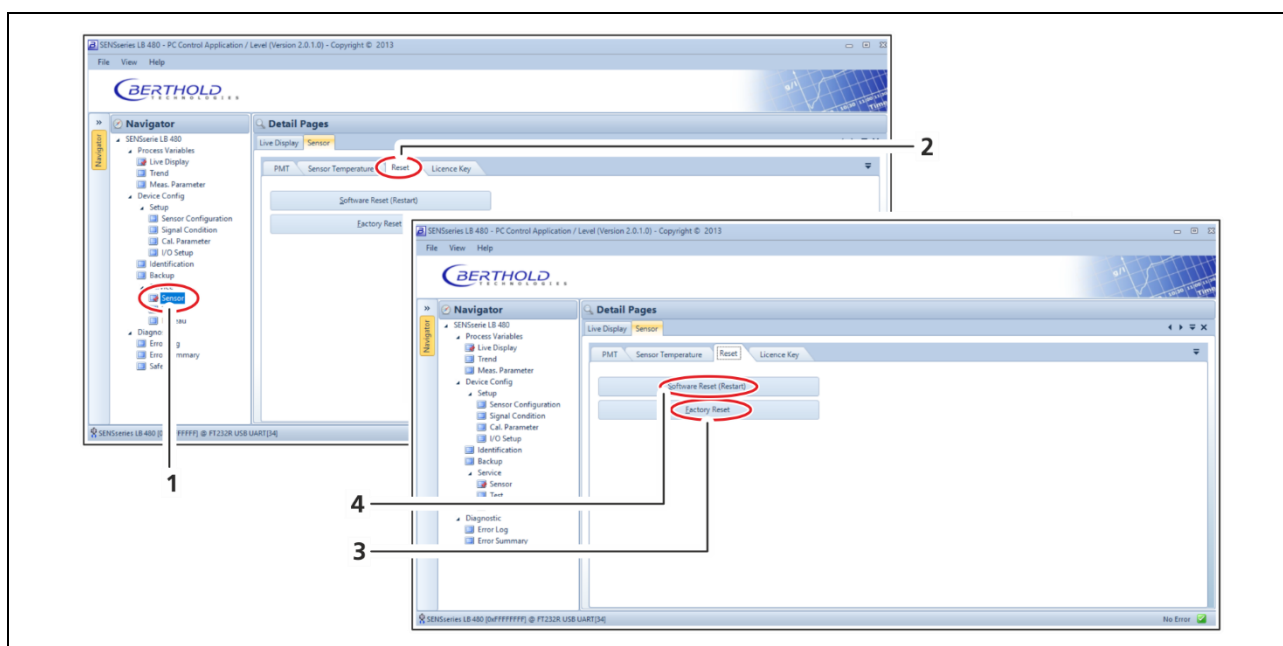


Fig. 8 Factory Reset and Software Reset (SW-Reset)

28. Open the software *LB 480-PC UserInterface* (Baudrate 38400) and click in the menu tree on **Device Config** ▶ **Service** ▶ **Sensor** (Fig. 8, Pos.1).

29. In the tab "Reset" (Fig. 8, Pos.2) click on the button <Factory Reset> and confirm with <Yes> (Fig. 8, Pos.3).

- ▶ The detector is reset to factory settings.

30. After the factory reset, perform a software reset by clicking on the <Software Reset> button (Fig. 8, Pos.4).

- ▶ The software update of the detector is complete and the previously saved calibration data and settings can be restored.

## Restore calibration data and settings

The transfer of the backup data to the detector is done by the Berthold software *LB 480-PC UserInterface*. Alternatively, you can enter the previously written down parameters.

