

Programmable controller



User's manual

Version EXPERT 1.0

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1. Introduction

Thank you for purchasing the CLARE 5 programmable controller. We believe that it will fully meet all your requirements and you will be satisfied with it.

This manual aims to introduce the user to the controller. It is divided into chapters, each containing several articles. Click on a chapter title to open it.

Working with the manual

Controlling this manual, finding information, index.

Installation of the controller

Connection of connectors on the back, jumper and basic electrical connections.

The design of the controller

Power, bus and processor boards, display, plastic box and controller variants.

Installation Guide

First steps with a new controller or after its reset.

Controller operation

Status and button bar, screens, graphs, error messages, thermostat mode.

Manual mode

Ramp, temperature, delay, delayed start, changes during the program.

Menu

Events, processes, information about the program and controller, application, instructions.

Programming mode

Program creation and editing, blocks and individual commands, labels, graphs.

Controller settings

Settings for inputs, controls, outputs, display, sound, system, records, connections.

Attachments

Thermocouples, list of screens, buttons, examples, technical specification.

2. Working with the manual


The articles in this manual are often linked to each other. Just click on the link (displayed in blue and underlined) to be taken to the relevant part of the manual. Example of a link to the Menu chapter:

[Menu](#)

At the beginning of most articles in the manual, there is often an interactive image that can also take us to other articles. For example, by pressing the button in the picture, we will be taken to the manual article describing the function of that button. In this way, it is possible to simulate the control of the controller to a certain extent.

Example of a button link to the Menu chapter:




An appendix with a list of all screens is also useful for easy orientation in the manual. So if we see an icon with a monitor on the controller display (e.g. ) , we can find a link to the description of the screen with this number in the list in the attachment.

Additional search options in the manual

- [Table of Contents and Index](#)


2.1. Table of Contents and Index

Controller operation	
Split display.....	
Description of the status bar.....	
Button bar.....	
Description of the default screen.....	
Touchpad calibration	



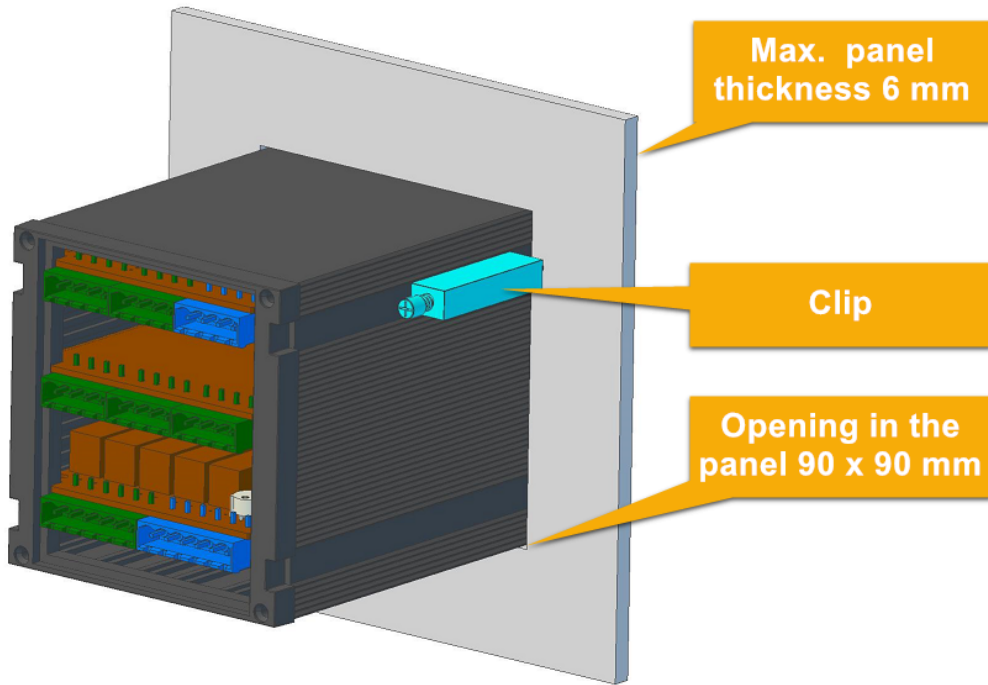
At the very beginning of the manual, we find its table of contents, which summarizes all chapters and articles along with the page numbers where they can be found. The names of the chapters and articles are also links that, when clicked, will take us to the specified page.

