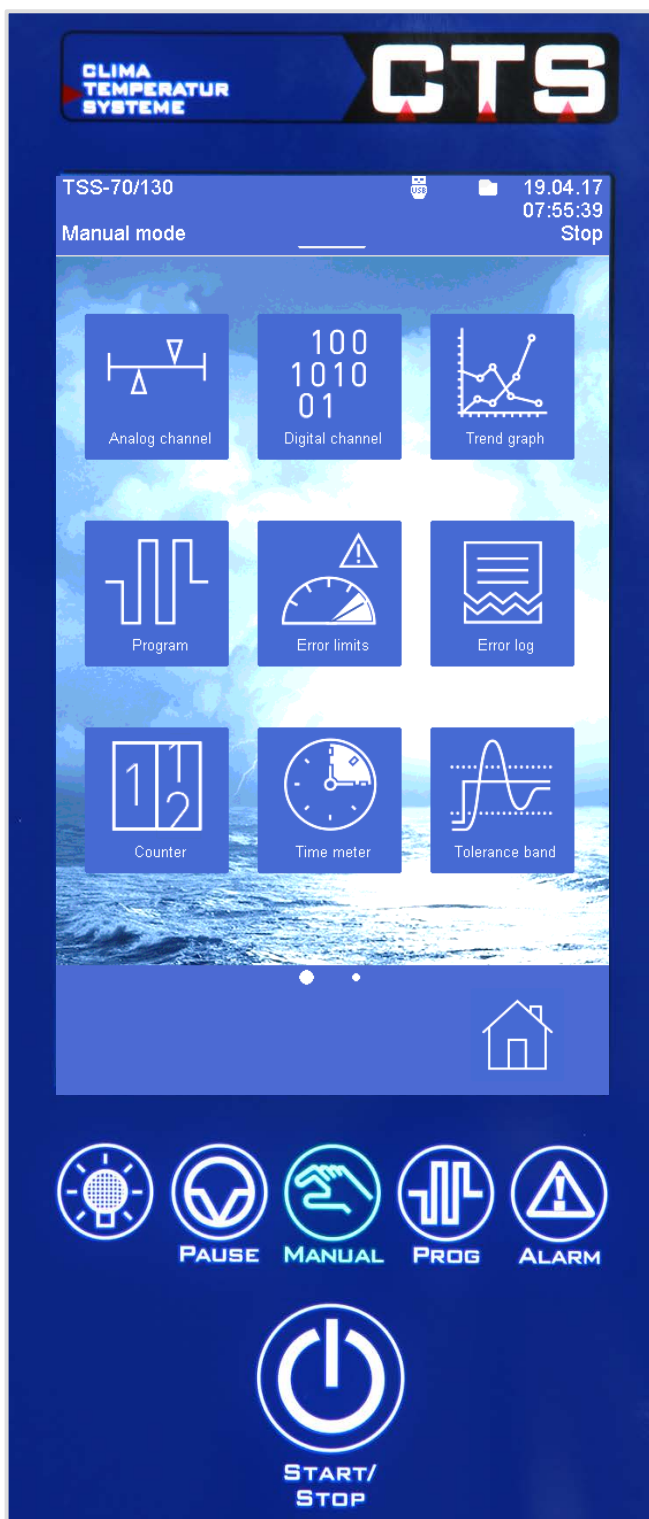


Operating instructions for CTS touch screen control panel

As from version TBV3.018



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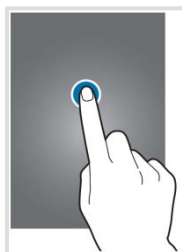
2. Basic information on the touch screen control panel

2.1. Using the touch screen

- The touch screen must only be touched with your fingers or a pen
- The touch screen cannot be operated with gloves
- The touch screen must not come into contact with water, because this could cause malfunctions
- Avoid pressing your finger hard on the touch screen
- Do not tap on the touch screen using pointed items
- To increase the life of the touch screen, the screen saver function should be used (see Chapter 4.11.1)

2.2. Finger movements

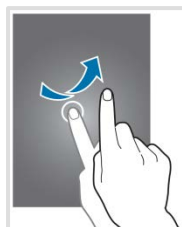
Tap



Basic operation of the touch screen. Tap your finger on the display. For example:

- Select function menus
- Insert values on the numeric keypad
- Select lines, programs, channels to be edited

Swipe



To display further menus swipe your finger across the display to the right or left.

To enter the **extended status line** menu swipe your finger from the upper display edge downwards.

Zoom

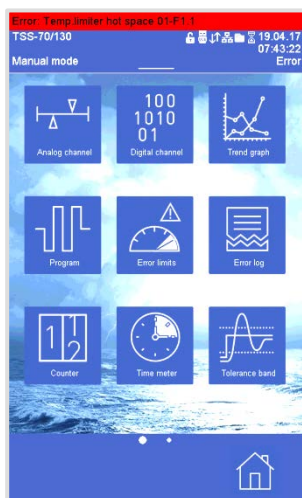


To enlarge the image, place two fingers on the display and move apart. Example: the **Trend graph** menu.

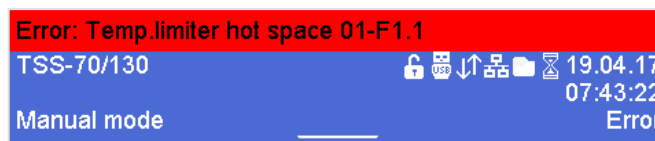
3. Control panel surface



3.1. Status line



The status line displays the most important device information.



Error:

Description of the error, warning and operating messages (see Chapter 3.9).

TSS-70/130

The device type is displayed.

Manualmode

The device is in manual or program mode.

**19.04.17
07:43:22**

Current date and time (see Chapter 4.11.4).

Error

Current status display: Error, warning, start, stop, pause.



Background processes are being updated, e.g. the measured data memory is being copied to the USB stick.



Customer-specific settings of the control panel are active, e.g. key tone, favourites toolbar or password.



The control panel has no customer-specific settings.



Network connection active (see Chapter 4.11.2).



The customer has initiated control via ASCII protocol or CID software.
This symbol is only displayed during the data exchange.



The connection to the USB stick is active.



Data from the trend graph are currently being recorded on the USB stick.



The trend graph recordings on the USB stick are defective.



The password protection system is active (see Chapter 4.11.8)

3.2. Extended status line



In the extended status line additional information and functions are made available.

To enter the **extended status line** menu swipe your finger from the upper display edge downwards.

Commission number: TSS70130_6_G3
ITC version: V3.15 - PLC version: 8
CTS TouchV3.016

The following information is displayed in the **extended status line**:

1st line: PLC program number

2nd line: ITC and PLC version numbers

3rd line: CTS-Touch version number

The following functions are available in the **extended status line**:



Enter the password via the numeric keypad, see Chapter 4.11.8.

This symbol is only displayed when the password protection system is active.



Create screenshot and save it on the USB stick, see Chapter 3.4.



Lock the display for cleaning, see Chapter 3.3.



Rapid access to the USB configuration, see Chapter 4.11.5. This symbol is only displayed if the USB stick is connected.



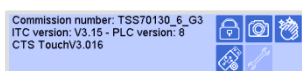
For service purposes only.

3.3. Display clean



The touch screen can be locked to avoid an unintended input. Select the **Display clean** function before cleaning the display.

Menu Display clean



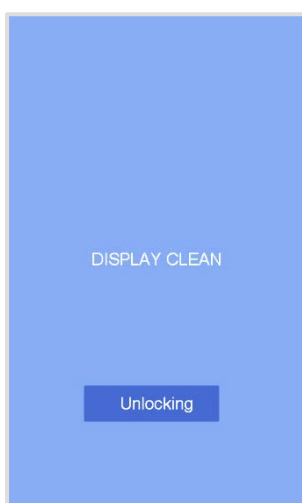
1. Swipe your finger from the upper display edge downwards
➡ The added status line is displayed

2. Select the  **Display clean** function

3. Clean the touch screen with a special display cleaner or a microfibre cloth

4. Tap on **Unlocking**

➡ The display is released again



Remark

Pay attention that no fluids enter the housing.

3.4. Create a screenshot




The current content of the display can be stored on a USB stick.

Menu Screenshot



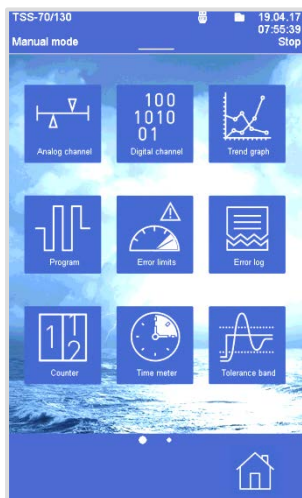
1. Connect USB stick

2. Swipe your finger from the upper display edge downwards

3. When the added status line is displayed, tap on the  **Create screenshot** function

➡ The current content of the display is stored on the USB stick.

3.5. Display / Home screen



All device functions can be accessed via the Home screen. The Home screen is provided with various function menus.



To display further function menus, swipe with your finger to the left or to the right.

3.6. Navigation keys

When a navigation key is tapped, the corresponding menu is displayed.

Assign navigation keys

Three navigation keys can be assigned as desired. To do so, touch the function menu on the display and hold for approx. 5 seconds. See also Chapter 4.11.1.



Remark

If a function menu is selected when all three navigation keys have already been assigned, the first navigation key on the right is overwritten. The other assignments are moved to the right.

Standard setting of the navigation keys



3.7. Function keys

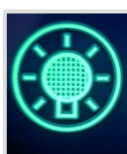
The function keys are allocated to predetermined functions. These keys can be pressed whatever the device state or mode.

Test space lighting



Function key is white

The test space lighting is deactivated, i.e. the device test space is not illuminated. When this key is hit the lighting is activated/switched on.



Function key is green

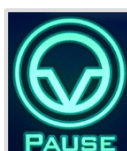
The test space lighting is activated, i.e. the test space of the device is illuminated. When this key is hit the illumination is deactivated/switched off. See also Chapter 4.11.6.

Pause



Function key is white

This has no effect on the device or the control system. If a program is active or if the device is being operated in manual mode, the "Pause" function is deactivated.



Function key is green

The basket moves upwards into the hot chamber or remains there and the test space door can be opened. The device is in "Pause" mode.

"Pause" is displayed in the status line.

All device components are set to standby. Thus, the device can be restarted immediately.



Remark

The test space door can only be opened if the **PAUSE** function key or the **Start / Stop** key has been activated.

Manual mode



Function key is white
The manual mode is deactivated, because a program has been started.
When the **MANUAL** function key is hit the analog channel menu is displayed.



Function key is green
Manual mode is active. "*Manual mode*" is now also displayed in the status line. If the **MANUAL** function key is hit, the program changes to the **Shock test manual** menu.



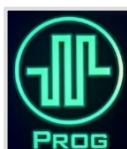
Remark

The manual mode can be started at any time as long as there are no device errors.

Program mode

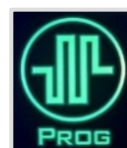


Function key is white
The device is in manual mode. If this key is hit the program changes to the **Editor** menu and the key flashes green.
See also Chapter 4.3.2.



Function key is green
The program mode is active. The status line now displays "*Program mode*".
If this key is hit, the program changes to the **Program status** or **Shock test status** menu. The **Program status** menu displays information about the active program. See also Chapter 4.5.10.

Timerfunktion



The function keys are green.
The timer function is activated. Until the program starts, the active **Manual** and **Prog** keys show the timer function. See Chapter 4.5.9.

Alarm



Function key is white
There are no messages.

The **error menu** **cannot** be opened if the **Alarm** key is hit.

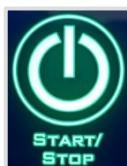


Function key is red
There is at least one error. The device state is now set to Stop. The **error menu** is displayed when the **Alarm** key is hit. See also Chapter 3.7.1.



Function key is yellow
There is at least one message. The **error menu** is displayed when the **Alarm** key is hit. See also Chapter 3.7.1.

3.7.1. Error menu



When an error message is displayed on the control panel, the green LED in the Start/Stop key flashes and the red LED in the alarm key is activated.



When the alarm key is hit, the **error menu** is displayed.

Error menu



The **error menu** displays all error or warning messages.
The following information is displayed:

- Number: Internal message numbering
- Type: Error or warning message
- Error text: Error description

When the fault on the device has been removed, the error message in the **error menu** must be confirmed by hitting the **Confirm error** key.
Warning messages do not need to be confirmed.



Remark

All error and warning messages are described in Chapter II.3 "Messages and digital channels". When no error or warning message is displayed, the **error menu** cannot be opened.

3.8. Start /stop key

When the **Start / Stop** key is hit, a program or the manual mode starts or stops.

Stop

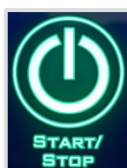


Function key is white
The device is not running.

'Stop' is displayed in the status line.

All device components are deactivated. The test space door can be opened.

Start



Function key is green
The device is in manual mode or a program is active.
'Start' is displayed in the status line.



Remark

The **start / stop** key flashes in green:

- when the **start / stop** key is hit and until the PLC control system starts the device
- when an error message is displayed

3.9. Error, warning and operating messages

Error message

The error message is displayed on the control panel and the entire device, or parts of it, are deactivated. When the fault has been removed, the error message in the **error menu** must be confirmed by hitting the **Confirm error** key. (See Chapter II.3 "Messages and digital channels").

Warning message

This warning message is displayed on the control panel while the device continues to run.

When the fault has been removed, the warning message is automatically deleted on the control panel and does **not** need to be confirmed. (See Chapter II.3 "Messages and digital channels").

Operating message

This operating message is displayed on the control panel while the device continues to run. Operating messages only serve as functional information.

3.10. Menu navigation



Analog channel (page 20)

Displays and modifies the analog channels in manual mode



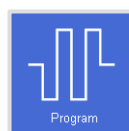
Digital channel (page 23)

Displays and modifies the digital channels



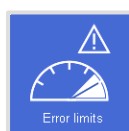
Trend graph (page 42)

Displays trends in the analog channels and configures the trend graph



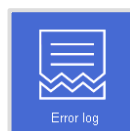
Program (page 46)

Creates, modifies, deletes and copies a program



Error limits (page 68)

Determines the admissible range of an analog channel in manual mode



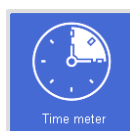
Error log (page 69)

Displays and describes the error or warning messages chronologically



Counter (page 70)

Displays the operation cycles of the magnetic valves



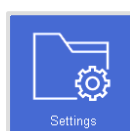
Time meter (page 70)

Indicates the component's operating hours



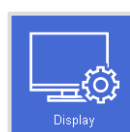
Tolerance band (page 71)

Determines how far the actual value can deviate from the set value of an analog channel (in manual mode)



Settings

See submenus



Display (page 74)

Changes the display settings



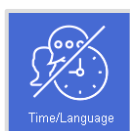
Network (page 75)

Defines the network parameters



Interfaces (page 79)

Settings for the serial interface (RS232 / 485)



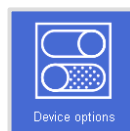
Time / Language (page 82)

Sets the time, date and language



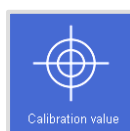
USB (page 83)

Settings to save the measurement recordings with the help of a USB stick



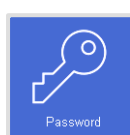
Device options (page 87)

Displays the device options for servicing purposes and activates/deactivates the customer's options



Calibration value (page 88)

Display the calibration value settings



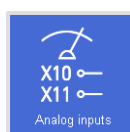
Password (page 90)

Settings for the password protection system



Analog values (page 92)

Displays all analog channels with additional information



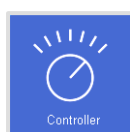
Analog inputs (page 92)

Displays all analog input channels with additional information



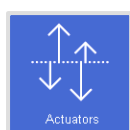
Digital I/O (page 93)

Displays the input / output cards with which communication takes place



Controller (page 93)

Displays all controller channels with additional information



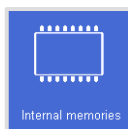
Actuators (page 94)

Displays all actuators with additional information



Calibration value customer (option) (page 94)

Determination of calibration values



Internal memory management (Page 96)

Deleting memory for program and measured data



Power failure (page 97)

Displays the time when the device is switched on or off



Channel scaling (option) (page 98)

Determining the channel scaling depending on the configuration

4. Functions of the control panel

4.1. Analog channel / Manual mode



Here, it is possible to change the set values of the analog channels for the manual mode. The analog channels vary according to the device and the configuration.



Remark

For thermal shock tests, the set values of the analog channels can additionally be changed in the **Shock test manual** menu, see Chapter 4.3.

