

Original Operating Instructions Terminal HT100 for CFC 100

Type: HT 100

Document No.: BA HT100 EN Rev3



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1 General information

1.1 Foreword

These operating instructions are an important aid to ensure the successful and safe operation of the CFC 100 compact flame controller with the HT 100 operating terminal described here. They contain important instructions on how to operate the device safely, properly and efficiently. Your attention will help avoid risks, minimize repair costs and downtimes and increase the reliability and service life of the device.

All figures and drawings in these operating instructions are provided for general illustration purposes and are not detailed to construction standard.

The operating instructions must always be available at the device. They must be read and applied by every person who is tasked with working with/on the device,

e.g.:

- Operation,
- troubleshooting during the workflow,
- maintenance,
- repairs (maintenance, inspection, repairs) and/or
- transport

The operator should seek written confirmation of this.

1.2 Warnings

These operating instructions use the following warnings:

⚠ DANGER

A warning of this hazard level indicates an impending hazardous situation.

If the hazardous situation is not avoided, it will result in severe injury or death.

Follow the instructions in this warning to avoid the danger of severe injury or death of persons.

⚠ WARNING

A warning of this hazard level indicates a possible hazardous situation.

If the hazardous situation is not avoided, it may result in severe injury or death.

Follow the instructions in this warning to avoid the possible danger of severe injury or death of persons.



A warning of this hazard level indicates a possible hazardous situation.

If the hazardous situation is not avoided, it may result in light or moderate injuries.

Follow the instructions in this warning to avoid injuries to persons.

CAUTION

A warning of this hazard level indicates possible damage to property.

If the situation is not avoided, it may result in damage to property.

Follow the instructions in this warning to avoid damage to property.

NOTICE

A note indicates additional information that makes it easier to handle the device.

1.3 Copyright

These operating instructions must be treated as confidential. They may only be used by the group of persons authorized to do so. They may only be made available to third parties with the written approval of BFI Automation.

All documents are protected by copyright laws.

The dissemination and reproduction of documents, including extracts, as well as the utilization and disclosure of their contents are not permitted unless explicitly authorized. Breaches of these provisions are punishable and incur an obligatory payment of damages.

We reserve the right to exercise all industrial property rights.

1.4 Disposal Information

The flame controller contains electric and electronic components and must not be disposed of as domestic waste. The current valid regulations in your local area must be observed.



1.5 Warranty

Carefully read these operating instructions before operating the compact flame controller!

The manufacturer accepts no liability for damage or operational stoppages resulting from the failure to observe the operating instructions.

The operating instructions must be amended by the operator to include operating instructions arising from existing national accident prevention and environmental protection regulations, including information regarding supervisory and reporting obligations to take account of operational anomalies, e.g. regarding work organization, workflows and deployed personnel.

In addition to the operating instructions and binding accident prevention regulations valid in the country and place of use, the recognized technical rules for safe and professional work must also be observed.

The warranty is invalidated e.g. as a result of:

- improper use
- use of inadmissible operating material
- incorrect connection
- preparatory works that do not form part of the delivery and service scope
- the failure to use genuine spare parts and accessories
- modifications that are not agreed with BFI Automation
- the failure to carry out prescribed maintenance work

NOTICE

We recommend that the operator agrees a service contract with BFI Automation. This ensures that the device and the settings are regularly checked by our service personnel and that the required wear and replacement parts are available without long delivery times.

1.6 Duties of the Operator

The CFC 100 compact flame controller may present risks if it is operated improperly or in an improper state.

The operator must only operate the device in a flawless condition. Hazard areas arising between BFI devices and on-site installations must be secured by the operator.

The operator must appoint and instruct responsible persons:

- Only deploy trained or instructed personnel.
- The responsibilities of personnel assigned to operational, setup, maintenance and repair work must be clearly defined!
- Regularly check the safety and hazard awareness in the working procedures of personnel in accordance with the operating instructions.
- Before starting work, the personnel charged with operating the device must have read and understood the operating instructions and, in particular, the chapter entitled "Safety" as well as the applicable regulations.
- The operating instructions and applicable regulations must be stored in such a way that they are accessible to the operating and maintenance personnel.
- Define the responsibility of the device operator and authorize him to reject instructions from third parties that contravene safety!

NOTICE

In addition to the operating manual, the generally applicable legal and other binding regulations for accident prevention and environmental protection must be observed and ensured.

1.7 Liability Disclaimer

All of the technical information, data and instructions for operation contained in these operating instructions correspond to the state of the art at the time of printing and are provided based on our previous experience and insights to the best of our knowledge.

We reserve the right to make technical changes as part of the ongoing development of the compact flame controller described in these operating instructions. No claims can be derived from the information, illustrations and descriptions contained in these operating instructions.

We accept no liability for damage and operational stoppages resulting from operating errors, non-adherence to these operating instructions or improper repairs. We expressly point out that only genuine replacement parts and accessories that have been approved by us may be used. This applies accordingly to the assemblies used from other manufacturers.

The installation and use of unapproved spare parts and accessories and any unauthorized modifications and changes are not permitted for safety reasons and shall invalidate any liability on the part of BFI Automation for resulting damage.

BFI Automation is liable for any faults or omissions on our part, excluding additional claims arising in the context of the warranty obligations outlined in the contract. Compensation claims are excluded, notwithstanding any legal argument upon which they might be based.

Translations are provided to the best knowledge of the translator. We cannot accept liability for errors in the translation, regardless of whether the translation was provided by us or on our behalf. Only the original text is binding.

The written descriptions and illustrations do not necessarily correspond to the scope of delivery or a possible order of spare parts. The drawings and diagrams are not to scale.

