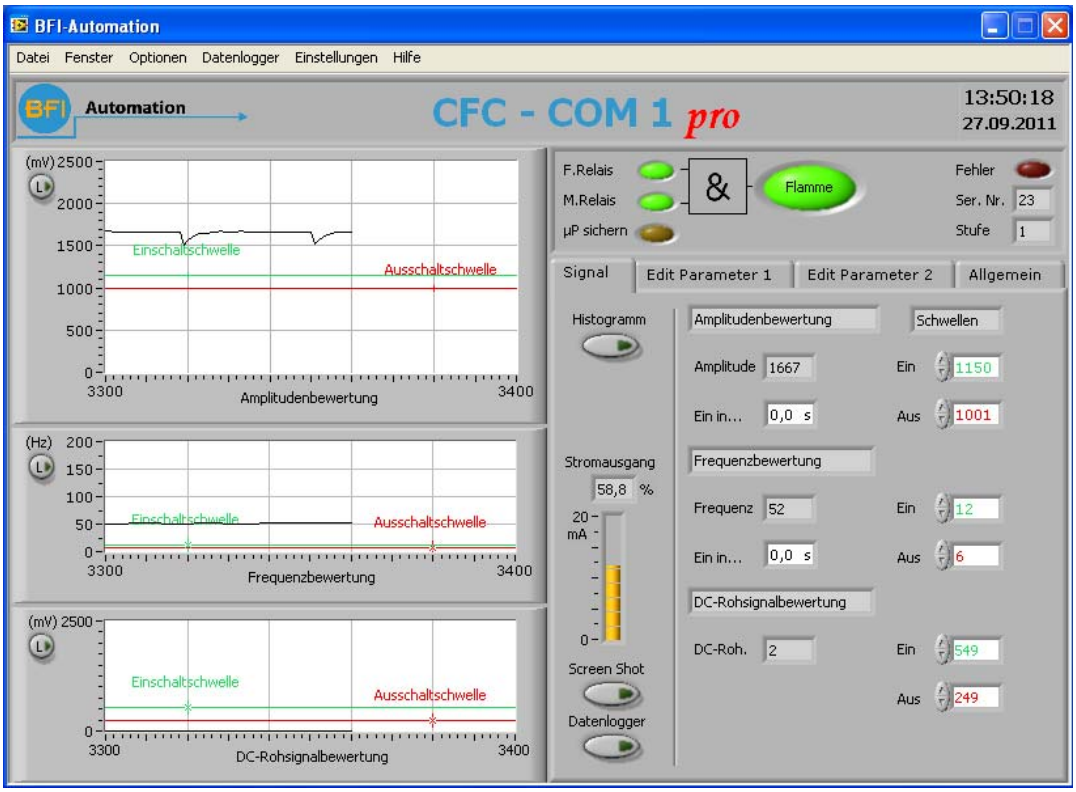
User manual
CFC Com1 software

Type: **CFC Com1**

Document: **HB CFC Com1 DE Rev4**



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1 General aspects

1.1 Introduction

This manual is an essential guide to successful and safe use of the CFC Com1 software in conjunction with a CFC x000 compact flame detector.

DANGER

Any modification to the CFC x000 parameters may only be made after the operating instructions of the compact flame controller have been read carefully.

This manual does not contain the original operating instructions and only explains the possibilities of parameterization with the CFC Com1 software.

NOTICE

Current software version: 1.89

2 Installation

2.1 Installation of the software

2.1.1 System requirements

The minimum and recommended hard and software requirements can be obtained from the following table.

	Minimum	Recommended
CPU	Pentium 200	at least P3 with 600 MHz
RAM	98 MB	256 MB
Graphic card	Standard VGA	
Screen resolution	800 x 600	1024 x 768
Free memory	1 GB	
Interfaces	RS-232	RS-232, USB 2.0
Operating system	from Win XP	tested up to Windows 10

NOTICE

The data logger function can only be used if the users is logged onto the computer as administrator.

2.1.2 Run setup

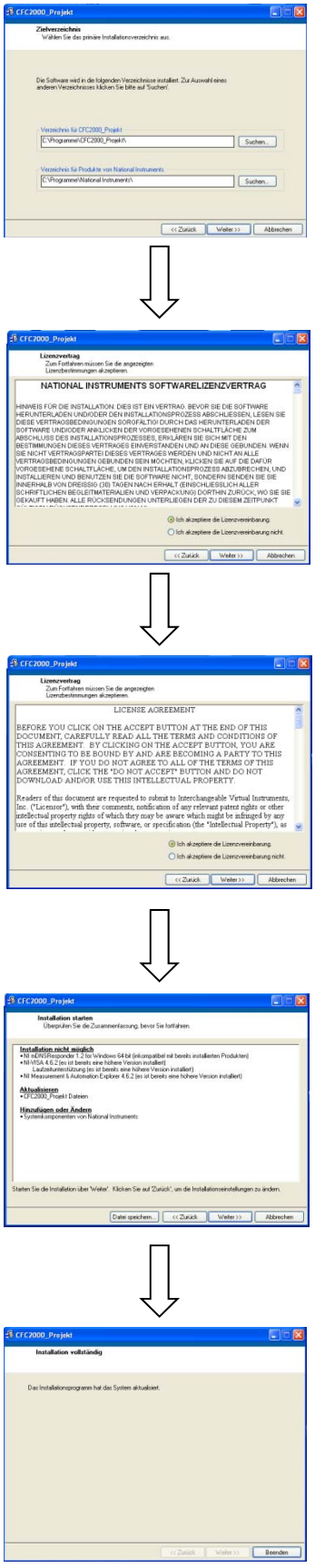
There are two ways of installing the software:

- Installing the software via *Setup.exe* that is stored in the *CFC_Com_1_Ver1.xxx\Installer_DE\Volume* folder.
- Using the autostart function of the CD-ROM drive. In this case, the CD starts automatically and a dialogue window is opened. Then click on the *Start installation button*.

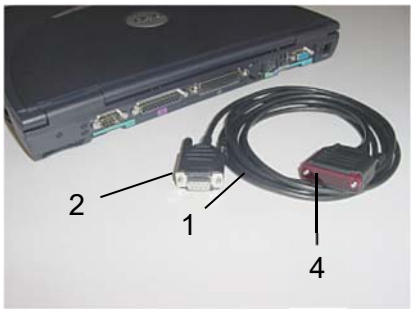
After successful execution of the installation, the following installation folders are suggested. Clicking the *Search* field of a folder allows you to assign a different file name. Clicking *Next* opens the licence agreement. The licence agreements for both LabView and CFC Com1 must be accepted successively.

Finally, checks are made for existing software components. Clicking *next* starts installation of the files into the specified folder.

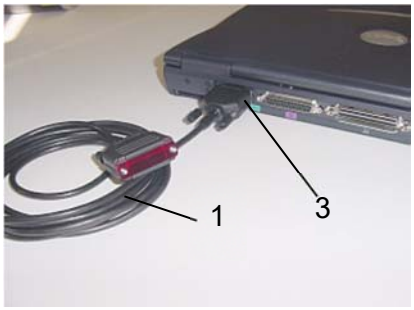
The install programme subsequently reports that the entire installation is completed after clicking *Finished*.



2.2 Connecting to the computer



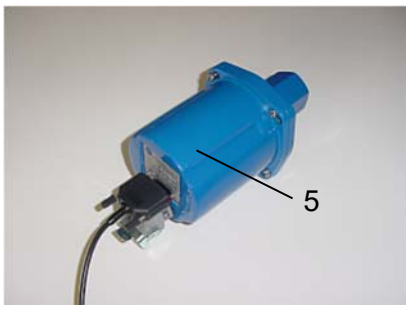
Connect the compact flame controller to the computer using a special data cable (1). The data cable consists of a 9 pin SUB-D plug (2) for connecting to the COM interface (3) of the computer and an IR interface in the SUB-D housing (4) for connecting to the compact flame controller (5). For computers without a serial interface, it is possible to use a USB/RS232 converter cable (accessory).A cable with direct USB connection is in preparation.



NOTICE

The compact flame controller must be connected to the power supply (24 V DC).

After connecting the compact flame controller to the computer and installing the software, the program can be started.

