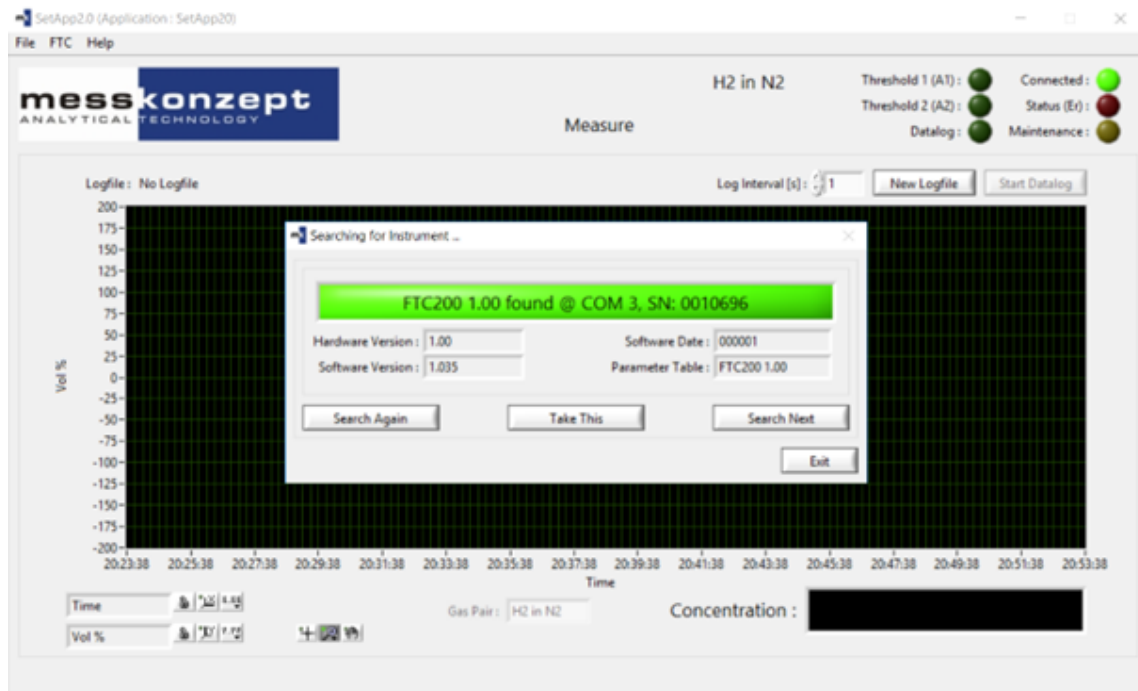**messkonzept**
ANALYTICAL TECHNOLOGY

SetApp 2.0
Setting, Logging and Visualization Software
Operating Manual
For FTC300, FTC200-OEM, and FTC130

Version 1.002 © Messkonzept GmbH
Date of issue: 06th February 2017

Contents

Thank you for using SetApp2.0 from Messkonzept.

The product described in this manual and products for use with it are subject to continuous developments and improvement. All information of technical nature and particulars of the product and its use (including the information in this manual) are given by Messkonzept in good faith. However, it is acknowledged that there may be errors or omissions in this manual. For the latest revisions to this manual contact Messkonzept or visit www.messkonzept.de.

Messkonzept welcomes comments and suggestions relating to the product and this manual.

Note!
The design of this software is subject to continuous development and improvement. Consequently, this software may incorporate minor changes in detail from information contained in this manual.

Important!
In correspondence concerning this software, please specify the version of SetApp2.0. You can find the version number in the **Help** drop-down menu choosing the **About** option.

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This manual applies to: SetApp2.0
Date of Release: July 2019
Software Version: 2.014

Part I

Operator Safety

This section provides information and warnings which must be followed to ensure safe operation and retain the instrument in safe condition. Read this section carefully before installing and using the software.

1 Notes on Safety Conventions and Icons

Warning!
"Warning" draws attention to application errors or actions that can lead to safety risks, including injury to persons or malfunctions, possibly even destruction of the device.
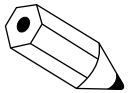
Note!
"Note" indicates an additional function or hint.