1.8 Declaration of Conformity

BFI Automation Mindermann GmbH
 Eggerscheidter Straße 57
 D - 40883 Ratingen, Germany

Declaration of Conformity According to EU Directives

We declare herewith that the flame monitoring system described below conforms by virtue of its design and construction and in the version placed on the market by us to the basic safety requirements of the following EU directives:

Low Voltage Directive 2006/95/EC

EMC Directive 2004/108/EC

This declaration of conformity is the result of a test conducted by BFI Automation in accordance with European requirements.

In the event of a change to the system that is not agreed with us, this declaration shall be rendered invalid.

Description of the system:	HT 100 operator terminal for CFC 100
Device designation:	HT 100
Directives:	2006/95/EC, formerly 73/23/EEC 2004/108/EC, formerly 89/336/EEC
Applied standards:	EN 55022, EN 61000-4, EN 60730 EN 298:2012-11 EN 50156-1 EN 60664-1 IEC 61511
Date/signature:	04.12.2008 <i>J.-M. Mindermann</i>
Capacity of signatory:	Managing Director

1.9 Manufacturer's Address

BFI Automation Mindermann
GmbH Ruegenstrasse 7

42579 Heiligenhaus, Germany

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2 Safety

2.1 Intended Use

The HT 100 operator terminal is used exclusively to parameterize the CFC 100 compact flame controller.

▲WARNING

Danger from inappropriate use!

Danger can result from the improper use of the device and/or use of the device for a purpose other than its intended purpose.

The device must only be used for its intended purpose.

Observe the procedures described in the operating instructions.

The manufacturer/supplier accepts no liability for damage arising from improper use. The risk is borne entirely by the user/operator.

2.2 Requirements Relating to Persons

NOTICE

Work on/with the device may only be carried out by persons who are authorized to do so based on their training and qualifications. In addition, these persons must also be authorized by the operator to carry out such work.

Personnel to be trained, taught and instructed or personnel undergoing general training must only be allowed operate the device under the continuous supervision of an experienced person!

Persons who are under the influence of drugs, alcohol or medication that influences their ability to react are not permitted to work on the device.

Connection, setup, maintenance and repair work may only be carried out by trained specialists.

This device can pose dangers if used improperly by untrained personnel or if used for a purpose other than its intended purpose.

In addition to the operating manual, the generally applicable legal and other binding regulations for accident prevention and environmental protection as well as all general safety and health requirements must be observed. The operator is required to instruct his personnel accordingly.

2.3 Safety Instructions

Note the following instructions regarding accident prevention when operating the HT 100 operating terminal:

NOTICE

Only operate the device in a technically flawless state!

- Do not remove or disable safety equipment.
- Prior to use, check the device for external signs of damage and defects! Any changes that occur (including changed in operating behavior) must be reported immediately to the responsible office/person! If necessary, shut down and secure the device immediately!
- Have adjustment and/or maintenance work performed by authorized technical specialists.
- Worn or damaged parts must be replaced.
- Only use suitable maintenance tools.
- After all repair work, attach all safety equipment and carry out electrical and mechanical checks.
- Note the procedures for switching on and off as well as the control displays in accordance with the operating instructions!
- Before switching on the device, make sure that it cannot pose a danger to anybody else!
- The operator must ensure that the device is only operated in a technically flawless state and that all relevant safety requirements and regulations are observed.
- Keep the operating instructions ready to hand in the vicinity of the device.
- The failure to observe the safety instructions in these operating instructions can lead to damage to property, personal injury or even death.

2.4 Safety Equipment

2.4.1 Basic Points

Check that all safety equipment and locks on the device are in a safe condition.

Only operate the device if all safety equipment is fitted and functioning properly! The operator or user of the compact flame controller is responsible for ensuring that the device is operated properly!

NOTICE

To protect the operating personnel, warning/hazard signs are attached to the device. Observe these signs. Damaged or illegible warning/hazard signs must be replaced immediately.

2.4.2 Safety Equipment on the HT100 Operator Terminal

The compact flame controller is equipped with the following safety equipment:

- Housing (protection against accidental contact)

2.5 Safety Instructions for Maintenance and Troubleshooting

2.5.1 Basic Points

- Observe the intervals for recurring checks/inspections prescribed or specified in the operating instructions!
- Workshop equipment appropriate to the task in hand is absolutely necessary in order to carry out maintenance work.
- Work on electrical equipment in the system may only be carried out by a qualified electrician or by trained persons working under the direction and supervision of an electrician in accordance with the electrical engineering rules.
- The adjustment, maintenance and inspection activities and intervals prescribed by BFI Automation, including information concerning the replacement of parts/part components, must be observed! These activities may only be performed by authorized technical specialists.
- Inform the operating personnel before carrying out specific tasks and maintenance work! Appoint a supervising official!
- The cable must be isolated from the power supply before any work is carried out on the connector.
- Tighten any screw connections loosened during maintenance and repair work!
- Safety equipment that is disassembled to facilitate maintenance and repair work must be refitted and checked immediately on completion of the maintenance and repair work.
- Ensure the safe and environmentally-sound disposal of spare parts!
- Only spare parts manufactured or approved by BFI Automation may be used.

2.5.2 Electric/Electronic Equipment

⚠ DANGER

Danger to life due to electric current

Contact with live lines or components poses a danger to life!

Before commencing work on electric installations, isolate the compact flame controller from the power supply!

NOTICE

Work on electric/electronic components/groups may only be carried out by qualified electricians in accordance with the electrical engineering rules.

Important Rules of Behavior

- Check the device regularly. Eliminate any defects or malfunctions immediately. Switch off the device until the fault is eliminated.
- If work needs to be carried out on live parts, a second person must be present who can switch off the power supply in an emergency.
Only use voltage-insulated tools!

2.5.3 Check According to Industrial Safety Regulations

If devices from different manufacturers or suppliers are combined or installed, the operator must carry out a detailed check in accordance with the applicable industrial safety regulations and electrical engineering rules prior to commissioning.