G	
Guide, 4, 22	
Guide: language, 23	
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Guide: temperature, 26	
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Guide: time, 24	



There is a keyword index at the end of this manual. The keywords are arranged alphabetically, and for each of them, the page or pages on which that keyword is discussed are given. Clicking on the page number will take us directly to that page.

3. Installation of the controller



The controller is installed in the panel with a **square hole with a side length of 90 mm**. The maximum wall thickness of the panel can be **6 mm**. The depth of the controller is 118 mm, but it is necessary to allow for approximately 20 mm for the wiring. The actual securing of the controller to the panel is done by tightening the plastic screws on the two enclosed clips.

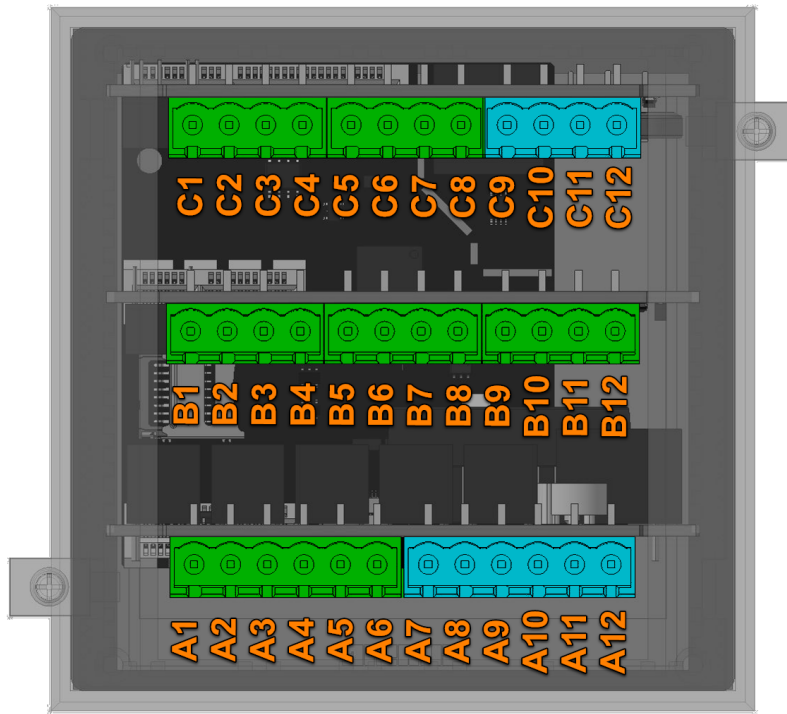
The individual wires are inserted into the connectors in the pull-out terminal box and secured by tightening the screws with maximum torque **0.4 Nm**. The largest cross-section of conductors can be **1.5 mm²**.

Thermocouple connection is carried out with a standardized compensation line designed for the respective type of thermocouple (J, K, S, etc.). Due to its properties at low temperatures, the compensation line for the type B thermocouple is not used and is replaced by twisted copper wires. To avoid the influence of electromagnetic radiation, it is advisable to use a shielded line or at least a twisted one.

Contents of the chapter Installation of the controller

- [Controller connectors](#)
- [Jumpers on the board](#)
- [Single-phase connection](#)
- [Three-phase connection](#)

3.1. Controller connectors



The CLARE 5 controller has terminal blocks on the back for connecting power, communication, inputs and outputs. Depending on the hardware configuration of the controller, 10 to 36 contacts are available. The minimum controller configuration is colored blue. In case the controller uses a **LAN module** (Ethernet), terminals **C1 to C4** are replaced by a standard **RJ-45** connector to connect to the network.

Terminal block on the source board:

Clamp	Designation	Description
A1, A2	R5	Switching relay No. 5 (3 A / 240 V)
A3, A4	R4	Switching relay No. 4 (3 A / 240 V)
A5, A6	R3	Switching relay No. 3 (3 A / 240 V)
A7, A8	R2	Switching relay No. 2 (3 A / 240 V)
A9, A10	R1	Switching relay No. 1 (3 A / 240 V)
A11	L	Phase wire 230V for powering the controller
A12	N	Neutral wire for powering the controller

Terminal blocks on the processor board:

