

Manual

Program Loader V2.0 Software

(PC software for Microsoft® Windows® Vista, XP, 2000, NT® 4.0, Me, 98, 95)

This manual describes the installation of the Program Loader PC software and as a support for starting up the Program 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.

IMPORTANT!

Depending on the status of the old to the new firmware version, two different methods must be used for performing the firmware update. This manual describes both methods.

The table below specifies which method must be used:

Old or current firmware:	New firmware:	Method:
Color sensor: SiColo3 V6.0, SiColo3 V6.1, SiColo3 V6.2	SiColo3 V6.3 and higher	1
Color sensor: SiColo4 V6.0, SiColo4 V6.1, SiColo4 V6.2	SiColo4 V6.3 and higher	1
Gloss sensor: RIsGd V4.0, RIsGd V4.1, RIsGd V4.2, RIsGd V4.3	RIsGd V4.4 and higher	1
Color gloss sensor: SiColoGd V1.0	SiColoGd V1.1 and higher	1
Spray jet monitoring sensor: SiJet2 V3.0	SiJet2 V3.1 and higher	1
Color sensor: SiColo3 V6.3	Higher versions	2
Color sensor: SiColo4 V6.3	Higher versions	2
Color sensor: Spectro3 V3.0	Higher versions	2
Gloss sensor: RIsGd V4.4	Higher versions	2
Color gloss sensor: SiColoGd V1.1	Higher versions	2
Spray jet monitoring sensor: SiJet2 V3.1	Higher versions	2

A. Installation of the Program Loader software

Hardware requirements for successful installation of the Program Loader software:

- IBM PC AT or compatible
- VGA graphics
- Microsoft® Windows® Vista, XP, Me, 2000, NT® 4.0, 98, or 95
- Serial RS232 interface at the PC
- Microsoft-compatible mouse
- Cable for the RS232 interface
- CD-ROM drive
- Approx. 5 MB of free hard disk space

The Program Loader 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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B. Method 1

Attention: Please read this chapter before you start!

Method 1 is explained by way of an example update from SI-COLO4 V6.2 to SI-COLO4 V6.3.

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, linearisation curves, etc. that are stored in the data memory (EEPROM) will be deleted.

With the Program Loader V2.0 software the data in the EEPROM can be saved and can be written back again after successful firmware update.

For this purpose the software creates an EEPROM backup file.

Unfortunately some of the commands that are required for saving the EEPROM are not implemented in older firmware programs. With **method 1** it is therefore **necessary** to use an alternative procedure for accessing the EEPROM data.

First of all, only the program is written to the program memory.

Next the data memory (EEPROM) is saved with the software commands that are contained in the new program.

Then the new firmware is written, which means a full reset of the micro-controller (program memory and data memory) and an update with the new firmware.

As a last step the saved EEPROM backup data are written to the sensor again.

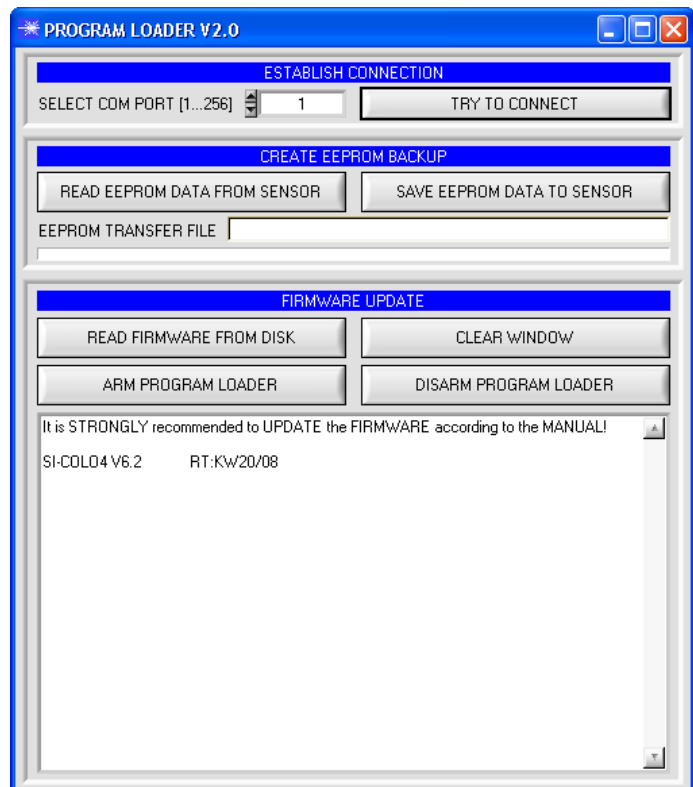
INFO! Updating only the program memory is not sufficient, because the data memory (EEPROM) also contains data that are only updated by way of a program memory and data memory update.