If any questions or issues arise, contact BFI Automation.

2.5.4 Safety Test Prior to Commissioning

⚠ WARNING

Danger of injury and damage to property due to improper handling!

Improper handling of the compact flame controller can lead to injury, death and damage to property!

To guarantee proper operation, the compact flame controller must be tested several times in all applications by starting and stopping the burner several times. The flame relay must switch off reliably in all cases if a flame is not present. Conduct this test while various adjacent burners are started and stopped and at varying boiler outputs. This is an essential prerequisite for ensuring safe and proper operation of the device!

3 Technical Data

3.1 General Features

- Voltage supply via the CFC 100 compact flame controller
- Menu-based operation
- Bi-directional RS232 interface
- Protective system IP 65

3.2 Electrical, Optical and Mechanical Systems

Display	3-row dot matrix LCD with 16 characters per row
Display color	White font against blue background
Illumination	Back-lit
Operating voltage	Supply via CFC 100
Operating temperature range	-20°C to +60°C
Housing material	ABS
Housing dimensions	165 x 92 x 30 mm
Protective system	IP 65

3.3 **Weight**

Operator terminal	0.220	kg
Cable	0.060	kg

3.4 **Dimensions**

Length (without connection cable)	165	mm
Width	92	mm
Height	30	mm
Cable length	2000	mm

(see Chapter 4.5)

4 Transport, Installation and Connection

NOTICE

All installation and connection work may only be carried out by qualified and authorized technical personnel! Observe the legal requirements as well as the setting instructions of the plant operator!

4.1 Scope of Delivery

- HT 100 operator terminal
- Connection cable
- Operating instructions

Refer to the order papers for the precise scope of delivery and compare with the delivery note.

Check for Completeness

Check the entire delivery for completeness based on the enclosed delivery note. Otherwise, we refer you to our conditions of sale and supply.

Reporting Damage

Following the delivery of the device and accessories, any damage caused by defective packaging or transport must be reported immediately to the forwarding agent, the insurance company and BFI Automation.

Take steps to minimize the damage incurred and prevent further damage.

Notify the insurer of the insurance claim without delay and, to expedite processing of the claim, submit all documentation relating to the claim as soon as possible (but not later than the expiry of possible forfeiture and/or limitation periods for compensation claims against third parties).

4.2 Packaging

The operator terminal is shipped in a variety of packaging material.

The primary packaging materials are cardboard and plastics (films, foamed material).

NOTICE

These materials must be disposed of in an environmentally friendly manner and in compliance with the corresponding waste disposal regulations.

4.3 Transport Regulations

NOTICE

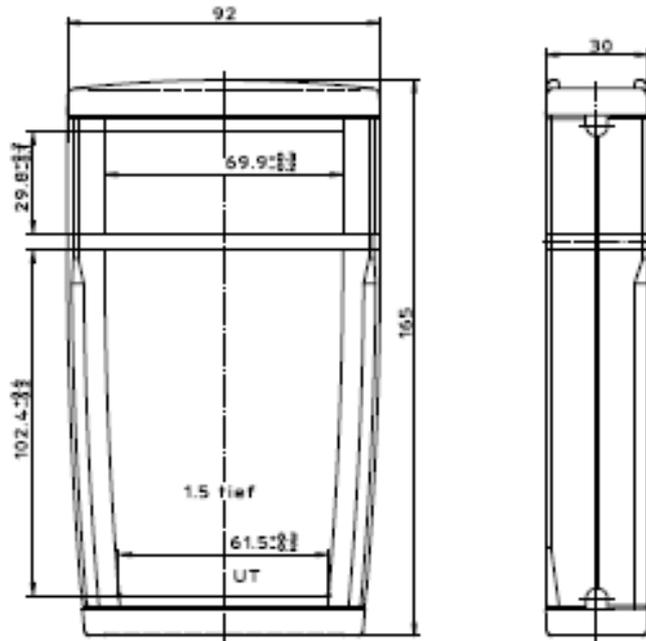
Do not allow the device to fall while it is transported and do not expose it to severe impacts! Do not expose the device to moisture!

4.4 Weight

See Chapter 3.3 *Technical Data*.

4.5 Space Required

See the illustration below.



4.6 Installation

NOTICE

*All installation and connection work may only be carried out by qualified and authorized technical personnel!
Observe the legal requirements as well as the setting instructions of the plant operator!*

The operator terminal is provided for the on-site parameterization of the CFC 100 compact flame controller. It is not designed for fixed installation.

4.7 Connection

The supplied cable is connected to the terminal and to the CFC 100. On the CFC 100, the metallic protective cap on the left beside the type plate must first be removed. Always tighten the screw connection at the cable ends.



4.8 Storage

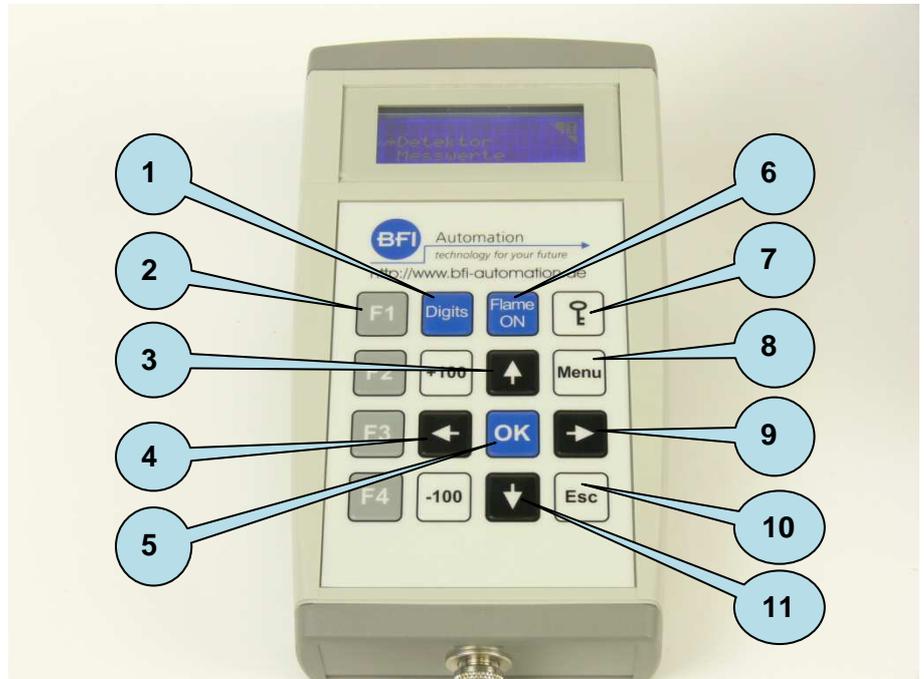
Do not unpack the packaged compact flame controller and accessories.

