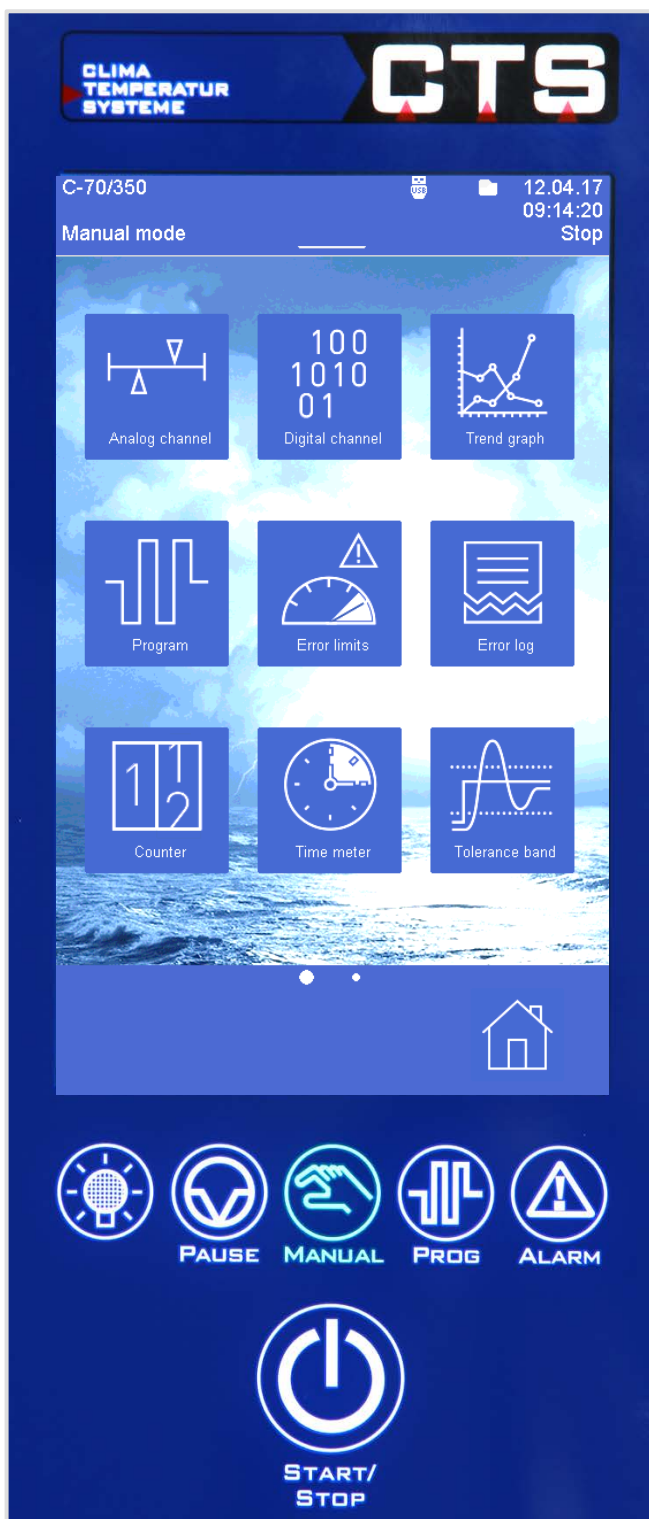


Operating instructions for CTS touch screen control panel

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 4.10.1)

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

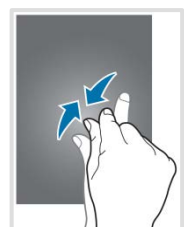
Swipe



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

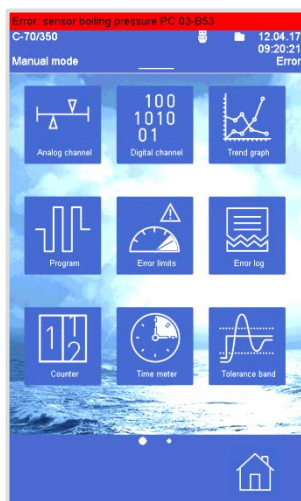


To enlarge the image, place two fingers on the display and move apart. Example: the **Trend graph** menu.

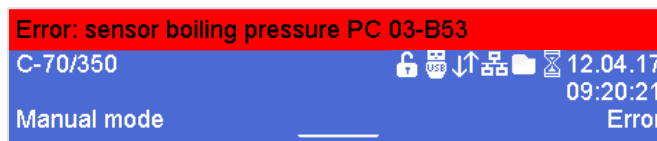
3. Control panel surface



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).

C-70/350

The device type.

Manualmode

The device is in manual or program mode.

**12.04.17
09:20:21**

Current date and time (see Chapter 4.10.4).

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 4.10.2).



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 4.10.8)

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: C70350_6_G3
ITC version: V3.16 - PLC version: 3
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 4.10.8.

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 4.10.5. This symbol is only displayed if the USB stick is connected.



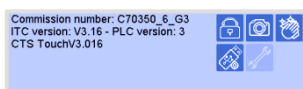
For service purposes only.

3.3. Display clean



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

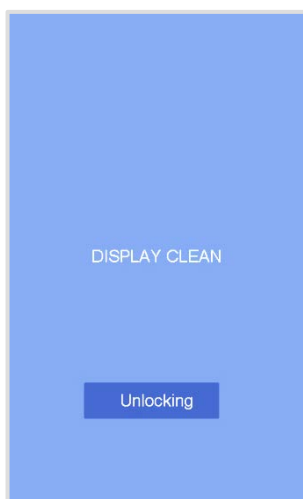
Menu Display clean



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

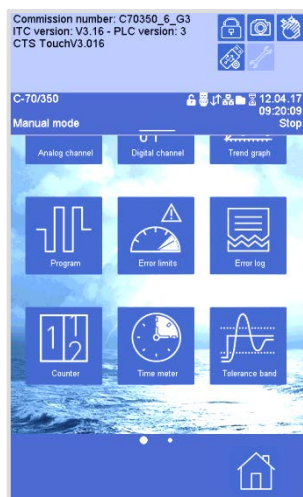
Pay attention that no fluids enter the housing.


3.4. Create a screenshot



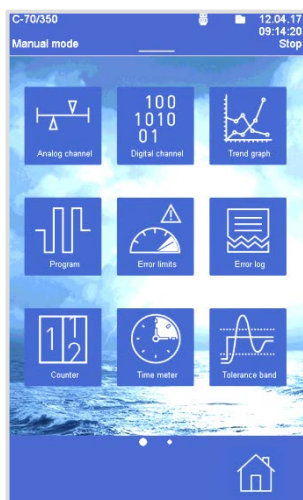
The current content of the display can be stored on a USB stick.

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 4.10.1.



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

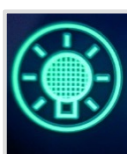
The function keys are allocated to predetermined functions. These keys can be pressed whatever the device state or mode.

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

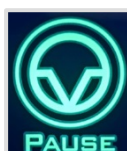
The test space lighting is activated, i.e. the test space of the device is illuminated. When this key is hit the illumination is deactivated/switched off. See also Chapter 4.10.6.

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 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

Before the test space door is opened, the **PAUSE** function key must be activated.

This switches off the test space circulation fan, stopping either extremely cold or hot air from blowing in the operator's face.

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
The manual mode is activated. "*Manual mode*" is now also displayed in the status line. When the **MANUAL** function key is hit the analog channel menu is displayed.



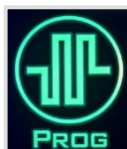
Remark

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

Program mode

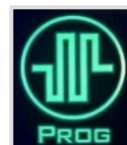


Function key is white
The device is in manual mode. When this key is hit the program changes to the **program selection** menu. In the **program selection** menu a program can be selected or a new program can be created. The **Start/Stop** key launches the selected program.



