

# Manual

## Software Firmware Loader V1.1

(PC software for Microsoft® Windows® XP, VISTA, 7)

This manual describes the installation of the Firmware Loader PC software and as a support for starting up the Firmware Loader software explains the individual functional elements of the graphic Windows® user interface.

The software allows the user to perform an automatic firmware update. The update will be carried out through the RS232 interface.

An initialisation file (xxx.ini) and a firmware file (xxx.elf.S) are required for performing a firmware update. These files can be obtained from your supplier. In some cases an additional firmware file for the program memory (xxx.elf.p.S) is also needed, and this file will be automatically provided together with the other two files.

**Important!** For a firmware update the two or three files must always be located in the same folder.

A plausibility check is performed after the initialisation file has been loaded with the Firmware Loader. If the initialisation file was changed or damaged, it will not be possible to perform a firmware update.

When the plausibility check is successfully completed, the instructions contained in the initialisation file will be carried out step by step.

The complete memory contents of the micro-controller in the sensor will be deleted in a firmware update. This means that both the program in the program memory and the data in the data memory will be lost.

The new firmware automatically writes the correct data to the program memory again.

However, the parameter settings, temperature curves, linearization curves, etc. that are stored in the data memory (EEPROM) will be deleted.

**With the Firmware Loader V1.1 the data will be saved in the EEPROM, and can be written back again after successful firmware update.**

**For this purpose the software creates an EEPROM backup file.**

## Installation of the Firmware Loader software

Hardware requirements for successful installation of the Firmware Loader software:

- IBM PC AT or compatible
- VGA graphics
- Microsoft® Windows® XP, VISTA, 7
- Serial RS232 interface at the PC
- Microsoft® compatible mouse
- Cable for the RS232 interface (cab-las4/PC, cab-las4/USB or cab-las5/PC, cab-las5/USB)
- CD-ROM drive
- 20 MB of free hard disk space

The software can only be installed under Windows. Windows must therefore be started first, if it is not yet running.

Please install the software as described below:

1. The software can be installed directly from the installation CD-ROM. To install the software, start the SETUP program in the INSTALL folder of the CD-ROM.
2. The installation program displays a dialog and suggests to install the software in the C:\"FILENAME" directory on the hard disk. You may accept this suggestion with **OK** or **[ENTER]**, or you may change the path as desired. Installation is then performed automatically.
3. During the installation process a new program group for the software is created in the Windows Program Manager. In the program group an icon for starting the software is created automatically. When installation is successfully completed the installation program displays "Setup OK".
4. After successful installation the software can be started with a left mouse button double-click on the icon.

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**Please read this chapter before you start!**