2 Warning Notices

Warning!
The manufacturer does not assume liability for inappropriate handling of the software. Malfunctions caused by inappropriate handling may lead to hazards.

3 Safety Instructions

Warning!
For safe operation of the device please pay attention to all instructions and warnings in this manual.
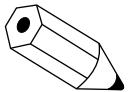
Note!
Software changes may only be done by Messkonzept.

Part II

Download and Installation

1 Requirements

SetApp2.0 runs on PCs with Windows XP, Windows Vista, Windows 7, Windows 8 and Windows 10.

2 Download

You can download the SetApp2.0 software from our homepage. The file needs to be saved and extracted to the PC.

3 Installation

Execute the .exe-file in the extracted folder. This will start the install wizard. Please read and accept the license agreements and choose an installation directory. After installation the PC needs to be restarted once.

Part III

Connecting the Device to PC via SetApp2.0

1 Connecting the Device to RS-232

Set up the RS-232 connection as described in the manual of the device under consideration.

2 SetApp: COM-Connection

After the installation is finished, start SetApp. Upon launch, SetApp automatically begins scanning the PC's COM-ports in ascending order for connected instruments. A window titled "Searching for instrument. . . " should appear as shown in Figure 1. When an instrument is detected, the search pauses. Press "Take This" to proceed with the shown device. If multiple devices are connected to the same PC on several COM-ports, click "Search Next" until SetApp finds the device you wish to work on.
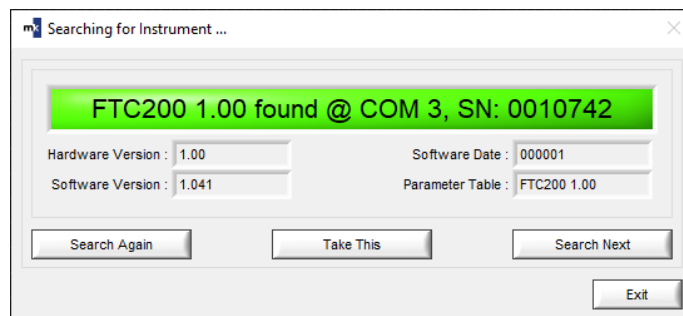
Figure 1: Searching for and choosing a COM-port.

If you encounter problems finding the device, please check that:

- SUB-D and/or USB cables are connected properly.
- The device is connected to a power supply.

Part IV

Settings

The structure of this manual follows the menu bar in the top left corner of SetApp 2.0. Step by step the manual will explain every single point of the menu.

1   File

The menu option **File** has 2 selections: **Main Chart** and **Exit**.

1.1   Main Chart

The Main Chart is the main window for reading measurement values, saving data, and adapting the scale in the x (time) and y (value) direction.

Note: The unit of the concentration in the bottom right corner can be changed in the **General Settings** menu option under **FTC**.
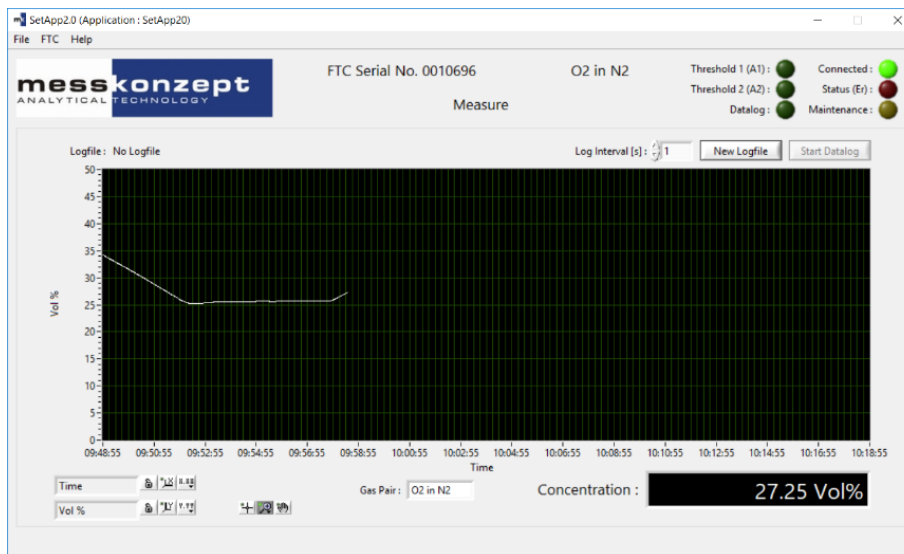
Figure 2: The main chart plotting the time against the Vol%.