The following regulations apply to storage:

- Store in a dry location. Maximum relative air humidity: 95 %
Make sure that the packages are not stored in the open air.
Furthermore, the floor of the storage area must be kept dry for the duration of storage.
- Protect against direct sunlight. Storage temperature - 20°C to 70 °C
- Store in a dust-free environment
- Avoid mechanical shocks and damage.

5 Description

5.1 Operator Terminal



Legend:

1. **Digits** hotkey -> display the flame intensity
2. Function key **F1** -> generates random numbers to allow generation of substitute passwords by BFI Automation
3. Arrow key **up** -> menu navigation
4. Arrow key **left** -> menu navigation
5. **OK** key -> select a menu item
6. **Flame ON** hotkey -> display the turn-on threshold
7. **Key symbol** hotkey -> go directly to the password menu
8. **Menu** key -> go directly to the highest menu level
9. Arrow key **right** -> menu navigation
10. **ESC** key -> go back one level
11. Arrow key **down** -> menu navigation

All of the other keys shown currently have no function.

The operator terminal for the CFC 100 allows you to perform a flame analysis, adjust the sensitivity of both channels and display the operating data of the device.

After you connect the terminal, a message showing the software version number of the HT 100 appears on the display for 3 seconds.

When the device is operated for the first time, a message requesting that the password be changed is displayed for 3 seconds until the password set at the factory is changed. If the password entered is lost, press and hold the **F1** key (2) within these 3 seconds to generate a random number, which BFI Automation can use to calculate a substitute password. This substitute password is only valid until the terminal is switched off, but allows you to enter a new password. In the as-delivered condition, the saved password is **00000**.

The first 2 main menu items then appear in the display. Navigation is done primarily using the arrow keys (3, 4, 9, 11). The arrow sign in the display shows the current menu item, which is selected by pressing the **right** (9) arrow key or the **OK** (5) key.

Use the **up** (3) and **down** (11) arrow keys to move around within a menu level.

To go back, use either the **left** (4) arrow key, the **ESC** (10) key or the **Menu** (8) hotkey.

The HT 100 is equipped with several hotkeys which can be used to jump selectively to a defined position in the menu.

The **Menu** (8) hotkey leads directly to the starting position of the main menu.

Press the **key symbol** (7) hotkey to go directly to the password entry menu item.

Press the **Flame ON** (6) hotkey to go to the **On thresholds** sub-menu of channel 1.

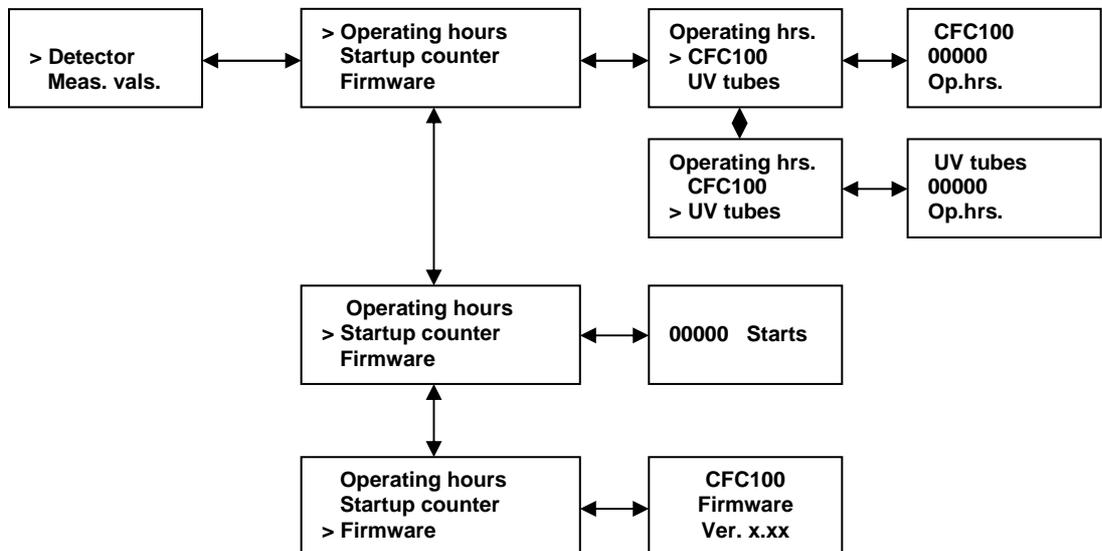
There is a special feature assigned to the **Digits** hotkey (1). On the one hand, you can use it to go directly to the visualization of current flame intensity as a decimal figure and a bar graph, where 100% on the bar graph corresponds to the parameter value of **20 mA limit value**. The special feature here is that you can only leave this item by pressing the **Digits** (1) key again. This brings you back to the menu item that was selected before you pressed the **Digits** (1) key.