**In this example a software update is performed from SPECTRO3 V4.0 to SPECTRO3 V4.1.**

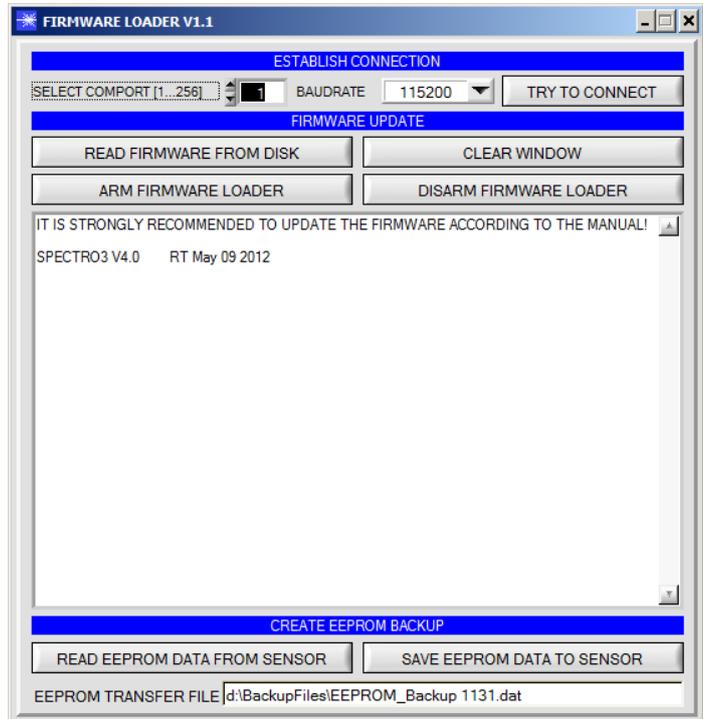
**Step 1:**

When the Firmware Loader software is started, this window opens on the Windows® user interface.

Immediately after starting, the software attempts to establish a connection to the connected sensor. If the sensor should not be connected at **COM PORT 1**, please select the corresponding **COM PORT**.

Please make sure that the correct **BAUDRATE** is selected.

Now try to establish a connection by clicking on **TRY TO CONNECT**. When the connection has been established, the sensor sends back information about the current firmware.



**Step 2:**

Press the **READ FIRMWARE FROM DISK** button and load the **xxx.ini** file.

The uploaded initialization file will be displayed in the status window.

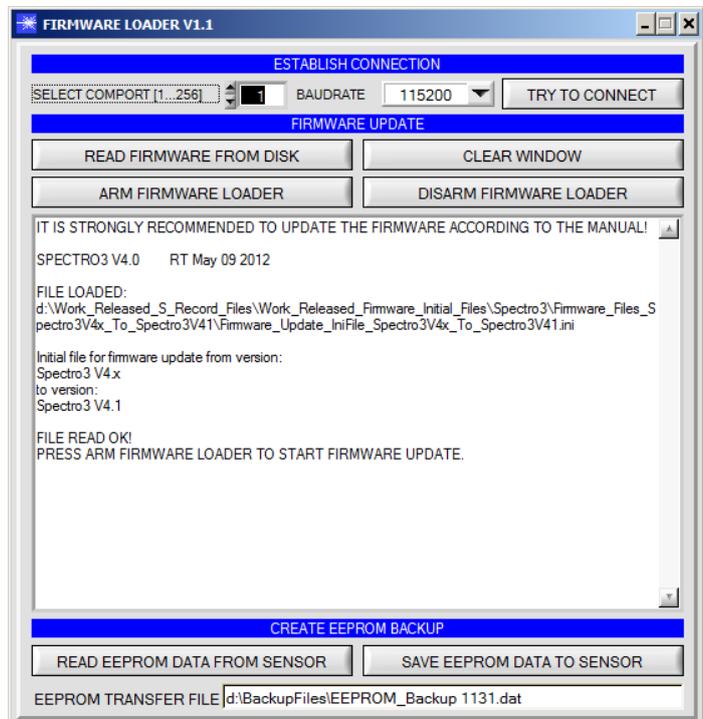
As described above, a plausibility check of the initialisation file will be performed first.

If the file is OK, the following message will be displayed:

[File read OK!](#)

[Press ARM FIRMWARE LOADER to start the firmware update.](#)

Please read the comments that are shown in the display window. These comments allow you to make sure that you have loaded the correct initialisation file.



### Step 3:

Now click on the **ARM FIRMWARE LOADER** button. The program now attempts to send a software command that interrupts the normal program run and jumps to the start address of the boot sector.

If this is successful, the sensor displays a prompt for loading the S-Record file to the sensor.