1.1.1   The Context Menu

To open the context menu "right click" on the grid. The menu is divided into eight sections as shown in figure 3. We briefly explain each section and its options below.

Section 1:

- **Clear chart** erases all graphs from the chart and starts a new one starting with the point when chart was cleared.

- **Synchronize to PC clock** uses the PC clock as reference for the timeline.

- **Export** has three options:

    - **Export data to excel.**

    - **Export data to clipboard.**

    - **Export a simplified graphic** from the chart.

Section 2:   Choose the units for the y-axis as ppm or vol. %.

Section 3 and 4:   Scale the range of y-axis.

Section 5:   Scale the range of the y-axis around the actual reading. For instance, **Scale 10% around actual reading** will show the actual reading $\pm\,10\%$ of the value. The upper boundary is the actual reading plus the 10%, whereas the lower boundary the actual reading minus 10%.

Section 6:   Clicking on **Concentration autoscale once** and **Concentration autoscale** scales the displayed range of the y-axis to the highest and lowest recorded values. The boundaries for **Concentration autoscale once** will be static, whereas **Concentration autoscale** will adapt the axis boundaries of the y-axis automatically.

Section 7:   Choose a time span for the x-axis.

Section 8:   Section 8 is analogue to section 6 for the x-axis (time): **Time autoscale once** will set the boundaries of the x-axis to the first recorded value on the left side and to the time when **Time auto scale once** was pressed on the right side. Following that, the span of the time becomes static, meaning that the starting point will constantly move forward in order to keep the difference between the current time and the starting point constant. Choosing **Time autoscale** will set the left boundary to the point when the recording started, while the right boundary constantly adapts to the current time. This means the span of the window is constantly growing.

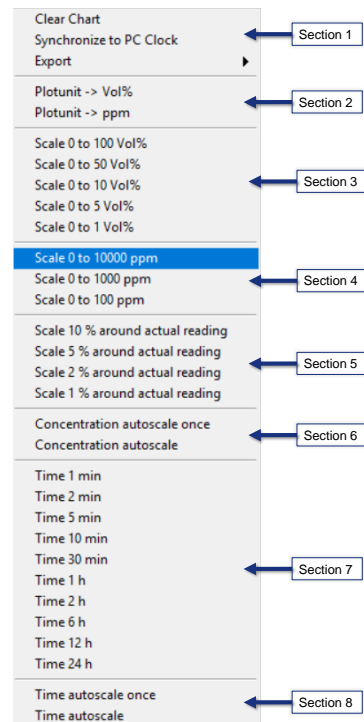Figure 3: The context menu with its numbered sections.

1.1.2   Chart Options

Figure 4 explains the usage of the buttons on the bottom left in the main chart.

1.1.3   Logging Data and the Indicator Lights

The **gas pair** which is currently selected is displayed next to the indicator lights in the measure window at the top right corner of the chart. In figure 5 it is **O_2 in N_2**.

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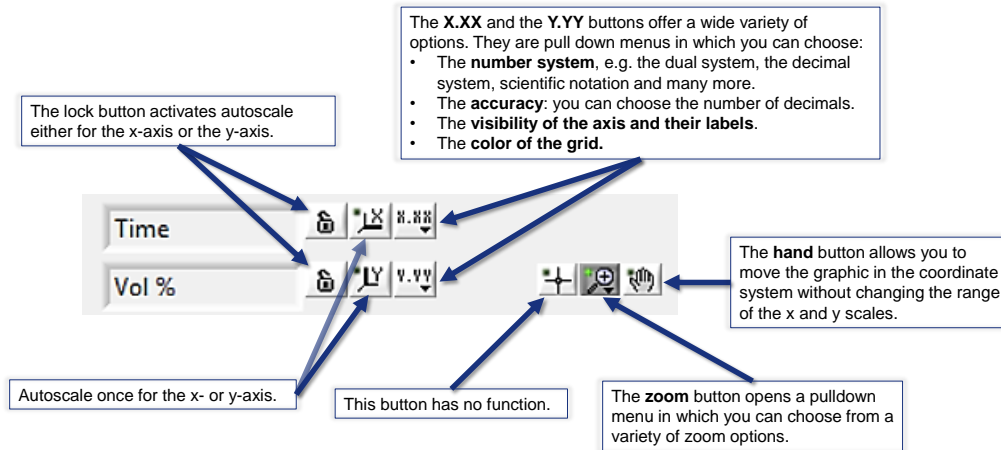
Figure 4: Further tools to adjust the main chart.