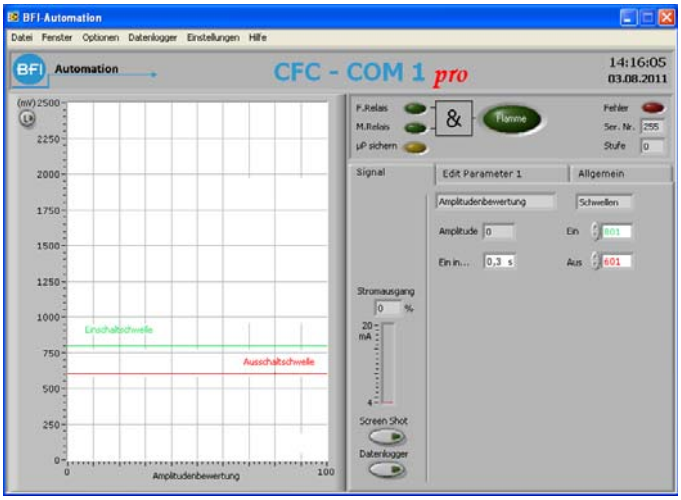


2.3 Programme for the CFC x000

2.3.1 Starting the program

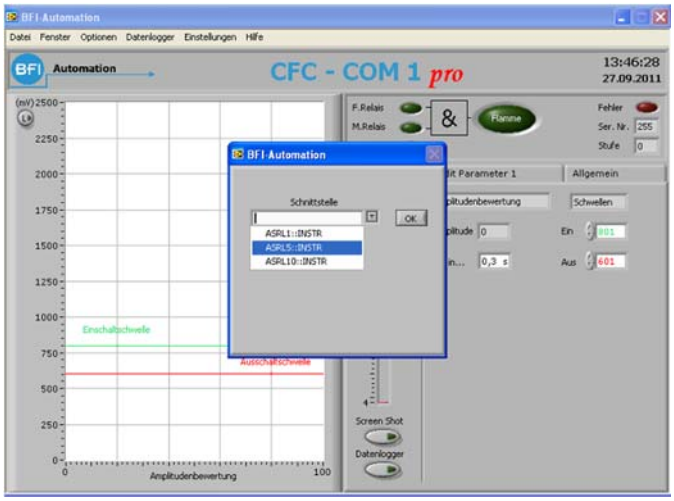
Start the programme by double-clicking the *CFC Com1* icon.
The illustrated CFC Com1 interface is displayed. The resolution cannot be changed.

The following window opens:



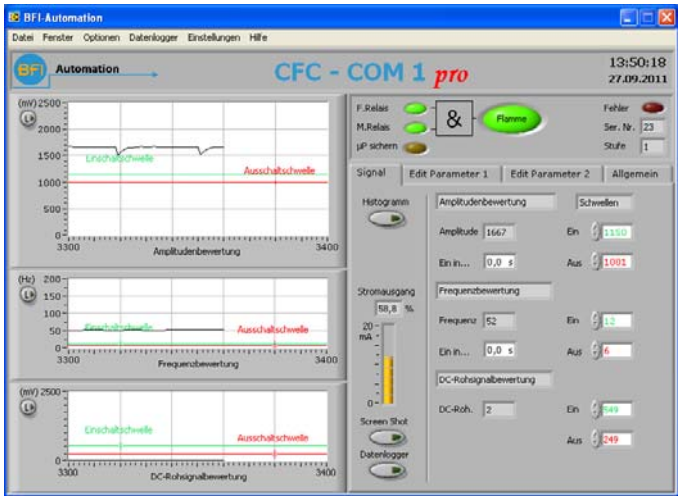
2.3.2 Selecting the interface

No interface is activated by default. This setting can be changed by clicking the *Interface* menu item in the *Settings* menu. All active COM interfaces are displayed.



2.3.3 Data transfer

Data transfer takes place immediately after selecting the correct interface.



NOTICE

During data transfer, the software automatically detects which CFC type is connected.

CAUTION

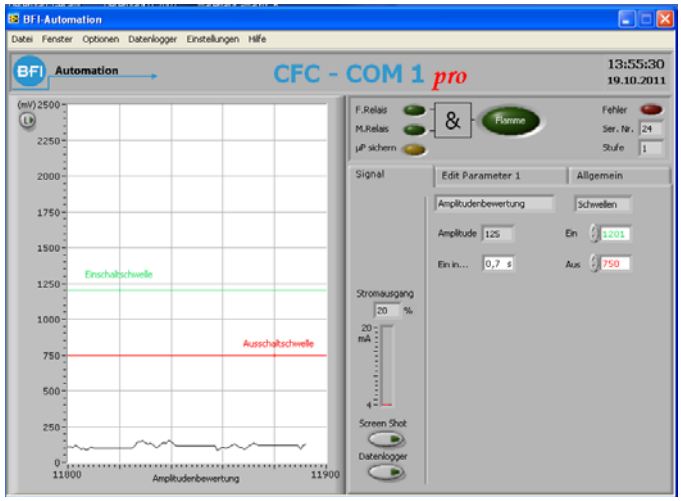
After starting, it is initially only possible to receive data. Settings or parameters can only be changed after entering the corresponding serial number and may only be performed by appropriately qualified and trained specialist staff!

Click the *Info* item in the *Help* menu to obtain information on the software version.
Close the window with the OK button or the ESC key.

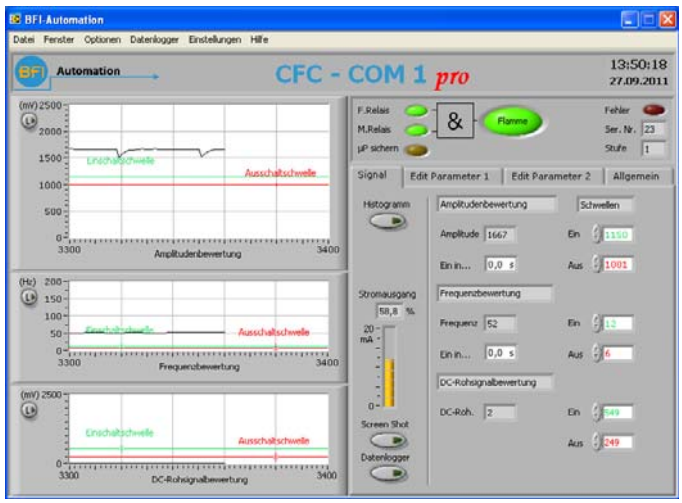
3 Visualization

The user interface is dependent on the connected CFC type.

View for the CFC 1000:



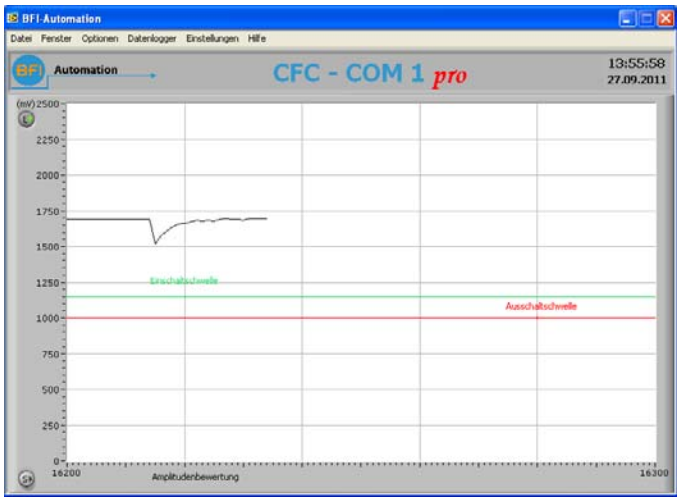
View for CFC 2000:



In the case of the CFC1000, only amplitude evaluation is displayed and only one parameter level is available. The frequency evaluation, DC raw signal evaluation and a second parameter evaluation is also visualised and enabled on devices after CFC 2000. These differences in display result from the different range of functions of the device types. The sections that do not apply to the CFC 1000 are marked in the following description.

3.1 Displaying the flame intensity

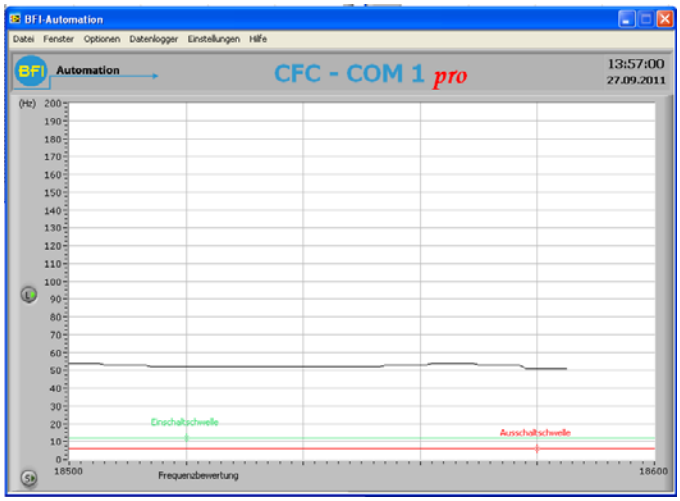
The upper window on the left-hand side of the screen displays the intensity of the measured flame radiation that has already been processed for evaluation by the amplifier and filter circuits. The radiation intensity is represented with the current threshold values by the amplitude evaluation in a diagram. Black always indicates the current actual value. Green indicates the set switch-on threshold and red indicates the switch-off threshold. The corresponding numerical values are displayed on the right of the diagram. The colours correspond to the colours in the diagram. Pressing the *L* button increases the size of the diagram. The screenshot button used for saving the currently-displayed diagram as image file is located in the bottom left corner. Pressing *L* button returns to the normal view.



3.2 Displaying the frequency evaluation

The middle window on the left-hand side of the screen displays the frequency of the flame modulation. The main modulation frequency of the flame or combustion to be monitored is determined by means of a specially developed frequency analysis.
As with the intensity display, the threshold values are again displayed in green and red and the actual value in black. This frequency can be used as an additional criterion for monitoring and evaluation. All three values are also displayed as numerical values on the right-hand side of the diagram.

Here, the diagram is also increased in size with the help of the *L* button and screenshots are activated by the *S* button. Pressing the *L* button again returns to the normal view.