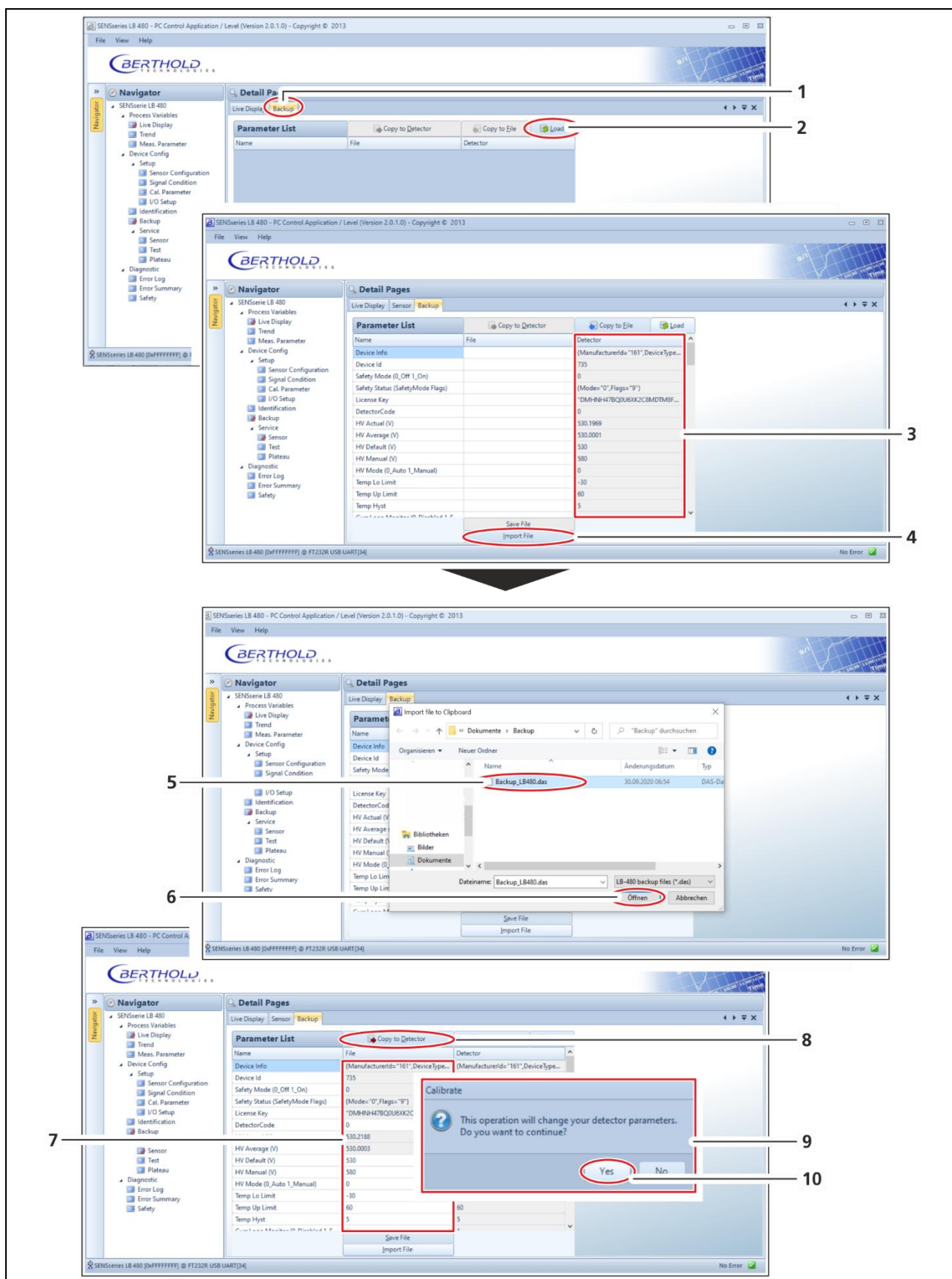


Fig. 9 Transfer the data to the detector

31. Open the software *LB 480-PC UserInterface* in the menu tree **Device Config ► Backup** (Fig. 9, Pos.1) and click on the button **<Load>** (Fig. 9, Pos.2).
  - All default values are displayed in the column "Detector" (Fig. 9, Pos.3).
32. Click on the button **<Import File>** (Fig. 9, Pos.4).
33. Select the backup file created in step 15 (Fig. 9, Pos.5) and click on the button **<Open>** (Fig. 9, Pos.6).
  - The stored calibration data and settings are displayed in the column "File" (Fig. 9, Pos.7).
34. Click on the button **<Copy to Detector>** (Fig. 9, Pos.8).
  - A confirmation window (Fig. 9, Pos.9) is displayed.
35. Click on the button **<Yes>** (Fig. 9, Pos.10) to transfer the data to the detector.
  - The calibration parameters and the settings are now restored.
36. The RS485 connection to the detector can be removed.
37. Close the wiring compartment (lid, cable glands) of the detector according to the guidelines in the safety manual / explosion protection manual and the operating manual of the detector.

#### 4 Putting the system into operation via HART®

38. Check the measuring range limits via the HART® communicator or host. To do this, simulate CPS values in the test menu under **Device Config ► Setup ► Service ► Test**.
  - There should not be any error messages at the detector and the current measured value must be plausible.
39. Deactivate the simulation.
40. If necessary, open the menu path **Device Config ► Access** to restore the previous state (see chapter 2 Preparation via HART) for write protection or safety mode.
  - The software update of the single detector system was successfully performed.