Indicator Lights: There are six indicator lights as shown in figure 5. Table 1 summarizes their meaning.
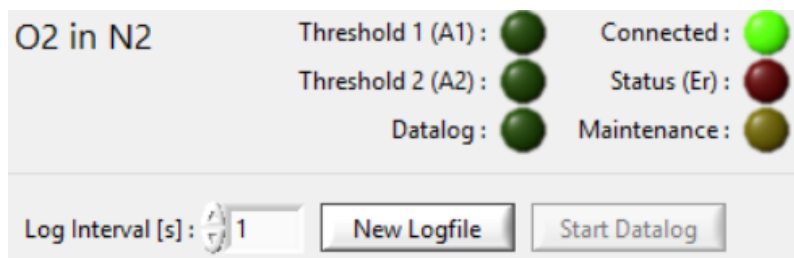
Figure 5: The indicator lights and data logging window.

Mode	Explanation
Connected	Indicates if the PC is connected to a device.
Status (Er)	When switched off, it indicates proper operation and absence of errors. Which "errors" trigger the status light can be chosen in the settings for the Status (Er) (**FTC → Messaging and Status**). Further details can be found in section 2.5.
Maintenance	A yellow maintenance light means that the device may need an inspection. Check the manual of your device for further information.
Threshold 1 (A1) and Threshold 2 (A2)	Lights up when the concentration thresholds are surpassed. The threshold settings can be found in **FTC → Threshold / Output Configuration**. This will be explained in details in section 2.4.
Datalog	This light indicates if data is currently being logged.

Table 1: The indicator lights and their explanation.

Datalog:

- **Log Interval [s]:** Sets the logging rate in seconds (only positive integers allowed). For example, if s is set to 2, a value will be logged every 2 seconds.

- **New logfile:** The button "**New Logfile**" will open a dialog to save a file with the logged data. Choose a directory and a name for the .csv file. Unfortunately, you cannot select an existing .csv file to resume logging into it, start a new log instead and copy the data lines to the desired location manually.

- **Start/Stop Datalog:** If a log file is selected the button "**Start Datalog**" will turn from grey to black. Pressing the button starts the recording and changes the name on the button to "**Stop Datalog**". Pressing the button opens a reminder window asking for confirmation whether the data log should be ended.

  Note: You can resume logging into an existing log file after logging has been stopped (unfortunately this is only possible if the log file has already been selected before): Simply press **Start Datalog** again. Data will be written in the next available empty line of your log file. Note that the file cannot be opened in another program (e.g. Excel) while logging.

1.1.4   Gas Pair Selection (only in Multi-Gas Mode)

In case your instrument is prepared for the multi gas mode, clicking on the entry field next to "**Gas Pair**" will open up a drop down menu with all the gas pairs. The selection of the gas pair also changes the measured gas pair in the device.

1.2   Exit

Clicking on the **Exit** option in the **File** drop down menu closes SetApp2.0.

2   FTC

The menu FTC has six selections:

1. Measure.

2. Calibration.

3. Parameter List.

4. Threshold/ Output Configuration.

5. Messaging and Status.

6. General Settings.

The manual will breakdown each of these sections. Elaboration on the General Settings can be found in section 2.4.4.
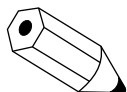
2.1 Measure

Main Chart is a synonym for **Measure**. Opening the Main Chart will open the Measure menu. For further information refer to section 1.1.

2.2 Calibration

Warning!
You can calibrate the device with the help of SetApp2.0. It is either possible to do an **offset calibration** or **an offset plus a gain calibration**. You may not do a gain calibration first!