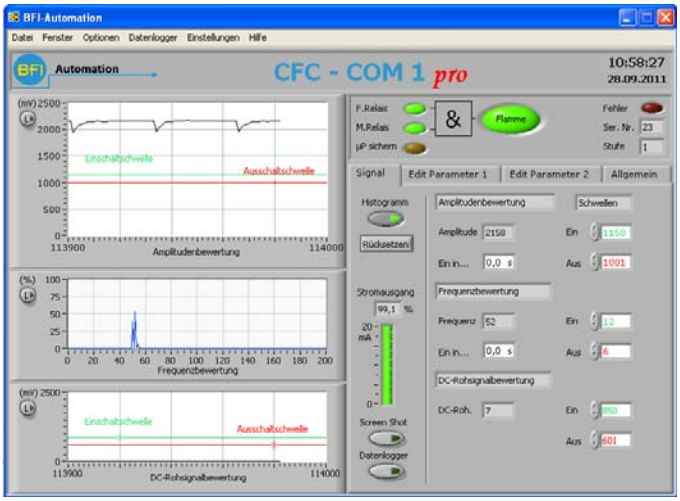


NOTICE

Not activated for the CFC 1000!

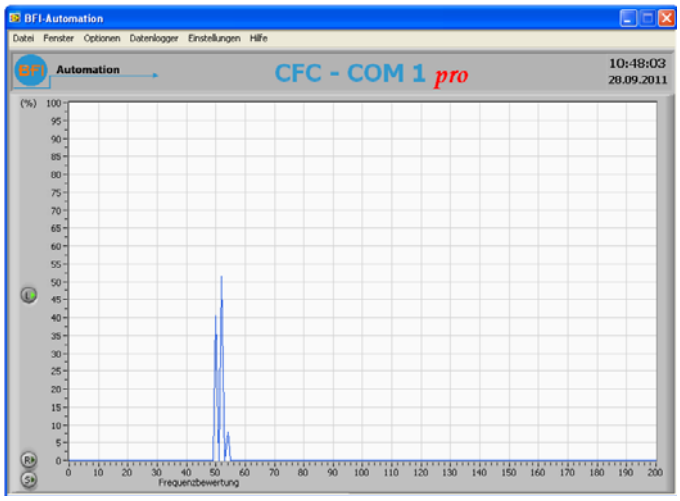
3.2.1 Histogram function

If the histogram button is pressed, the frequency evaluation display changes from the current value to frequency distribution per unit of time.



If the histogram button is active, the *Reset button* appears under it. If this is activated, the collected frequency distribution data is deleted and the distribution is redisplayed subject to the current frequencies.

The size of the histogram can also be increased or decreased by pressing the *L* button.



In addition to the already familiar *L* and *S* buttons, there is also the *R* button in this view. It also resets the frequency history.

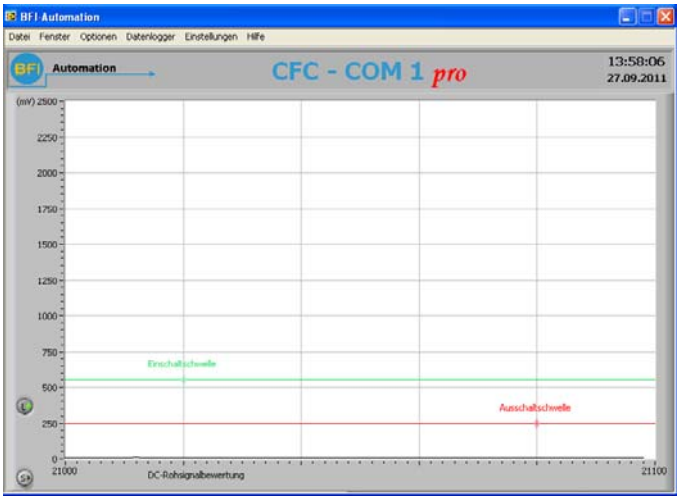
NOTICE

Not activated for the CFC 1000!

3.3 Displaying the DC raw signal

The lower window on the left-hand side of the screen displays the DC raw signal evaluation. The radiation intensity or the radiation level is visualised. The switching threshold of the DC raw signal has no influence on the "ON" or "OFF" signal flame.

This frequency can be used as an additional criterion for monitoring and evaluation. All three values are displayed as numerical values on the right-hand side of the diagram.



Pressing the *L* button increases the size of the diagram. The screenshot button used for saving the currently-displayed diagram as file is located in the bottom left corner. Pressing *L* button returns to the normal view.

NOTICE

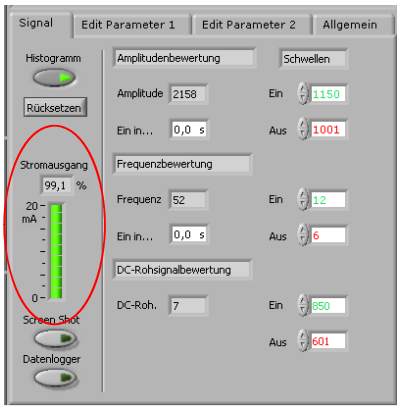
The DC raw signal is only visualised by compact flame controllers with infrared sensors (CFC x000IRx)!

NOTICE

Not activated for the CFC 1000!

3.4 Displaying the mA signal

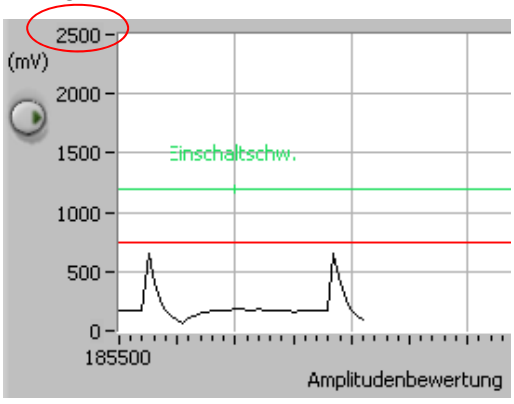
The 0/4 to 20 mA current output signal of the CFC is displayed as bargraph and percentage value on the left-hand side of the signal tab.



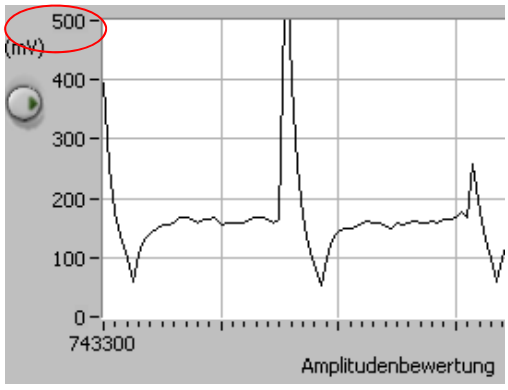
3.5 Changing the scaling for the x and y axes

The scaling of the x and y axes of the two diagrams for the analogue flame signal and the frequency signal can be freely selected. This is very helpful particularly when setting the sensitivities and the threshold values and for stretching and compressing the time axis. The final scale value can be marked with the help of the mouse, subsequently modified via the keyboard and confirmed with ENTER. Adjustment of all values on this axis and in the graph is then performed automatically.

Comparison of the following two figures displays a possible change in view:



Standard display range (0 to 2500 mV)



Modified display range (0 to 500 mV)

The **standard values** are **2500 mV** for the amplitude evaluation and DC raw signal evaluation as well as **200 Hz** for the frequency evaluation.

NOTICE

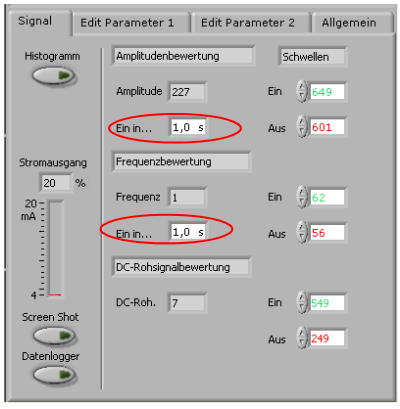
The maximum analogue flame signal is 2500 mV! A change in the scaling to higher values is not advisable.

A longer display period can be set by changing the time axis. This is particular advantageous if changes in the signal are to be displayed over a prolonged period of time (e.g. burner start, change of fuel).

To reset the axis scaling, refer to section 3.12.

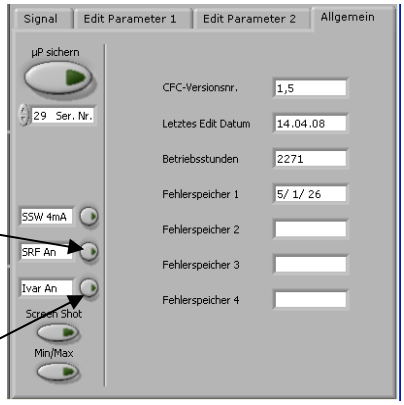
3.6 Switch-on delay

The lower value with the designation *ON in* adjacent to the diagrams in the lower illustration indicates the quantisation or starting delay time. As long as the flame signal has not exceeded the switch-on thresholds, the preset delay value in seconds is displayed in this field.
If the flame signal exceeds the switch-on thresholds, the time counts down to zero and then the flame relay is activated. Should the flame signal drop below the starting thresholds again before expiry of the set time, the time is reset again to the default value. The switch-on delay can be set to a value between 0.4 and 6 seconds.



3.7 Current starting value *(SSW)*

The initial value of the current output is specified to 0 or 4 mA here.