Function key is green
The program mode is activated. "*Program mode*" is now displayed in the status line. When this key is hit the **program status** menu is displayed. In the **Program status** menu information on the active program is displayed. See also Chapter 4.4.10.

Timer function



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 4.4.9.

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

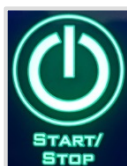
There is at least one error. The device state is now set to Stop. The **error menu** is displayed when the **Alarm** key is hit. See also Chapter 3.7.1.



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

No.	Type	Error text
022	Error	Pt100 suet gas PC 03-B19
045	Error	Pt100 suction vapour PC 03-B18
047	Error	sensor boiling pressure PC 03-B5

Confirm error

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

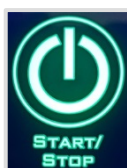
When the **Start / Stop** key is hit, a program or the manual mode starts or stops.

Stop



Function key is white
The device is not running.
'Stop' is displayed in the status line.
All device components are deactivated.

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 19)

Displays and modifies the analog channels in manual mode



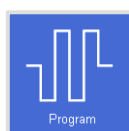
Digital channel (page 21)

Displays and modifies the digital channels



Trend graph (page 22)

Displays trends in the analog channels and configures the trend graph



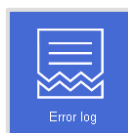
Program (page 26)

Creates, modifies, deletes and copies a program



Error limits (page 48)

Determines the admissible range of an analog channel in manual mode



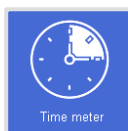
Error log (page 49)

Displays and describes the error or warning messages chronologically



Counter (page 50)

Displays the operation cycles of the magnetic valves



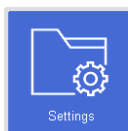
Time meter (page 50)

Indicates the component's operating hours



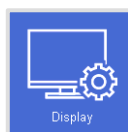
Tolerance band (page 51)

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



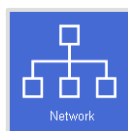
Settings

See submenus



Display (page 54)

Changes the display settings



Network (page 55)

Defines the network parameters



Interfaces (page 59)

Settings for the serial interface (RS232 / 485)



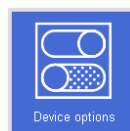
Time / Language (page 62)

Sets the time, date and language



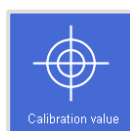
USB (page 63)

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



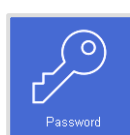
Device options (page 67)

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



Calibration value (page 68)

Display the calibration value settings



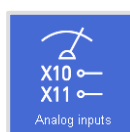
Password (page 70)

Settings for the password protection system



Analog values (page 72)

Displays all analog channels with additional information



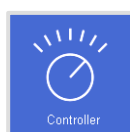
Analog inputs (page 72)

Displays all analog input channels with additional information



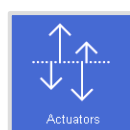
Digital I/O (page 73)

Displays the input / output cards with which communication takes place



Controller (page 73)

Displays all controller channels with additional information



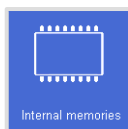
Actuators (page 74)

Displays all actuators with additional information



Calibration value customer (option) (page 74)

Determination of calibration values



Internal memory management (Page 76)

Deleting memory for program and measured data



Power failure (page 77)

Displays the time when the device is switched on or off



Channel scaling (option) (page 78)

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.

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.



Important remark regarding humidity control

- Activate humidity control:
Enter the humidity set value within the device limits
- Deactivate humidity control:
Enter the humidity set value "0"

Display analog channels



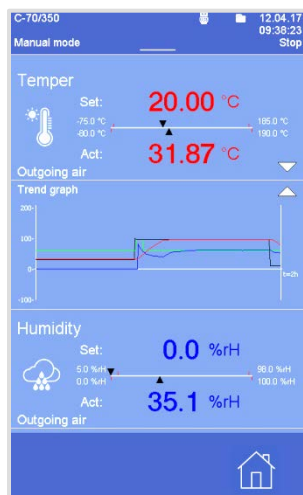
For every analog channel a scale is displayed showing the range of values.

The numbers above the line represent the permitted input area; from 3.0 °C to 95.0 °C in the example.

The numbers below the line represent the current error limits. In the example from 0.0 °C to 100.0 °C. See also Chapter 4.5.

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 4.3).

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 4.3.2).

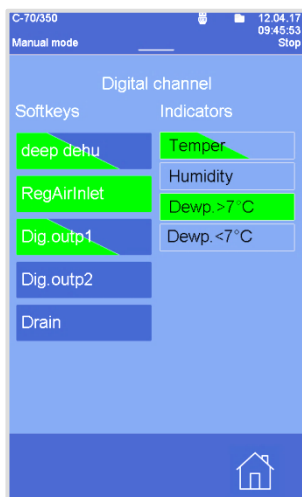
The number of digital channels displayed is limited to 10.

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.

For example, **deep dehumidity** can only be activated if the indicator **Dewp. <7°C** is active.

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, the **Humidity** can only be activated if the temperature is < 95°C.

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

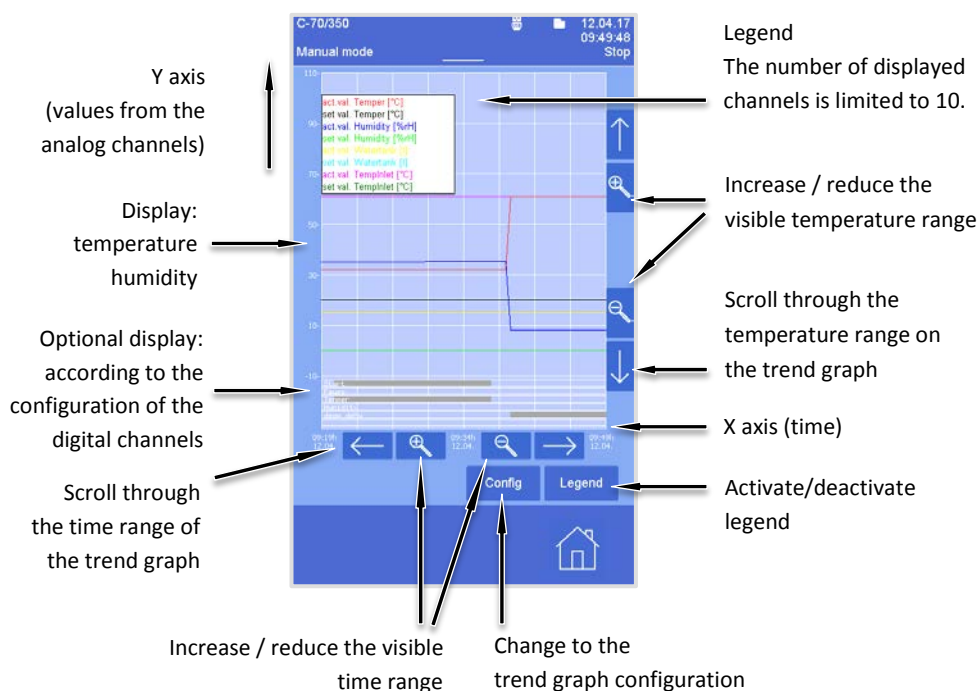
The digital channels can only be changed temporarily in the program mode. When the next line of code is reached in the program, the softkeys are overwritten again with the default settings from the program.

4.3. Trend graph

4.3.1. 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 (°C / % r.h.) can be dropped.