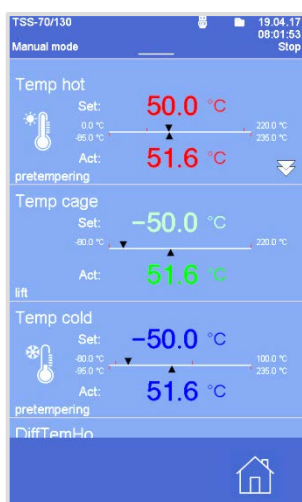
The set values are regulated as base values. The set values can be changed during operation. When the device is started, it first starts the set values currently set. The set values are maintained until the device is stopped or the set values are changed.



Remark

For the program mode, the set values of the analog channels **cannot** be changed here.

Modify analog channels



1. Tap on the channel which is to be changed

Further channels can be displayed by swiping your finger upwards or downwards on the display.



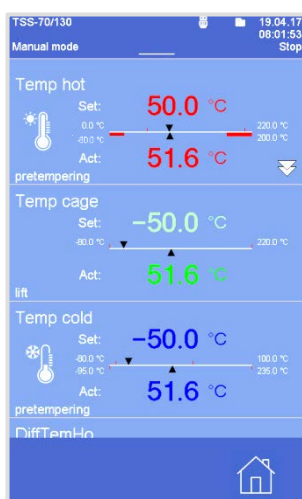
Numeric keypad



2. Input the set value via the numeric keypad
3. Confirm the value with the **Enter** key

➡ The numeric keypad is closed and the new set value is taken over.

Display analog channels



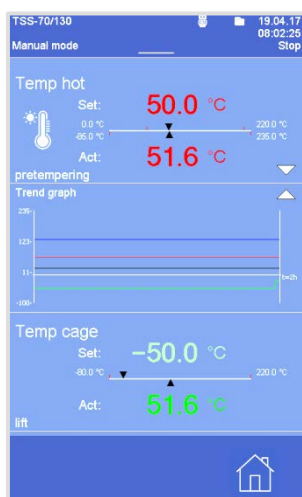
For every analog channel a scale is displayed showing the range of values.

The numbers above the line represent the permitted input area; from 0.0 °C to 220.0 °C in the example.

The numbers below the line represent the current error limits. In the example from -80.0 °C to 200.0 °C. See also Chapter 4.6.

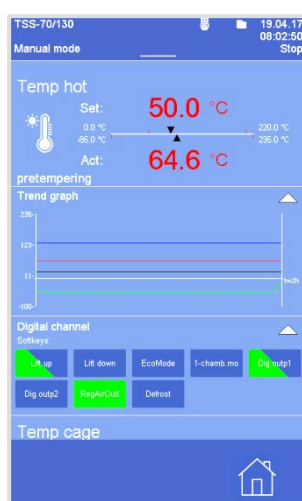
The black arrows on the number line mark the current set or actual value.

Further display of analog channels



When the white double arrow is tapped, the trend graph is also displayed (see Chapter 4.4).

The trend graph is hidden when the lower white arrow is tapped.



The digital channels are shown when the upper white arrow is tapped.

The trend graph and the digital channels are hidden when one of the white arrows is tapped.



Remark

The trend graph is displayed in the way it was adapted in the configuration (see Chapter 4.4.2).

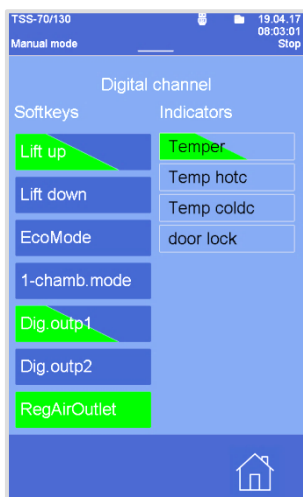
The number of digital channels displayed is limited to 10.

4.2. Digital channel



Digital channels can only be activated or deactivated.
There is a difference between softkeys and indicators.

Softkeys Indicators



Softkeys: Softkeys are digital channels which can be activated or deactivated. To activate a softkey, it is necessary to tap on it. When the softkey is active, it is displayed in green.



Remark

If only one half of a softkey is displayed in green after it has been tapped on, the preconditions to activate this softkey are missing. The softkey is selected and activated as soon as possible.

Indicators: Indicators are only displayed and cannot be changed. When an indicator is active, it is displayed in green.



Remark

If only one half of an indicator is displayed in green, the precondition to activate this indicator is missing. For example, at a warning message.

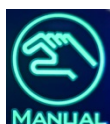
To display further channels, swipe your finger upwards or downwards on the display.

The digital channels can only be changed temporarily in the program mode. When the next line of code is reached in the program, the softkeys are overwritten again with the default settings from the program.

4.3. Thermal shock test

Thermal shock tests can be carried out in manual or program mode.

4.3.1. Shock test manual mode



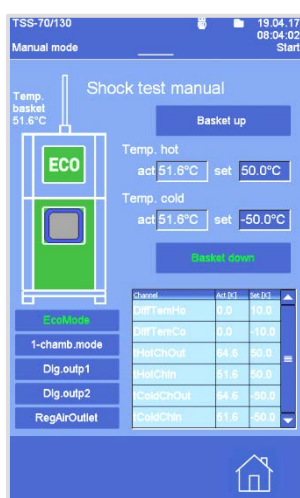
If the **MANUAL** function key is hit, the program changes to the **Shock test manual** menu.

Annotations for the 'Shock test manual' menu:

- Display:** Actual temperature in the basket (points to 'Temp. basket 51.6°C')
- Current status display** (points to the central status area)
- Switch on / off the digital channels** (points to the 'EcoMode' button)
- Move basket into the hot chamber (after the device has been started)** (points to 'Basket up' button)
- Input fields:**
 - Set temperature hot chamber (points to 'Temp. hot act 51.6°C set 50.0°C')
 - Set temperature cold chamber (points to 'Temp. cold act 51.6°C set -50.0°C')
- Move basket into the cold chamber (after the device has been started)** (points to 'Basket down' button)
- Scroll through the list of the analog channels** (points to the channel list table)
- Input fields:**
 - Set values of analog channels. (points to the 'set' column in the channel list)

Channel	Act (°C)	Set (°C)
DRTempTo	0.0	10.0
DRTempCo	0.0	-10.0
HotChOut	54.5	50.0
HotChIn	51.6	50.0
ColdChOut	54.5	-50.0
ColdChIn	51.6	-50.0

Activate Eco mode



1. Tap on the digital **EcoMode** channel

➔ The digital channel is active and the Eco mode icon is displayed in the status indicator

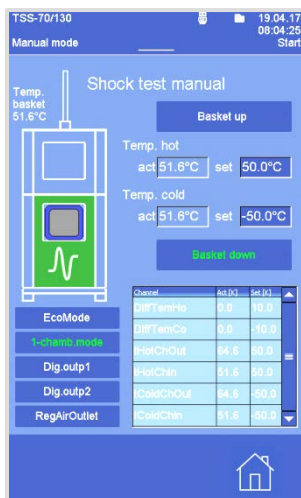
For further information about Eco mode see operating instructions, Chapter II.2.



Remark

The Eco icon is only visible if the digital **EcoMode** channel is active and the device has been started.

Activate 1-chamber mode



1. Tap on the digital **1-chamb mode** channel
 - ➔ The basket moves downwards into the cold chamber or remains there.
 - ➔ The digital **1-chamb mode** channel is active and the one-chamber mode icon is displayed in the status indicator

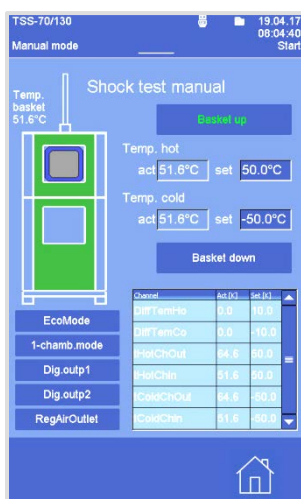


Remark

1-chamber mode can only be activated if the device has been started.

For further information about one-chamber mode see operating instructions, Chapter II.2.

Move basket



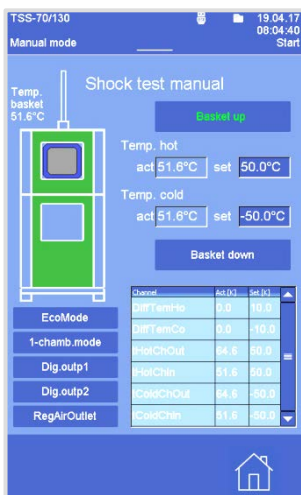
1. Tap on the **Basket up** key
 - ➔ The key is active and the basket moves upwards into the hot chamber
2. Tap on the **Basket down** key
 - ➔ The key is active and the basket moves downwards into the cold chamber



Remark

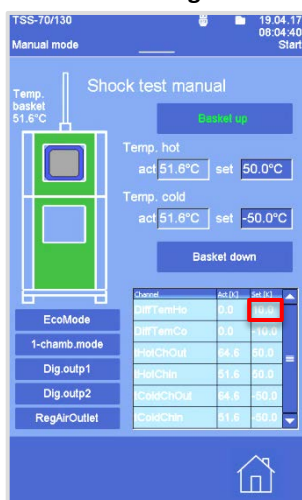
The basket can only be moved if the device has been activated.

Define set temperature



1. With **Temp. hot**, or **Temp. cold** tap on the **Set** input field
2. Enter the new set value via the numeric keypad
 - ➔ The defined set values are adopted and the temperature of the hot or cold chamber is controlled accordingly.

Define set values of analog channels

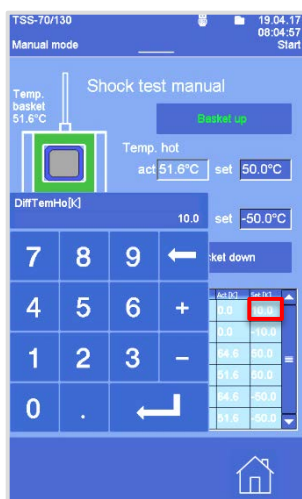


1. Tap in the **Set[K]** column on the analog channel which is to be changed



Remark

It is not possible to change all set values of the analog channels.

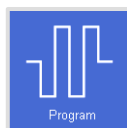


2. Enter the new set value via the numeric keypad
 ➔ The new set value is taken over into the list of analog channels.

4.3.2. Shock test program



When the device stops, the **Editor** menu is displayed if you tap on the **PROG** function key.



The **Editor** menu is displayed if you tap on **Program** on the home screen.

The screenshot shows the 'Editor' menu for a shock test program. The interface includes the following elements and annotations:

- Program name:** An arrow points to the 'Prog.name' field, which contains 'SchockPrg.z00'.
- Program number:** An arrow points to the 'No' field, which contains '99'.
- Number of test cycles:** An arrow points to the 'Cycles' field, which contains '9999'.
- Set temperature:** An arrow points to the 'Temperature' section, which includes 'Hot' (50.0°C) and 'Cold' (-50.0°C) settings.
- Pre-heating:** An arrow points to the 'Pretemper. control' section, which includes 'Hot' (10.0K) and 'Cold' (-10.0K) settings.
- Dwell time (per cycle) in the hot and cold chamber:** An arrow points to the 'Dwell time [min]' section, which includes 'Hot' (20) and 'Cold' (20) settings.
- Further program settings:** An arrow points to the 'Preparation', 'Hot chamber', 'Cold chamber', and 'Cycle ending' buttons.
- Created or modified shock test program is saved:** An arrow points to the 'Save' button.
- Overview over the created programs:** An arrow points to the 'Program' button at the bottom.

The central part of the screen displays a graph showing the temperature profile over time, with a red line indicating the test cycle.

4.3.3. Create shock test program

There are two ways to create a shock test program:

1. Copy program 99

The reference program 99 is saved and thus copied in the **Editor** menu under another program number.

In the **Editor** menu all program-relevant settings can be made.

- ➔ This newly created program can no longer be changed while the program is running.

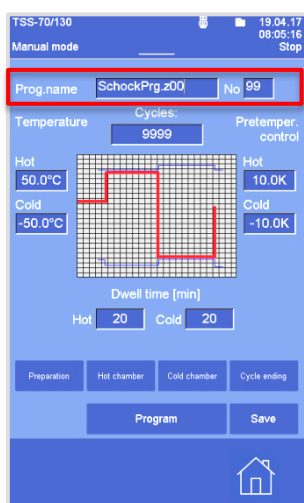
2. Use program 99 itself

The reference program 99 is used directly as a test program. In the **Editor** menu all program-relevant settings can be made.

- ➔ This program can be changed in the **Shock test status** menu while the program is running.

4.3.3.1. Copy program 99

Editor



If the **Editor** menu is called up, program 99 is displayed.



Remark

Reference program no. 99 serves as a template to create a shock test program. It contains all necessary pre-settings and cannot be deleted.

1. Enter the name and number of the program in the input fields of the **Editor** menu under Prog.name and No.



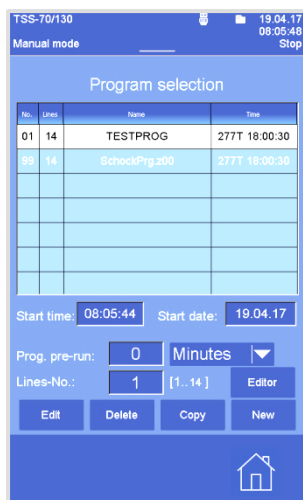
- ➔ See example on left: **TESTPROG** and No.1.



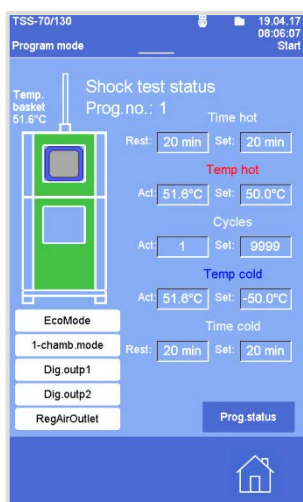
Remark

The program number must be unambiguous and not yet in use. Otherwise an existing program is overwritten.

2. Make all further settings in the **Editor** menu. See Chapter 4.3.4.
3. Tap on **Save** to save the settings in the new program.



- ➔ If you tap on the **Program** key, the **Program selection** menu with the newly created program is displayed.



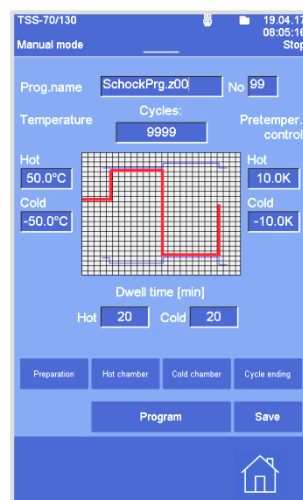
- ➔ If the selected program has been started, the current status of a running program is displayed in the **Shock test status** menu. See Chapter 4.5.10.



Remark

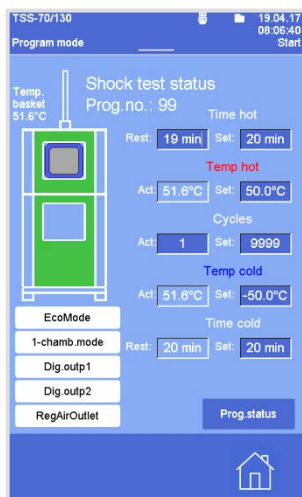
A newly created program cannot be changed in the **Shock test status** menu.

4.3.3.2. Use program 99



If the Editor menu is called up, program 99 is displayed.

1. Make all further settings for program 99 in the **Editor** menu. See Chapter 4.3.4.
2. Tap on **Save** to save the settings of program 99.



- ➡ If the selected program has been started, the current status of the running program is displayed in the **Shock test status** menu. See Chapter 4.5.10.



Remark

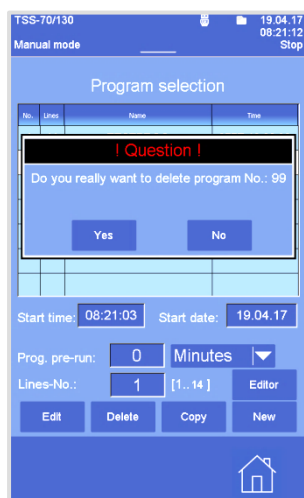
Reference program 99 may be changed in the **Shock test status** menu. See Chapter 4.5.10.

4.3.3.3. Reset program 99



The changed reference program 99 may be reset to its original status.

1. Tap in the **Program selection** menu on reference program 99 and then **Delete**.



- ➡ A question popup is displayed.
2. Tap on **Yes** and complete the process.
- ➡ Reference program 99 has been reset.