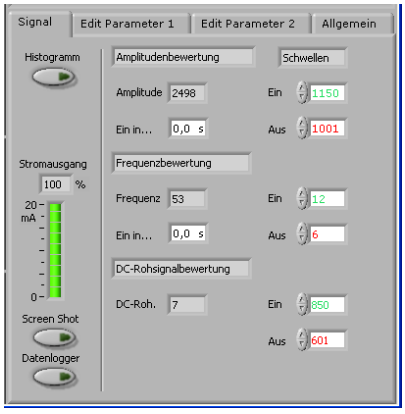
3.8 Current relay function (SRF)

The current relay function allows the analogue signal (current output) to be coupled with the flame relay. When the SRF is switched on, the current output is only enabled when the flame relay is activated.

3.9 Variable lower current limit

In addition, the compact flame controller allows selection of the lower value of the analogue signal as a variable and therefore independent of the turn-off threshold (for a more detailed explanation, see section 5.9).

3.10 Displaying the parameters

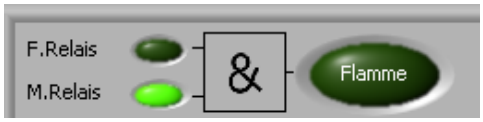


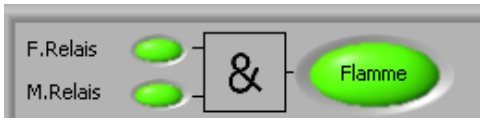
In addition to the respective current values for amplitude, frequency and DC raw signal, the corresponding switch-on and switch-off thresholds can also be read.

3.11 Displaying the relay states

The status of the flame and monitor relay is visualised via the LEDs arranged on the upper left. The flame relay is only driven when the "Flame" LED lights up bright green.

The flame signal is evaluated in two separate channels. The monitor channel monitors the safety-related function of hardware and software and drives the monitor relay (M.Relay). The evaluation channel process of the flame signal is subject to the set software parameters and controls the flame relay (F.Rely). Both channels must switched on simultaneously to activate the binary output signal (flame).





NOTICE

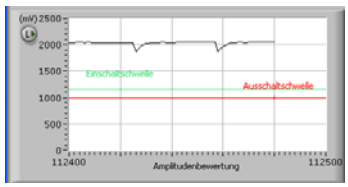
*The **Flame ON** binary signal is set when both relays are driven. The series connection of both relay contacts conforms to the SIL 3 requirements.*

3.12 Resetting axis scaling

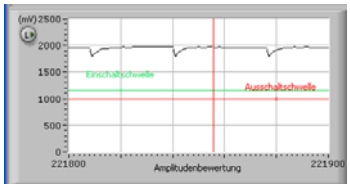
In the *Window* menu, the axis scaling can reset to the respective default state with the *Axis scaling* menu item. This reset has no influence on the relevant settings for the flame monitoring.

3.13 Diagram view

It is possible to switch between the oscilloscope and flow diagram under *Diagram view* in the *Window* menu.



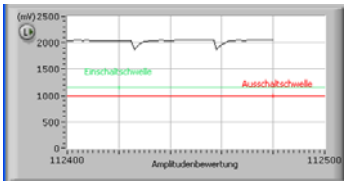
Oscilloscope diagram



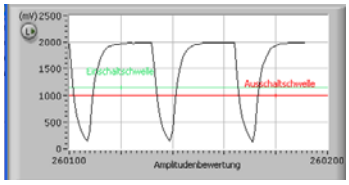
Flow diagram

3.14 Shutter visualisation

The shutter in the amplitude evaluation window can be visualised under *Shutter Visualisation* in the *Window* menu.



without shutter

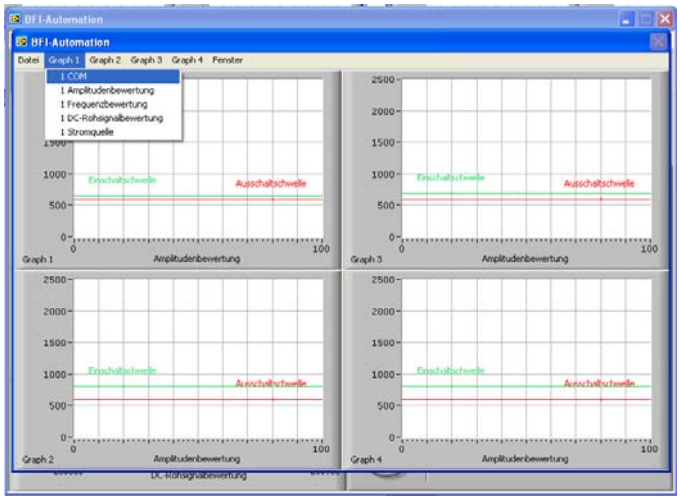


with shutter

3.15 Multiple display of different CFCs

When several compact flame controllers are in use, it is possible to display up to four signals simultaneously. This function is activated with the *Multiple display* menu item in the *Window* menu.

Each connected CFCx000 has a separate graph for visualising its parameters. Selection takes place under the respective menu items of the graphs. The selection of parameters for Graph 1 can been seen as follows. Exiting multiple display takes place by clicking *Exit* in the *File* menu.



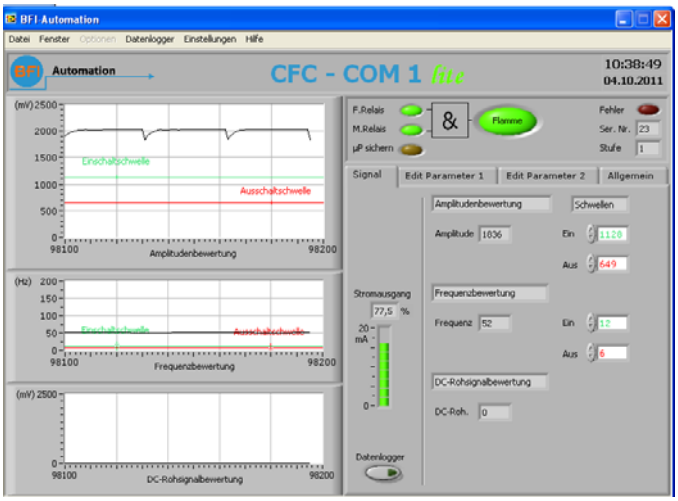
NOTICE

Connecting the compact flame controller for multiple display takes place via a standard USB hub.

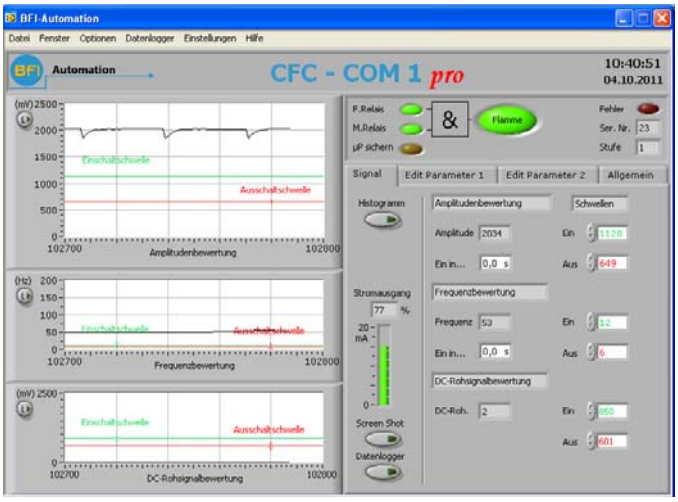
3.16 Changing between *Lite* and *Pro view*

It is possible to display the CFC Com 1 programme in the ***Lite*** or ***Pro*** versions.

*In the **Lite** version, some setting options and displays are deactivated. However, the CFC can be fully parameterized.*

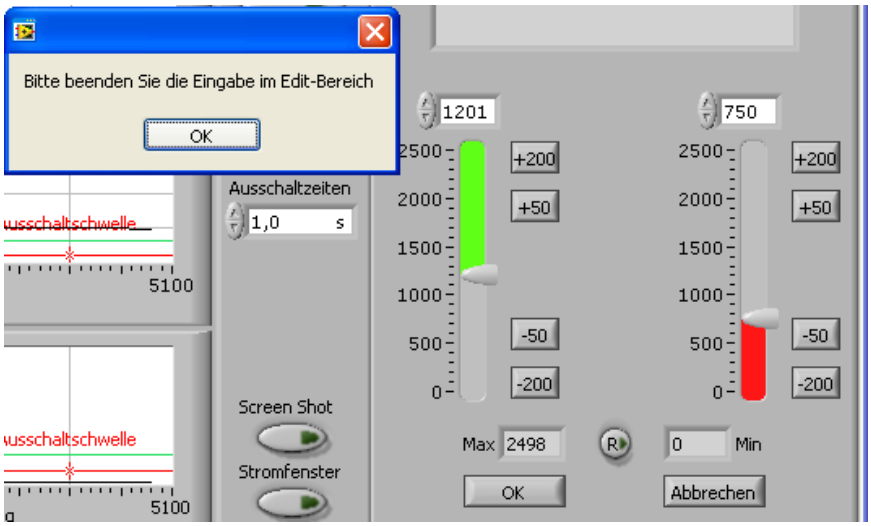


In the ***Pro*** version, all displays and setting options are displayed.