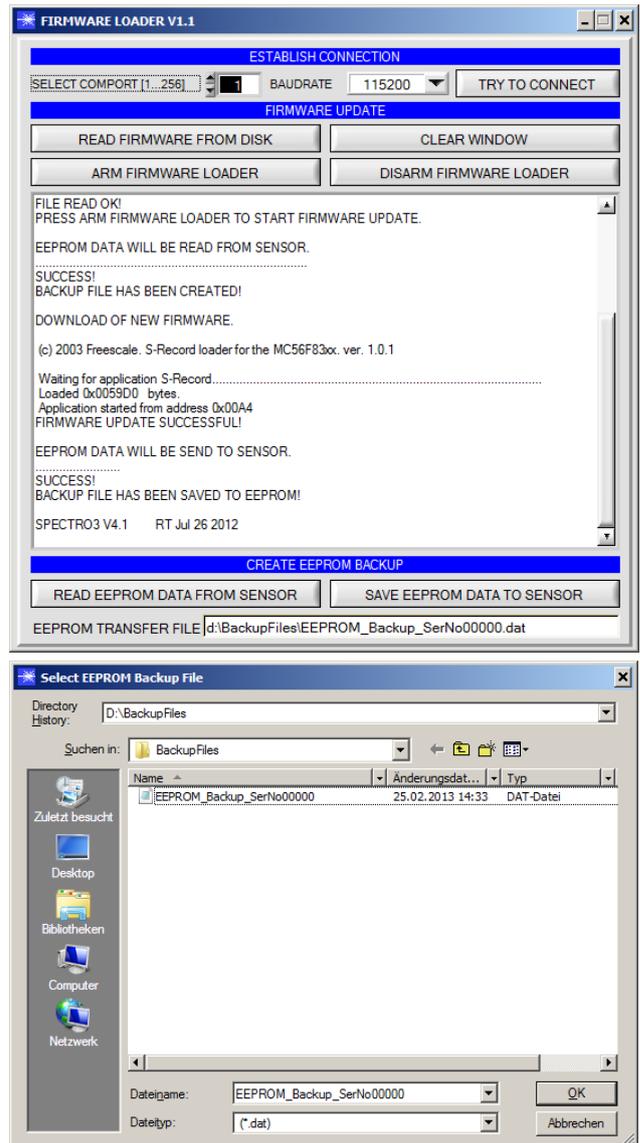
When you press the **ARM FIRMWARE LOADER** button the firmware update will be performed automatically.

In the course of the update process you will only be prompted to enter a name for the EEPROM backup file. If the firmware update should run perfectly until the EEPROM data are read out, but should then go wrong for any reason whatsoever, the EEPROM backup file can always be written back with **SAVE EEPROM DATA TO SENSOR**.

The file name for your **EEPROM backup file** should be chosen such that the names for several sensors cannot be mixed up. Using a file name that contains the sensor serial number might be advisable. Saving this file for future updates also might be a good idea.

After a successful update the sensor displays the status line of the new firmware.

The complete update process may take up to 1 minute.



If, contrary to expectations, there should be any trouble with the update of the program memory, it will still be possible to perform an update, even though it may look like the sensor was "killed".

Please make sure that you have selected the correct **COM PORT** and the correct **BAUDRATE**.

You will not get any connection when you click on **TRY TO CONNECT**.

Load the corresponding **xxx.ini** file from the hard disk.

Then click on the **ARM FIRMWARE LOADER** button.

The program will try to send the software command to the update. This will not work, however, and you will get a **CONNECTION FAILURE** message.

However, the Firmware Loader software now is "armed" for 30 seconds.

If you perform a hardware reset within these 30 seconds, the firmware update will be performed.

After a successful update the sensor displays the status line of the new firmware.

The complete update process may take up to 1 minute.

INFO! In case that the sensor was "killed", the sensor will work with a BAUDRATE of 115200.

You may at any time create an EEPROM backup file for archiving it on your hard disk.

To do this, click on **READ EEPROM DATA FROM SENSOR**. You will be prompted to choose an initialization file in case that there has not yet been loaded any. Afterwards you will be asked to enter a file name. The selected name will be shown in the **EEPROM TRANSFER FILE** display.