4.3.3.4. Editor

Edit program



No.	Lines	Name	Time
01	14	TESTPROG	277T 18:00:30
99	14	ShockPrg.z00	277T 18:00:30

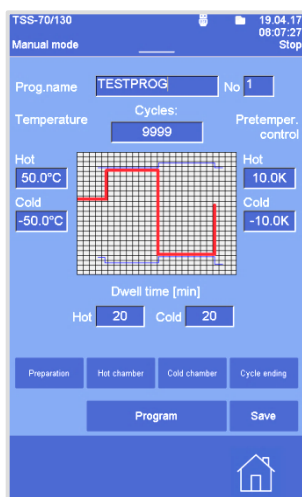
Start time: 08:05:44 Start date: 19.04.17

Prog. pre-run: 0 Minutes

Lines-No.: 1 [1..14] Editor

Edit Delete Copy New

1. Select the new program in the **Program selection** menu
2. Tap on **Editor**



Prog.name: TESTPROG No: 1

Temperature: 9999 Cycles: 9999

Hot: 50.0°C Cold: -50.0°C

Pretemper. control: Hot: 10.0K Cold: -10.0K

Dwell time [min]: Hot: 20 Cold: 20

Preparation Hot chamber Cold chamber Cycle ending

Program Save

In the editor, all program-relevant settings can be made. To do so, tap on the input field and enter the new set values via the numeric keypad or the keyboard.

- No:** program number
- Prog.name:** program name
- Temperature Hot:** set temperature in the hot chamber
- Temperature Cold:** set temperature in the cold chamber
- Pretemper. control Hot:** temperature difference to the set value in the hot chamber
- Pretemper. control Cold:** temperature difference to the set value in the cold chamber (for a detailed description of the pre-temperature control see Chapter 4.3.5)
- Cycles:** number of shock test cycles
- Dwell time Hot:** the time (per cycle) during which the basket is in the hot chamber
- Dwell time Cold:** the time (per cycle) during which the basket is in the cold chamber



Remark

The settings made in the editor apply to all lines of code. If **1-chamber mode** or **Eco mode** are also to be activated/deactivated for all lines of code, this must be set in the **Preparation** menu.

For descriptions of the **Preparation**, **Hot chamber**, **Cold chamber** and **Cycle ending** program settings see Chapter 4.3.4.

Prog.name *



Remark

If the program has been changed in the editor, "Prog.name" is marked with "*".

Lines of code visible

TSS-70/130 19.04.17 08:05:48 Stop
Manual mode

Program selection

No.	Lines	Name	Time
01	14	TESTPROG	277T 18:00:30
99	14	SchockPrgr.z00	277T 18:00:30

Start time: 08:05:44 Start date: 19.04.17

Prog. pre-run: 0 Minutes

Lines-No.: 1 [1..14] Editor

Edit Delete Copy New

Home icon

An existing program can be displayed completely.

1. Tap on **Edit**

TSS-70/130 19.04.17 08:07:57 Stop
Manual mode

Edit: TESTPROG

Line	Type	Time(s)	Temp hot [°C]	Temp cold [°C]	Offset (ms)	
1		0	50.0	-50.0	10.0	
2		0	50.0	-50.0	10.0	
3		0	50.0	-50.0	10.0	
4		0	50.0	-50.0	10.0	
5						
6		0	50.0	-50.0	10.0	
7		0	50.0	-50.0	10.0	
8		20	50.0	-50.0	10.0	
9		0	50.0	-50.0	10.0	
10		0	50.0	-50.0	10.0	
11		20	50.0	-50.0	10.0	
12						
13						
14						

Insert Delete Graph Limits Save Back

Home icon

➔ When you tap on **Edit** the **Edit** window opens.



Remark

A shock test program should be changed in the **Editor** menu, because a predefined structure is necessary to ensure correct operation.
The **Edit** field in the shock test program only serves to display the program.

4.3.4. Program settings

Specific functions can be activated / deactivated.
To do so, tap on the **On/Off** key next to the function.



White font: Function deactivated

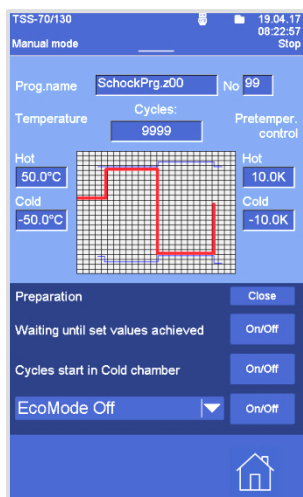


Green font: Function activated

➔ If you tap on **Save**, the settings are saved.



In the **Preparation** menu the settings for the program launch are made.
Here, the digital channels for all lines of code can be defined.

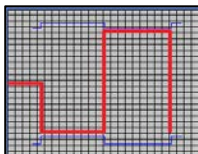


Waiting until set values achieved

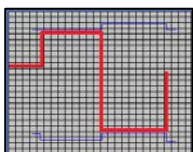
The program only starts when the set values in the hot and cold chamber are reached.

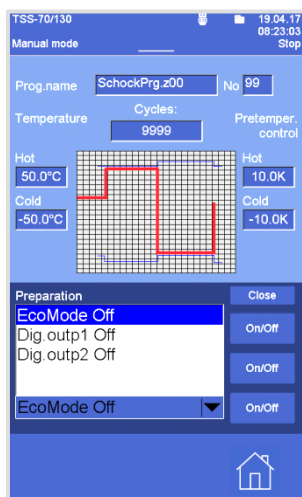
Cycles start in Cold chamber

On: The program starts in the cold chamber (key font green/active).



Off: The program starts in the hot chamber (key font white/inactive).





In the **Preparation** menu the digital channels for all lines of code can be activated / deactivated.

EcoMode

Eco mode is selected via the ▼ list and activated/deactivated by hitting the **On/Off** key.

On: Eco mode activated (font green/active).

Off: Eco mode deactivated (font white/inactive).

For further information about Eco mode see operating instructions, Chapter II.2.

Digital output

The digital channels are selected via the ▼ list and activated / deactivated by hitting the **On/Off** key.

On: Digital output active (font green/active).

Off: Digital output inactive (font white/inactive).

➔ If you tap on **Close** and then on **Save** the settings are saved.

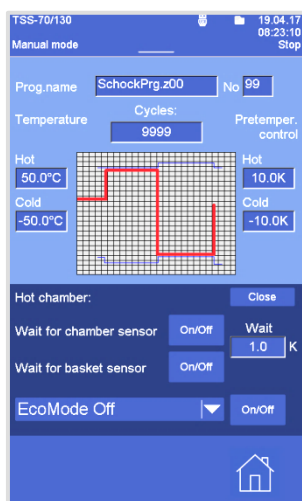


Remark

The settings for the digital channels made in the **Preparation** menu apply to all lines of code.

Hot chamber

In the **Hot chamber** menu the settings for the test cycle in the hot chamber are made.

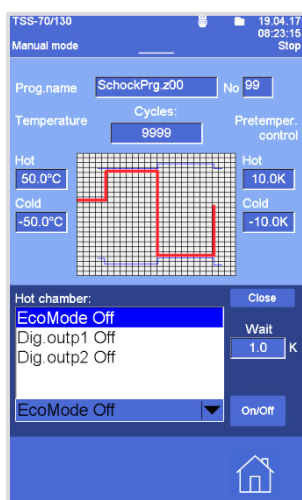


Wait for chamber sensor

- On:** The **dwell time** will only run if the actual temperature value in the hot chamber lies within the preset tolerance. The tolerance is entered in the input field below **Wait** (key font green/active).
- Off:** The **dwell time** will run as long as entered in the editor under **dwell time** (key font white/inactive).

Wait for basket sensor

- On:** The **dwell time** will only run if the actual temperature value at the basket sensor in the hot chamber lies within the preset tolerance (key font green/active). The tolerance is entered in the input field below **Wait**.
- Off:** The **dwell time** will run as long as entered in the editor under **dwell time** (key font white/inactive).



In the **Hot chamber** menu the digital channels for the hot chamber can be activated/deactivated.

EcoMode

Eco mode is selected via the ▼ list and activated/deactivated by hitting the **On/Off** key.

- On:** Eco mode activated (key font green/active).
- Off:** Eco mode deactivated (key font white/inactive).

For further information about Eco mode see operating instructions, Chapter II.2.

Digital output

The digital channels are selected via the ▼ list and activated/deactivated by hitting the **On/Off** key.

- On:** Digital output active (key font green/active).
- Off:** Digital output inactive (key font white/inactive).

➡ If you tap on **Close** and then on **Save** the settings are saved.

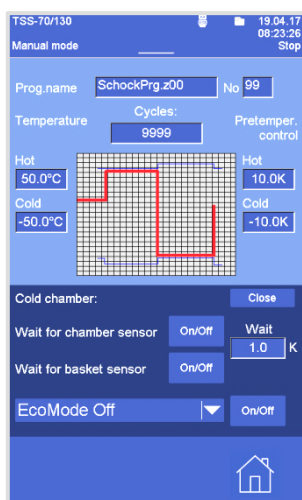


Remark

If the digital channels in the **Hot chamber** menu have been activated/deactivated, previous settings made in the **Preparation** menu become inactive.

Cold chamber

In the **Cold chamber** menu the settings for the test cycle in the cold chamber are made.

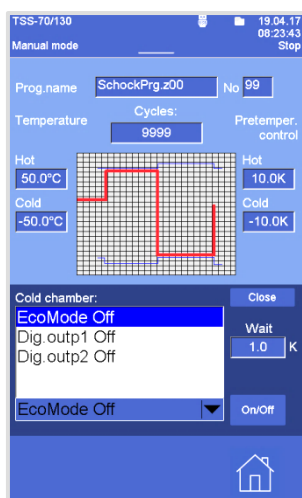


Wait for chamber sensor

- On:** The **dwell time** will only run if the actual temperature value in the cold chamber lies within the preset tolerance. The tolerance is entered in the input field below **Wait** (key font green/active).
- Off:** The **dwell time** will run as long as entered in the editor under **dwell time** (key font white/inactive).

Wait for basket sensor

- On:** The **dwell time** will only run if the actual temperature value at the basket sensor in the cold chamber lies within the preset tolerance (key font green/active). The tolerance is entered in the input field below **Wait**.
- Off:** The **dwell time** will run as long as entered in the editor under **dwell time** (key font white/inactive).



In the **Cold chamber** menu the digital channels for the cold chamber can be activated/deactivated.

EcoMode

Eco mode is selected via the ▼ list and activated/deactivated by hitting the **On/Off** key.

- On:** Eco mode activated (key font green/active).
- Off:** Eco mode deactivated (key font white/inactive).

For further information about Eco mode see operating instructions, Chapter II.2.

Digital output

The digital channels are selected via the ▼ list and activated/deactivated by hitting the **On/Off** key.

- On:** Digital output active (key font green/active).
- Off:** Digital output inactive (key font white/inactive).

➔ If you tap on **Close** and then on **Save** the settings are saved.

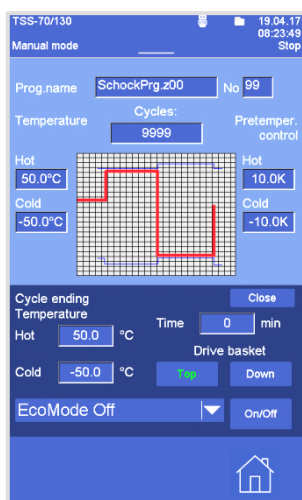


Remark

If the digital channels in the **Cold chamber** menu have been activated/deactivated, previous settings made in the **Preparation** menu become inactive.

Cycle ending

The **Cycle ending** menu is used to change the settings for how the program runs after the entered cycles have been processed.



Cycle ending Temperature

Hot: Set temperature in the hot chamber (top) after the shock test

Cold: Set temperature in the cold chamber (bottom) after the shock test

Drive basket

Top: After the shock test, the basket is in the hot chamber (top)

Down: After the shock test, the basket is in the cold chamber (bottom)

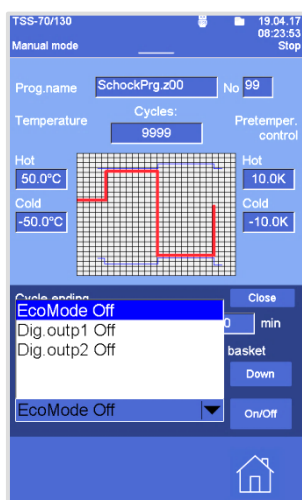
Time

The **Time** input field determines how long the temperature control remains active after the shock test.



Remark

After the time entered in the **Time** field is up, temperature control stops and the basket remains in the selected position.



In the **Cycle ending** menu, the digital channels can also be activated / deactivated for the next steps after the shock test.

EcoMode

Eco mode is selected via the ▼ list and activated/deactivated by hitting the **On/Off** key.

On: Eco mode activated (key font green/active).

Off: Eco mode deactivated (key font white/inactive).

For further information about Eco mode see operating instructions, Chapter II.2.

Digital output

The digital channels are selected via the ▼ list and activated/deactivated by hitting the **On/Off** key.

On: Digital output active (key font green/active).

Off: Digital output inactive (key font white/inactive).

➔ If you tap on **Close** and then on **Save** the settings are saved.



Remark

If the digital channels in the **Cycle ending** menu have been activated/deactivated, previous settings made in the **Preparation** menu become inactive.

4.3.5. Pre-heating

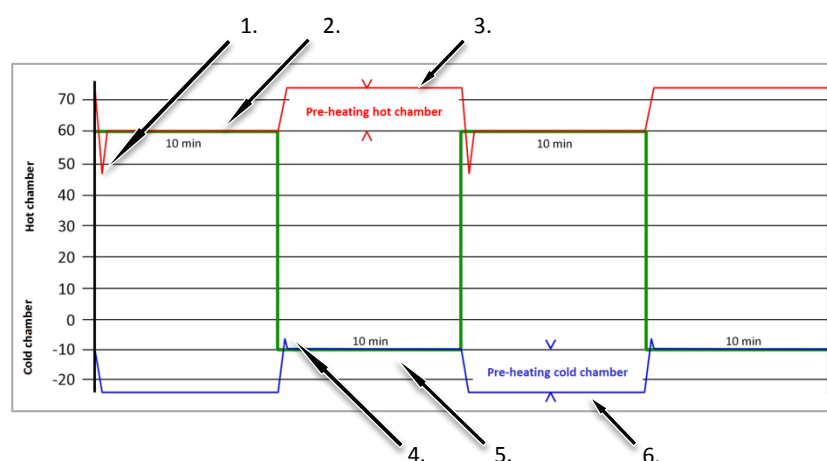
If the basket enters one of the chambers, the temperature in this chamber drops.

If the set value in the chamber which the basket enters is to be reached again as quickly as possible, the chamber is pre-heated in time. In other words, the hot chamber is pre-heated by a determined value above the set value or the cold chamber is pre-cooled by a determined value below the set value.

The extent of the temperature drop depends on:

- the temperatures in the chambers
- the basket temperature
- the test specimen

Accordingly, the values for the pre-heating must be defined depending on these three factors.

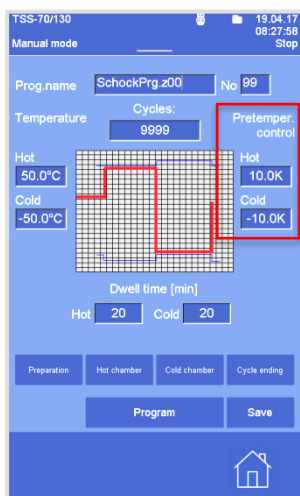


- basket set temperature
- temperature profile in the hot chamber
- temperature profile in the cold chamber

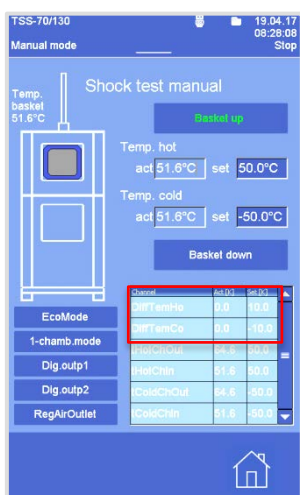
1. +45 °C
Temperature after the cold basket enters the hot chamber. The temperature drops.
2. +60 °C
Set temperature (= actual temperature) of the hot chamber with basket
3. +72 °C
Set temperature + pre-heating 12K
4. -5 °C
Temperature after the hot basket enters the cold chamber. The temperature increases.
5. -10 °C
Set temperature (= actual temperature) of the cold chamber with basket
6. -22 °C
Set temperature + pre-heating -12K

The values for the pre-heating can be entered in the following menus:

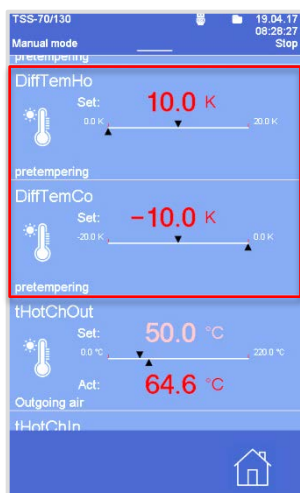
- In the **Editor** menu for the selected program



- In the **Shock test manual** menu under analog channels (DiffTemHo and DiffTemCo) for the manual mode



- Directly in the analog channels for the manual mode

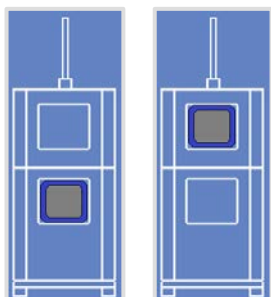


Remark

The values set for the pre-heating are not taken into consideration in one-chamber mode.