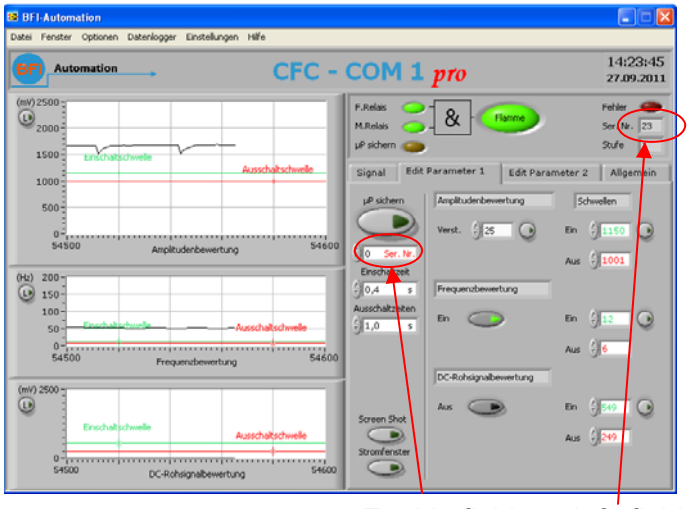
Switching between both modes takes place under *Window - > Lite/Pro* or by clicking the red ***pro*** letters or the ***green*** letter on the user interface.

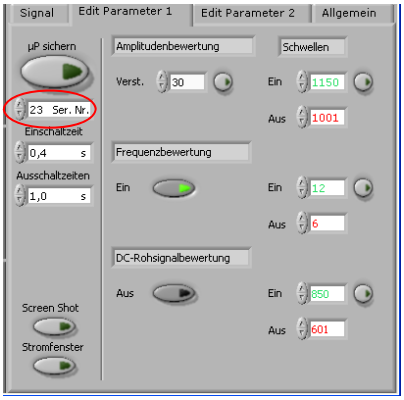
It is possible to switch between both display formats in display mode. If it is necessary to switch between the pro to Lite display in comfort edit mode, an Info window appears that prompts you to exit the Edit section. It is only possible to change to the Lite view after pressing the "OK" or "Cancel" button.



4 Edit or input section

The edit or input section is used to adjust the compact flame controller to the requirements of the combustion process.
It consists of buttons and inputs fields, in which parameters can be set or corresponding numerical values entered.





4.1 Activating the edit section

To enable the ***EDIT PARAMETER 1, EDIT PARAMETER 2*** or ***General*** sensitivity levels, the last two digits of the serial number of the connected compact flame controller must be entered into the ***Ser. Nr.*** enable field. The entire serial number can read on the type plate of the compact flame controller or in the ***Ser. No.*** info field and entered into the software. If the wrong serial number is entered, the Edit section remains locked and the input field flashes red. Input can be repeated as often as required. This serves as a safety barrier to prevent unintentional changing of parameters.

The respective parameters are displayed for editing under the ***Edit Parameter1*** and ***Edit Parameter 2*** tabs.

Changing the parameters of a non-activated parameter level is not possible but has no influence on the flame signal. The settings are activated only when the corresponding level in the compact flame controller is selected. **Activation of the second channel takes place via an external control voltage of 24 V DC at pin 7 of the plug-in connector.**

NOTICE

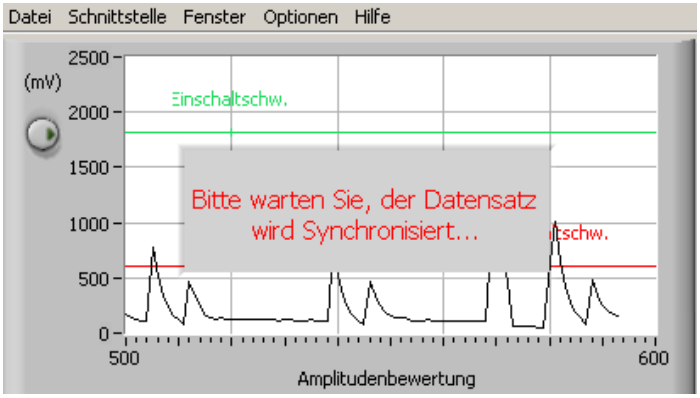
Parameter changes of a non-active channel are only effective after switch-over! It is necessary to check that the set parameters also ensure safe operation after switching over!

4.2 Saving data on the microprocessor

If settings are changed, the parameters are saved directly to the main memory (RAM). This is indicated by the message *Synchronising data set, please wait*.

NOTICE

The compact flame controller immediately operates with the new parameters which however, are not yet permanently saved.

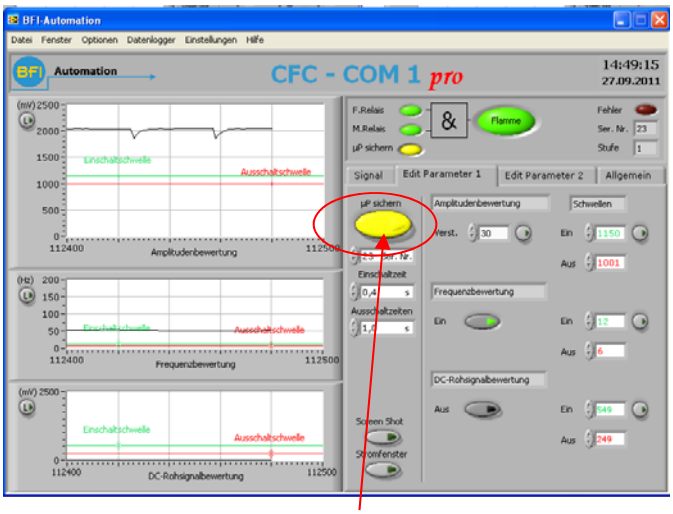


*Changed settings are initially buffered in the RAM of the compact flame controller and must be permanently saved to the EEPROM by clicking the **Save to µP** button!*

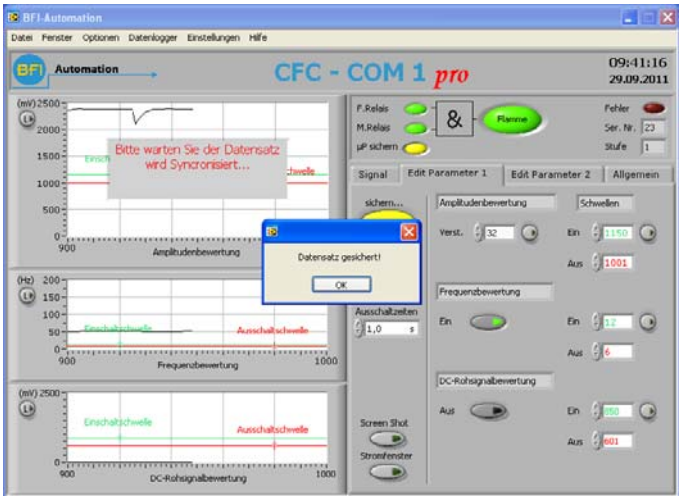
Parameters are only permanently saved in the EEPROM after pressing the ***µP*** key. If the parameters are not permanently saved, they will be lost after a loss of voltage.

NOTICE

It is particularly useful that parameters are not saved permanently to the EEPROM when tests are performed since various different settings can be tested without the need to change the parameters saved in the EEPROM. When the voltage to the compact flame controller is switched off, the settings last saved in the EEPROM by pressing the µP button are applied.



Save to µP button

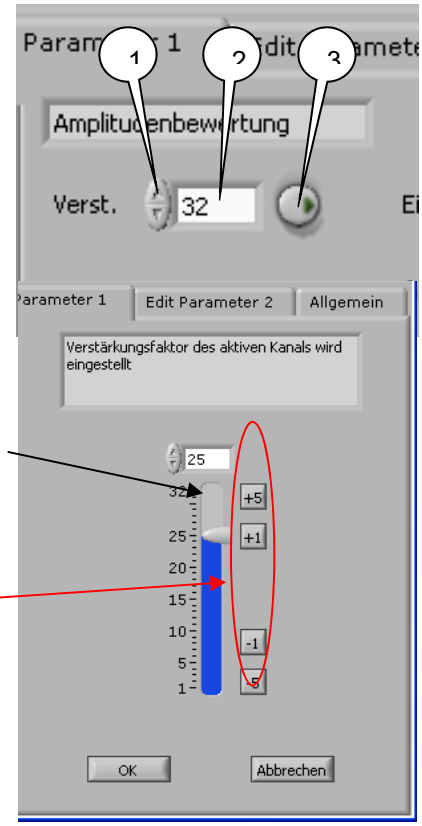


4.3 Gain setting

A change in the gain setting (sensitivity setting) influences the flame signal displayed with the amplitude evaluation. By default, the compact flame controller has the maximum gain of 32 (highest sensitivity). The gain setting can be read from the numerical value and at the slide controller.

There are three ways of changing the gain:

- With the mouse pointer via the ***UP/DOWN*** keys next to the number value (1)
- Direct input of a value into the input field (2)
- By pressing the round button (3) next to the number value, a further display is possible, in which, in addition to options 1. and 2. there is the also following:
  - To change the gain, move the mouse pointer over the wide pointer of the slide controller and press the left mouse key. Hold the mouse key pressed and move the bar up or down. The exact settings of the controller are also visualised by the numerical value.
  - The corresponding values are added or subtracted directly to the gain number value via the fixed value switches.