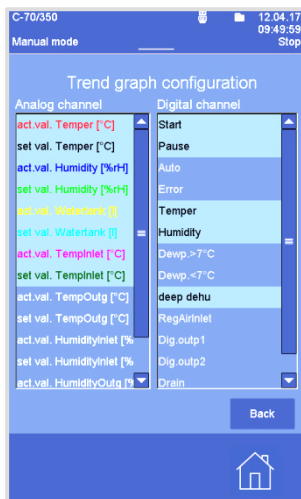
Remark

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

4.3.2. Trend graph configuration

The trend graph's surface can be adapted individually.

Configuring digital channels

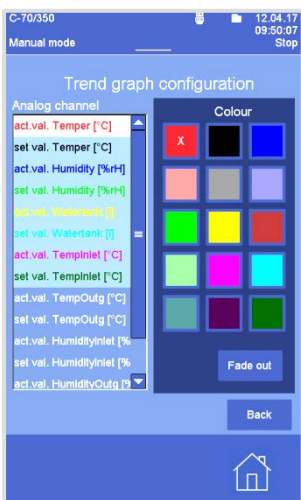


1. Tap in the **Digital channel** column on the channels which are to be displayed in the trend graph

➡ The active channels have a light-blue background.

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

Configuring analog channels



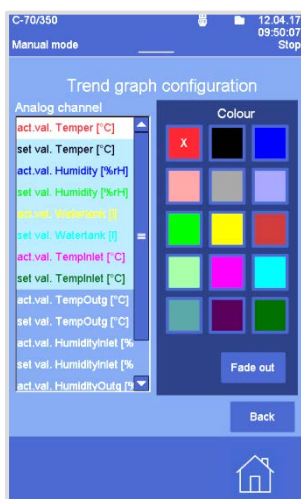
1. Tap in the **Analog channel** column on the curve which is to be displayed in the trend graph

➡ The **Color** 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 **Color** field opens automatically.
2. Tap on the **Fade out** field
 - ➡ The selected curve is no longer displayed in the trend graph.

4.3.3. 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



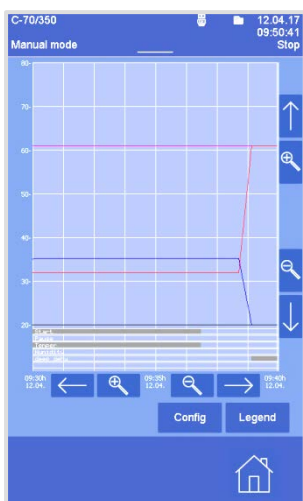
2. With the help of the / keys



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.

4.4. Program mode

4.4.1. Important remarks on program creation

First line of code

A defined start value consisting of the temperature / humidity should always be entered as the first line of code.

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

Non-linear temperature / humidity change

If a linear temperature / humidity change is not necessary it is a good idea to program it as a jump (i.e. temperature / humidity change at time $t = 0$).

When a jump is programmed, the temperature and/or humidity is changed at maximum speed.

However, because the change cannot take place at any unlimited speed, the 'wait' function should be used in this case. It ensures that a requested temperature / humidity level is maintained.

Linear temperature / humidity change

Check whether the maximum speed of the temperature change is exceeded during programming (see "Technical performance data").

If the temperature and humidity are programmed simultaneously with a linear change, only a smaller rate of change can be reached. Check whether a simultaneous linear change of both parameters is necessary.

If you want to regulate the temperature / humidity close to their limits, the test program cannot be run in exactly the idealized, programmed way.

The closer two temperature / humidity values are to these limits, the slower the actual course approximates the set course of the curve.

Here again the 'wait' function ensures that the level to be reached is maintained.

Humidity control

The humidity can only be controlled within a determined temperature range (see "Technical performance data"). If this determined temperature range is exceeded during programming, humidity is only regulated until this temperature limit is reached. When changing from a temperature at which climate control is not possible to another within the climate range, the humidity is controlled from the time the temperature enters the climate range.



Remark

If the set or the actual value of the temperature exceeds or falls below the temperature range for climate operation, the humidity control is deactivated. Any predefined humidity set value is ignored. However, the actual value for humidity is uncontrolled, because relative humidity exists at any temperature.

4.4.2. Test program components (program cycle)

Test program

The test program consists of any number (1-200) of successive lines of code. With the help of the CTS touch screen control panel, test programs can be created and up to 99 different programs saved. The program defines the exact flow of the test cycle. The development of a test program is described in Chapter 4.4 .

Temperature/ humidity couple

A temperature/ humidity couple consists of a set value for the temperature and a set value for the relative humidity (relative humidity for C devices only).

These values form the “corner points” of the test program.

Line of code

One such line comprises a temperature / humidity couple, 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 / humidity couple with the corresponding runtime.

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

Runtime

This determines how long a temperature / humidity couple remains constant or the time in which another temperature / humidity couple is to be reached.

Loop

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

Additional functions

The device is provided with various additional functions depending on the device type and the customer's desires.

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 multiple lines of code, it must be re-entered in every line.

4.4.3. Program structure

Program name → Edit: Versuch_1 *

Line overview

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

Scroll bar → scroll through the program

Line

- Insert
- Delete

Graph → display graph, see page 41 Graph

Limits → Edit error limits, see page 42 Limits

Back → go to the Program selection menu

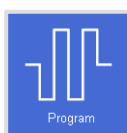
Save → save modified program

Line	Type	Time(sec)	Temp(°C)	Humidity(%)	Temp def.	Humid def.
1		0	20.0	0.0	0	0
2		20	60.0	0.0	0	0
3		5	LS			
4		10	20.0	50.0	1	0
5		30	50.0	70.0	1	0
6		10	45.0	50.0	1	0
7		0	45.0	50.0	1	0
8		0	45.0	50.0	1	0
9		0	45.0	50.0	1	0
10		0	45.0	50.0	1	0
11		0	45.0	50.0	1	0
12		60	10.0	0.0	1	0

4.4.4. Program



The **Program selection** menu is displayed when the **PROG** function key is tapped.



The **Program selection** menu is displayed when **Program** is tapped on the Home screen.

Program selection menu

Program selection

No.	Lines	Name	Time
01	09	TEST_1	05:45:00
02	04	TEST_6554	01:00:00

Start time: 10:46:13 Start date: 12.04.17

Prog. pre-run: 0 Minutes

Lines-No.: 1 [1..9]

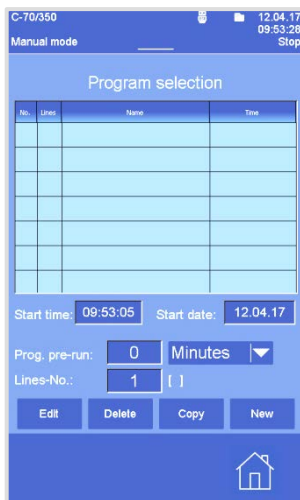
Edit Delete Copy New

A list of the stored programs is displayed.

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

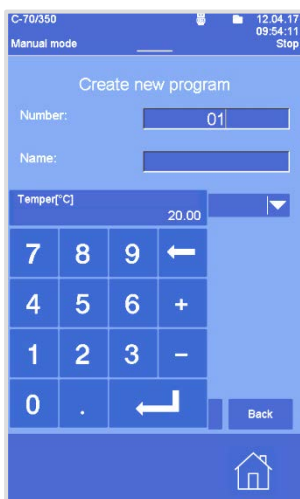
- Program number
- Number of code lines
- Program name
- Program runtime
- Start time / Start date
- Program pre-run
- Other functions

4.4.5. Create a program

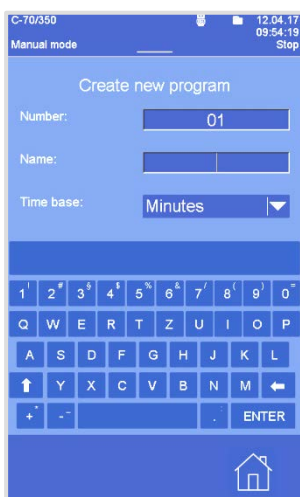


1. Tap on **New**

Create new program

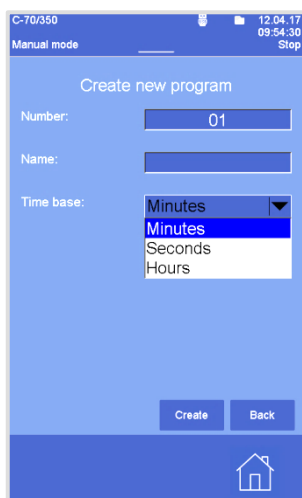


2. Tap on the first input field
3. The program number is entered via the numeric keypad (1-99 possible)
4. Confirm the input by hitting the **Enter** key
5. Tap on the second input field



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 (min)	Temp (°C)	Humidity (hPa)	Step	Step	Step	Step
1		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.