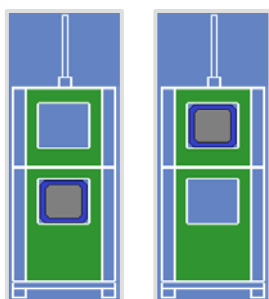
4.3.6. Status display

For a quick overview of the current device status, the respective statuses are displayed in different graphs.

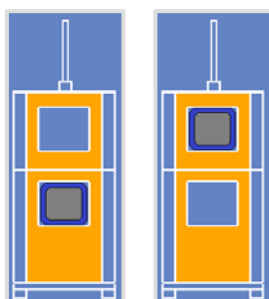


The device is not running.

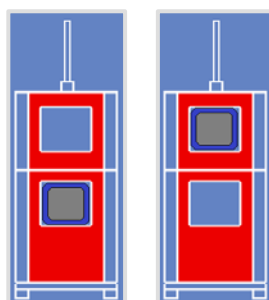
- Left figure: Basket in the cold chamber (down)
- Right figure: Basket in the hot chamber (on top)



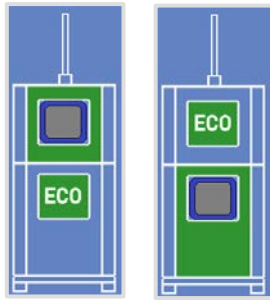
The device is running.



The device is running, but a warning message is displayed.

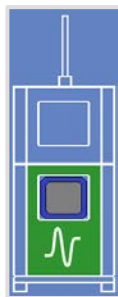


The device is not running, an error message is displayed.



The device is running and Eco mode is active.

- Left figure: Basket in the hot chamber
- Right figure: Basket in the cold chamber



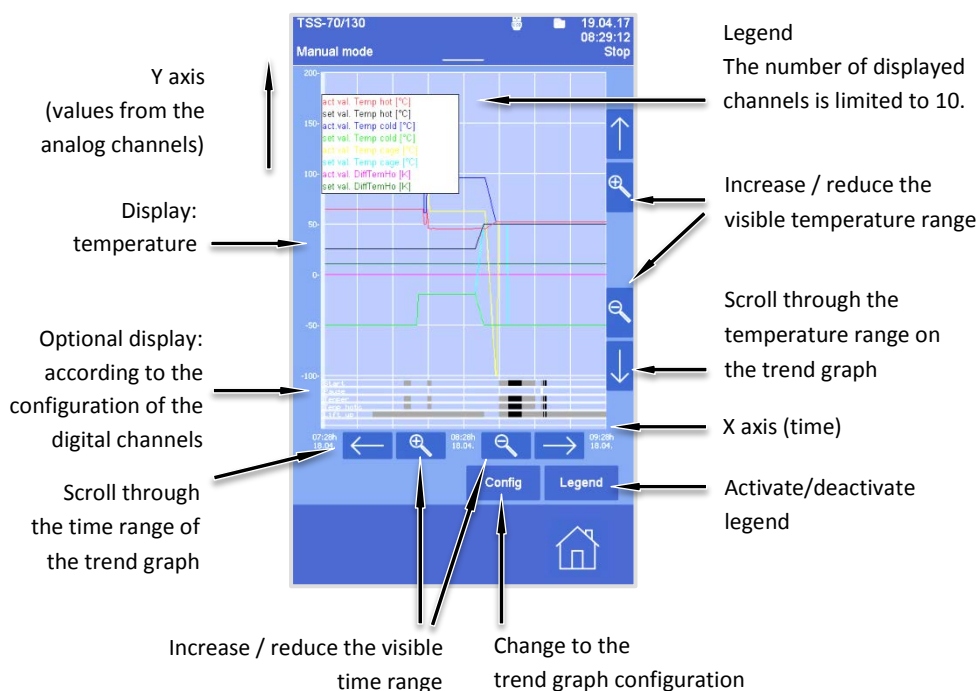
The device is running and one-chamber mode is active.

4.4. Trend graph

4.4.1. Surface of the trend graph



With the help of the trend graph, the course of the set or actual values in the analog channels is displayed graphically. The course of 7 days is recorded as a maximum. A maximum of one day can be displayed on the screen.



The trend graph is updated every 30 sec.

All values of the analog channels are displayed in the same scale. Thus, the unit information can be dropped.



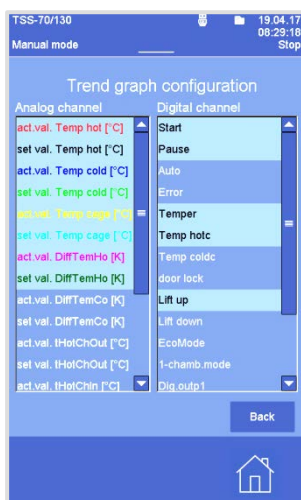
Remark

Values which lie between two update times are not displayed. The trend graph connects the respective values only after the update was carried out.

4.4.2. Trend graph configuration

The trend graph's surface can be adapted individually.

Configuring digital channels

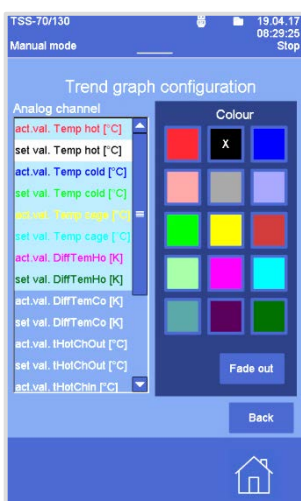


1. Tap in the **Digital channel** column on the channels which are to be displayed in the trend graph

➡ The active channels have a light-blue background.

A maximum of 6 channels can be displayed in the trend graph.

Configuring analog channels



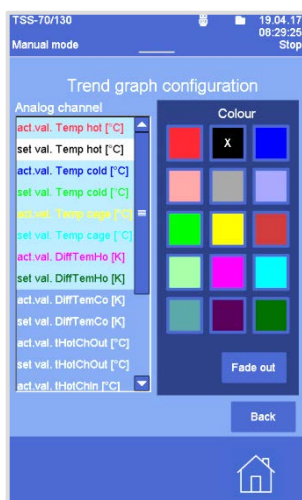
1. Tap in the **Analog channel** column on the curve which is to be displayed in the trend graph

➡ The **Colour** field opens automatically.

2. Tap on the desired colour for the curve

➡ The selected curve is taken over in the trend graph with the corresponding colour.

Fading out analog channels



1. Tap in the **Analog channel** column on the curve which is **not** to be displayed in the trend graph
 ➡ The **Colour** field opens automatically.
2. Tap on the **Fade out** field
 ➡ The selected curve is no longer displayed in the trend graph.

4.4.3. Zoom and move the trend graph

Zoom trend graph





The displayed trend graph range can be enlarged or reduced.

To do this, there are two possibilities:

1. With the help of the **Zoom** movement



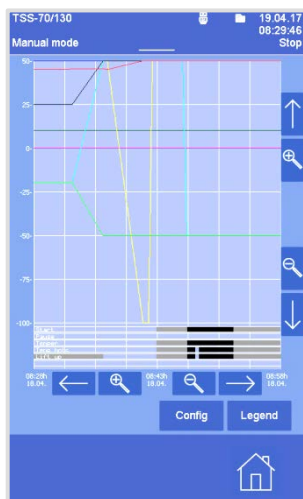
2. With the help of the  /  keys



Remark

The trend graph can be enlarged or reduced in both the X axis and the Y axis.

Move trend graph





The displayed trend graph range can be moved. Thus, the complete course of 7 days at most is displayed.

To do this, there are two possibilities:

1. With the help of the **Swipe** movement



2. With the help of the  /  keys



Remark

The trend graph can be moved in both the X axis and the Y axis.

4.5. Program mode

4.5.1. Important remarks on program creation

First line of code

A defined start value, i.e. the set value of the temperature, is always to be entered as the first line of code.

In the first line of code, the runtime is always $t=0$; this cannot be changed. This ensures that the control system does not adopt the final value of the last testing.

Non-linear temperature change

If a linear temperature change is not necessary it is suitable to program it as a by-pass (i.e. temperature change at time $t = 0$).

By-pass programming uses the maximum rate of temperature change.

However, because the change cannot take place at any speed, the 'wait' function should be use in this case. It ensures that there is a constant dwell time at a requested temperature level.

Linear temperature change

It must be checked if during programming the maximum speed of temperature change is exceeded (see "Technical performance data").

4.5.2. Test program components (program cycle)

Test program

The test program consists of an optional number (1-200) of subsequent lines of code. With the help of the CTS touch screen control panel test programs can be created and up to 98 different programs saved. The program defines the exact flow of the test cycle. The development of a test program is described in chapter 4.5.

Line of code

These comprise a temperature set value, a determined runtime, an optional 'wait' function and, also optionally, the switching on/off of additional functions.

An active line of code always includes a temperature set value with the corresponding runtime.

A passive line of code includes a beginning/end of a loop or the 'wait' function. Unlike the active line of code the passive one does not contain a runtime ($t=0$).

Runtime

It is determined for how long a set value remains constant or in what time another set value shall be reached.

Loop

A loop is suitable for a simplified programming of repetitive program sections. The beginning / end of a loop each time requires a whole (passive) line of code.

Additional functions

According to the device type and the customer's desires the device is provided with various additional functions.

The first 24 functions can be programmed via the CTS control panel.

It is possible to activate/deactivate various additional functions in one line of code. If, however, a function is to remain active over various lines of code, it must be re-entered in every line.

4.5.3. Program structure

Program name

Line overview

- Line number
- Line type
- Time
- Temperature
- Additional functions

Scroll bar
scroll through the program

Line

- Insert
- Delete

Graph
display graph, see page 60 Graph

Limits
Edit error limits, see page 61 Limits

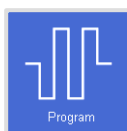
Save
save modified program

Back
go to the Program selection menu

4.5.4. Program



The **Editor** menu is displayed if you tap on the **PROG** function key. The **Program selection** is displayed if you tap on the **PROG** function key again.



The **Editor** menu is displayed if you tap on **Program** on the home screen. The **Program selection** menu is displayed if you tap on the **Program** key in the **Editor** menu.

Program selection menu

No.	Lines	Name	Time
01	14	TESTPROG	277T 18:00:30
99	14	SchockPrg.z00	277T 18:00:30

Start time: 08:05:44 Start date: 19.04.17

Prog. pre-run: 0 Minutes

Lines-No.: 1 [1..14] Editor

Edit Delete Copy New

A list of the stored programs is displayed.

In the **Program selection** menu, the following is displayed:

- Program number
- Number of code lines
- Program name
- Program runtime
- Start time / Start date
- Program pre-run
- Other functions

4.5.5. Create program for 1-chamber mode

No.	Lines	Name	Time
01	14	TESTPROG	277T 18:00:30
99	14	ShockPrg.z00	277T 18:00:30

Start time: 08:05:44 Start date: 19.04.17

Prog. pre-run: 0 Minutes

Lines-No.: 1 [1..14] Editor

Edit Delete Copy New



Remark

A shock test program is to be created and edited in the **Editor** menu. See Chapter 4.3.3.

1. Tap on **New**

Create new program

Number: 02

Name:

7 8 9 ←

4 5 6 +

1 2 3 -

0 . ↵

Back

2. Tap on the first input field
3. The program number is entered via the numeric keypad (1-98 possible)
4. Confirm the input by hitting the **Enter** key
5. Tap on the second input field

Number: 02

Name:

Time base: Minutes

Name:

1 2 3 4 5 6 7 8 9 0

Q W E R T Z U I O P

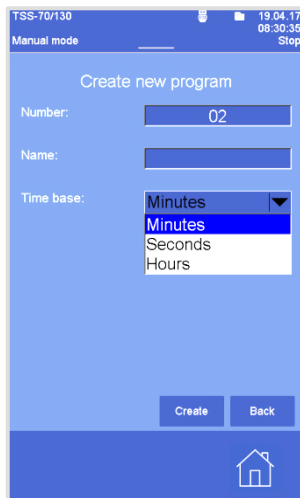
A S D F G H J K L

↑ Y X C V B N M ↵

+ - . ENTER

6. Enter the program name via the keyboard (20 characters possible)
7. Confirm the input by hitting the **Enter** key

Time base



8. Select the time base in the ▼ list

9. Tap on the **Create** field



Remark

Only whole numbers can be entered in the line of code as time values. At a time of < 1 hour, for example, the time base **Hours** is inappropriate.

In this case the time base **Minutes** must be selected.



Line	Type	Time(s)	Temp hot (°C)	Temp cold (°C)	Diff (temp (°C))	Diff (temp)
1	0	0.0	0.0	0.0	0.0	0.0

➔ The program has been created and consists of one line.



Remark

In the first line of code the runtime is always t=0 which cannot be changed.

4.5.6. Copy program

Copy program



No.	Line	Name	Time
01	14	TESTPROG	277T 18:00:30
02	14	Prog02	277T 18:00:30
99	14	ShockProg_01	277T 18:00:30

Start time: 08:30:48 Start date: 19.04.17

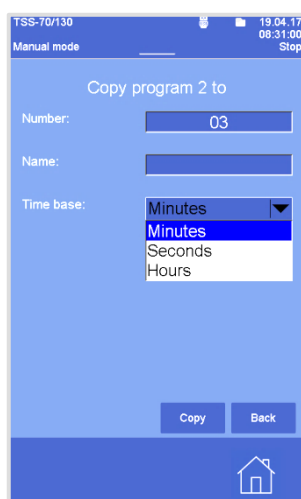
Prog. pre-run: 0 Minutes

Lines-No.: 1 [1..1] Editor

Edit Delete Copy New

An existing program can be copied.

4. In the **Program selection** menu, select the program which is to be copied
5. Tap on the **Copy** field



Copy program 2 to

Number: 03

Name:

Time base: Minutes

Minutes
Seconds
Hours

Copy Back

➔ When the **Copy** field is tapped, the **Copy program to** window is displayed.

6. Enter the new program number in **Number** in the input field using the numeric keypad.
7. Enter the new program name in **Name** in the input field using the keyboard.
8. Select time base in the ▼ list

➔ When the **Copy** field is tapped, the new program is displayed in the **Program selection** menu.



Remark

The program number and name must be unambiguous and must not yet exist.

4.5.7. Edit program

Edit program



An existing program can subsequently be changed.

1. Select the program which is to be processed in the **Program selection** menu
2. Tap on the **Edit** field



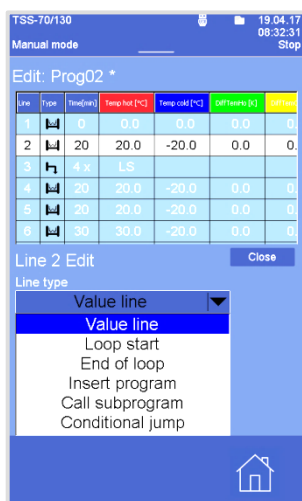
➡ When the **Edit** field is tapped, the **Edit** window is displayed.

The first line of code is always a value line with a t=0 runtime which cannot be changed.

The line type of the other code lines can be changed.

To do so, tap on the desired line of code in the **Type** column.

Edit line type



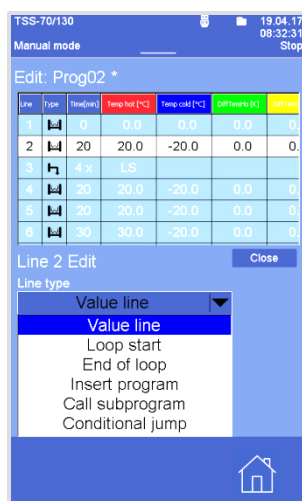
The following line types can be selected:

- Value line
- Loop start
- End of loop
- Insert program
- Call subprogram
- Conditional jump

To select the type for a certain line, tap on the desired line of code in the **Type** column.

1. Select the line type in the ▼ list

Value line



Under **Value line**, additional values can be defined in the selected line.

1. Select "Value line" in the ▼ list
2. Tap on **Close**
 - ➔ When **Close** is tapped, the **Edit** window is displayed.