5.1.1 The “Detector” Menu Item

This menu item provides the following information about the CFC 100 compact flame controller:

- Operating hours of the CFC 100 and the UV tubes
- Startup counter
- Firmware

Menu structure

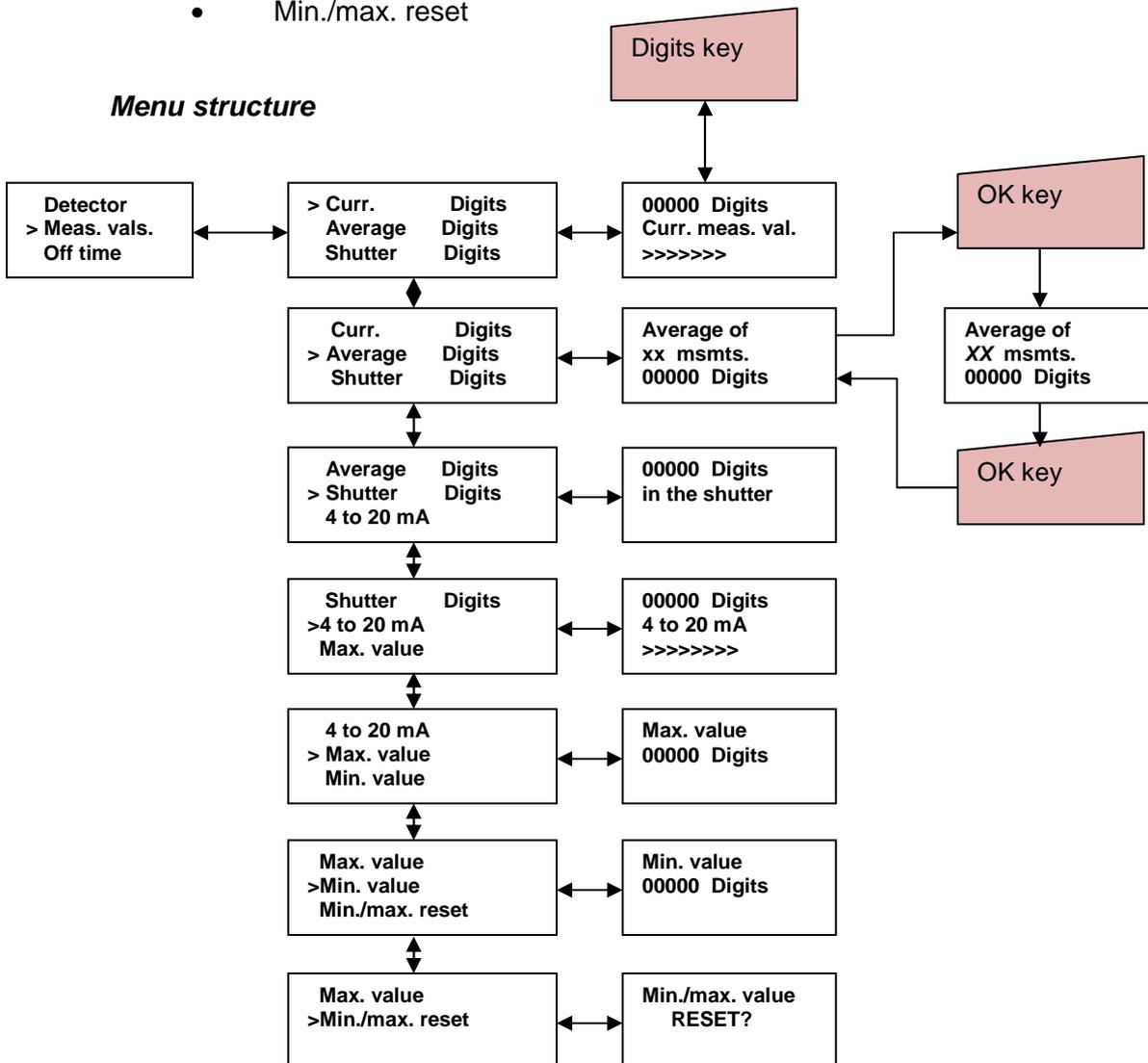


5.1.2 The “Measured values” Menu Item

All of the available measured values can be accessed here:

- Current measured value in digits and as a progress bar
- Average value of xx measurements (number can be edited) in digits
- Shutter value
- Current output 4 to 20 mA in digits and as progress bar
- Max. recorded value
- Min. recorded value
- Min./max. reset

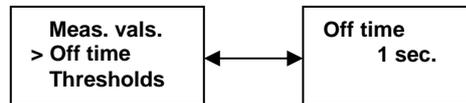
Menu structure



5.1.3 The “Off time” Menu Item

Select this menu option to display the current value in seconds for the factory-set shut-down time.