**It is essential that you follow the steps described below
for performing a perfect firmware update with
a backup of the EEPROM data!**

Step 1:

When the **Program Loader V2.0** 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** and try to establish a connection by clicking on **TRY TO CONNECT**. When the correct **COM PORT** has been selected, the sensor sends back information about the current firmware.



Step 2: (not necessary with method 2)

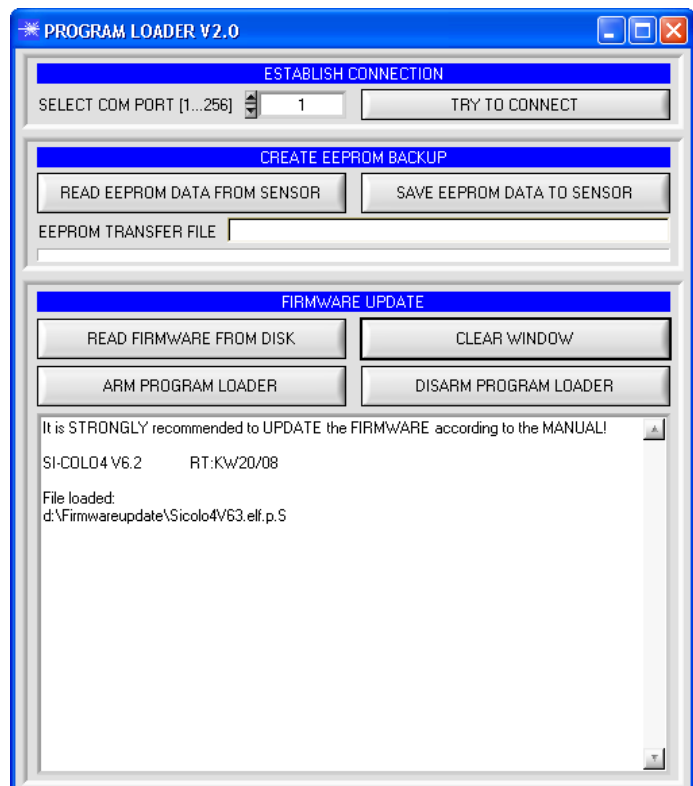
As described above, only the new program must be written first.

For this purpose press the **READ FIRMWARE FROM DISK** button and load the **xxx.elf.p.S** file (in this example Sicolo4V63.elf.p.S).

It is important that the file extension is **elf.p.S** and not **elf.S**. If you should not have this file, please contact your supplier.

ATTENTION! Do not load a file with an **elf.S** extension here!

The loaded file will be displayed in the status window.



Step 3: (not necessary with method 2)

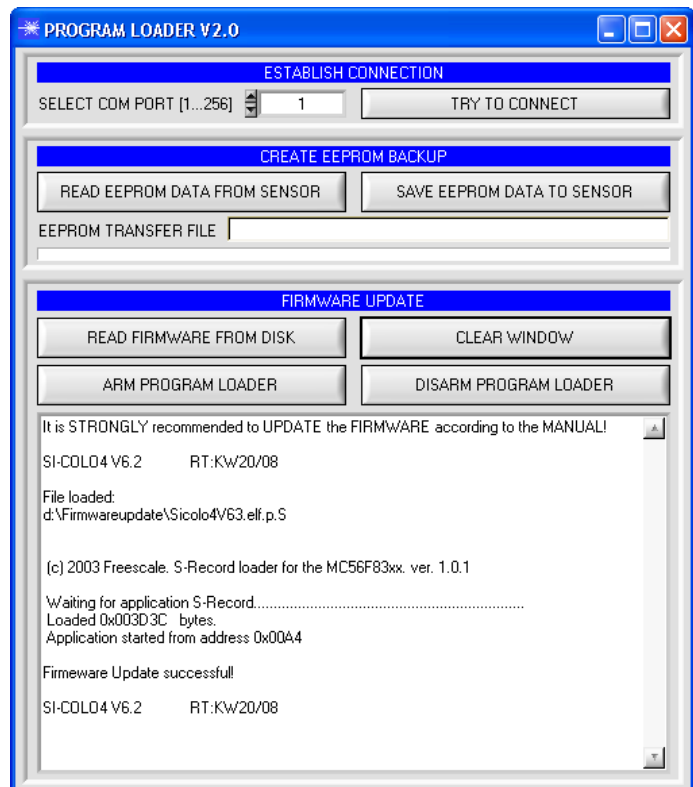
Now click on the **ARM PROGRAM LOADER** button. The program now attempts to send a software command that interrupts the normal program run and jumps to the start address of the boot sector.