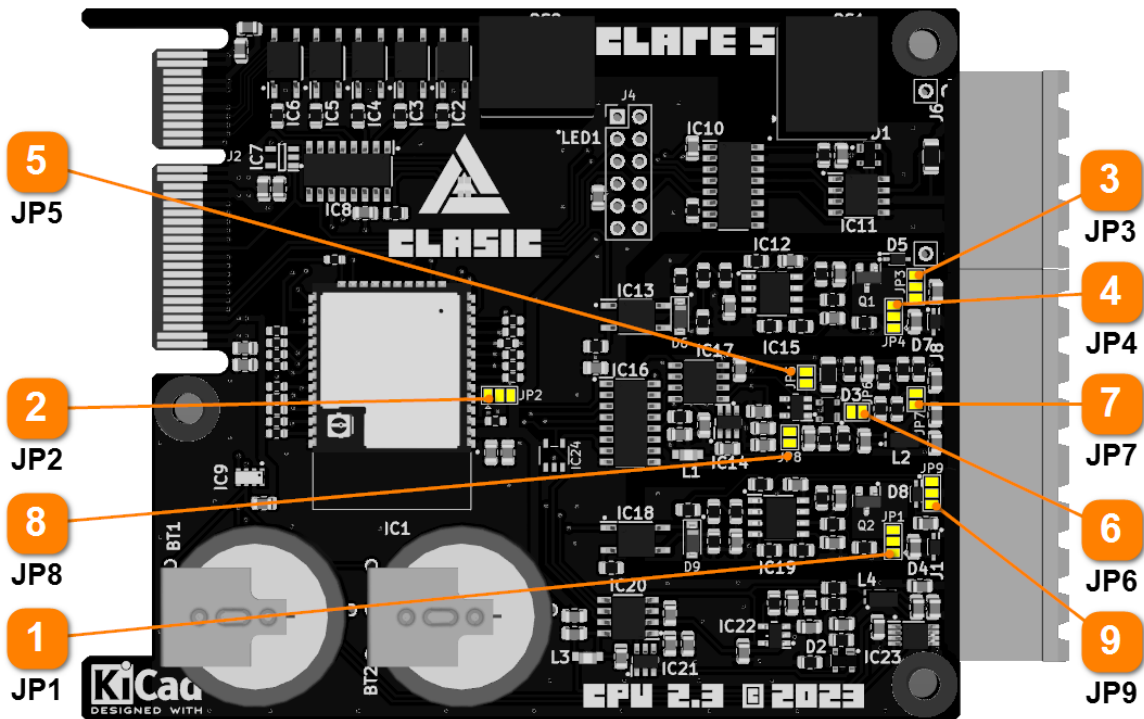
Clamp	Designation	Description
C1	Ter	Terminator for RS-485 line. Connect to terminal C2 if it is to be used
C2, C3	485	RS-485 communication line (C2 = B wire, C3 = A wire)
C4	— —	Grounding of the communication RS-485 line
C5, C6	AO2	Universal analog output #2 (C5 +, C6 -)
C7, C8	AI2	Universal analog input #2 (C7 +, C8 -, max. 10 V)
C9, C10	AO1	Universal analog output #1 (C9 +, C10 -)
C11, C12	TC	Thermocouple input (C11 +, C12 -)

Terminal blocks on the expansion board:

Clamp	Designation	Description
-------	-------------	-------------

B1	DI2	Digital input #2
B2	— —	Grounding for digital inputs
B3	DI1	Digital input #1
B4	— —	Grounding for digital inputs
B5, B6	AO4	Universal analog output #4 (B5 +, B6 -)
B7, B8	AI4	Universal analog input No. 4 (B7 +, B8 -, max. 10 V)
B9, B10	AO3	Universal analog output #3 (B9 +, B10 -)
B11, B12	AI3	Universal analog input No. 3 (B11 +, B12 -, max. 10 V)


3.2. Jumpers on the board




Inputs and outputs on the processor board of the controller can be configured. The input marked **TC** (clamps **C11**, **C12**) is a fixed thermocouple, while the second input **AI2** can be set as thermocouple, voltage or current. Both outputs **AO1** and **AO2** they can be configured as voltage or current. The basic configuration includes two thermocouple inputs and two voltage outputs. In the following jumper overview, the default configuration is highlighted in bold.

1  **JP1**
upper jumper - current output AO1
lower jumper - voltage output AO1

2  **JP2**
Reserved - no function
Standard settings - **right jumper**

3  **JP3**
upper jumper - voltage output AO2
lower jumper - current output AO2

4  **JP4**
upper jumper - current output AO2
lower jumper - voltage output AO2

5



connected - voltage input 0 - 10 V
disconnected - thermocouple or current input 4 - 20 mA

6



connected - current input 4 - 20 mA
disconnected - thermocouple or voltage input 0 - 10 V

7



connected - thermocouple or current input 4 - 20 mA
disconnected - voltage input 0 - 10 V

8



connected - current input 4 - 20 mA or voltage input 0 - 10 V
open - thermocouple input

9



upper jumper - voltage output AO1
lower jumper - current output AO1

Default jumper configuration on the processor board are highlighted in bold.