Note!

Offset (1-point) Calibration:

1. Set the value for **"Offset Gas"** concentration.
2. Apply the offset gas in the chosen concentration.
3. Wait until the signal is stable. The run in time depends on the used gases, please wait at least 30 minutes for precise results (>60min. for helium mixtures). The signal should not change greatly for several minutes. Minor noise is fine.
4. Press "**Start Offset Calibration**".

Gain (2-point) Calibration:

1. Follow steps 1 to 4 of the offset calibration above.
2. Apply the gain gas in the chosen concentration.
3. Wait until the signal is stable (see point 3 above).
4. Press "**Start Gain Calibration**".

Example: Range: 20-50 Vol.% H_2 in N_2.
1. Choose the gas pair H_2 in N_2 as described in 1.1.4 or on the instrument.
2. Choose 20 Vol.% for the offset gas and 50 Vol.% for the gain gas then press **Set** for both of them.
3. Apply a gas mixture of 20 Vol.% H_2 in N_2. The gas needs to be mixed very precisely otherwise the calibration will not be accurate.
4. When the signal is stable press the **Start Offset Calibration** button.
5. Apply a gas 50 Vol.% H_2 in N_2. Again, it is very important to use very precisely mixed gases.
6. When the signal is stable press **Start Gain Calibration** button.

If you have any questions about the calibration tool, feel free to contact us and we will gladly assist you in calibrating the device.
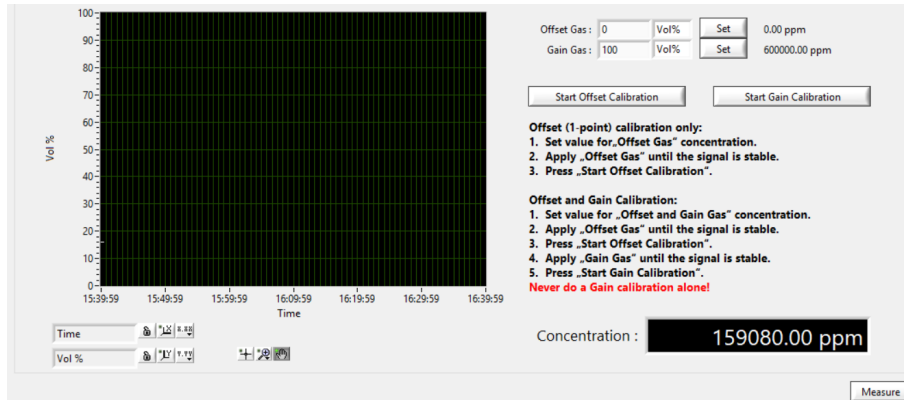
Figure 6: The calibration window.

2.3 Parameter List

The **parameter list** is a table in which all settings and calculations are listed.

Reading the current parameters: Parameters can be read from the instrument by clicking on the chosen parameter and then on the **refresh** button. You can also read all parameters at once by clicking on **Refresh all Parameters**, upon which the current value of each parameter will be shown in the **Value** column of the parameter list.

Saving the parameter list: The current parameter list can be downloaded from the instrument to a file on your computer. Pressing the **Save Parameter List to File** button opens a save file dialog in which you can choose a file name and location to store the parameter list.

Downloading the parameter list to the device: A parameter list can be saved to the device, as well. To download a parameter list on your device, you need to click on the **Download Parameters to FTC** button. Choose the desired .par file and download it. You will get a warning that uploading incorrect parameters can destroy the device. Please contact us if you are not sure how this works, we will gladly help you.

Often times Messkonzept can assist you by remote maintenance. Our service employees might ask you to send a parameter list of your device to Messkonzept. If your problem can be fixed by changing device parameters, you may be asked to to download an updated version of the parameter list to your device.

Warning!
- Changing parameters in the parameter list can lead to serious damage for the device and the vicinity. Do not ever write in the parameter list without contacting Messkonzept!
- The **Work Directory** is the default directory for saving and loading parameter lists.