4.4.6. Copy program

Copy program



No.	Line	Name	Time
01	04	TEST_1	01:00:00

Start time: 09:56:15 Start date: 12.04.17

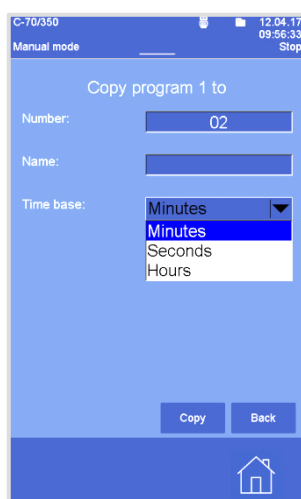
Prog. pre-run: 0 Minutes

Lines-No.: 1 [1..4]

Edit Delete Copy New

An existing program can be copied.

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



Copy program 1 to

Number: 02

Name:

Time base: Minutes

Minutes
Seconds
Hours

Copy Back

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

3. Enter the new program number in **Number** in the input field using the numeric keypad.
4. Enter the new program name in **Name** in the input field using the keyboard.
5. 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.

4.4.7. 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



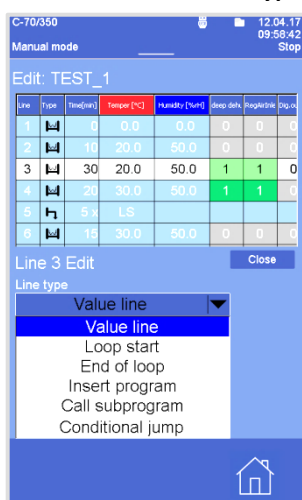
➔ When the **Edit** field is tapped, the **Edit** window is displayed.

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



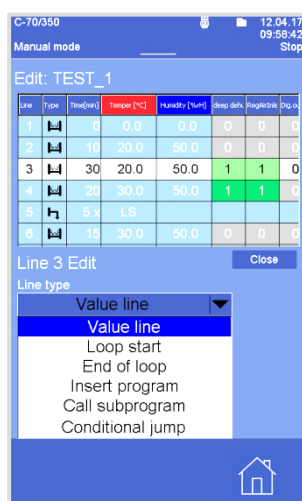
The following line types can be selected:

- 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 4.4.5) 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 or humidity for the line, tap on the **Temper** or **Humidity** column
 4. Then, enter the set value via the numeric keypad
 5. Tap on **Save**
 - ➔ The edited program is saved.

**Change
digital channels**

[illegible]

The digital channels have a grey background and can be activated / deactivated directly in the line of code. (Here deep dehumidity, supply air regulation and digital output).

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).

Add
Wait function

C-70/350 12.04.17
09:59:00
Stop

Manual mode

Edit: TEST_1 *

Line	Type	Time[day]	Temper [°C]	Humidity [%m]	deep def.	FreezeStk	Exp.
1		0	0.0	0.0	0	0	0
2		10	20.0	50.0	0	0	0
3		30	20.0	50.0	1	1	0
4		20	30.0	50.0	1	1	0
5		5x	LS				
6		15	30.0	50.0	0	0	0

Line 3 Edit Close

Line type Value line ▼


Analog channel ▼

Temper [°C]

Wait

1.00 On

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

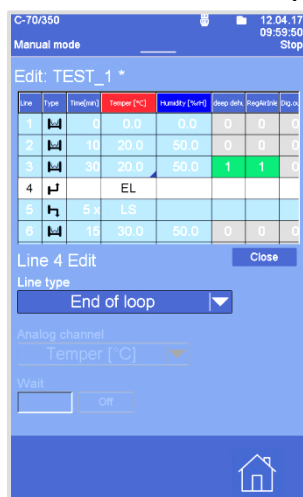
Save program



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

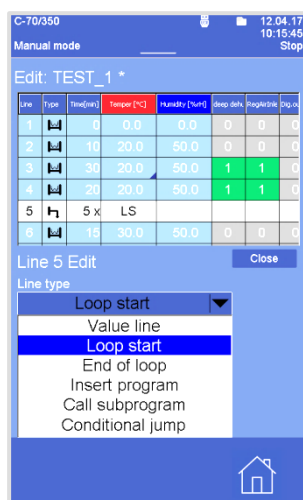
All lines of code, which stand between "**Loop start**" and "**End of loop**", are repeated. The number of runs is defined by the predefinition made in the **Time** column of a "**Loop start**" line.



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



In this example a loop was programmed which involves the program part (lines 3 and 4) running three times.

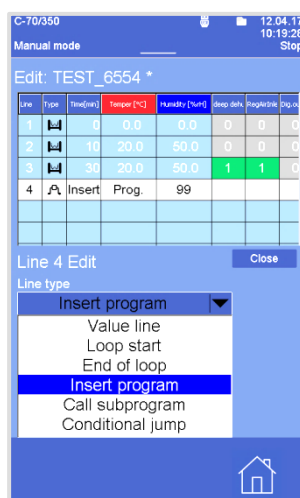
Insert program



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



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



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

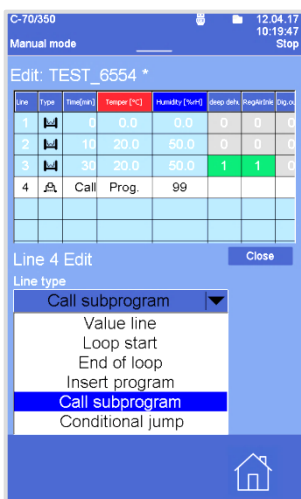
1. Tap on the **99** field and enter the number of the program which is to be inserted via the numeric keypad
2. Complete the process by hitting **Save**



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

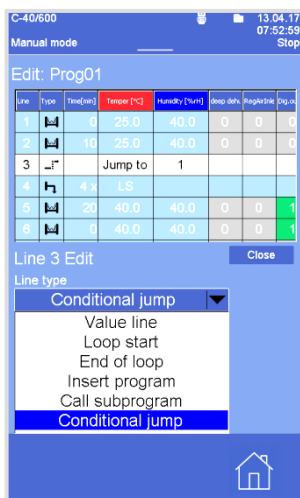
1. Tap on the **99** field and enter the number of the subprogram via the numeric keypad
2. Complete the process by hitting **Save**



Remark

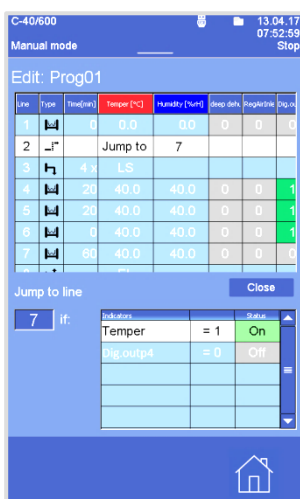
The inserted subprogram must be in the **Program selection** menu.