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

The file will be **automatically** loaded to the sensor.

After a successful update of the program memory the sensor displays the status line of the **old** firmware, because until now only the program memory has been overwritten with the new program.

The firmware information, however, is located in the data memory that so far has remained untouched.



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**.

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

Load the corresponding **elf.p.S** file from the hard disk.

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

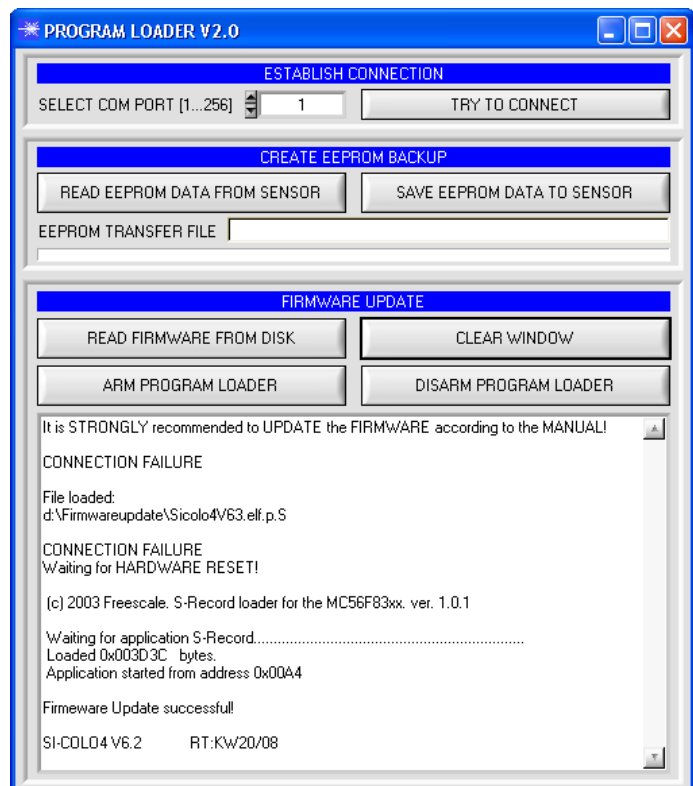
The program will try to send the software command for the update. This will not work, however, and you will get a **CONNECTION FAILURE** message.

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

If you perform a hardware reset within these 30 seconds, the **elf.p.S** file will automatically be uploaded to the sensor.

After a successful update of the program memory the sensor displays the status line of the **old** firmware, because until now only the program memory has been overwritten with the new program.

The firmware information, however, is located in the data memory that so far has remained untouched.



Step 4:

The successful update of the program memory now allows you to make a backup of the EEPROM data contained in the data memory.

For this purpose click on **READ EEPROM DATA FROM SENSOR**. You will be prompted to enter a file name. The selected name will be shown in the **EEPROM TRANSFER FILE** display.