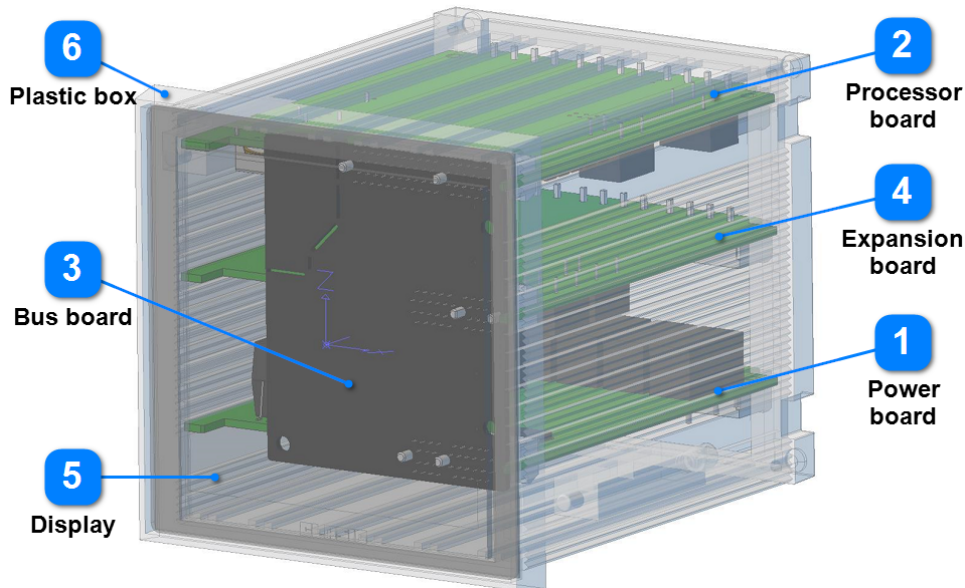
INPUT	TYPE	JP5	JP6	JP7	JP8
TC (AI1)	thermocouple	-	-	-	-
AI2	thermocouple	X	X	S	X
	voltage	S	X	X	S
	current	X	S	S	S

X - disconnected, S - connected

EXIT	TYPE	JP1	JP3	JP4	JP9
AO1	voltage	D	-	-	H
	current	H	-	-	D
AO2	voltage	-	H	D	-
	current	-	D	H	-

D - lower jumper, H - upper jumper

4. Design of the controller



The CLARE 5 controller consists of five main components: source board, bus board, processor board, display and plastic box. Furthermore, the controller can be supplemented with an expansion board with additional inputs and outputs or an Ethernet module. This modular solution enables easy and quick replacement of individual components in the event of their failure. Detailed informations about these components are described in the following articles of the manual.

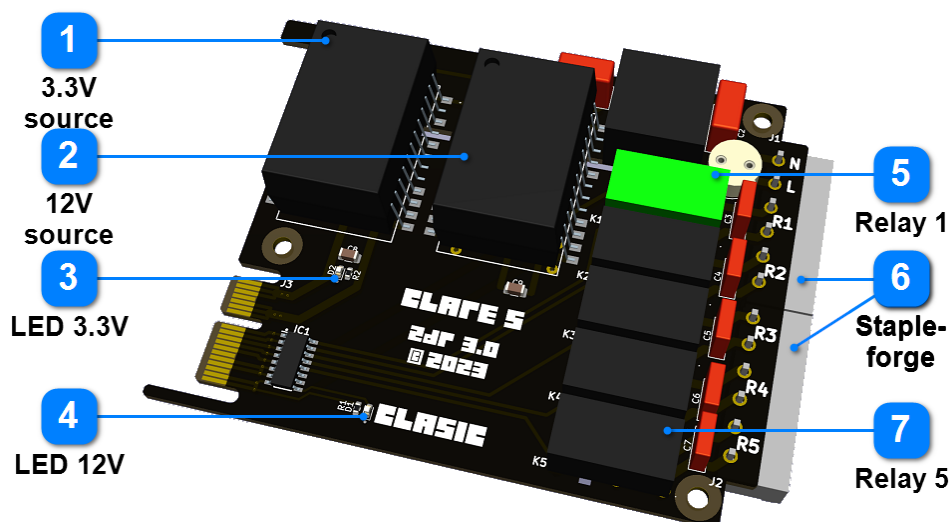
Dimensions of the controller:

height: 96 mm, width: 96 mm, depth: 118 mm (without terminal blocks attached)