Conditional jump



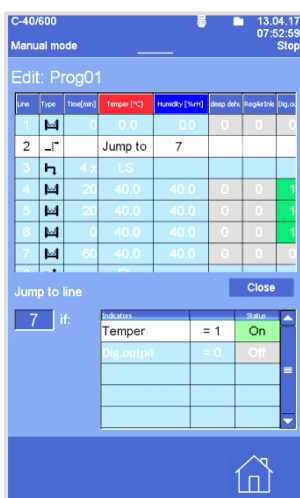
When the program is running, it is possible to jump to any line of code when the predefined conditions are met.

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.output4 = 0 (inactive)** is not taken into account, because the status is inactive.

Graph

No.	Lines	Name	Time
01	09	TEST_1	05:45:00
02	04	TEST_6554	01:00:00

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

Line	Type	Time	Temp	Humidity	Step	Step left	Step right	Step
1		0	0.0	0.0	0	0	0	0
2		10	20.0	50.0	0	0	0	0
3		30	20.0	50.0	1	1	0	0
4		20	30.0	50.0	1	1	0	0
5		5 x	LS					
6		15	30.0	50.0	0	0	0	0
7		30	60.0	50.0	0	0	0	0
8			EL					
9		60	30.0	50.0	1	1	0	0

➔ 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



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



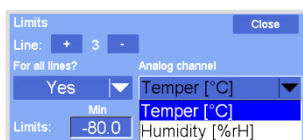
➡ When the **Edit** field is hit, the selected program is displayed.

3. Tap on the **Limits** field



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

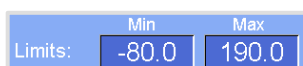
Limits



The Limits dialog box contains the following fields: 'Line' with a '+' button, the number '3', and a '-' button; a 'Close' button; 'For all lines?' with a 'Yes' button and a dropdown arrow; 'Analog channel' with a dropdown menu showing 'Temper [°C]'; and 'Limits' with 'Min' and 'Max' fields. The 'Min' field contains '-80.0' and the 'Max' field contains '190.0'.

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



The Limits dialog box shows the 'Min' field with '-80.0' and the 'Max' field with '190.0'.

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



Remark

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

Tolerances



The Tolerance selection menu shows a list of options: 'Inactive', 'Always' (highlighted in blue), '1st band', '2nd band', and 'Always' with a dropdown 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 4.9.



The Tolerance dialog box shows the 'Tolerance' dropdown set to 'Always' and the 'Value' field set to '5.0 °C'.

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



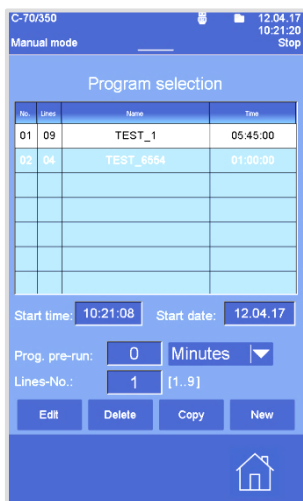
Remark

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**

4.4.8. Delete program

Delete program



No.	Lines	Name	Time
01	09	TEST_1	05:45:00
02	04	TEST_6554	01:00:00

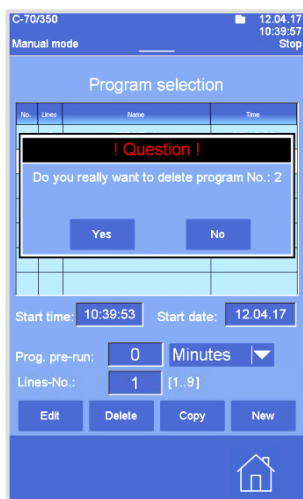
Start time: 10:21:08 Start date: 12.04.17

Prog. pre-run: 0 Minutes

Lines-No.: 1 [1..9]

Edit Delete Copy New

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



! Question !

Do you really want to delete program No.: 2

Yes No

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

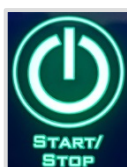
4.4.9. Start program

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)

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 status at timer function

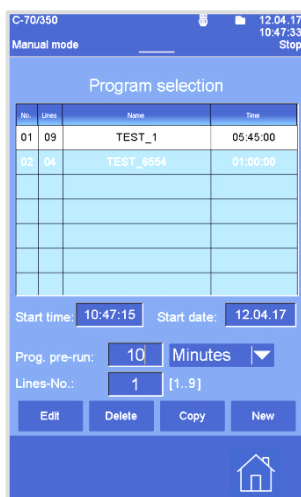


If a start time is defined, the program status displays when the program starts.



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.

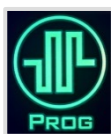


Remark

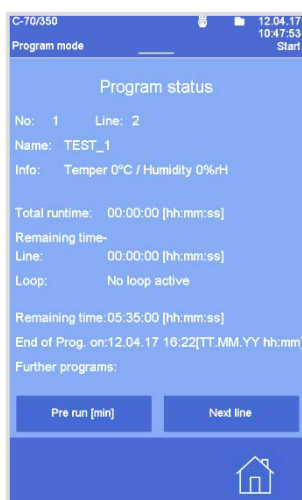
The time which has been entered in the **Prog. pre-run** input field is skipped when the program starts.

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

4.4.10. Program status



The program status displays all information on the current program.

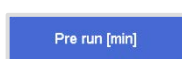


The program status can be displayed:

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

Information in the program status:

- 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)



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.



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

4.5. Error limits



Edit error limits

C-70/350

Manual mode

12.04.17
10:53:00
Stop

Error limits

No.	Name		Min	Max
00	Temper	Manual:	-80.0 °C	190.0 °C
		Actual:	-80.0 °C	190.0 °C
01	Humidity	Manual:	0.0 %rH	100.0 %rH
		Actual:	0.0 %rH	100.0 %rH



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 limit** 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	Temper	Manual: -20.0 °C	140.0 °C
		Actual: -20.0 °C	140.0 °C
01	Humidity	Manual: 20.0 %rH	70.0 %rH
		Actual: 20.0 %rH	70.0 %rH

In the **error limit** menu, min. -20 °C / max. 140 °C and 20 % r.h. / 70 % r.h. were defined.

Temper	
Set:	50.00 °C
75.0 °C	195.0 °C
20.0 °C	140.0 °C
Act:	60.88 °C
Ingoing air	
Humidity	
Set:	50.0 %rH
5.0 %rH	95.0 %rH
20.0 %rH	70.0 %rH
Act:	8.0 %rH
Ingoing air	

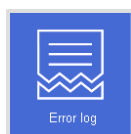
In the analog channels, the error limits are displayed below the number line. The excluded range is marked by a red bar on the number line.



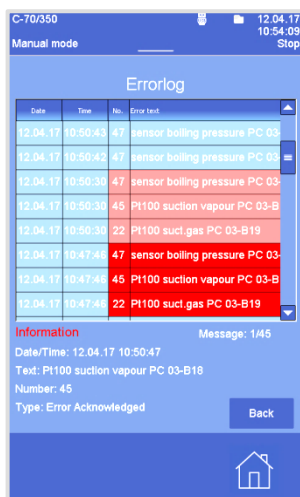
Remark

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

4.6. Error history



Display 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).

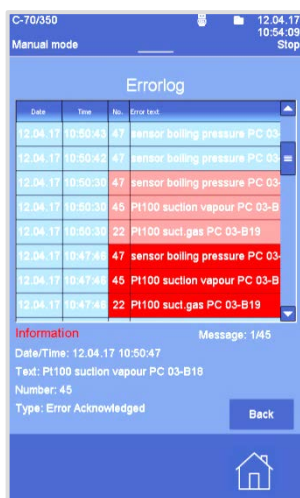
With the help of the lateral scroll bar, the error history can be scrolled through. When you tap on a message, the following details concerning the selected message are displayed below the error history:

- **Date / Time:** Moment the error appeared
- **Description:** 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 4.10.6 Customer options.