Edit value line



1. Tap on the **Time** column to define the runtime for a certain line of code
2. Enter the time via the numeric keypad

Depending on the selected time base (see Chapter 4.5.5) the runtime can be entered in hours, minutes or seconds, but only whole numbers are possible.

3. To define the set value of the temperature for the line, tap on the **Temper** column
4. Then, enter the set value via the numeric keypad
5. Tap on **Save**
 - ➔ The edited program is saved.

Change digital channels



The digital channels have a grey background and can be activated / deactivated directly in the line of code.

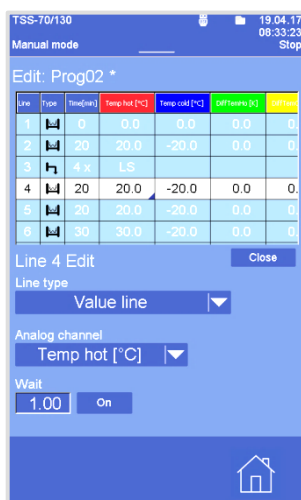
1. Tap on the desired field
 - ➔ The display changes from 0 to 1, the field turns green and the digital channel is active. (0=inactive, 1=active).



Remark

For 1-chamber mode, the **1-chamb.mode** digital channel must be active in all lines of code.(See program example on left).

Add Wait function



The Wait function is activated to ensure that the set value for the temperature is reached.

1. In the ▼ list under **Analog channel**, select the analog channel to which the wait function is to be assigned
2. Tap on the **On** or **Off** key to activate the wait function
3. Enter the tolerance range in the input field under **Wait** using the numeric keypad

This tolerance range is the range above or below the set value in which the actual value must lie. Only then does the program jump to the next line.

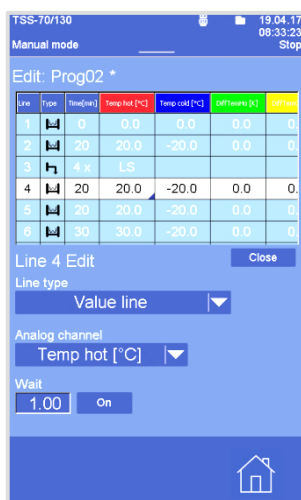
The active wait function is marked with a blue triangle.



Remark

The tolerance range must not be defined too tightly. Otherwise, the required actual value could be reached very late or not at all.

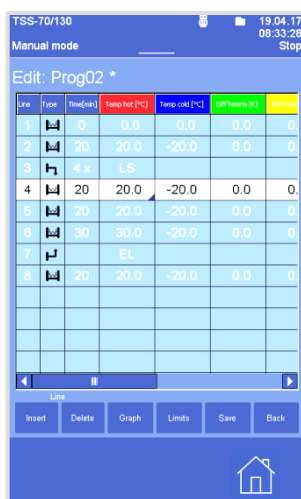
Close line of code



1. Tap on **Close**

➡ The code line editing is terminated.

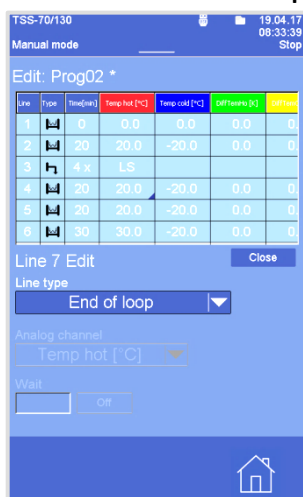
Save program



1. Tap on **Save**

➡ The edited program is saved.

Loop



A loop serves to repeat a program part multiple times.
The beginning / end of a loop always requires a whole line of code.

Lines of code



In the first line of code of the loop "**LS**" (Loop start) and the number of runs are displayed.



In the last line of code of the loop "**EL**" (End of loop) is displayed.

Number of runs

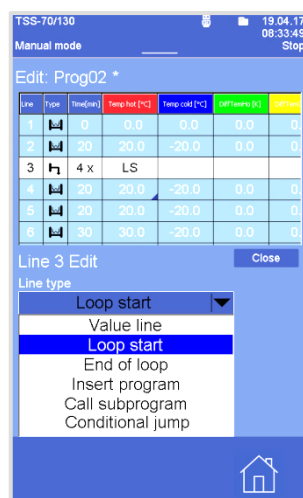
All lines of code, which stand between "**Loop start**" and "**End of loop**", are repeated. The number of runs is defined by the predefinition made in the **Time** column of a "**Loop start**" line.



Remark

If "1" are predefined in the **Number of runs** field, the lines of code run once between "**Loop start**" and "**End of loop**" and will not be repeated

Program loop



1. Tap on the line of code after which the loop is to start (in the **Line** column)
2. Tap on the **Line insert** field
3. In the new line, tap on the symbol
4. Select **Loop start** in the **Line type** field
→ and **1x** is displayed in the new line of code.
5. Tap twice on the **1x** field and enter the number of runs via the numeric keypad
6. Insert the lines of code which are to be repeated
7. Tap on the **Line insert** field
8. In the new line tap on the symbol
9. Select **End of loop** in the **Line type** field
→ is displayed in the new line of code.
10. Tap on **Close**

Program example

[illegible]


In this example a loop was programmed which involves the program part (lines 4, 5 and 6) running four times.

**Insert
program**

[illegible]

Inserted programs interrupt the main program.

The main program only continues when the inserted program is terminated. In the inserted program both the analog and digital channels as well as time control are active.

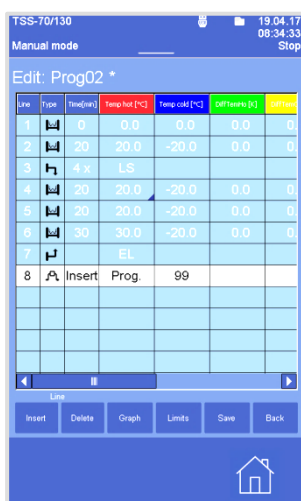
1. Tap on the line of code after which the program is to be inserted (in the **Line** column)
2. Tap on the **Line insert** field
3. In the new line tap on the  symbol

The screenshot shows the 'Manual mode' interface of a TSS-70/130 device. At the top, the date and time are 19.04.17 and 08:34:27. The title bar indicates 'Edit: Prog02 *'. Below this is a table representing a ladder logic program with 6 lines. Each line has a 'Line' number, a 'Type' (represented by a symbol), and several numerical values in different columns.

Line	Type	Time/Step	Temp hot [°C]	Temp cold [°C]	OffTime1 [s]	OffTime2 [s]
1		0	0.0	0.0	0.0	0
2		20	20.0	-20.0	0.0	0
3		4 s	LS			
4		20	20.0	-20.0	0.0	0
5		20	20.0	-20.0	0.0	0
6		30	30.0	-20.0	0.0	0

Below the table, there is a 'Line 8 Edit' label and a 'Close' button. A dropdown menu is open, showing the following options: 'Insert program', 'Value line', 'Loop start', 'End of loop', 'Insert program' (highlighted in blue), 'Call subprogram', and 'Conditional jump'. At the bottom right, there is a house icon.

4. Select **Insert program** in the **Line type** field
5. Tap on **Close**



➡ When **Close** is tapped, the first **Edit** window is displayed

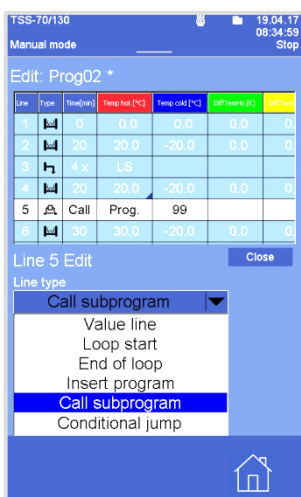
1. Tap on the **99** field and enter the number of the program which is to be inserted via the numeric keypad
2. Complete the process by hitting **Save**



Remark


The inserted subprogram must be in the **Program selection** menu.

Call up subprogram



Another program flow is carried out parallel to the program.

During a temperature program, for example, digital functions may run (also in another time base).

1. Tap on the line of code after which the subprogram is to be inserted (in the **Line** column)
2. Tap on the **Line Insert** field
3. In the new line, tap on the  symbol
4. Select **Call subprogram** in the **Line type** field
5. Tap on **Close**



➡ When **Close** is tapped, the first **Edit** window is displayed

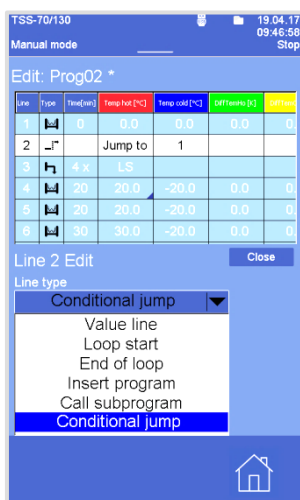
1. Tap on the **99** field and enter the number of the subprogram via the numeric keypad
2. Complete the process by hitting **Save**



Remark

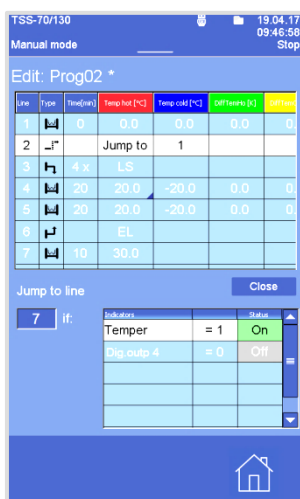
The inserted subprogram must be in the **Program selection** menu.

Conditional jump



When the program is running, it is possible to jump to any line of code when the predefined conditions are met.

1. Tap on the line of code after which the conditional jump is to be inserted (in the **Line** column)
2. Tap on **Line insert**
3. Tap on the icon in the new line
4. Select **Conditional jump** in the **Line type** field
5. Tap on **Close**



6. Tap on the number field behind **Jump to**
7. In the input field below **Jump to line**, enter the line number where you want the program to jump when the conditions are met.
 - ➡ The conditions for the indicators can be determined in the indicator list.
8. Select indicator and determine condition
 - = 1: Indicator active
 - = 0: Indicator inactive
9. Determine the condition status
 - On: Condition is taken into account
 - Off: Condition is not taken into account
10. Tap on **Close**
11. Terminate the process by hitting **Save**

Conditional jump - example



In this program example the program jumps from the 2nd program line to the 7th program line if the indicator is **Temper = 1 (active)**.

The indicator **Dig.out4 = 0 (inactive)** is not taken into account, because the status is inactive.

Graph



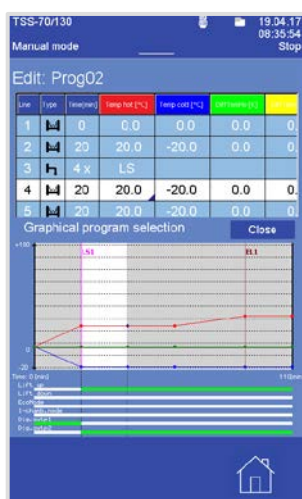
A preview of the program can be displayed graphically.

1. Select the program which is to be edited in the **Program selection** menu
2. Tap on the **Edit** field



➔ When the **Edit** field is tapped, the first **Edit** window is displayed.

3. Tap on the **Graph** field



➔ The graphical program preview is displayed.

4. Tap on the **Close** field

➔ The graphical program preview is hidden.



Remark

If a program line was tapped, this range is displayed in a brighter manner in the graphic program preview. (Only value lines for which a time is entered).

The colours of the digital channels in the line overview correspond to the colours of the curves in the graphical program preview.

Error limits and tolerances



Program selection

No.	Lines	Name	Time
1	14	TESTPROG	277T 10:00:38
2	8	Prog02	05:20:00
3	1	Prog03	00:00:00
89	14	SchockProg.z00	277T 10:00:38

Start time: 08:52:21 Start date: 19.04.17

Prog. pre-run: 0 Minutes

Lines-No.: 1 [1..8] Editor

Edit Delete Copy New

In the program, every line of code or the complete program can be programmed with error limits and tolerances.

1. Select the program which is to be edited in the **Program selection** menu
2. Tap on the **Edit** field



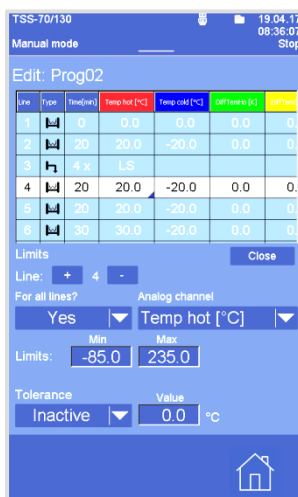
Edit: Prog02

Line	Type	Time(s)	Temp hot [°C]	Temp cold [°C]	OffTemp [s]	OffTemp
1	0	0.0	0.0	0.0	0.0	0
2	20	20.0	-20.0	0.0	0.0	0
3	4 x	LS				
4	20	20.0	-20.0	0.0	0.0	0
5	20	20.0	-20.0	0.0	0.0	0
6	30	30.0	-20.0	0.0	0.0	0
7		EL				
8	20	30.0	-20.0	0.0	0.0	0

Insert Delete Graph Limits Save Back

➡ When the **Edit** field is hit, the selected program is displayed.

3. Tap on the **Limits** field



Limits

Line: 4

For all lines? Yes

Analog channel: Temp hot [°C]

Limits: Min: -85.0 Max: 235.0

Tolerance: Inactive Value: 0.0 °C

Close

➡ When the **Limits** field is tapped, the error limits can be determined.

Limits



The dialog box 'Limits' has a 'Close' button at the top right. It contains a 'Line:' field with a '+' button, the number '4', and a '-' button. Below this is a 'For all lines?' dropdown menu currently set to 'Yes'. To the right is an 'Analog channel' dropdown menu currently set to 'Temp hot [°C]'. At the bottom, there are two input fields: 'Limits: Min' with the value '-85.0' and 'Limits: Max' with the value '235.0'.

The error limits are determined to define the admissible range of an analog channel, for example the max./min. temperature compatibility of the test specimen.

1. Select the desired line of code
2. In the ▼ list under **Analog channel**, select the analog channel
3. **For all lines?** (Yes / No) to define if the entry is to be valid for the selected line of code only, or for the whole program



This is a simplified view of the 'Limits' dialog box, showing the 'Limits: Min' field with the value '-85.0' and the 'Limits: Max' field with the value '235.0'.

4. Enter the error limits in the **min** and **max** fields next **Limits**



Remark

When an error limit is exceeded an error message is displayed on the control panel and the device stops.

Tolerances



A dropdown menu for 'Tolerance' with the following options: 'Inactive' (highlighted in blue), 'Always', '1st band', '2nd band', and 'Inactive' (at the bottom with a downward arrow).

The tolerances are determined to define the admissible deviation between the set value and the actual value.

1. Select tolerance
For further information see Chapter 4.10.



The 'Tolerance' dialog box has a 'Tolerance' dropdown menu set to 'Inactive' and a 'Value' field with the value '0.0' and a unit selector set to '°C'.

2. Enter the tolerance value (±-tolerance) in the **Value** field



Remark

When the actual value is outside the tolerance defined, a warning message is displayed on the control panel.

3. Tap on **Close** and complete the process with **Save**

4.5.8. Delete program

Delete program



No.	Lines	Name	Time
1	14	TESTPROG	277T 16:00:36
2	8	Prog02	05:20:00
3	1	Prog03	00:00:00
99	14	SchockProg200	277T 16:00:36

Start time: 08:52:21 Start date: 19.04.17

Prog. pre-run: 0 Minutes

Lines-No.: 1 [1..8] Editor

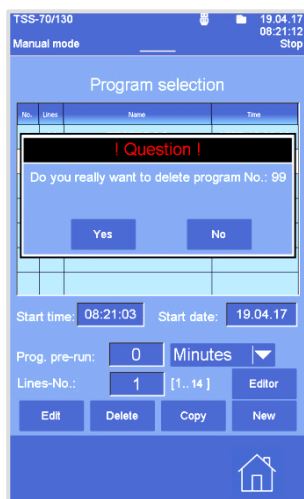
Edit Delete Copy New

1. Select the program which is to be deleted in the **Program selection** menu
2. Tap on **Delete**



Remark

The reference program 99 cannot be deleted.



! Question !