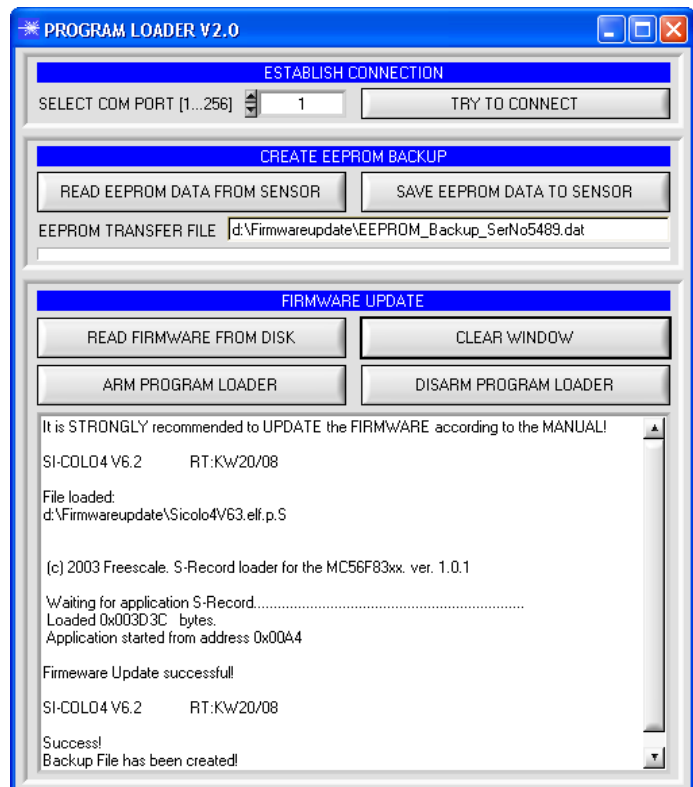
The file name for your **EEPROM backup file** should be chosen such that the names for several sensors cannot be mixed up. Using a file name that contains the sensor serial number might be advisable. Saving this file for future updates also might be a good idea.

The Program 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!

Step 5 may only be performed when this message has been displayed.



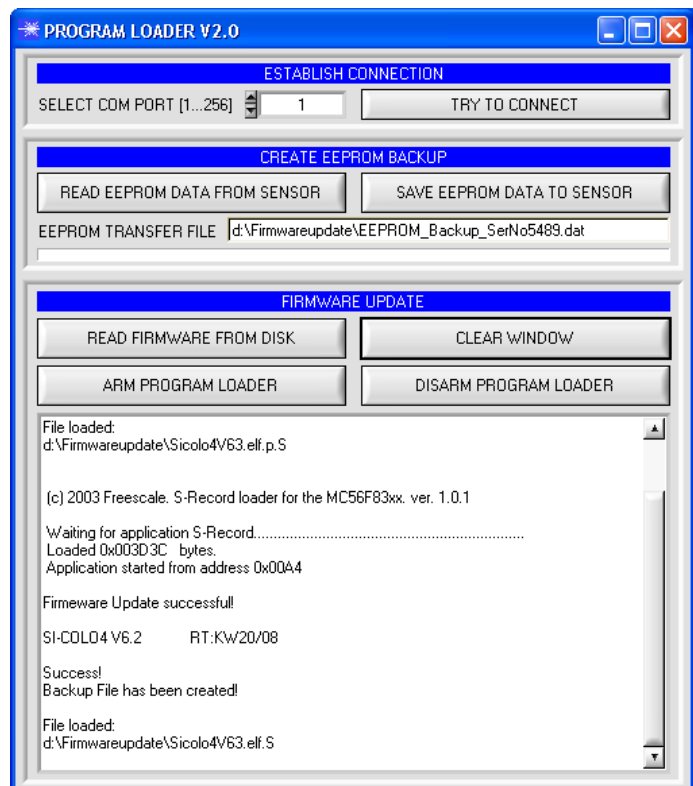
Step 5:

Now click on **READ FIRMWARE FROM DISK** to load the **xxx.elf.S** file (in this example: Sicolo4V63.elf.S).

It is important that the file extension is **elf.S** and not **elf.p.S**.

If you should not have this file, please contact your supplier.

The loaded file will be displayed in the status window.