4.7. Counter



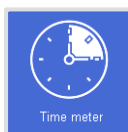
In the **Counter** menu the operation cycles of the magnetic valves are displayed.



Remark

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

4.8. Time meter



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



Remark

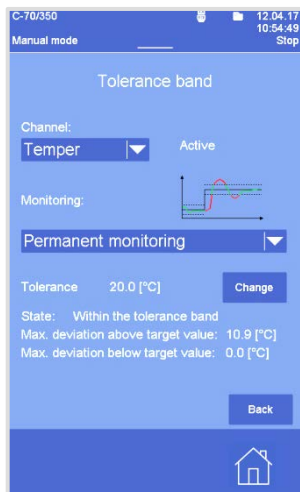
The **Time meter** menu serves to inform the operator. Limits can only be entered by the CTS customer service.

4.9. 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.

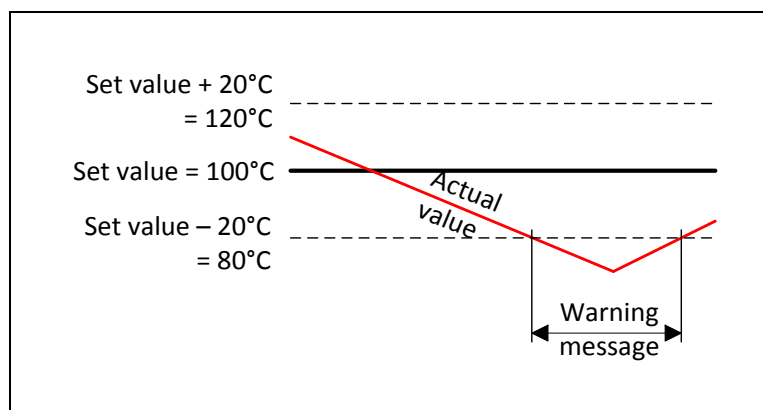
Tolerance band monitoring Program mode



During program mode, the permitted deviations are displayed in the **Tolerance band** menu, but they cannot be changed here. See page 42 "Limits".



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

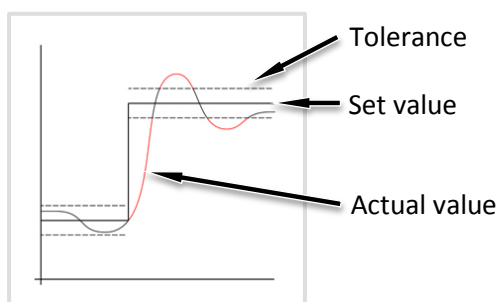


The following settings are available for tolerance band monitoring:

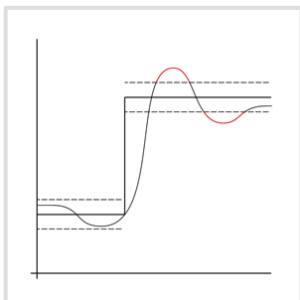
- Monitoring OFF
- Permanent monitoring
- 1st entry into the tolerance band
- 2nd entry into the tolerance band

Permanent monitoring

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

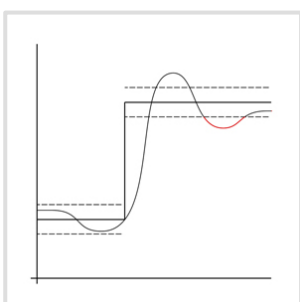


1st entry into the tolerance band



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



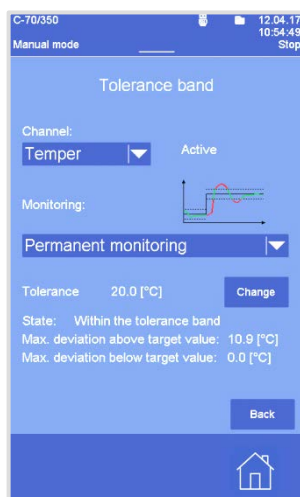
A warning message is only displayed if the actual value is outside tolerance range after the 2nd entry into the tolerance band.



Remark

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

State



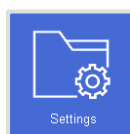
Depending on the monitoring type or the tolerance value selected, the current deviations are displayed.

State:

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

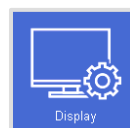
The maximum deviation shows the current maximum deviation between the set value and the actual value.

4.10. Settings



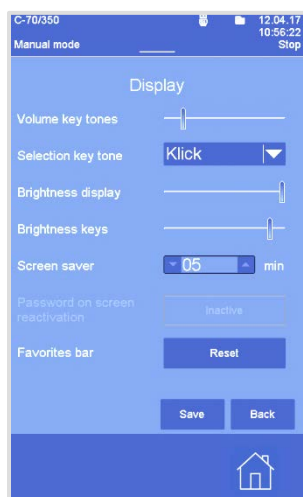
The system data submenus display system information and allow system settings to be altered.

4.10.1. Display



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

Display settings



Various display settings can be altered.

Volume

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 4.10.8).

This setting is only possible when the password protection system is active. (See Chapter 4.10.8).

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.

4.10.2. Network



Network parameters



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

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<->52199	192.168.1.120	Full

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

Network filter

Filtered MAC-address	Access privileges	Access privileges
00-0A-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: 00-0A-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.

Network filter

Filtered MAC-address	Access privileges	Access privileges
00-0A-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: 00-0A-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

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.

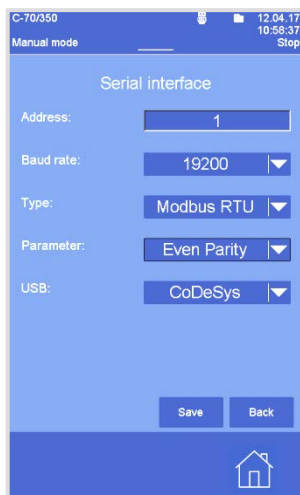
(See picture above "Filtering active").

4.10.3. 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).

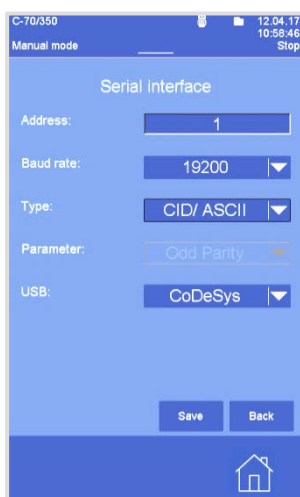
The standard value of the chamber address is 1. It is freely selectable at any time.

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.

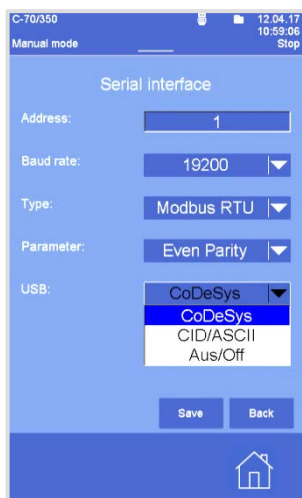
There is no need to choose between CID and ASCII. The right internal protocol is recognized and set automatically.



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.

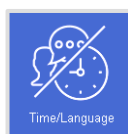
Save

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.

4.10.4. 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. 10:59:16.

➔ The new time is immediately applied.

Date

Tap on the input field and define the date via the numeric keypad, e.g. 12.04.17 for April 12, 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.

4.10.5. USB connection

USB connection on the test cabinet



The device is provided with a USB connection.

The USB connection is located at the test space 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.