Do you really want to delete program No.: 99

Yes No

Start time: 08:21:03 Start date: 19.04.17

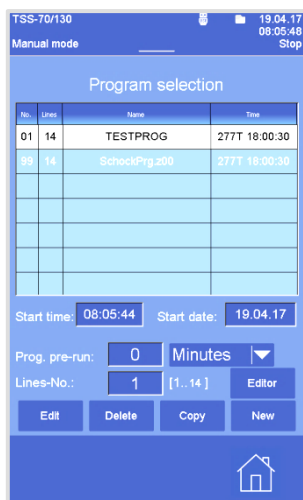
Prog. pre-run: 0 Minutes

Lines-No.: 1 [1..14] Editor

Edit Delete Copy New

3. Tap on **Yes** to confirm the query
➡ The program is deleted.

4.5.9. Start program



No.	Lines	Name	Time
01	14	TESTPROG	277T 18:00:30
99	14	SchockPrg.z00	277T 18:00:30

Start time: 08:05:44 Start date: 19.04.17

Prog. pre-run: 0 Minutes

Lines-No.: 1 [1..14] Editor

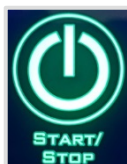
Edit Delete Copy New

1. Select the program which is to be started in the **Program selection** menu



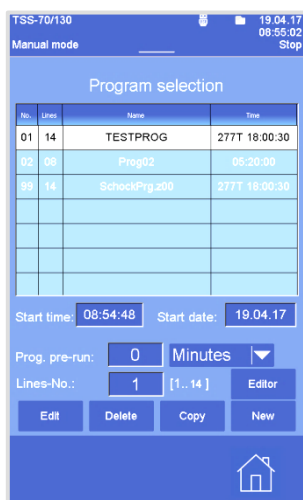
Remark

The program only starts if all conditions are met. The program, for example, is not started when an error message is displayed in the status line or the start time of the program has been changed.



2. Tap on the Start / Stop key
➔ The program starts.

Start time (timer function)



No.	Lines	Name	Time
01	14	TESTPROG	277T 18:00:30
92	06	Prog02	05:20:30
99	14	SchockPrg.z00	277T 18:00:30

Start time: 08:54:48 Start date: 19.04.17

Prog. pre-run: 0 Minutes

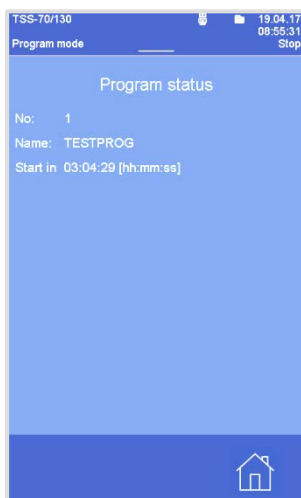
Lines-No.: 1 [1..14] Editor

Edit Delete Copy New

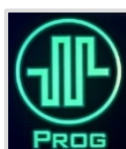
The start time of a program can be defined.

1. In the **Program selection** menu, select the program which is to be processed
2. Enter the desired start time in the input fields at **Start time** and **Start date**
➔ When the program is started, the timer function is active.

Program state at timer function

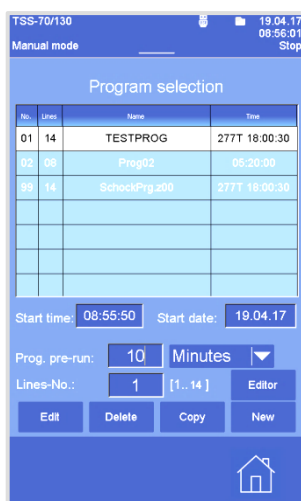


If a start time is defined, the program status displays when the program starts.



Until the time up to the program start, the active **Manual** and **Prog** keys indicate the timer function.

Program pre-run



As soon as the program starts, it jumps to a predefined program position.

The time which is to be skipped at the program start is predefined in the program pre-run.

1. In the **Program selection** menu, select the program which is to be processed

Then, there are two input options:

- Enter the desired advance time in the **Prog. Pre-run** input field using the numeric keypad
- Enter the desired start line in the **Lines-No.:** input field using the numeric keypad
 - ➔ The pre-run time in the **Prog. pre-run** input field changes automatically once the line number has been entered.

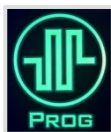


Remark

The time which has been entered in the **Prog. pre-run** input field is skipped when the program starts.

- ➔ When the program is started, the program advance is active.

4.5.10. Program status



The program status displays all information on the current program.



The program status can be displayed:

- when a program is started
- when the program is running, by tapping on the **PROG** function key

Information in the program state:

- Program number
- Current line
- Program name
- Information about the lines
- Total program runtime
- Remaining runtime of the current line
- Loop information for the current line
- Remaining runtime of the current program
- End of program (date and time)
- Further programs (e.g. subprograms)

Pre run [min]

When the **Pre run (min)** key is hit, you can enter how many minutes are to be skipped in the running program via the numeric keypad.

When a negative value is input, e.g. -5 min. the remaining runtime of the current line is extended by this time.



Remark

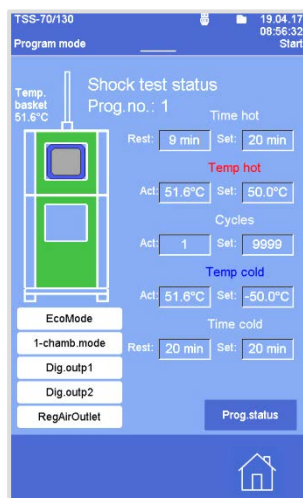
When the advance times are input, the program can also skip lines. When a negative value is input (rewind time), the program jumps up to the start of the current line at most. It is not possible to return to already processed lines of code.

Next line

When the **Next line** key is hit, the running program is continued in the next line.

Shock status

If the **Shock status** key is hit, the program changes to the **Shock test status** menu.



In the **Shock test status** menu, the current status of a running program is displayed. The following information is displayed:

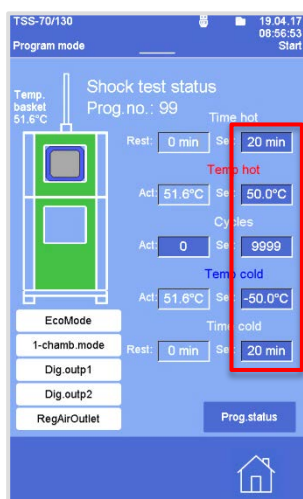
- Current program number
- Actual temperature in the basket
- Current basket position (marked with a blue frame)
- Remaining dwell time of the basket in the hot or cold chamber (in the **Rest field under Time hot or Time cold**)
- Programmed dwell time of the basket in the hot or cold chamber (in the **Set field under Time hot or Time cold**)
- Actual and set temperature in the hot chamber (in the **Act and Set fields under Temp hot**)
- Actual and set temperature in the cold chamber (in the **Act and Set fields under Temp cold**)
- Current number of cycles (in the **Act field under Cycles**)
- Number of programmed test cycles (in the **Set field under Cycles**)
- Current device status marked by colours (see 4.3.6)
- Current status of the digital channels:

Eco-Mode

Digital channel inactive

Eco-Mode

Digital channel active



Only reference program 99 may be changed in the **Shock test status** menu. The values in the fields marked in dark blue can be adapted when the program is running.



Remark

Only the set values which have been changed are saved (see red frame).

Prog.status

If the **Prog.status** key is hit, the program changes to the **Program status** menu and the settings are saved.

4.6. Error limits



Edit error limits

TSS-70/130 Manual mode 19.04.17 08:57:10 Stop

Error limits

No.	Name	Min	Max
00	Temp hot	Manual: -85.0 °C Actual: -85.0 °C	235.0 °C
01	Temp cold	Manual: -95.0 °C Actual: -95.0 °C	235.0 °C

The error limits are determined to define the admissible range of an analog channel in the manual mode, for example the max./min. temperature compatibility of the test specimen.

In the **Error limits** menu the error limits for the manual mode are defined and displayed and the error limits for the program mode are displayed.



Remark

The error limits for the program mode must be determined in the **Edit program** menu (error limits/tolerances).

For every analog channel a lower and upper limit can be determined. These limits are freely selectable within the respective channel configuration.

For example, in the case of a test specimen which may never exceed 100 °C, the max. limit should be set to 100 °C.

In the upper **Manual** limit line, the min. and max. limits of an analog channel in the manual mode are determined.

In the lower **Actual** limit line, the current min. and max. limits of an analog channel in the manual mode and the program mode are displayed.



Remark

In the manual mode, the same value is displayed in the lower limit line as the one defined in the upper limit line.

Example for error limits

No.	Name	Min	Max
00	Temp hot	Manual: 10.0 °C Actual: 10.0 °C	200.0 °C
01	Temp cold	Manual: -70.0 °C Actual: -70.0 °C	100.0 °C

In the **Error limits** menu, min. 10 °C / max. 200 °C have been defined as the hot chamber temperature and min. -70 °C / max. 100 °C as the cold chamber temperature.

Temp hot

Set: 50.0 °C

Act: 51.6 °C

Temp cage

Set: -50.0 °C

Act: 51.6 °C

Temp cold

Set: -50.0 °C

Act: 51.6 °C

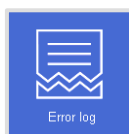
In the analog channels, the error limits are displayed below the number line. The excluded range is marked by a red bar on the number line.



Remark

When an error limit is exceeded an error message is displayed on the control panel and the device stops.

4.7. Error history



In the **Error log** menu the error and warning messages are listed and described. Thereby, the time history of an error can exactly be understood. This information can be used as logfile (for booking, recording).

Display error history



With the help of the lateral scroll bar, the error history can be scrolled through. When you tap on a message, the following details concerning the selected message are displayed below the error history:

- **Date / Time:** Moment the error appeared
- **Text:** Error text which is displayed on the control panel
- **Number:** Internal message numbering
- **Type:** Error message, warning message or system error with current message status.



Remark

Messages in the error history cannot be deleted.



For a better orientation, the colours of the messages vary as follows:


	New error	Error cause removed	Error confirmed
Warning message	orange	light blue	-
Error message	red	pink	light blue
System error	dark red	pink	light blue
Operating message	light yellow	-	-

See also Chapter 3.7.1 Error menu and 4.11.6 Customer options.

4.8. Counter



In the **Counter** menu the operation cycles of the magnetic valves are displayed.

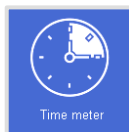
TSS-70/130		19.04.17
Manual mode		08:56:22
		Stop
Counter		
01 lift	Meter reading	52
Maintenance spindle	Limit 2	0
02 sv cooling 1	Meter reading	364
Limit 1	Limit 2	0
03 sv bypass C	Meter reading	51
Limit 1	Limit 2	0
04 sv reinject. C	Meter reading	474
Limit 1	Limit 2	0
05 sv reinject. C	Meter reading	
		



Remark

The **Counter** menu serves to inform the operator. Limits can only be entered by the CTS customer service.

4.9. Time meter



The **Time meter** menu lists all components with set operating hours.

TSS-70/130		19.04.17
Manual mode		08:58:30
		Stop
Time meter		
01 Hour counter		3.20 [h]
Limit 1	Limit 2	
1.00 [h]	0.00 [h]	
02 Compressor cooling		9.00 [h]
Limit 1	Limit 2	
1.00 [h]	0.00 [h]	
03 Compr. Pre cooling		8.40 [h]
Limit 1	Limit 2	
0.00 [h]	0.00 [h]	
04 defrost		2.00 [h]
defrost cold chamber	Limit 2	
0.00 [h]	0.00 [h]	
		



Remark

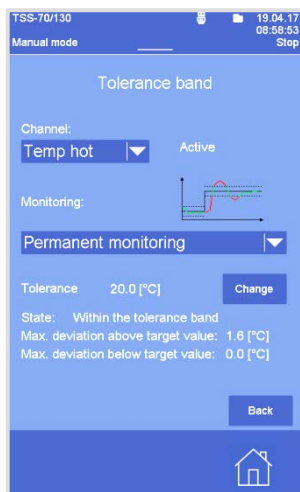
The **Time meter** menu serves to inform the operator. Limits can only be entered by the CTS customer service.

4.10. Tolerance band



A tolerance band indicates the permitted deviation of the actual value compared with the set value of an analog channel.

Tolerance band monitoring Manual mode



In the **Tolerance band** menu, the permitted deviations of an analog channel of the manual mode can be defined.

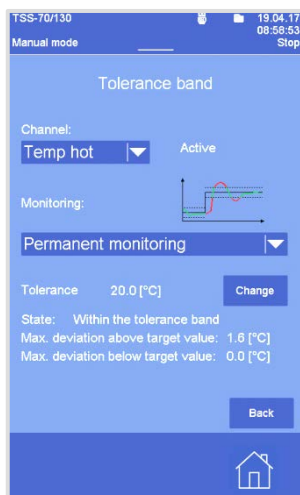
Only one channel is displayed at a time, because a range of information is displayed per channel.

The other channels can be selected in the list.

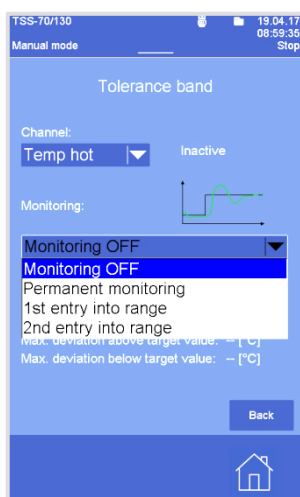
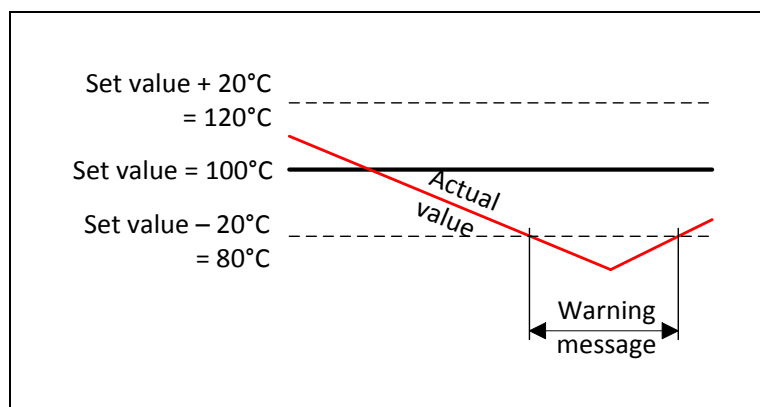
Tolerance band monitoring Program mode



During program mode, the permitted deviations are displayed in the **Tolerance band** menu, but they cannot be changed here. See page 61 "Limits".



The indicated tolerance value (here 20 °C) always defines a symmetrical band around the set value:

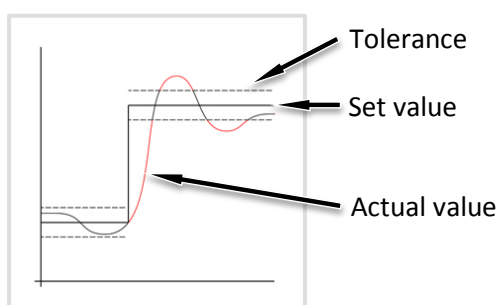


The following settings are available for tolerance band monitoring:

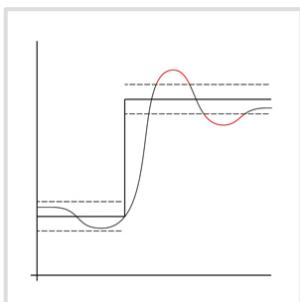
- Monitoring OFF
- Permanent monitoring
- 1st entry into the tolerance band
- 2nd entry into the tolerance band

Permanent monitoring

When the actual value is outside the tolerance a warning message is displayed.

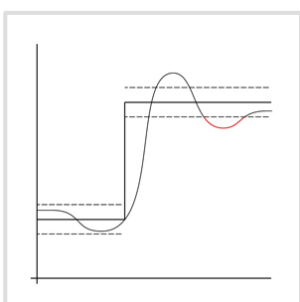


1st entry into the tolerance band



A warning message is only displayed if the actual value is outside the tolerance range after the 1st entry into the tolerance band.

2nd entry into the tolerance band



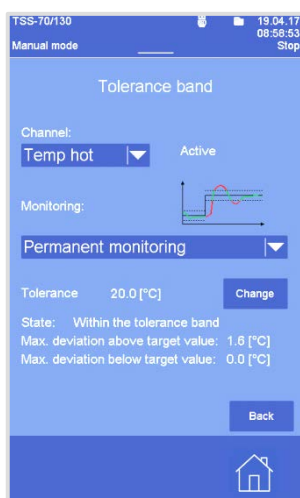
A warning message is only displayed if the actual value is outside tolerance range after the 2nd entry into the tolerance band.



Remark

The tolerance band monitoring can be activated in program or manual mode.

State



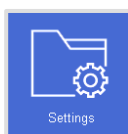
Depending on the monitoring type or the tolerance value selected, the current deviations are displayed.

State:

- Within the tolerance band
- Actual value larger than upper tolerance
- Actual value less than lower tolerance

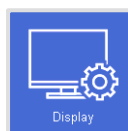
The maximum deviation shows the current maximum deviation between the set value and the actual value.