Menu structure



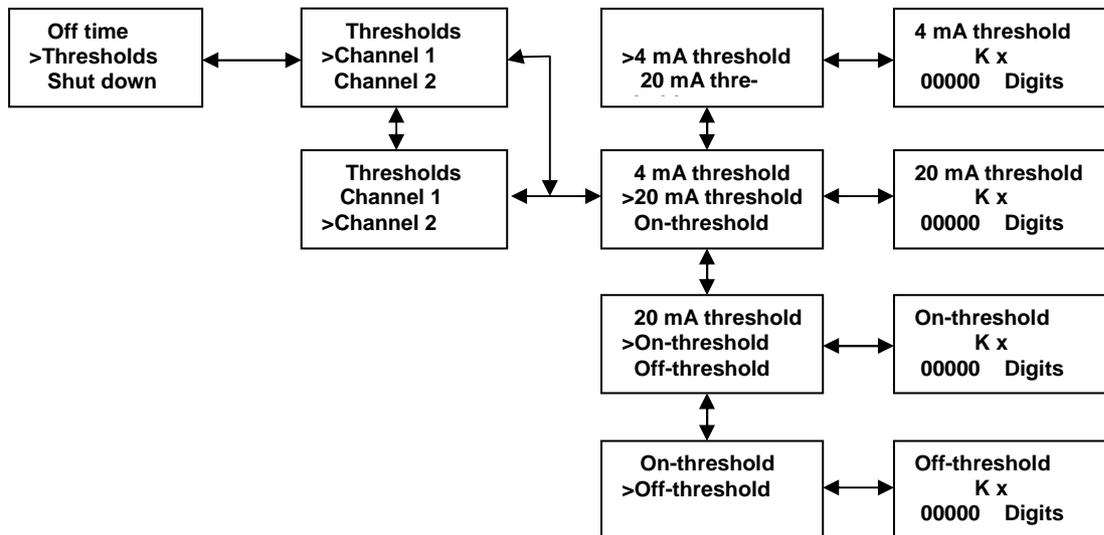
5.1.4 The “Thresholds” Menu Item

You can display and edit the threshold values for both channels here. Edit mode is password-protected! This means that you must first log in from the password menu and you can then switch to edit mode by pressing the **OK** key (5).

The following parameters per channel are available here for selection:

- 4 mA threshold
- 20 mA threshold
- On-threshold of the flame relay
- Off-threshold of the flame relay

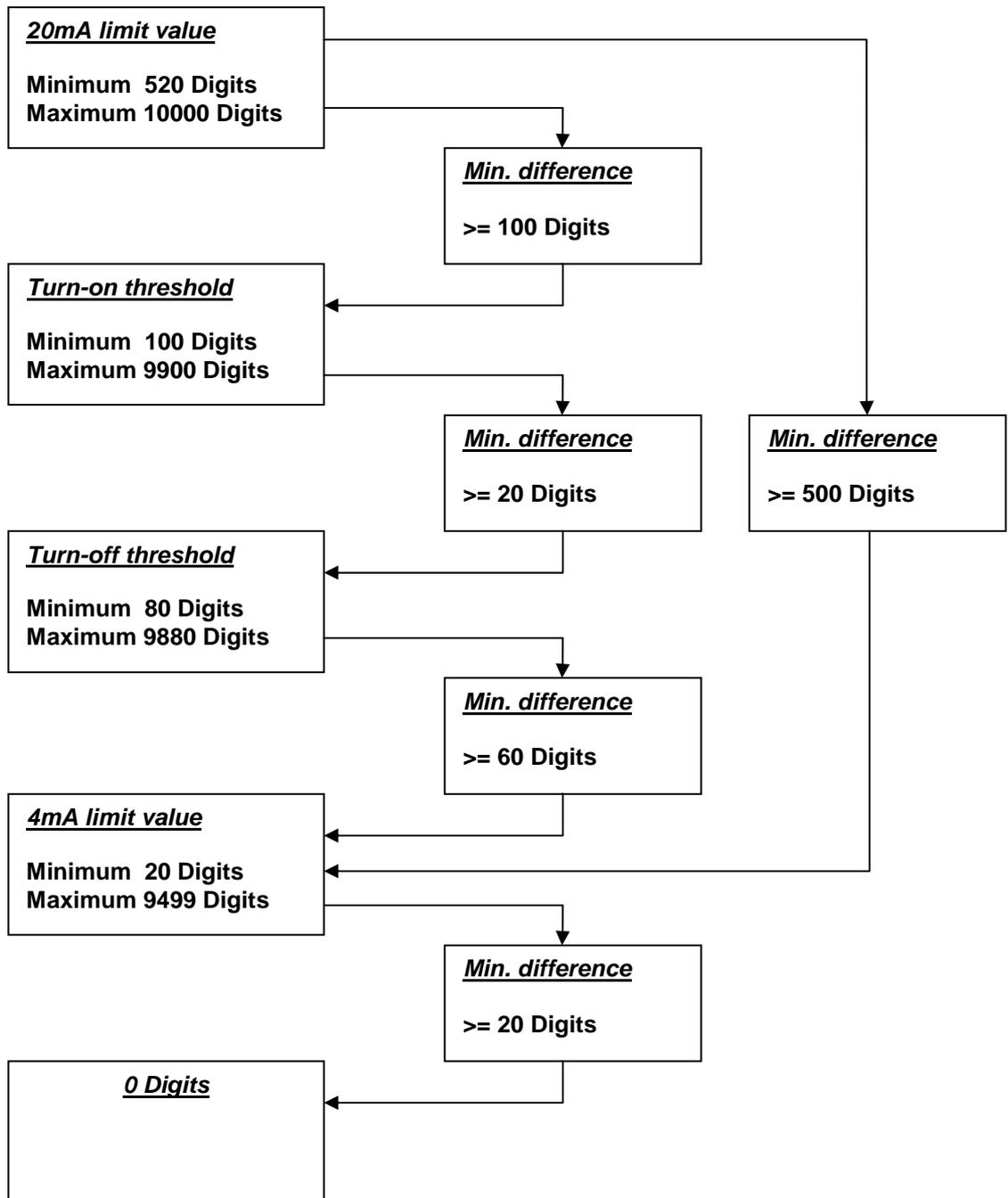
Menu structure



When edit mode is activated, the cursor flashes at the input position. After you enter the value, this value is checked for range overlaps. Only after the value is identified as plausible is it saved as a parameter. (See also 5.1.4.1)

5.1.4.1 Limit Values of the Individual Thresholds

The individual threshold values are subject to specific minimum clearances to one another. If these minimum differences are undershot, the error message “range overlap” is triggered during the plausibility check. The diagram provides information about the connections and minimum differences:

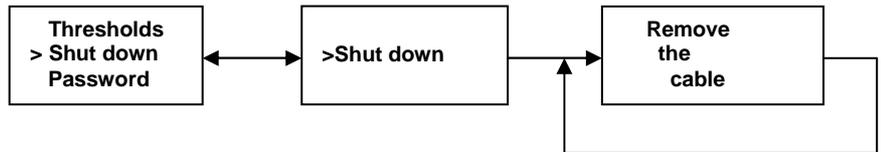


5.1.5 The “Shut down” Menu Item

This item is used to shut down the terminal correctly.