1. Connect USB stick
2. 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
3. In the **Name:** input field, enter a description for the recording
4. Tap on **Start**
 - ➔ The measuring data are stored on the USB stick.

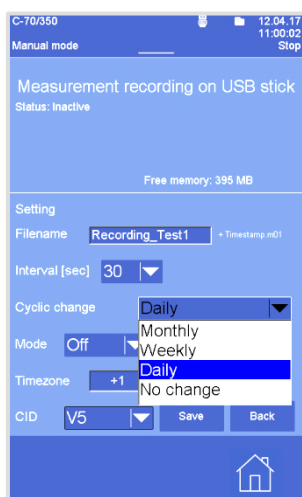
Read in the test programs from a USB stick



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 4.4.4 Program).

Store current measuring data on a USB stick

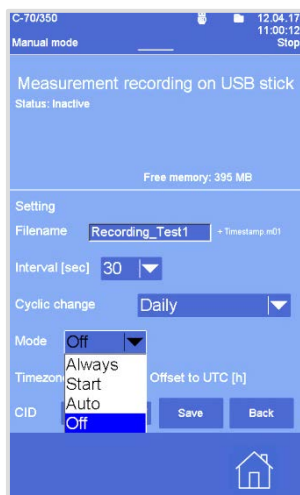


The measuring data can be recorded on a USB stick when the test sequence is running.

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

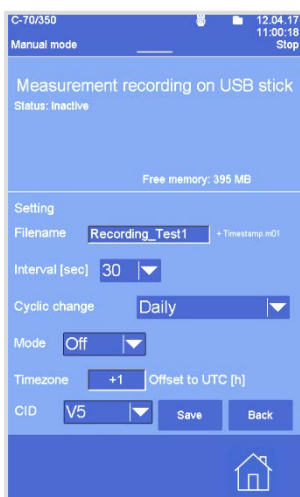
Always: When a USB stick is connected, the data are recorded

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

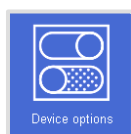


In this field the current settings of the measurement recording are displayed.



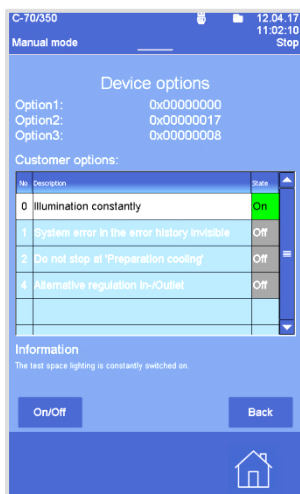
If "Off" is selected in the **Mode** field, no settings are displayed.

4.10.6. 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

Store operating messages in errorlog On

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

Store operating messages in errorlog Off

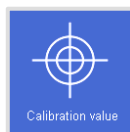
The operating messages are only displayed on the control panel and are not documented.



Remark

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

4.10.7. Calibration value



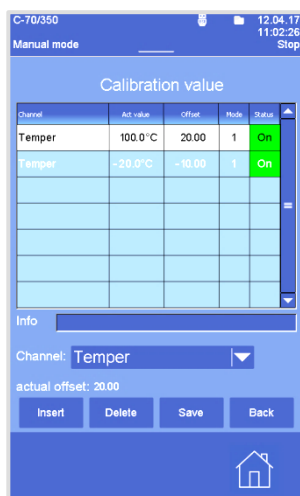
In the **Calibration value** menu, the channel's deviations from the actual values determined during calibration, can be entered.



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



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

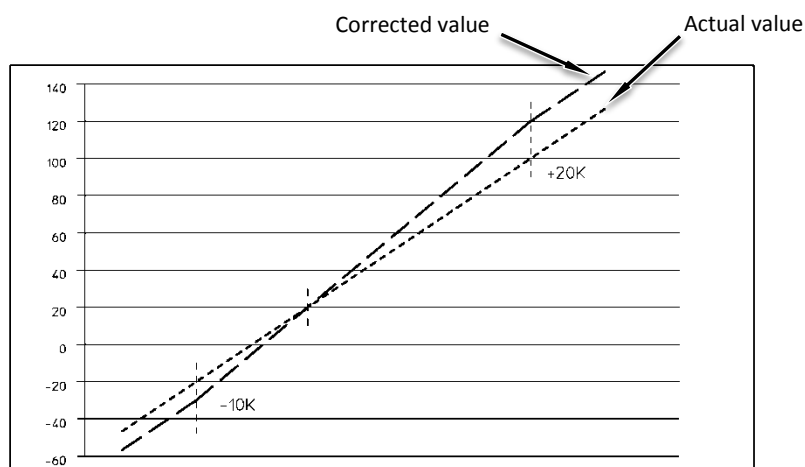
The **Modus** column distinguishes between:

1: 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.

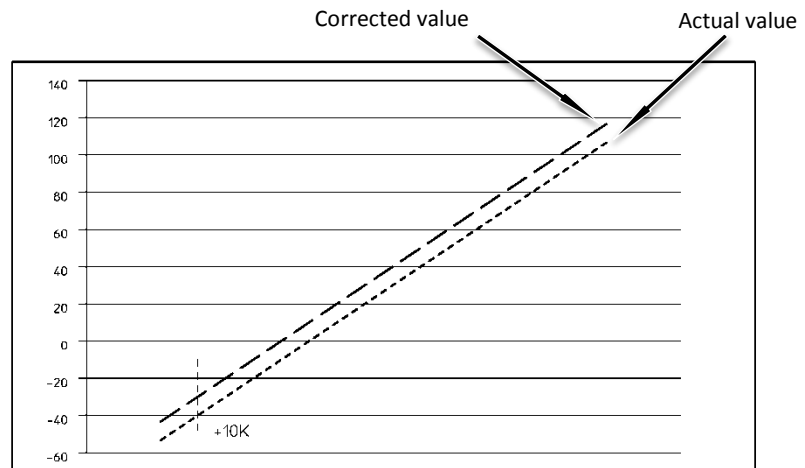




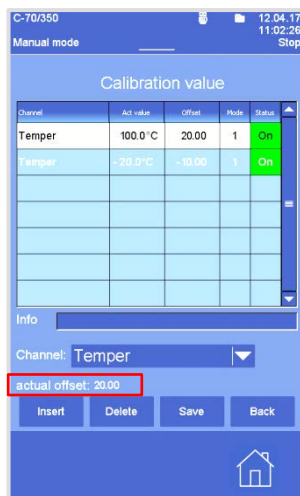
2: Modus 2 fixed

One calibration value per channel is sufficient

The channel is corrected over the total range by the offset value entered.



Offset

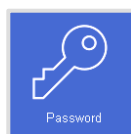


In the **Info** field, further information is stored regarding the offset values.

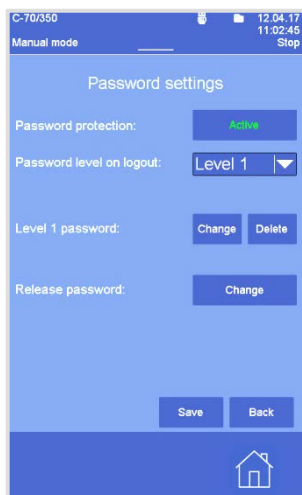
The current offset of the selected channel is always displayed.