4.11. Settings



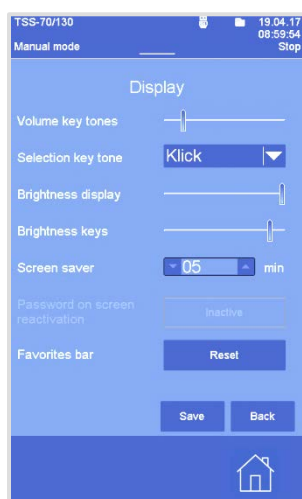
The system data submenus display system information and allow system settings to be altered.

4.11.1. Display



In the **Display** menu, display settings are altered.

Display settings



Various display settings can be altered.

Volume key tones

When you tap a key on the display, this makes a sound. In the **Volume key tones** field, the volume can be changed. To do so, the control device is moved to the corresponding position.

Key tone

In the **Selection key tone** field, you can choose between seven tones.

Brightness display

In the **Brightness display** field, the display brightness can be changed. To do so, the control device is moved to the corresponding position.

Brightness key

In the **Brightness key** field, the key brightness can be changed. To do so, the control device is moved to the corresponding position.

Screen saver

The screen saver is activated after an adjustable time (from 1 min. to 30 min.). Thus, the display's lifetime is extended.

Password on screen reactivation

When the screen saver is active, the password protection system, which is set at **Level at lock**, works. (See Chapter 4.11.8).

This setting is only possible when the password protection system is active. (See Chapter 4.11.8).

Favourites bar

The navigation keys can be assigned as preferred (see Chapter 3.6). To deactivate this assignment tap on the **Reset** key.

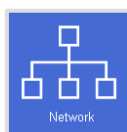
Save

When the **Save** key is hit, the display settings are taken over.

Back

The **Display settings** menu is closed without saving the settings made.

4.11.2. Network



In the **Network** menu the network parameters are defined to integrate the device into a customer-provided LAN.

Network parameters



IP address

IP addresses are necessary to address the device in the network. The allocation of the IP address for the network must be carried out by the operator's network administrator.

MAC address

The MAC address (Medium Access Control Address - 8-byte address) can be used to identify any network interface card which is clearly defined in the worldwide card electronic system.

On delivery the network interface card control system has a unique worldwide MAC address which cannot be changed. It is only made available for the display.

IP port

The IP port serves for internal communication with the CID software (via an existing network). The same IP port must be used on the device and on the PC.



Remark

Port number 80 is reserved for data queries via the HTTP protocol and port number 1080 for the CTS ASCII protocol.

⇒ This means that port numbers 80 and 1080 may not be used. All other port numbers can be used for the CID communication, if they are released in the network.

⇒ For communication with the CID software the port numbers from 8001 to 8050 should be used. (See also CID user manual).

Subnet mask

The subnet mask identifies which part of the IP address identifies the network and which a specific computer.

This is indicated by the operator's network administrator.

Default gateway

This is indicated by the operator's network administrator.



Options

This shows additional network options. Either the respective options are active when the device is supplied or they can be activated subsequently. If they are ordered later, options can be activated by entering a code.

Connection

The program changes to the **Network connection** menu.

Filter list

The program changes to the **Network filter** menu.

Save

The changed network parameters are saved.

Back

The **Network parameter** menu is closed without saving the settings made.



Remark

Changes of the IP address, the IP port, the subnet mask and the default gateway are entered via the numeric keypad by tapping on the respective field. The options are exclusively entered with codes which activate the respective option.

Network connection



IP-Port	IP address communication partner	Access privileges
8001<->51633	192.168.1.120	Full

Settings:
MAC-address: 00-0A-F7-17-E0-CD Delete

Back

Network connection

Here, the current network connections are displayed, e.g. from the device control to the CID program on the customer-provided PC.

Settings

In addition to the network connection selected, the MAC address of the communication partners is displayed.

Delete

The network connection selected is disconnected and removed from the list.

Network filter

TS-70/130
Manual mode
19.04.17
09:02:04
Stop

Network filter

Filtered MAC-address	Access privileges	Access privileges
00-A0-F7-17-E0-CD	Full	Active
00-00-00-00-00-00	Full	Active
00-00-00-00-00-00	Full	Active
00-00-00-00-00-00	Full	Active
00-00-00-00-00-00	Full	Active

Access privileges: Full

Filtered MAC-address: 00-A0-F7-17-E0-CD

Network filter active: [Disable] [Back]

Network filter

A blocking list of at most 10 entries is compiled. The communication partners listed here can have limited access rights.

MAC-address

To define the access rights for the network connections, the corresponding MAC address must first be entered.

1. Select any line
2. Enter the corresponding MAC address in **Filtered MAC-address**



Remark

For the connections currently active, the corresponding MAC address is displayed in the **Network connection** menu.

TS-70/130
Manual mode
19.04.17
09:02:04
Stop

Network filter

Filtered MAC-address	Access privileges	Access privileges
00-A0-F7-17-E0-CD	Full	Active
00-00-00-00-00-00	Full	Active
00-00-00-00-00-00	Full	Active
00-00-00-00-00-00	Full	Active
00-00-00-00-00-00	Full	Active

Access privileges: Full

Filtered MAC-address: 00-A0-F7-17-E0-CD

Network filter active: [Disable] [Back]

Access privileges

1. Tap on the network connection line which is to be allocated an access right.

Access privileges: Full

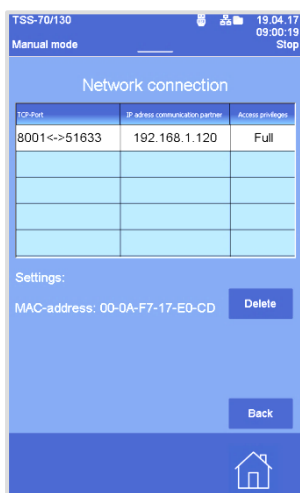
Filtered MAC-address: Full

Read only

2. In the **Access privileges** ▼ list, select the desired access right for the network connection

- Full: Full access rights to the control system via the network connection
- Read only: the processes running on the device can only be read, but not changed
the interface commands carrying out changes to the device settings via the selected network connection will not be executed.

➡ The defined access rights are saved immediately.



➔ The current access rights are also displayed in the **Network connection** menu.



Remark

Changed access rights are only adopted when the connection is re-established.

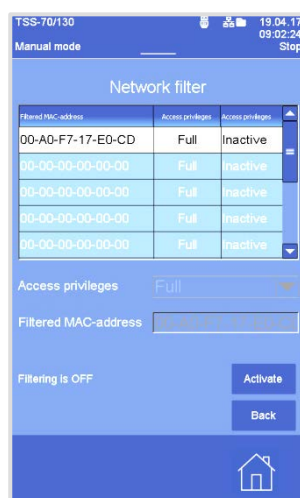


Filtering active

In the picture on the left the network filter is active.

If you tap on **Disable** all entries in the blocking list are ignored and full access rights are activated for each network connection.

(See picture below "Filtering is OFF").



Filtering is OFF

In the picture on the left the network filter is not active.

If you tap on **Activate**, the entries in the blocking list are activated. Every new network connection is checked to see if the access is restricted.

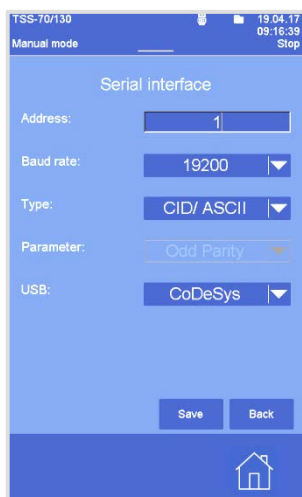
(See picture above "Filtering active").

4.11.3. Interfaces



In the **Interfaces** menu the settings for the serial interface (RS232 / 485) are made.

Serial interface



Chamber address

The chamber address is part of the communication protocol.

If the device is controlled via the CID software, the chamber address determines the device number on the CID.

If, for example, five devices are connected in series the chamber addresses should be numbered consecutively from 1 to 5 and, if possible, in the order the devices are located (position).

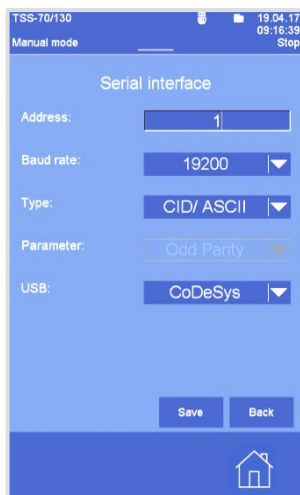
The standard value of the chamber address is 1. It is freely selectable at any time.

Baud rate

The baud rate represents the transmission rate (bits per second) with which serial data is transmitted. The device standard transmission rate is 19200 bit/s.

The following rates are possible:

- 1200 bit/s
- 2400 bit/s
- 4800 bit/s
- 9600 bit/s
- 19200 bit/s
- 38400 bit/s
- 57600 bit/s



Type

The interface type describes the way in which the serial interface can communicate between a device and a PC.

The standard for this type is CID/ASCII.

- CID / ASCII: Connection with CID software, customer-provided control via commands of the ASCII protocol

Parameter setting: Odd Parity

- ASCII-Comp.: Customer-specific connection

Parameter setting: No Parity

- Modbus RTU: Control via Modbus protocol in the RTU mode

Parameter selection: Even Parity or Odd Parity

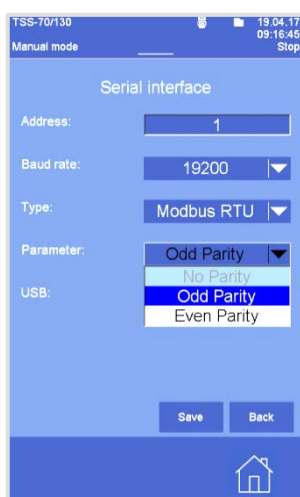


Remark

The chamber address selected should start with 1, with the numbers chosen rising to a maximum of 32.

As regards the baud rate and parameter, ensure that the communicating devices (PCs and devices) each have the same settings.

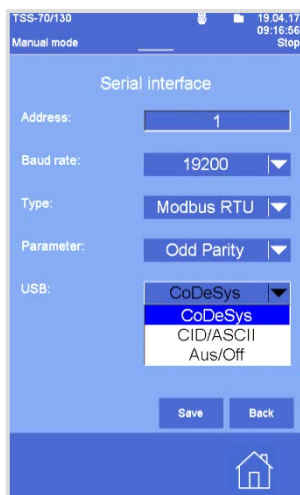
There is no need to choose between CID and ASCII. The right internal protocol is recognized and set automatically.



Parameter

Here, the possible interface parameters are displayed or selected.

- Odd Parity (CID standard).
- Even Parity
- No Parity



USB

If a USB interface (optional) is installed, the communication type can be selected.

- CoDeSys: Type of communication for customer service
- CID/ASCII: Connection with CID software, customer-provided control via commands of the ASCII protocol
- Off: Deactivate USB connection



Remark

If there is a USB connection to the customer-provided PC a virtual COM port is supplied using the corresponding driver.

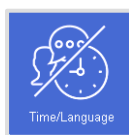
Save

When the **Save** key is hit the new settings of the serial interface are taken over.

Back

The **Serial interface** menu is closed without saving the settings made.

4.11.4. Time / language



In the **Time/Language** menu time, the date and language are set.



Time

Tap on the input field and define the time via the numeric keypad, e.g. 09:17:00.

➔ The new time is immediately applied.

Date

Tap on the input field and define the date via the numeric keypad, e.g. 19.04.17 for April 19, 2017.

➔ The new date is immediately applied.



Language

The language for the menus of the control panel can be selected in the ▼ list.

Language config.

The language for device-specific texts can be selected in the ▼ list.

For the language of the channel names and the error texts, you can choose between English and the standard language.

Save

When the **Save** key is hit, the new language settings are taken over.

Back

The **Time/Language** menu closes without the language setting changes being saved.

4.11.5. USB connection

USB connection on the test cabinet



The device is provided with a USB connection.

The USB connection is located at the hot chamber door, laterally below the door latch.

In special devices, the USB connection is installed individually near the control panel.

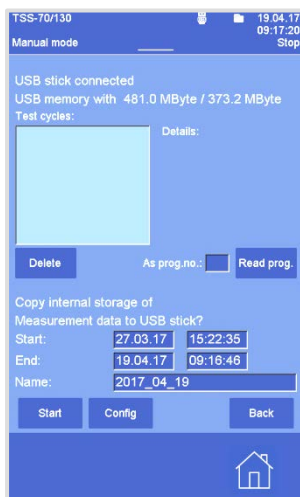
These are the possibilities for using the USB connection:

- Save measuring data from the internal storage of the control panel on a USB stick
- Transmit test programs from the USB stick to the internal storage of the control panel
- Save current measuring data on a USB stick during the test sequence
- Save the current content of the display on a USB stick. See Chapter 3.4.



In the **USB** menu, the use of the USB connection is defined.

Copy measuring data onto a USB stick



In the internal storage of the control panel, all measuring data from the last 7 days are recorded.

These measuring data can be stored on a USB stick, e.g. to use the data in the CID program.

2. Connect USB stick
3. Using the numeric keypad, enter in the **Start:** / **End:** input fields the time period during which the measuring data are to be stored on the USB stick
4. In the **Name:** input field, enter a description for the recording
5. Tap on **Start**
 - ➔ The measuring data are stored on the USB stick.

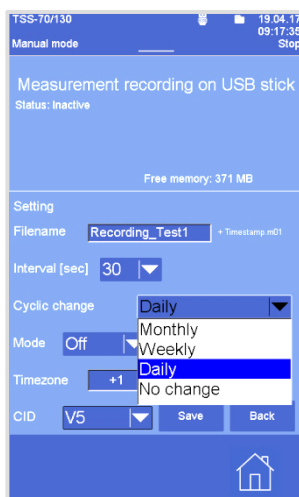
Read in the test programs from a USB stick



Test programs which have been created externally, e.g. on the CID program, can be read into the internal storage of the control panel with the help of a USB connection.

1. Connect USB stick
 - ➔ The **Test cycles** field displays the programs which are stored on the USB stick
2. Tap on the desired program
3. Enter the new program number in the **As prog. no.:** field
4. Tap on **Read prog.**
 - ➔ The program which has been read in is displayed in the **Program selection** menu. (see Chapter 4.5.4 Program).

Store current measuring data on a USB stick

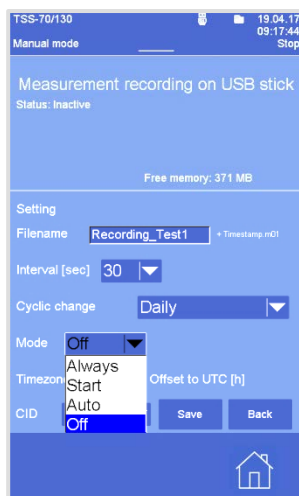


The measuring data can be recorded on a USB stick when the test sequence is running.

1. Connect USB stick
2. Tap the **Config** key in the **USB** menu
3. In the **File name:** input field, enter a description for the recording
4. Select the update time of a recording in the ▼ list beside **Interval:** (default setting 30 sec.).
Selectable update times: 30, 60, 120 or 600 sec.
5. In the **Cyclic change:** field, select from the ▼ list when a new measurement recording is to be started

- Daily:** Every day, a new measurement file is created and the current measurement data are stored in this file
- Weekly:** Every week, a new measurement file is created and the current measurement data are stored in this file
- Monthly:** Every month, a new measurement file is created and the current measurement data are stored in this file
- No change:** A new measurement file is created and the current measurement data are stored in this file only

Mode



6. In the ▼ list beside **Mode**: select when the data are to be saved
 - Always: When a USB stick is connected, the data are recorded
 - Start: When the device starts, the data are recorded
 - Auto: When a test program starts, the data are recorded
 - Off: No measuring data are recorded

Time zone



7. In the **Time zone** field, the current time difference to UTC must be entered. This guarantees that the measurements recorded (e.g. during evaluation in the CID program) always correspond to the current time.

CID version



8. In the ▼ list under **CID**, select the CID version to evaluate the measurement recording. This guarantees that the measurements recorded are optimally displayed during evaluation in the CID program.
9. Tap on **Save**
 - ➡ The settings of the measurement recording are adopted.

Measurement recording on USB stick

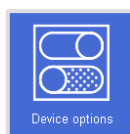


In this field the current settings of the measurement recording are displayed.



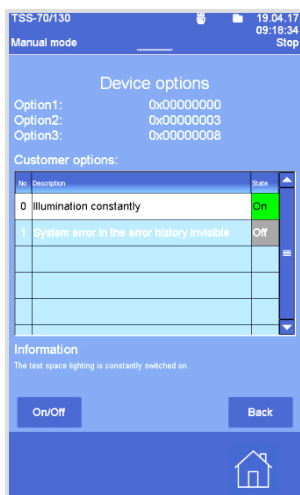
If "Off" is selected in the **Mode** field, no settings are displayed.