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2.4 Threshold/ Output Configuration

In this window, the output signals and thresholds can be configured. On the right side of each parameter, next to the set button, the current settings that are saved on the device are shown (see figure 7). To show the actual saved settings on the device, click on the **Refresh all Parameters** button. To restore the factory settings, click on the **Reset to Factory Defaults** button. Below we explain each section of the window in detail.
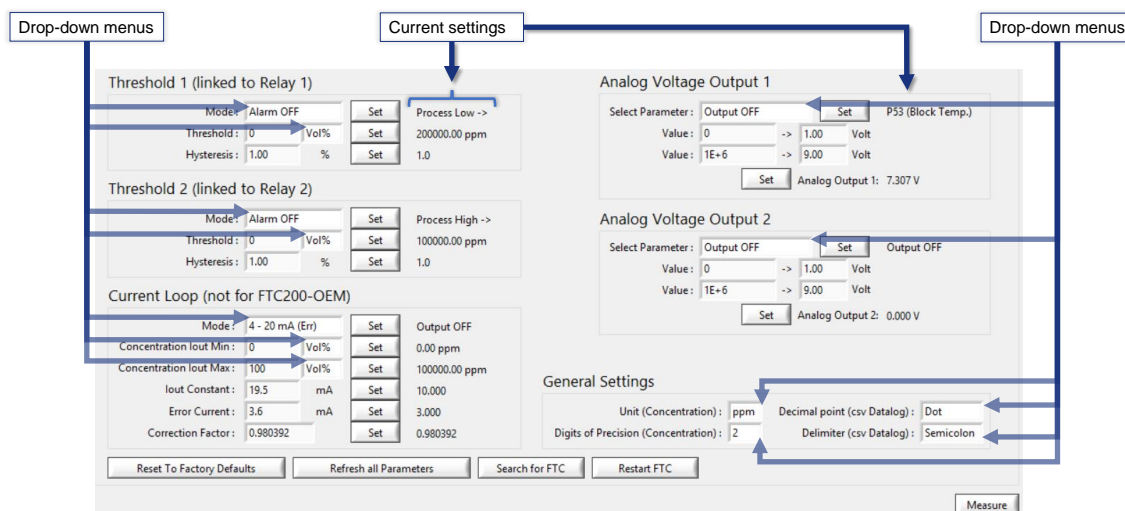

Figure 7: The threshold window.

2.4.1 Threshold

Threshold 1 and **Threshold 2** define limits at which reaction of the relays (alarms) are triggered.

Threshold 1: By setting thresholds, the gas concentration can be surveyed, and, once the concentration surpasses the set boundary (the threshold), the relay, as well as the indicator light, go on.

1. *Mode:* **Process High to Low** or **Process Low to High** decide if the relay triggers on increasing concentration (Low to High) or decreasing concentration (High to Low). To choose a mode by clicking on the drop-down menu next to **Mode**. Choose an option and click on **Set**.

2. *Value and Unit:* The threshold value and the unit can be set in the entry fields and drop-down menu next to **Threshold**.

3. *Hysteresis*: The hysteresis is a change of the effect which occurs delayed compared to a change of the cause. It characterizes a differing behavior of the output that not only depends on the input variable, but also on its direction. In our case, the input is the threshold's vol.% and the output is the indicator light and/or the relay going on. Setting the hysteresis prevents unwanted frequent indication of the threshold being surpassed when the vol.% stays right at and/or around the threshold. The hysteresis is set as a as

a percentage of the threshold vol.%. The value of the hysteresis can be set by entering a value between 0% and 100% in the field next to **Hysteresis** and then clicking the **Set** button. I tried it and it doesn't seem to work!

Here's an example that illustrates the concepts of mode, threshold and hysteresis: the mode is set to *Process Low to High*, the threshold is set to *40%*, and the hysteresis is set to *10%*. Assume the gas concentration is 45% and decreases continuously. When the concentration level reaches 40%, the indicator light will not go on. Instead, the light will turn on when the gas concentration reaches:

$$40\% - (10\% \times 40\%) = 40\% - 4\% = 36\%$$

Threshold 2: **Threshold 2** is similar to threshold 1 but offers additional functionalities. It can be linked to the maintenance status signal as well as to an auxiliary signal fed from outside into the instrument. Like the internal signal, the auxiliary signal can be set to either cross the threshold from high to low or from low to high. The procedure to set the threshold is the same as explained for **Threshold 1**.