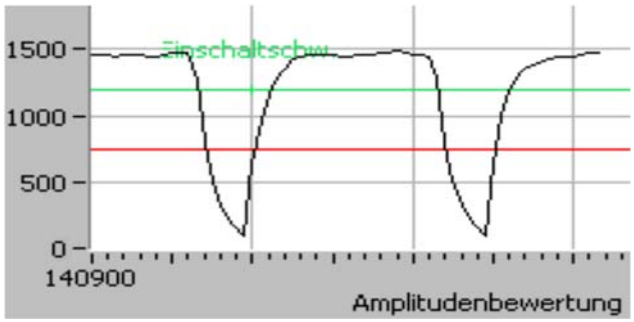


4.4 Amplitude evaluation

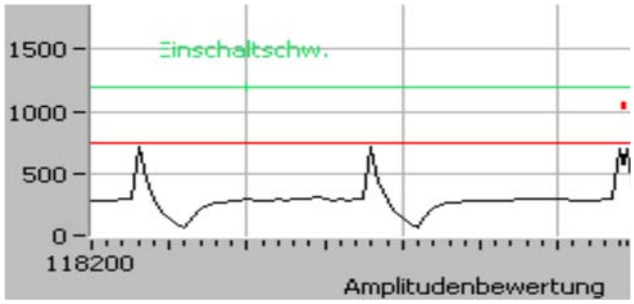
The amplitude evaluation visualises the radiation modulation of the measured flame radiation. It is an important parameter for flame monitoring. The current value and the corresponding switching thresholds are displayed in the window of the amplitude evaluation.

4.4.1 Setting the switching threshold

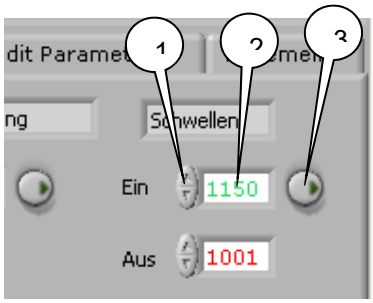
After starting the burner, the flame signal (black line) must intersect the green switching threshold from below. The flame relay is activated after the switch-on delay time has elapsed. This process must take place within the ignition safety time set at the burner controller. The switch-on and switch-off threshold can be modified within certain limits. The values for the thresholds are dependent on the flame signal and on the set sensitivity. The switch-on threshold must be set higher than the frequency of the extraneous light signal and lower than that of the own burner. If the burner is shut down or fails, the flame signal must drop clearly below the switch-off threshold.



Signal *above* the switch-on threshold

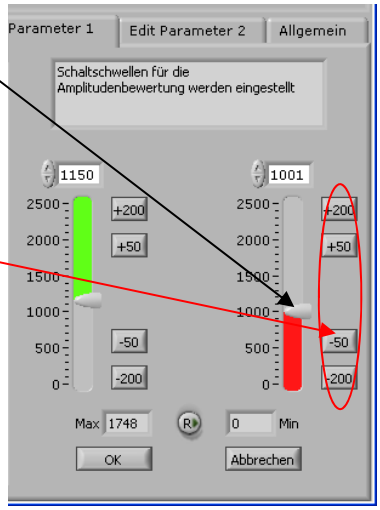


Signal *below* the switch-off threshold



Three are four different ways of setting the thresholds:

- With the mouse pointer via the ***UP/DOWN*** keys next to the number value (1)
- Direct input of a value into the input field (2)
- By pressing the round button (3) next to the number value, a further display is possible:
  - To change the switching thresholds, move the mouse pointer over the wide pointer of the slide controller and press the left mouse key. Hold the mouse key pressed and move the bar up or down. The exact settings of the controller is also visualised by the numerical value.
  - The corresponding values are added or subtracted directly to the switching thresholds value via the fixed value switches.



Min/Max values for the switch-on and switch-off thresholds of the amplitude evaluation:

ON	min. max.	650 mV 2200 mV
OFF	min. max.	600 mV 1100 mV
Default factory setting	ON = 1500 mV	OFF = 800 mV

The minimum difference between the switch-on and switch-off threshold is 26 mV.

4.5 Frequency evaluation

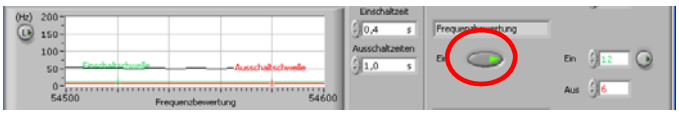
In addition to the amplitude evaluation, the CFC 2000 compact flame controller offers the option of performing frequency evaluation of the flame. The frequency evaluation is subject to the modulation rate (flicker frequency) and was developed to eliminate the extraneous light in multi-burner systems. The flame signal of the flame to be monitored differs characteristically from other signal sources (extraneous light) by a higher flicker frequency.

NOTICE

The frequency evaluation can not be activated for the CFC 1000.

4.5.1 Activating the frequency evaluation

Integration of the frequency evaluation into the flame monitoring takes place via the ***Frequency evaluation*** *ON/OFF button*.



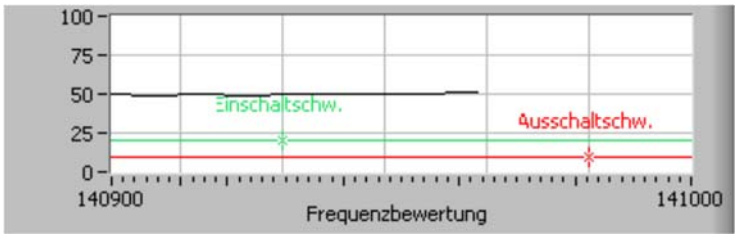
NOTICE

When the frequency evaluation is activated, the flame signal must exceed both the switch-on threshold of the amplitude evaluation and the switch-on threshold of the frequency evaluation. Activation of the flame relay (Flame ON) takes place after the set switch-on delay. The flame relay remains active until one of both switch-off thresholds drops below the duration of the safety time.

For switch-on and switch-off delays, refer to section 4.7.

4.5.2 Setting the switching thresholds

The green values stands for the switch-on threshold, the red value for the switch-off value and the black value is the current value, the measured flicker frequency.

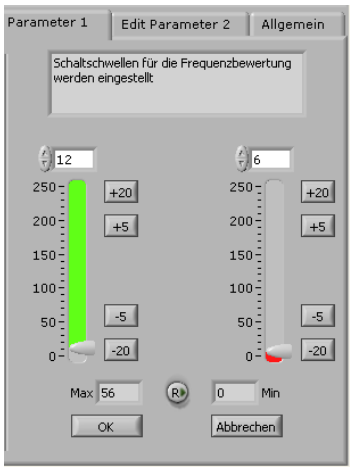


The switch-on threshold must be set higher than the frequency of the extraneous light and lower than that of the useful light. If the burner is shut down or fails, the frequency signal must drop clearly below the switch-off threshold.

Three are four different ways of setting the thresholds:

- With the mouse pointer via the ***UP/DOWN*** keys next to the number value
- Direct input of a value into the input field

  - By pressing the round button next to the number value, a further display is possible:
  - To change the frequency, move the mouse pointer over the broad pointer of the slide controller and press the left mouse key. Hold the mouse key pressed and move the bar up or down. The exact settings of the controller is also visualised by the numerical value.
  - The corresponding values are added or subtracted directly to the switching thresholds value via the fixed value switches.



The minimum difference between the switch-on and switch-off threshold is 6 Hertz.

ON	min. max.	11 250
OFF	min. max.	5 200
Default setting	ON = 40	OFF = 20

Min/ Max values for the switch-on and switch-off thresholds of the frequency evaluation

4.6 DC *raw signal evaluation*

The DC raw signal evaluation is only visualised on CFCs with IR sensors.

NOTICE

Not activated for the CFC 1000!

4.6.1 Activating the DC raw signal evaluation

NOTICE

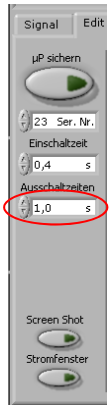
Activation of the switching thresholds of the DC raw signal evaluation is currently not planned.

4.7 Safety times

- **Safety time for operation (switch-off time)**

NOTICE

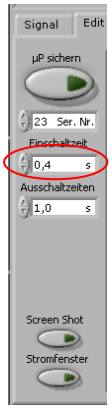
The set safety time for operation applies to both sensitivity levels!



The safety time can be adjusted to the safety specifications of the system.
Activate the corresponding field for the switch-off time by double clicking with the mouse and enter the new value via the keypad. Confirm with ***ENTER***.
The ***UP/DOWN*** switches are also available.
The safety time operation can be set between 0.4 – 6 seconds.

NOTICE

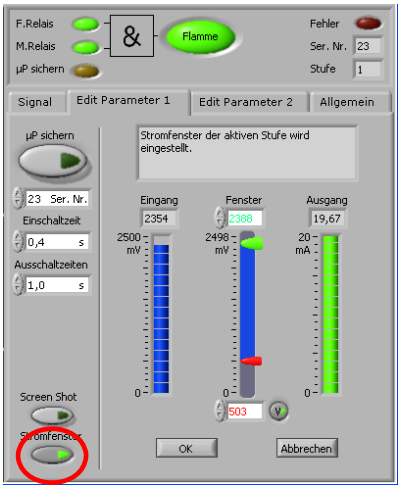
The safety time for operation (switch-off time) is also subject to the hardware settings (refer to operating instructions BA CFC x000 DE).