4.11.6. Device options



The device options are displayed for service purposes.
The customer options can be activated or deactivated.

Customer options on / off



1. Select the desired customer option in the line
2. Tap on **On/Off**

In the **State** column is displayed which options are activated or deactivated.

Illumination constantly On

The test space lighting is constantly switched on

Illumination constantly Off

The test space lighting is switched on with the help of the function key on the control panel and is automatically deactivated after 10 mins.

System error in the error history invisible On

In the **Error history** menu the system errors are not displayed.

System error in the error history invisible Off

In the **Error history** menu the system errors are displayed.

Do not stop at "Preparation cooling" On

The program continues to run during the program mode, although the operating message "Preparation cooling" is displayed

Do not stop at "Preparation cooling" Off

The program stops during the program mode when the operating message "Preparation cooling" is displayed on the control panel

Save operating messages in error history On

The operating messages are displayed on the control panel and documented in the **Error history** menu.

Save operating messages in error history Off

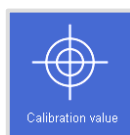
The operating messages are only displayed on the control panel and are not documented.



Remark

The number and type of the customer options depend on the device configuration.

4.11.7. Calibration value



In the **Calibration value** menu, the channel's deviations from the actual values determined during calibration, can be entered.



Remark

The **Calibration value** menu serves to inform the operator. Deviations can only be entered by the CTS customer service or optionally in the **Calibration value customer** menu.

Offset

Channel	Act. value	Offset	Modus	Status
TempCold	100.0°C	20.00	1	Ein
TempCold	-20.0°C	-10.00	1	Ein

In the **Offset** column, the determined offset value by which the actual value is corrected is entered.

An offset value can be entered for each analogue channel.

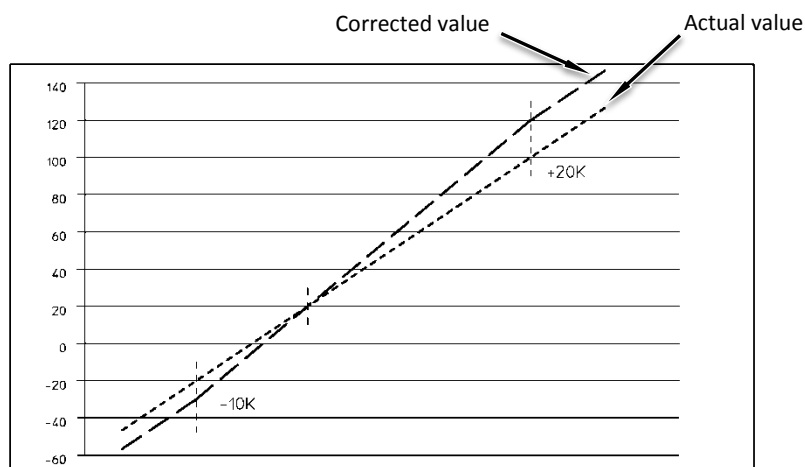
The **Status** column displays whether the offset value is currently taken into consideration.

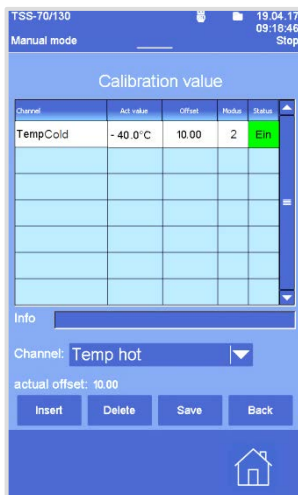
Off: Line inactive

On: The channel's actual value is corrected by means of the entries

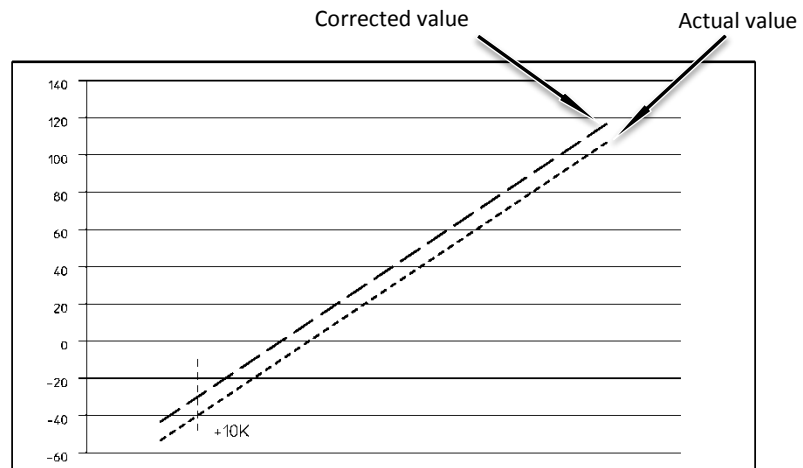
The **Modus** column distinguishes between:

- Modus 1 interpolated
Linear interpolation between two calibration values
The channel is corrected depending on the actual value.
Between the defined grid points, the values are constructed using linear interpolation.





- 2: Modus 2 fixed
One calibration value per channel is sufficient
The channel is corrected over the total range by the offset value entered.



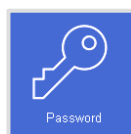
Offset



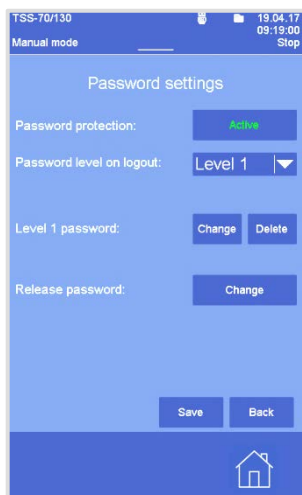
In the **Info** field, further information is stored regarding the offset values.

The current offset of the selected channel is always displayed.
The current offset displays the value by which the actual value of the channel selected is corrected.

4.11.8. Password settings



Password settings



In the **Password settings** menu, all changes regarding password protection are made.

Password protection

The password protection system is activated / deactivated when the key is hit.

The current settings are displayed in the status line with the following icons:



Password protection system active, as regards access rights see **Release password**, Chapter 5

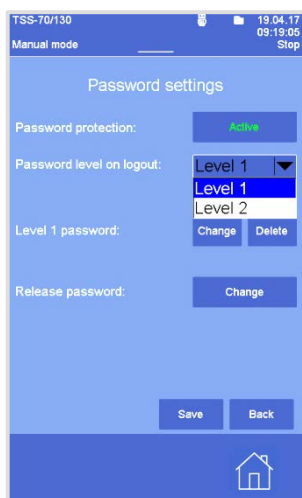


Password protection system active, as regards access rights see **Level 1**, Chapter 5



Password protection system active, as regards access rights see **Level 2**, Chapter 5

Level on lock

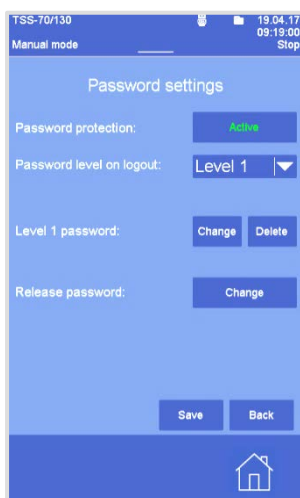


Level 1 or **Level 2** can be selected.

Depending from the level selected, only this level is active at lock and the corresponding access rights are possible.
(See Access rights chart, Chapter 5).

To activate the lock, tap on the  symbol in the extended status bar.

Change / delete password level 1



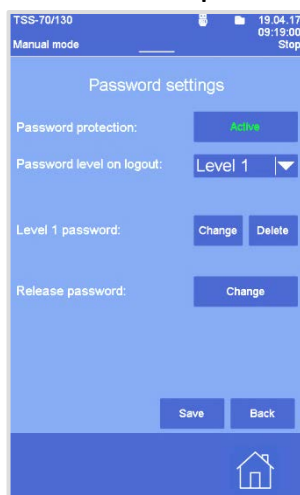
Change password for *Level 1*:

1. In the **Level 1 Password** line, tap on the **Change** key
2. Enter the current password for Level 1
3. Enter a new password for Level 1

Delete password for *Level 1*:

1. Tap on the **Level 1 password Delete** key
 - ➔ The former password is deleted and reset to the password for Level 1 (as supplied).

Change release password



Change release password:

1. Tap in the **Release password** line on the **Change** key
2. Enter the current release password
3. Enter the new release password
4. Enter the new release password again



Remark

The release password and that for level 1 must be stored safely.
If the release password is lost the CTS service must be contacted.

4.11.9. Analog values



A list of all analog channels which were created in the control configuration.

TSS-70/130 Manual mode 19.04.17 09:19:15 Stop

Display Analog Values

No.	Name	Set	Act
1	Temp hot	50.00°C	51.60°C
3	Temp cold	-50.00°C	51.60°C
2	Temp cage	-50.00°C	51.60°C
4	DiffTempHo	10.00K	0.00K
5	DiffTempCo	-10.00K	0.00K
6	HotChOut	50.00°C	54.60°C
7	HotChIn	50.00°C	51.60°C
8	ColdChOut	-50.00°C	54.60°C
9	ColdChIn	-50.00°C	51.60°C

Input range min: 0.00°C
Input range max: 220.00°C
Limit min: 10.00°C
Limit max: 200.00°C

Back

The analog channels are entered with their name, set value, actual value and unit.

All values on the list are constantly updated.

If a line on the list is selected, the input areas belonging to it and the error limits are displayed below the list.

4.11.10. Analog input channels



A list of all analog input channels which were created in the control configuration.

TSS-70/130 Manual mode 19.04.17 09:19:24 Stop

Display analog inputs

Name	Channel	Value	Type
TempHotChOutg	E0.0	125.00	Ohm
TempHotChInlet	E0.1	120.00	Ohm
TempColdChOutg	E0.2	125.00	Ohm
TempColdChInlet	E0.3	120.00	Ohm
Temp cage	E0.4	120.00	Ohm
PCand.cool	E1.0	2.00	V
back pr. C	E1.1	2.00	V
Press.gC	E1.2	120.00	Ohm
fluid.vapC	E1.3	120.00	Ohm

Count: 5747717
Amplification: 0.43234494
Offset: 3.27929688
Sensor type: 11

Back

The analog input channels are indicated with their name, channel number, standard value and type.

All values on the list are constantly updated.

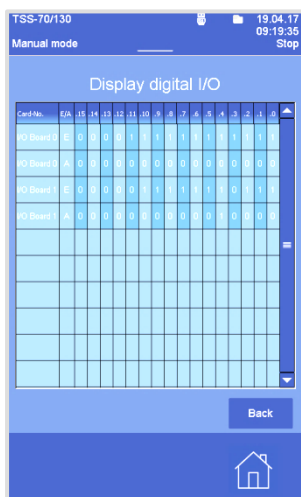
If a line on the list is selected, the information belonging to it is displayed below the list:

- Count
- Amplification
- Offset
- Sensor type

4.11.11. Digital I/O



A list of all input /output cards which were created in the control configuration and with which communication takes place.

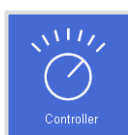


Per card one line each are displayed for the inputs and outputs with card type, number and digital status.

In case of I/O option cards this monitoring is not possible, in which case all configured cards are displayed.

All values on the list are constantly updated.

4.11.12. Controller channels



A list of all controller channels which were created in the control configuration.



The controller channels are indicated with their name, release, set value and controller output.

All values on the list are constantly updated.

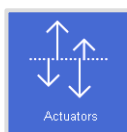
If a line on the list is selected, the information belonging to it is displayed below the list:

- Actual value
- P-component
- I-component
- D-component

The controller output is scaled to ± 10 corresponding to $\pm 100\%$.

Only control devices with Enable=1 are active.

4.11.13. Actuator channels



A list of all actuators which were created in the control configuration.

Name	Actuating var.	PulsUp	PulsDown
Temp hot	0.0	0	0
Temp condS11	0.0	0	0
Pis Cooling	0.0	0	0
Inject. PC	0.0	0	0
Inject. C	0.0	0	0

The actuators are indicated with their name, correcting variable, PulsUp (heating) and PulsDown (cooling).
All values on the list are constantly updated.

The correcting variable is scaled to ± 10 corresponding to $\pm 100\%$.

4.11.14. Calibration value customer (option)



The channel's deviations from the actual value can be determined in the **Calibration value customer** menu.

See also Chapter 4.11.7 Calibration values.

Channel	Act. value	Offset	Mode	Status
Temp hot	44.0°C	4.00	1	On
Temp hot	±1.0°C	4.00	1	On

1. Tap on **Insert**
2. In the ▼ list of the **Channel** field, select the channel for which an offset value is to be entered
➡ The selected channel is displayed in the 1st column of the table
3. Tap on the field in the **Mode** column and select the desired mode via the numeric keypad.
 - 1: Mode 1 interpolated
 - 2: Mode 2 fixed

For the description of modes 1 and 2 see Chapter 4.11.7.

4. If mode 1 is desired, enter the actual value in the **Act. value** column.



Remark

If mode 2 is desired, no actual value must be entered in the **actual value** column.

5. Tap on the field in the **Offset** column and use the numeric keypad to enter the defined offset value by which the actual value is to be corrected.

Channel	Act. value	Offset	Mode	Status
Temp hot	44.0°C	4.00	1	On

Info: Temp hot

Insert Delete Save Back



Remark

At least two lines with actual value and offset must be created in mode 1.
In mode 2, only one line with offset must be created.

6. Tap on the field in the **Status** column and switch the offset function on or off
7. Tap on **Info** and enter a text to explain the offset

Channel	Act. value	Offset	Mode	Status
Temp hot	44.0°C	4.00	1	On
Temp hot	41.0°C	4.00	1	On

Code: 0303

Back

8. Tap on **Save**
9. Enter the code via the numeric keypad. Standard setting: **0303**.



Remark

The code corresponds to the determined release password. See Chapter 4.11.8 Password.

An offset value can be entered for all analogue channels in the **Channel** field of the list.



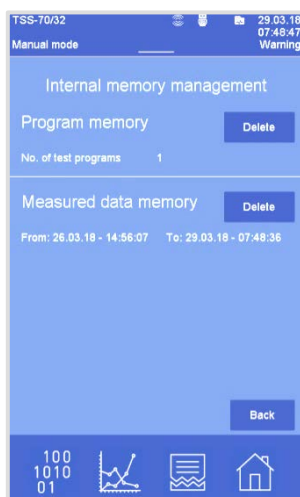
Remark

Each line entered must be saved individually.

4.11.15. Internal memory management

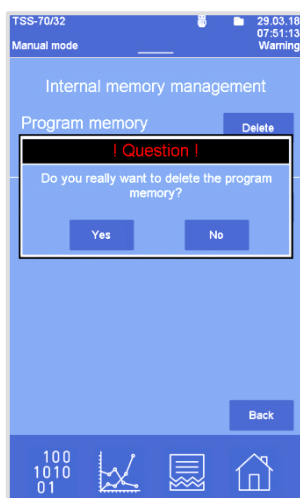


In the **Internal memory management** menu the program memory and measured data memory can be deleted.



All programs which have been created, and are currently displayed in the **Program selection** menu, are deleted. See Chapter 4.5.4.

All measurement data which have been recorded, and are displayed in the **Trend graph** menu, are deleted. See Chapter 4.4.



1. Tap on **Delete**
2. Tap on **Yes** to confirm the query
 - ➡ The program memory or the measured data memory are deleted.

4.13. Channel scaling (option)



All channels (except PT100 inputs) are scalable. In the **Channel scaling** menu, the names, units and limits of the measuring ranges can be defined. The settings depend on the device configuration



To do so, tap on the desired channel in the corresponding column. The settings can be defined via the numeric keypad or the keyboard. If you tap on **Enter**, the settings are saved.

- Name: name of the channel
- from: lower full scale value
- to: upper full scale value
- Unit: determine the unit

When you tap on **Back** the main menu is displayed.


















































































If the **Default** key is hit, the preset values are restored for all channels.





The defined settings are displayed in the analog channels.

5. Access rights

The password protection system is provided with three levels. Access rights are assigned to every level. Thus, every operator can be assigned access rights, depending on their job. See Chapter 4.11.8 Password settings.

Access rights	Level with release password	Level 1	Level 2
Display in the status line			
Set digital channels			
Change analog channels			
Edit program			
Start/stop program	 	 	 
Start/stop manual mode	 	 	 
Start/stop pause	 	 	 
Program advance			
Defined program start time			
Create program			
Copy program			
Delete program			
Display/confirm error	 	 	 
Display/change error limits	 	 	 
Display error history			
Display counter			
Display time meter			
Display/change tolerance bands	 	 	 
Display/change system settings	 	 	 
Display power failures			

 Full access rights

 No access rights

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