2.4.2   Current Loop (not for FTC 200-OEM)

The **Current Loop** is an output signal. You can choose between different output modes with and without live zero and error indication. For more details, please check the manual of the instrument and map it to the amperage.

To change the mode, click on the entry field next to **Mode**. Choose from the popup menu the preferred mode by clicking on one of the options. Press the **Set** button to confirm the selection. Table 2 elaborates the function of each mode.

2.4.3   Analog Voltage Output

Analog Voltage Output 1 and **Analog Voltage Output 2** is used to route the value of a parameter to a voltage output.

Select a parameter from the drop-down menu in the entry field next to **Select Parameter** and confirm it by pressing the **Set** button (see figure 7). Then choose the start and end boundaries for the values as well as for the voltage. The lower boundary of the measuring range will be mapped to lower boundary of the voltage range. Analogously, the higher boundary of the measuring range will be mapped to the upper boundary of the voltage range. The measured signal must be inserted in *ppm*. Once the values are inserted, confirm the settings by pressing the **Set** button. The calculated voltage signal will be displayed next to the **Set** Button.

An elaboration of the parameter codes can be found in table 3.

Mode	Explanation
Output OFF	Disables the output.
I-Out frozen	The output during calibration is fixed on the last measured value.
Constant I-Out	Lets you choose a mA value from the technically permissible range, namely between 0 and 22 mA. The constant value can be entered in the field next to **I$_{out}$** and then confirmed by clicking on **Set**, after which the device will give it as a constant output. It is used for checking the signal path after the FTC, e.g. at commissioning or for failure search.
4-20mA	The maximum and minimum mA values are set to 4 and 20mA, respectively. These values can be mapped to the upper and lower boundaries of the measuring range by entering the concentration values in the **Concentration I$_{out}$ Min** and the **Concentration I$_{out}$ Max** entry fields and clicking on **Set**. That means that an output of 4mA will correspond to the lower boundary of the measuring range and the an output of 20mA to the upper one.
4-20mA Err	Equivalent to the previous option but has an additional feature where a mA value that is $\geq 0mA$ and $< 4mA$, or $> 20mA$ and $\leq 22mA$ can be set for the **Error Current**. This is done by entering the value in the field next to **Error Current** and then clicking on **Set**. The default value of the error current is 3mA. In case an error occurs, the error current value will be shown as the output on the device (Refer to the device's user guide for relay settings).
0-20mA	The maximum and minimum mA values are set to 0 and 20mA, respectively. These values can be mapped to the upper and lower boundaries of the measuring range by entering the concentration values in the **Concentration I$_{out}$ Min** and the **Concentration I$_{out}$ Max** entry fields and clicking on **Set**. That means that an output of 0mA will correspond to the lower boundary of the measuring range and the an output of 20mA to the upper one.
0-20mA Err	This mode is also equivalent to the previous one but has the additional feature of setting an error current, just like the mode **4-20mA Err**. A mA value that is $> 20mA$ and $\leq 22mA$ can be set for the **Error Current** as explained above.
0-20mA (Corr.)	If a conversion from mA to voltage output between 0 and 10V is required, following Ohm's Law, a correction factor should be added in the field next to **Correction Factor** in order for the device to give the desired output. E.g. if an external resistor of 510Ω is used to convert the 20mA into 10V: $10V = (I \cdot R) \cdot \text{CF}^1 \leftrightarrow \text{CF} = \frac{10V}{0.02A \cdot 510\Omega} \approx 0.98$.

Table 2: The menu items of the current loop mode.

Parameter	Explanation
P0	Measured concentration after linearization and calibration.
P1	Measured concentration after linearization and before calibration.
P2	Normalized measured signal, ranges from 0 to 1.
P3	Measured raw signal, half bridge voltage in mV.
P53	Actual block temperature in °C.
P133	Auxiliary signal in ppm, source is set in factory (P12).
P134	Auxiliary signal ranging from 0 to 1, source is set in factory (P12).

Table 3: The menu items of the current loop mode.

2.4.4 General Settings

In the general settings menu in the bottom right corner you can change settings concerning the displayed output and the Datalog.