- **Switch-on delay (switch-on time)**

The flame signal must exceed to the switch-on thresholds for the set switch-on time in order for the flame relay to be activated.
The switch-on time can be freely selected between 0.4 and 6 seconds. The delay enables the compact flame controller to be optimally adjusted to the system.
Activate the corresponding field for the switch-on delay by double-clicking with the mouse and entering the new value via the keypad. Confirm the new value with ***ENTER***.

4.8 Relationship between current limit value (20 mA) and amplitude evaluation



The current output is formed from the signal of the amplitude evaluation. If the amplitude of the radiation is increased, the current of the analogue output is also increased until the 20 mA mark is reached. This mark can be freely selected within the range of the amplitude evaluation from the value of the switch-on threshold up to 2498 mV.

Switching over to the *Current window* display takes place by clicking the ***Current window*** switch. Activation of the current window is indicated by the bright green switch. In the amplitude evaluation window, the voltage value is represented as a red line from which the final current value is reached. The amplitude signal may not exceed this voltage value. The compact flame controller does not output more than 20 mA.

The green bargraph displays the current output current value. The blue bargraph displays the current amplitude signal. The middle bar with the slide controllers display the set initial current value or final current value. The corresponding voltage values can read above and below the display.

If an undefined value is confirmed, the previous value is set again. The setting can also be made with the UP/DOWN switched next to the numerical values. The values are changed in increments of 1.

NOTICE

The initial current value is calculated automatically from $\mathbf{I_{var}}$ (see section 4.9).

4.9 Variable lower current limit (I_{var})

The switch-off threshold of the amplitude evaluation influences the initial current value so that the analogue value of the switch-off threshold is at 25% of the final current value (20 mA).

In the case of an initial current value of 0 mA, the switch-off threshold is at 5 mA.

In the case of an initial current value of 4 mA, the switch-off threshold is at 8 mA.

If the final current is assigned another amplitude value (voltage) (section 4.8), automatic recalculation of the initial current value voltage takes place.

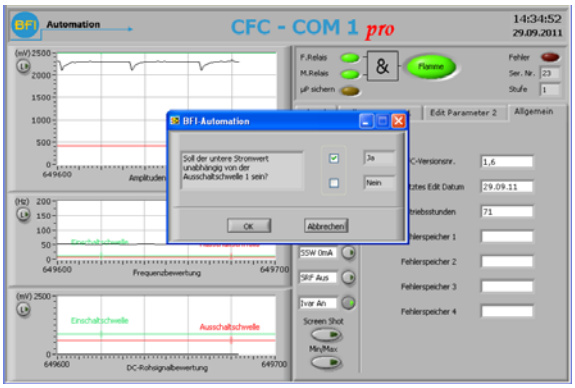
By activating the ***I_{var} ON*** function, it is possible to cancel automatic recalculation of the lower current mark. Cancellation can take place in several ways:

- Activating via the V-switch in the current window
- Activating the *General switch Ivar ON* tab
- Activating via the *Options -> Lower current threshold variable* menu item

4.10 Current relay function (SRF)

By default, the current output is only dependent on the amplitude evaluation of the flame modulation and the set current window. The switch-on thresholds have no influence on the current output.

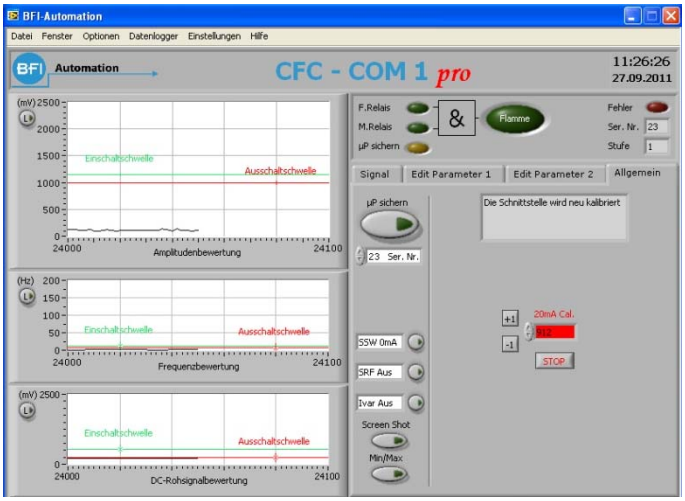
The ***current relay function*** offers the possibility of activating the current output only when the flame relay has picked up. Select **Current relay function** in the **Options** menu. The following window appears in which the relationship can be defined.



4.11 Calibrating the current output

On delivery, the CFC x000 is calibrated to an exact final current value of 20 mA. Should disruptive deviations occur, it is possible to calibrate the current output to the measured value acquisition system used.

To calibrate the current output signal, click the ***Calibrate current output*** menu item in the ***Options*** menu. The following window opens:



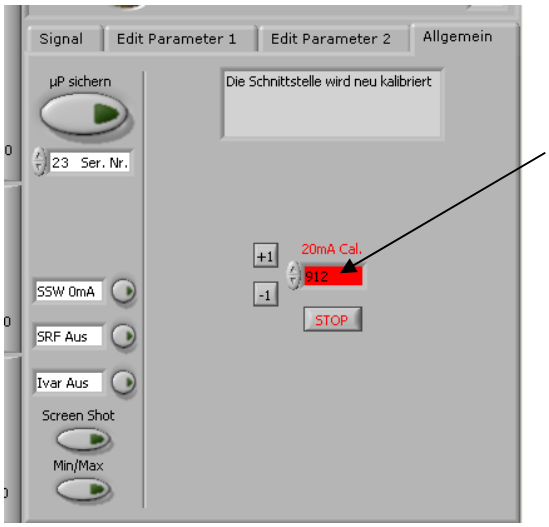
Dependence of the current output signal on the amplitude evaluation is cancelled. The final current value is set to 20 mA. The measured value acquisition system should now display 20 mA irrespective of the amplitude evaluation.

If the specified current is smaller than 20 mA, the red-highlighted numerical value must continue to be increased until the control system detects 20 mA.

If the specified current is greater than 20 mA, the red-highlighted numerical value must continue to be decreased until the control system detects 20 mA.

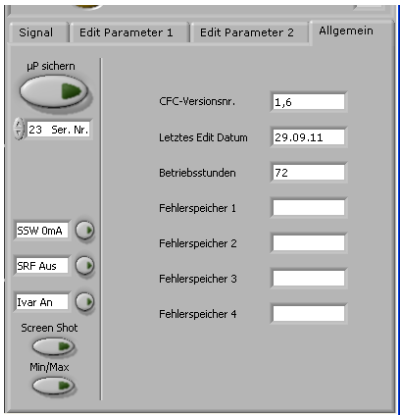
The value can be changed between 890 and 1022. To complete calibration, click the ***STOP*** switch.

If the compact flame controller is subsequently aligned to the flame and the amplitude evaluation signal is greater that the mark of the final current value, the control system must detect exactly 20 mA.



4.12 Fault memory

The CFC x000 has an error memory that archives errors that have occurred and displays them in the *Global* section. The last four errors are displayed according to the FiFo principle (*First in First out*).
Fault memory 1 is the most recent error code.



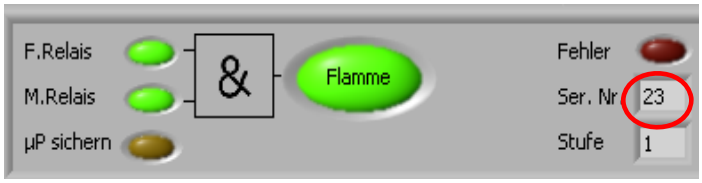
The following information is revealed by the error code.

For example, the following figure shows a brief loss of voltage (BOT fault) with activated channel 1 at operating hour 320:

5 / **1** / **320**
Error type — Error channel — Operating hour

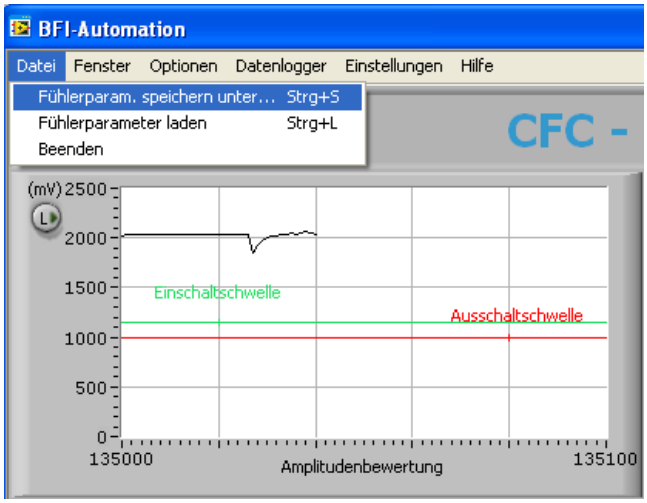
Error type	Plain text	Channel	Operating hours
1	RAM error	Y	zzzz
2	Flame relay error	1 or 2	0 – 65535
3	Electric potentiometer error		
4	Watchdog time error		
5	BOT error – Brown Out Detect	1 or 2	0 – 65535

Error signaling is indicated via the red LED in the upper right part of the user interface. In addition, a signal is output to PIN 8 of the plug-in connector. (see CFC operating instructions)



5 Data management

The menu File contains two functions for data management that simplify or support the work with the CFC x000 compact flame controller. The parameters of the compact flame controller can be saved in a file and transferred to another compact flame controller.