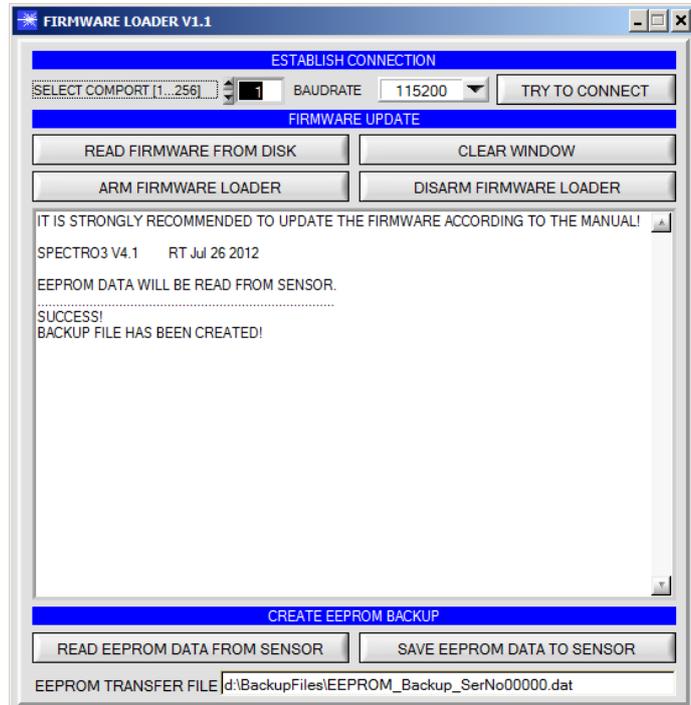
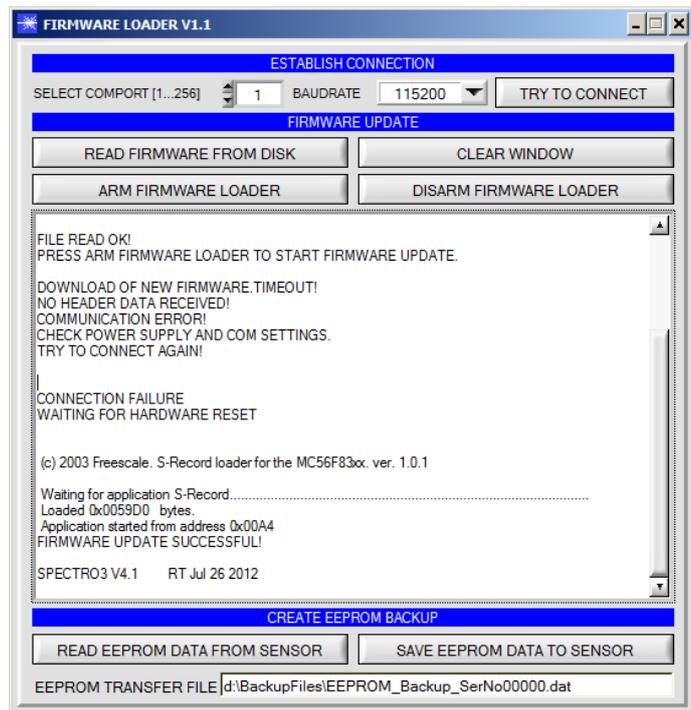
The file name for your **EEPROM backup file** should be chosen such that the names for several sensors cannot be mixed up. Using a file name that contains the sensor serial number might be advisable.

The Firmware Loader then reads all the EEPROM data from the data memory and saves these data in the selected file.

Upon successful completion the following message will be displayed:

**Success!**  
**Backup File has been created!**

If something should go wrong in a firmware update, any you have created the **backup file**, the saved **EEPROM backup file** can at any time be uploaded to the sensor again with **SAVE EEPROM DATA TO SENSOR**.



**CLEAR WINDOW** resets the display window.

If you should not get any response for a longer time, or if messages should be displayed in the status line, **DISARM FIRMWARE LOADER** can be used to cancel the firmware update process. However, you should always wait for approx. 1 minute before you press this button.