- *Display Settings:* **Unit (concentration)** is either parts per million (ppm) or percent (%). **Digits of Precision (concentration)** is any number between 0 and 3.

- *Datalog Settings:* **Decimal point (csv datalog)** is either dot(.) or comma(,). **Delimiter (csv Datalog)** can be any of the following semicolon (;), colon (:), comma (,), and tabulator (?).
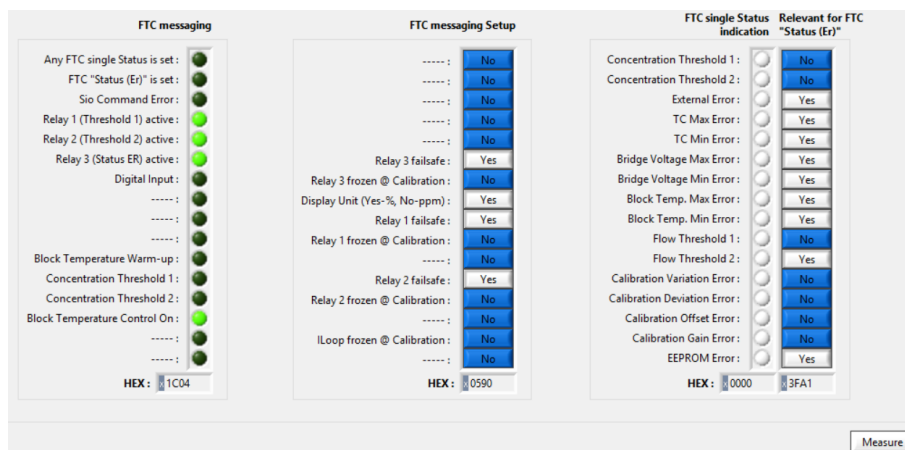
2.5   Messaging and Status

Figure 8: The FTC messaging and status window.

The columns shown in figure 8 are explained below:

2.5.1   FTC Messaging

The first column **FTC Messaging** is a table of indicators. The indicators show which settings are active. The empty lines in between are for future indicators. More details concerning the

content of the indicators can be found in the manual.

2.5.2 FTC Messaging Setup

The second column **FTC Messaging Setup** consists of buttons which turn options on and off. As in the first column the empty lines are for future options. More details concerning the content of the buttons can be found in the manual.

2.5.3 FTC Single Status Indication / Relevant for FTC Status(Er)

The last column is split into two columns. First the **FTC Single Status Indication** column and second the **Relevant for FTC "Status(Er)"** column.

- *FTC Single Status Indication column:* Here the indicators show for which status the conditions are met.

- *Relevant for FTC Status(Er):* If a button in this column is set to **Yes**, and the corresponding indicator comes on then the **Status (Er)** indicator will come on. If a button is set to **No** the indication of the corresponding light is irrelevant for the **Status (Er)** indicator.

Part V

Help

The menu option **Help** has two selections: **About** and **Search for FTC**.
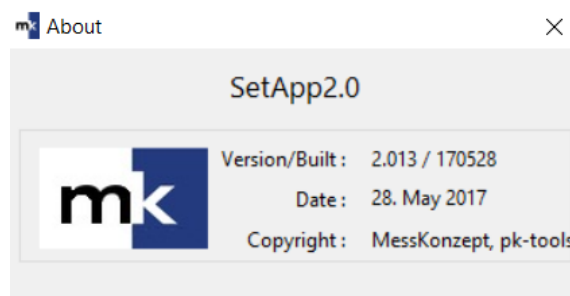
1 About

Figure 9: Options of the output signal.

The menu option **About** gives information about:

- the version number,

- the Built-ID,

- the release date and

- the copyright owners.

2 Search for FTC

If you wish to work on a different device that is connected to the same PC via another COM-port, click on the **Search for FTC** option. The window shown in figure 1 will pop up. SetApp2.0 will, then, automatically look for FTC devices. Proceed as described in part III.

Warning!

- The **Exit** button closes the SetApp2.0 entirely.
- Opening the **Search for FTC** menu disconnects the instrument with SetApp2.0. To Connect the same instrument again, search for the instrument and select it again.
- While the **Search for FTC** window is open no data is logged and no values are drawn to the measuring grid.