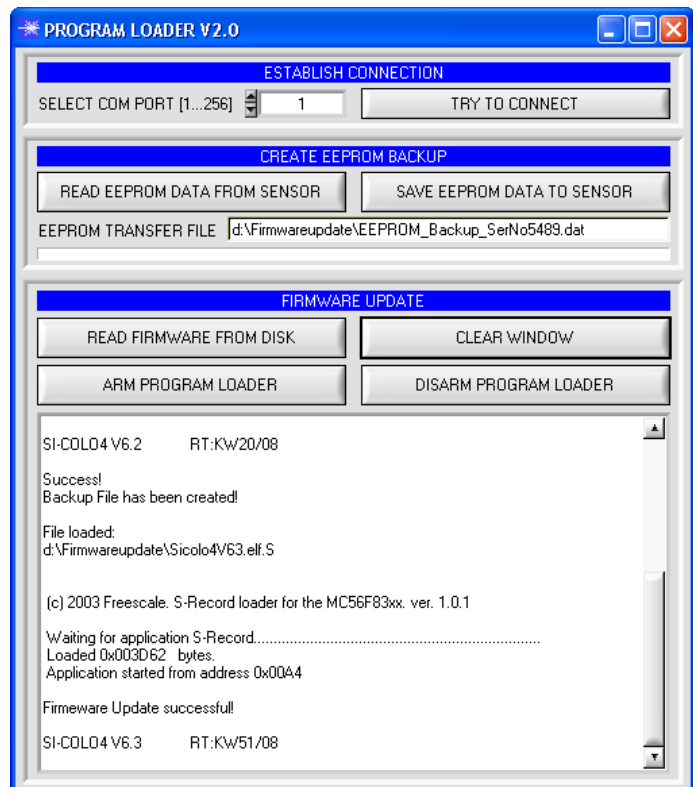
Step 6:

Click on the **ARM PROGRAM 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.

The file will be **automatically** loaded to the sensor.

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



If, contrary to expectations, there should be any trouble when updating with the **xxx.elf.S** file, 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**.

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

Load the corresponding **elf.S** file from the hard disk.

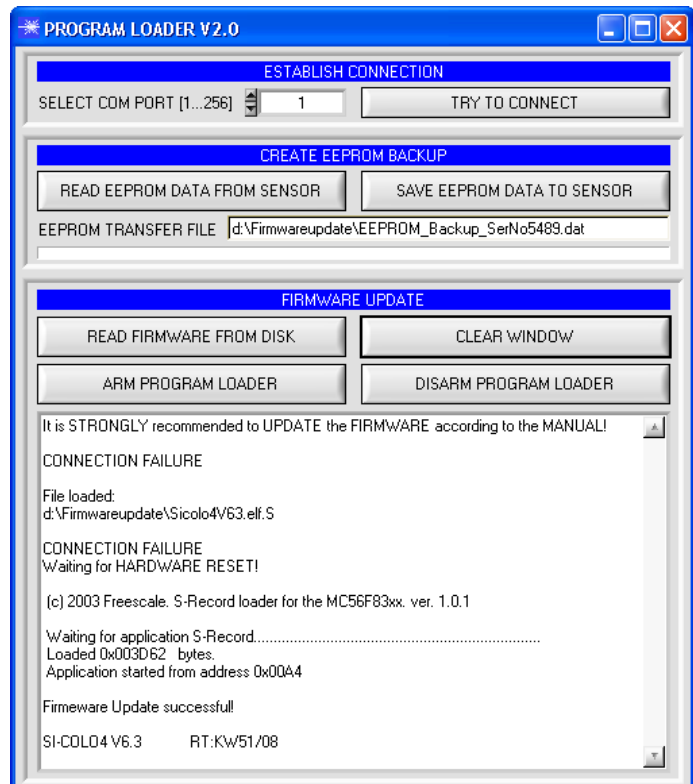
Then click on the **ARM PROGRAM LOADER** button.

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

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

If you perform a hardware reset within these 30 seconds, the **elf.S** file will automatically be uploaded to the sensor.

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



Step 7:

As a last step you must now transfer the saved EEPROM data to the sensor again.

To do this, click on the **SAVE EEPROM DATA TO SENSOR** button.