If you simply remove the cable without first shutting down via the menu, there is a risk that the CFC100 will receive incomplete telegrams.

Menu structure

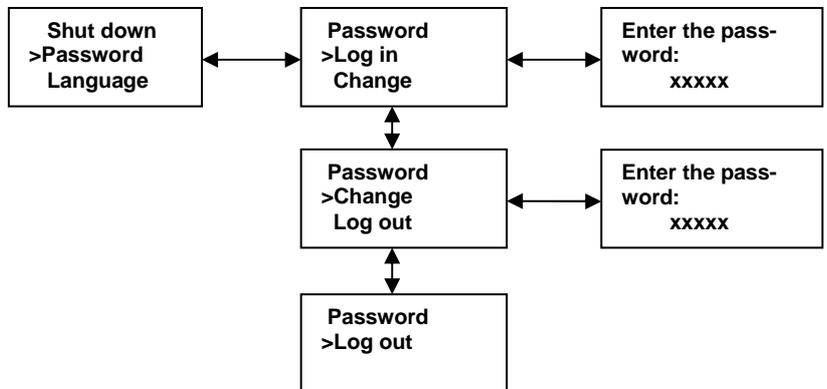


5.1.6 The “Password” Menu Item

The password for the operating terminal is administered with the following options:

- Logging in (required for editing the threshold values)
- Changing
- Log out

Menu structure



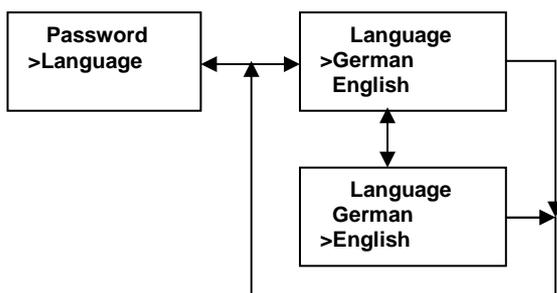
If you forget the entered password, you can press and hold the **F1** (2) hotkey during the first 3 seconds immediately after you connect the HT100. The device generates a maximum 10-digit random number that BFI Automation GmbH can use to calculate a substitute password. This substitute password is valid in addition to the current password until the terminal is switched off and allows you to enter a new password.

5.1.7 The “*Language*” Menu Item

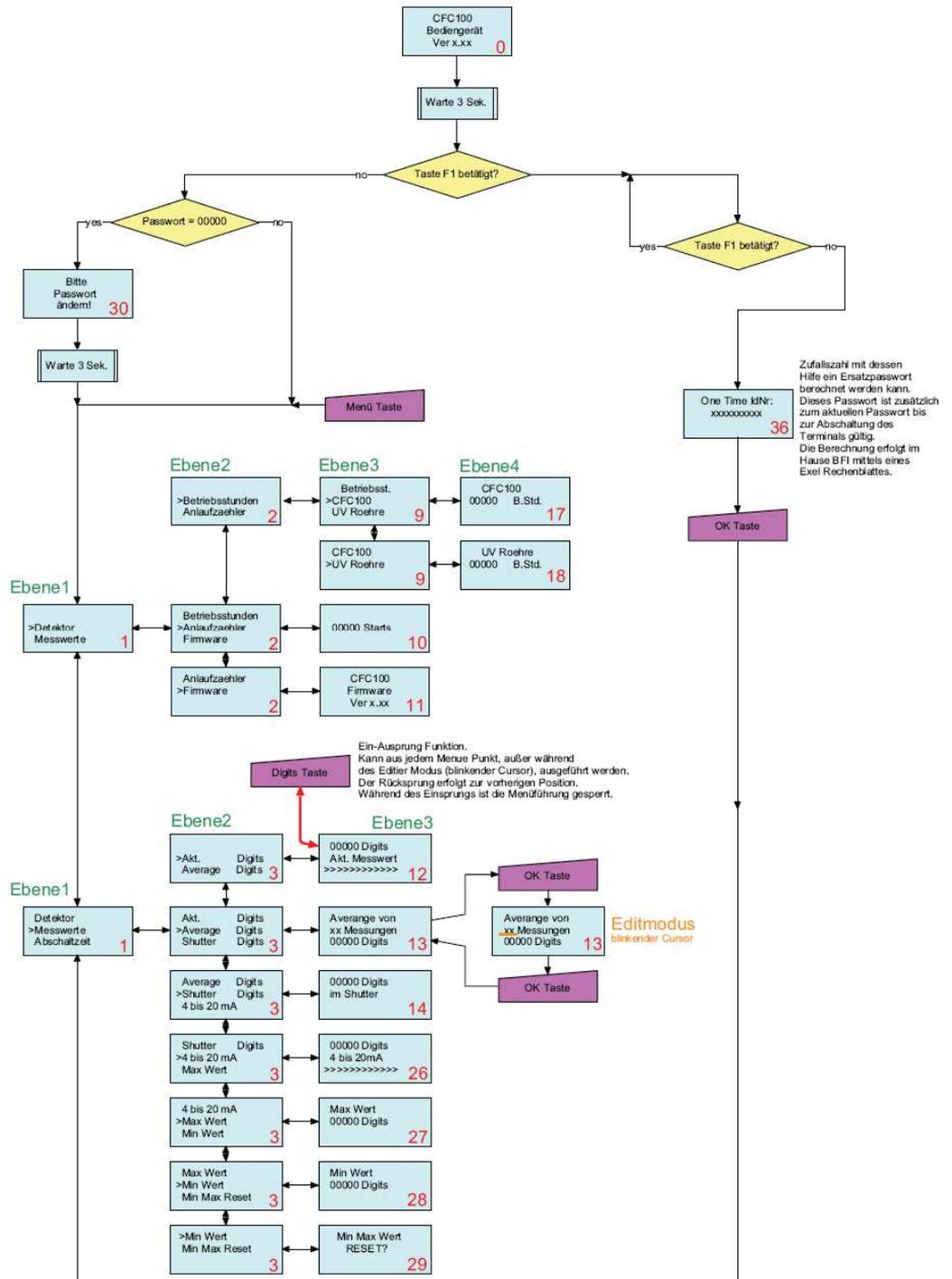
The display on the operating terminal can be set to one of two languages that can be selected here:

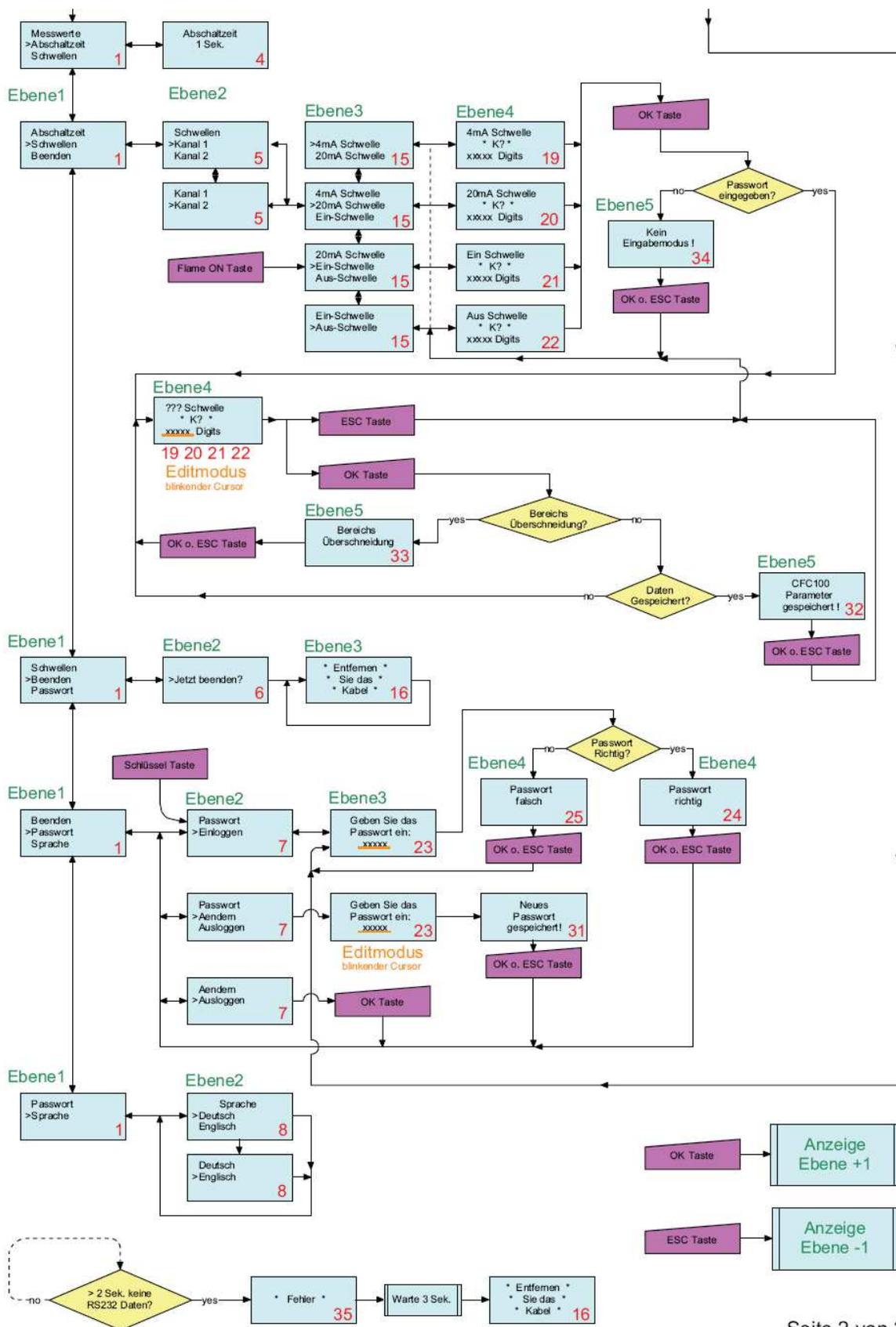
- German
- English

Menu structure



6 Menu Navigation Diagram





7 Maintenance and Care

The operator terminal is maintenance free.

For cleaning, wipe the outside of the housing only with a damp cloth and clean the screen regularly.

NOTICE

In the as-delivered condition, the screen is protected against scratches by a film. Do not scratch the screen!

8 Malfunions

Problem:	Cause:	Remedy:
Segments missing from the display	Faulty display or display driver	Send to BFI Automation for repair
Key is not accepted	Contact faulty	Send to BFI Automation for repair
After 3 seconds, the message "Remove the cable" is displayed	Shut down was selected in the menu	Disconnect the cable briefly and re-connect it
After 3 seconds, the message "Remove the cable" is displayed	The HT100 has not received any data for more than 2 seconds because there is a faulty data line or an interrupted data channel in the HT100 or in the CFC100 or in the cable.	Check/send in or replace the cable Check/send in the HT100 Check/send in the CFC100

9 Order Data

To order the operator terminal from BFI Automation, specify the following order details:

Type	Order number
HT 100 operator terminal	7040-2010-00