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

4.10.8. 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

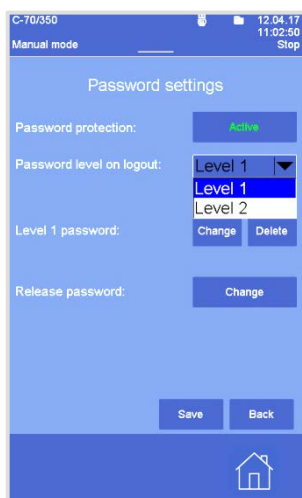


Password protection system active, as regards access rights see **Level 1**, Chapter 5



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

Level on lock

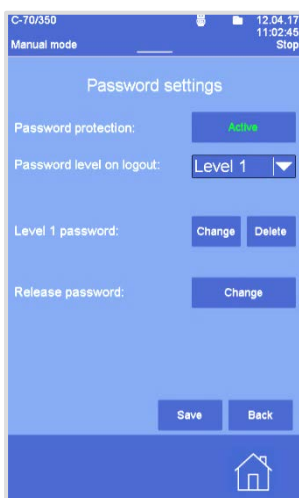


Level 1 or **Level 2** can be selected.

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



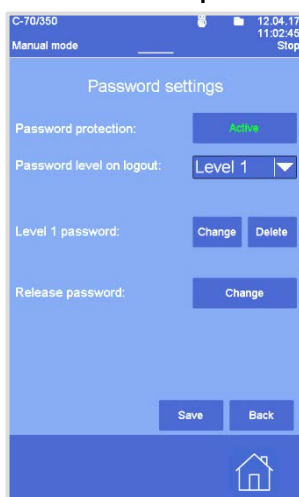
Change password for *Level 1*:

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.

4.10.9. Analog values



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

C-70/350 Manual mode 12.04.17 11:03:06 Stop

Display Analog Values

No.	Name	Set	Act.
1	Temper	50.00°C	31.87°C
2	Humidity	50.00%rH	35.10%rH
3	WaterTank	15.00l	15.00l
4	TempInlet	50.00°C	60.88°C
5	TempOutg	50.00°C	31.87°C
6	HumidityInlet	50.00%rH	5.00%rH
7	HumidityOutg	50.00%rH	35.10%rH
8	Coolpoint	35.70°C	14.50°C
9	BathTemp	36.59°C	1.89°C

Input range min: -75.00°C
Input range max: 185.00°C
Limit min: -20.00°C
Limit max: 140.00°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.

4.10.10. Analog input channels



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

C-70/350 Manual mode 12.04.17 11:03:14 Stop

Display analog inputs

Name	Channel	Value	Type
BathTemp	E0.0	100.74	Ohm
TempOutg	E0.1	112.40	Ohm
TempInlet	E0.2	123.57	Ohm
Humidity	E0.3	3.51	V
PCool.cool	E0.4	1.75	V
back pr. C	E1.0	5.72	V
press. gas C	E1.1	126.36	Ohm
isot. vap C	E1.2	110.95	Ohm
isot. long C	E1.3	103.39	Ohm

Count: 6817280
Amplification: 0.46359715
Offset: 2.33089304
Sensor type: 10

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

4.10.11. Digital I/O



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

C-70/350 Manual mode 12.04.17 11:03:25 Stop

Display digital I/O

Card No.	EA	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
IO Board 1	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
IO Board 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IO Board 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IO Board 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

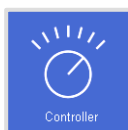
Back

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.

4.10.12. Controller channels



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

C-70/350 Manual mode 12.04.17 11:03:32 Stop

Display controllers

Channel	Enable	Set	y
TempDir	0	50.00	0.00
TempInd	0	50.00	0.00
deawpoint bath	0	36.69	0.00
deawpoint deepdwth	0	36.69	0.00
deawpoint compr air	0	36.69	0.00
boiling	0	20.00	0.00
Adj boiling temp	0	50.00	0.00
superheating C	0	6.00	0.00
MOP C	0	3.50	5.50

Act value: 31.88
P-component: 0.00
I-component: 0.00
D-component: 0.00

Back

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

All values on the list are constantly updated.

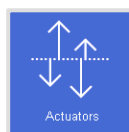
If a line on the list is selected, the information belonging to it is displayed below the list:

- 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.

4.10.13. Actuator channels



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

C-70/350 Manual mode 12.04.17 11:03:49 Stop

Display actuators

Name	Actuating var.	PulsUp	PulsDown
TempDirSt1	0.0	0	0
TempIndSt1	0.0	0	0
Setpoint	0.0	0	0
setpoint deepdash	0.0	0	0
boiling St1	0.0	0	0
boiling St2	0.0	0	0
Pie Cooling	0.0	0	0
Door frame heat	0.0	0	0
reject. PC	0.0	0	0
Add. Dehum	0.0	0	0

Back

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 $\pm 100\%$.

4.10.14. Calibration value customer (option)



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

See also Chapter 4.10.7 Calibration values.

C-70/350 Manual mode 12.04.17 11:29:22 Stop

Calibration value customer

Channel	Act. value	Offset	Mode	Status
TempOutg	0.0°C	4.00	1	On

TempOutg

Info

Channel: TempOutg

Insert Delete Save Back

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 4.10.7.

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
TempOutg	20.0°C	2.00	1	On
TempOutg	100.0°C	-3.00	1	On

Info: TempOutg

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

Code:

7 8 9 ←

4 5 6 +

1 2 3 -

0 . ↩

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 4.10.8 Password.

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



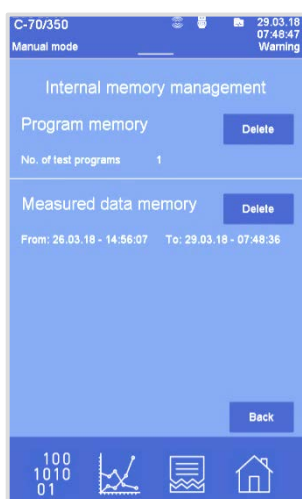
Remark

Each line entered must be saved individually.

4.10.15. Internal memory management

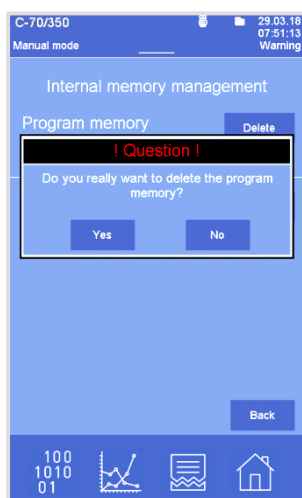


In the **Internal memory management** menu the program memory and measured data memory can be deleted.



All programs which have been created, and are currently displayed in the **Program selection** menu, are deleted. See Chapter 4.4.4.

All measurement data which have been recorded, and are displayed in the **Trend graph** menu, are deleted. See Chapter 4.3.

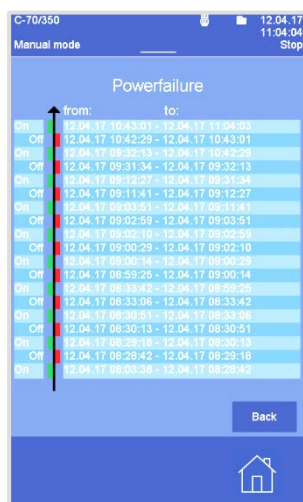


1. Tap on **Delete**
2. Tap on **Yes** to confirm the query
 - ➡ The program memory or the measured data memory are deleted.

4.11. Power failure



The **Power failure** menu shows when the device has been switched on or off.



The power failure list starts and ends with an **On** line, because the device must be in operation to display power failures. An **Off** entry is created when a power failure occurs. This line shows when a power failure occurred.



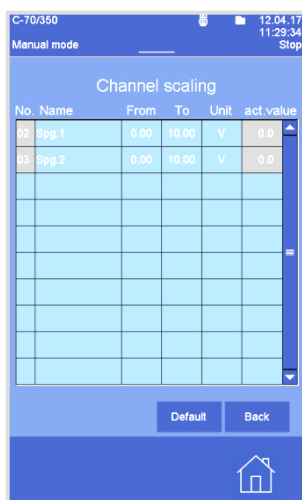
Remark

A control system reset is also displayed as a power failure.

4.12. 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 4.10.8 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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