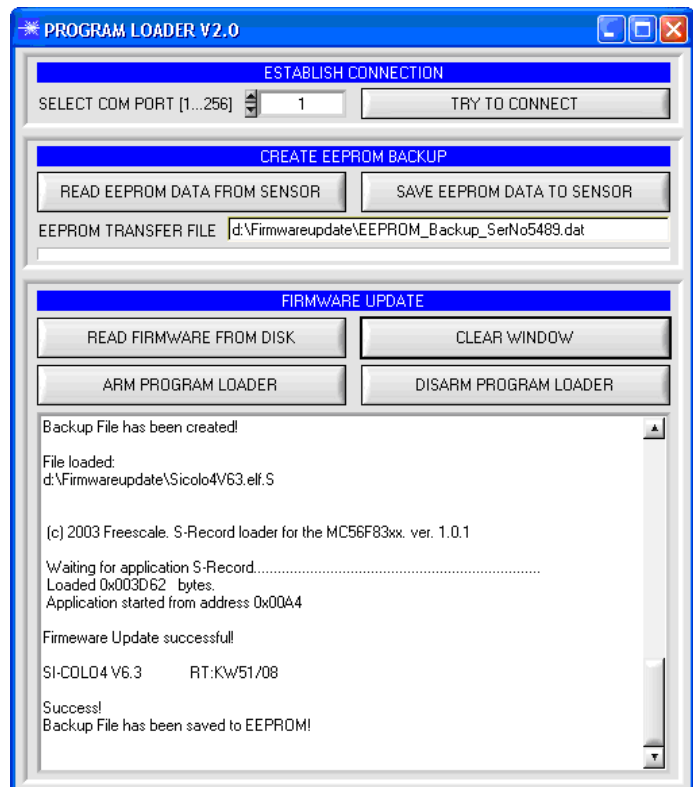
You will then be prompted to select a backup file that should be written to the EEPROM.

The **Program Loader** then writes all the EEPROM data from the backup file to the data memory of the sensor.

After successful completion the following message will be displayed:

Success!

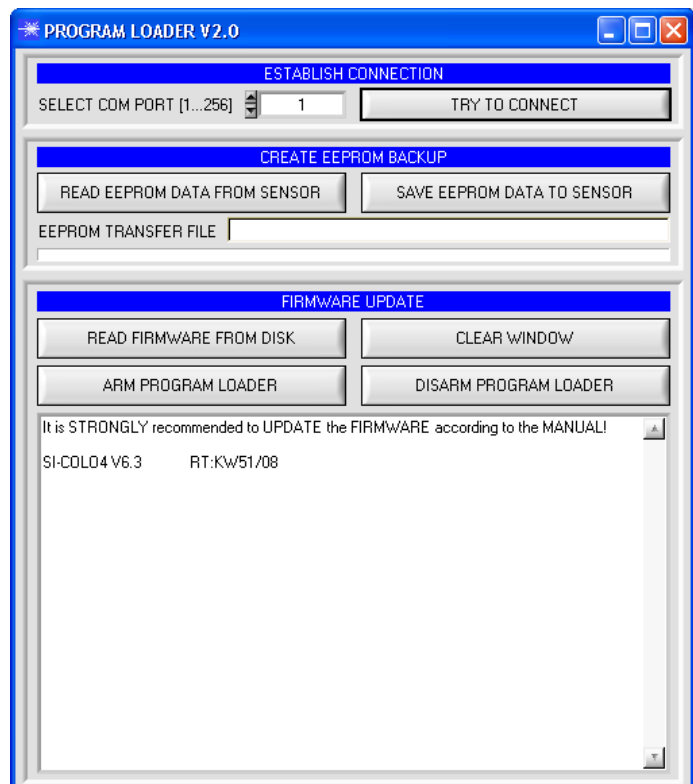
Backup File has been saved to EEPROM!



CLEAR WINDOW resets the display window.

If you should not get any response for a longer time, or if another message should be displayed in the status line, **DISARM PROGRAM LOADER** can be used to cancel the firmware update process.

However, you should always wait for approx. 1 minute before you press this button.



C. Method 2

Attention: Please read this chapter before you start!

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, linearisation curves, etc. that are stored in the data memory (EEPROM) will be deleted.

With the Program Loader V2.0 software the data in the EEPROM can be saved and can be written back again after successful firmware update.

For this purpose the software creates an EEPROM backup file.

First of all the data memory (EEPROM) is saved.

Then the new firmware is written, which means a full reset of the micro-controller (program memory and data memory) and an update with the new firmware.

As a last step the saved EEPROM backup data are written to the sensor again.

Compared to **method 1**, **method 2** does **not** require the alternative procedure via the program memory, because the corresponding software commands are already implemented.

It is **essential** that you follow steps 1,4,5,6,7 described under method 1 for performing a perfect firmware update with a backup of the EEPROM data!

(Step 2 and step 3 can be ignored.)