5.1 Saving sensor parameters

With the help of the ***Sensor param. save under...*** command, all relevant data and settings of the compact flame controller can be be saved to a file. Any target folder on the computer can be selected.

The advantages of electronic data management are:

- saving of the settings
- comparison and evaluation in offline mode
- transmitting of the data (evaluation by BFI-Service)
- transferring the settings to other devices
- possibility of documentation for operators

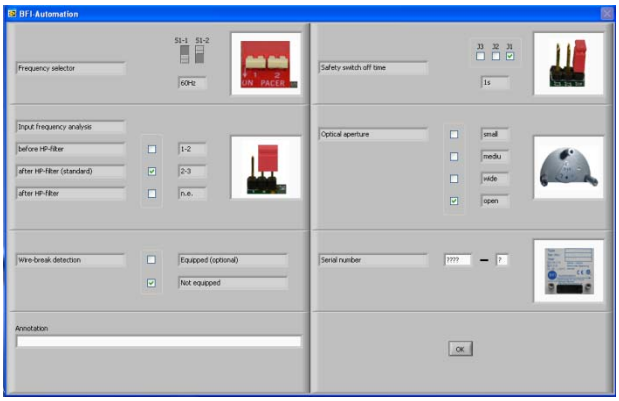
NOTICE

Only data already saved in the EEPROM of the compact flame controller with the ***Save to µP*** *button is transferred to the hard disc!*

In addition to the setting data read from and saved directly to the EEPROM, the hardware setting can be noted before saving.

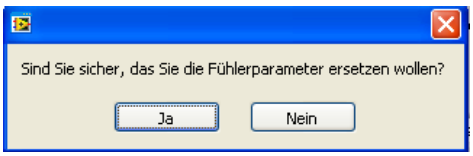
The *Frequency selection switch S1-1 or S1-2* input refers to the settings of the frequency filter, *J1/J2/J3 bridged* to the switch-off time of the safety channel. The J4 jumper specifies whether the input of the frequency analysis takes place before or after the high-pass. The current opening degree of the aperture can be noted in the optical aperture section. The compact flame controller is prepared for *relay wire fracture detection*; this function is not active in the standard configuration. The serial number and the version can also be stored.

System-specific data can also be recorded in this field.



After input has been confirmed with the **OK** button, the usual Windows Folder and file input window is opened and it is then possible to specify the storage location and the name of the file.

5.2 Loading sensor parameters



The saved parameters can be loaded onto the CFC x000 from the computer with the ***Load sensor param.*** item in the ***File*** menu. The data is written directly to the EEPROM.

For safety reasons, data can only be uploaded in Edit mode.
An additional safety confirmation dialogue prevents unintentional overwriting of the data.
All previously set and stored data is lost when the new parameters are uploaded.

NOTICE

Ensure that the hardware settings are also transferred accordingly!

NOTICE

After installation on the burner, each new and preset compact flame controller must be checked for proper function and security against extraneous light!

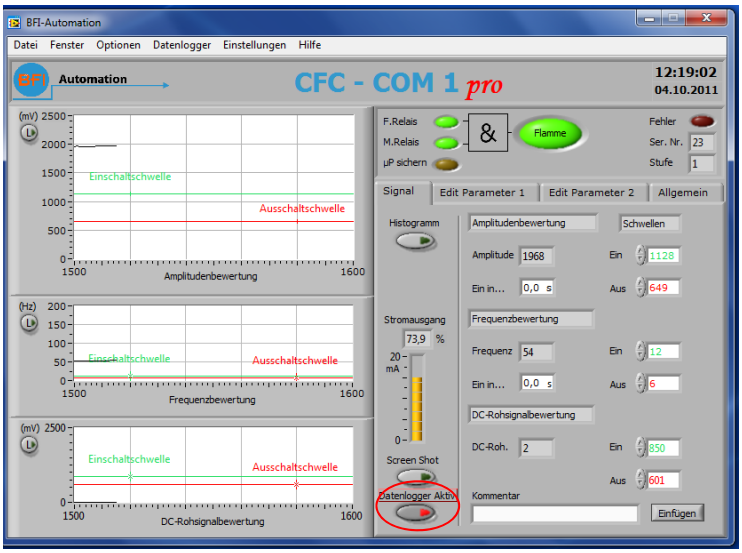
5.3 Data logger

The CFC x000 allows online saving of the detailed flame signal and the signal outputs on the computer. A space-saving text file is used as file format.
The maximum recording time depends on the size of the memory of the computer used. Approx. 3 MB per hour can be considered as a reference value. *Data recording is started by clicking the **Data logger** button with the left mouse button.* The shutter, which repeats every second, can be displayed or hidden via the menu. Hiding the shutter is particularly helpful if the recording is to be evaluated graphically. The hardware settings and important system parameters can then be saved in the *Notes* field. Any target folder on the computer can be selected for the data logger file.

NOTICE

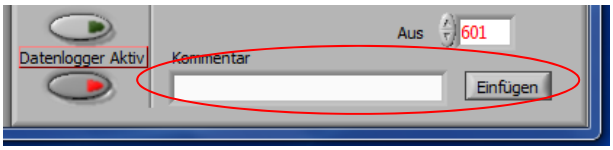
*Saved data logger files have the file designation **Name.log**.*
*Files with the saved sensor parameters have the designation **Name.par**.*

The active data logger can be recognised by the red button.



*Pressing the red **OFF** button deactivates the data logger again. Following that, a hardware settings query takes place as described in section 5.14. After input has been confirmed with the OK button, the usual Windows Folder and file input window is opened and it is then possible to specify the storage location and the name of the file.*

During recording of the data, comments can be entered that are the visible in the recorded file. For this purpose, the text is entered into the comment field and accepted by pressing the ***Add*** button.



All recorded parameters can be imported into a spreadsheet program for evaluation.

A file from the data logger looks like this:

Notizen:												
Frequenzwahlschalter 1+2 = ?0												
Frequenzwahlschalter 3+4 = ?0												
SJ3 gebrückt = ?5sec												
Relaisdrahtbrucherkennung Aktiv = ?												
Komplette Typennummer = ? 1285												
Ballastanteil 33%												
Kohlefeuer ohne Öl												
offene Blende												
Fühlerparameter CFC2000 :												
Anal. Einschwelle=1001			Anal. Ausschwelle=750			Freq. Einschwelle=22				Freq. Ausschwelle=10		
Roh. Einschwelle=549			Roh. Ausschwelle=249			Einschaltzeit1 1/10s=10				Verstärkung=32		
Anal. Einschwelle2=1499			Anal. Ausschwelle2=1001			Freq. Einschwelle2=90				Freq. Ausschwelle2=70		
Roh. Einschwelle2=601			Roh. Ausschwelle2=300			Einschaltzeit2 1/10s=10				Verstärkung2=10		
Ausschaltz.1+2 1/10s=10			Chipnummer=188			CFC-Versionsnummer=1,5				Betriebsstunden=25		
Stromfenst. oben=2498			Stromfenst. unten=0			Kalib. Strom=908				Checksumme=175		
Kanal Verknüpfung=Und			DC-Rohsignalbew.=Aus			Frequenzbewertung=An				Fehlerverh.=Flüchtig		
Strom Rel. Funkt.=An												
Zähler	Ana.	EZ.Ana.	Frq.	EZ.Frq.	DC Roh.	mA	Verst.	Fl.Rel.	Mo.Rel.	Stufe	Fehler	Zeit
29	2498	0	28	0	2434	20	32	1	1	1	0	10:14:50
30	2498	0	28	0	2434	20	32	1	1	1	0	10:14:50
14	2498	0	30	0	2434	20	32	1	1	1	0	10:14:50
15	2498	0	30	0	2434	20	32	1	1	1	0	10:14:50
16	2498	0	30	0	2434	20	32	1	1	1	0	10:14:50

6 Faults

Problem:	Display:	Cause:	Remedy:
Programme does not start communication	CFC1000 start screen is not displayed. No changes on the screen	No or the wrong interface selected	Select the correct interface
Evaluation signals stop	No changes on the screen	Communication between the CFC and the computer interrupted	Check connection, restart programme
Parameter file cannot be transmitted to the CFC	Info window indicates that this function can only be executed in Edit mode.	Edit mode must be switched for this function.	Enter the serial number into this field and then transmit the parameter file to the device.
Data logger does not start	Error 8 occurs when opening/creating/replacing a file in the CFC2000.vi	No access rights to the file in the C:\Program Files\CFC2000_Projekt\data*log.log path	Execute this program as Admin or at least have admin rights assigned to this path.
Parameters cannot be changed	Enable field for the serial number flashes red	Wrong or no serial number entered	Enter serial number

7 Order data

The CFC Com1 software can be obtained from BFI Automation Mindermann GmbH using the following order data:

Article	Article number
CFC Com1 communication software incl. IR/USB data interface cable, 1.5m	6040-4901-00

Accessories

Article	Article number
IR/USB data Interface cable, 1.5m	6040-4810-10
IR/USB data Interface cable, 3m	6040-4810-13