Contents of the chapter Design of the controller

- [Power board](#)
- [Processor board](#)
- [Bus board](#)
- [Expansion board](#)
- [Controller display](#)
- [Box and accessories](#)
- [Ethernet module](#)
- [Variants of the controller](#)

4.1. Power board



The power board contains a 230V power supply input filter, two pulse sources for 12V and 3.3V, 1 to 5 relay outputs (3 A / 240 VAC) and a terminal board. The input filter prevents the penetration of electromagnetic interference in both directions. The correct function of the pulse sources is confirmed by the illumination of the blue LED for voltage 3.3V and the green LED for voltage 12V. In the picture, the most frequently used Relay No. 1 (R1) is highlighted in green. The power board can be ordered in versions with the required number of relay outputs.

Order codes:

CL5-ZDR1 - board with one relay output

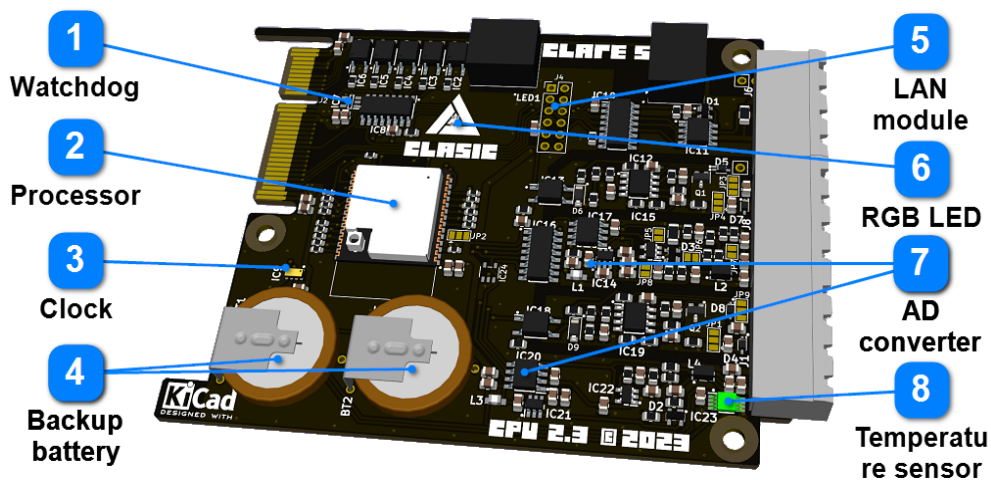
CL5-ZDR2 - board with two relay outputs

CL5-ZDR3 - board with three relay outputs

CL5-ZDR4 - board with four relay outputs

CL5-ZDR5 - board with five relay outputs

4.2. Processor board



The processor board is the main component of the controller. The board contains an ESP32 processor, a real-time clock, two analog inputs, two digital outputs, a temperature sensor, a watchdog safety circuit, an information RGB LED, DC-DC converters, and terminal blocks. The board can be expanded with an optional RS485 or LAN communication port. Analog input AO2 and both analog outputs are galvanically isolated.

1

Watchdog

A watchdog safety circuit checks the processor function and the voltage on the processor board. In case of low voltage or an inactive processor, it resets the entire board.

2

Processor

The controller contains a dual-core 32-bit processor with a frequency of 240 MHz. It also integrates 16GB of flash memory, which is used for both firmware and data storage.

3

Clock

The real-time clock accuracy is provided by high quality crystal. It can be adjusted to achieve maximum inaccuracy at steady temperature 37 seconds per year (1 ppm).

4

Backup battery

The controller contains one CR2032 battery as standard, two CR2032 batteries in the PRO version. The lifetime stated by the manufacturer is at least 10 years, but the real one is twice as long.

5

LAN module

There is a free slot for a LAN expansion module. This module cannot be combined with the RS485 communication output; it is necessary to select only one variant.

6**RGB LED**

This glowing RGB diode provides information about the following states:

slowly blue flashes - the controller is in idle state

fast blue flashing - the controller is in delayed start mode

fast green flashes - the program is running, regulation is in progress

fast red flashes - the program is suspended or an error has occurred

7**AD converter**

The high-precision 22-bit AD converter MCP3550 with integrated noise reduction and a sample frequency of 12.5 Hz. Each analog input has its own converter.

8**Temperature sensor**

Very accurate temperature sensor MCP9804 is used for temperature measurement at the end of the thermocouple or compensation line.

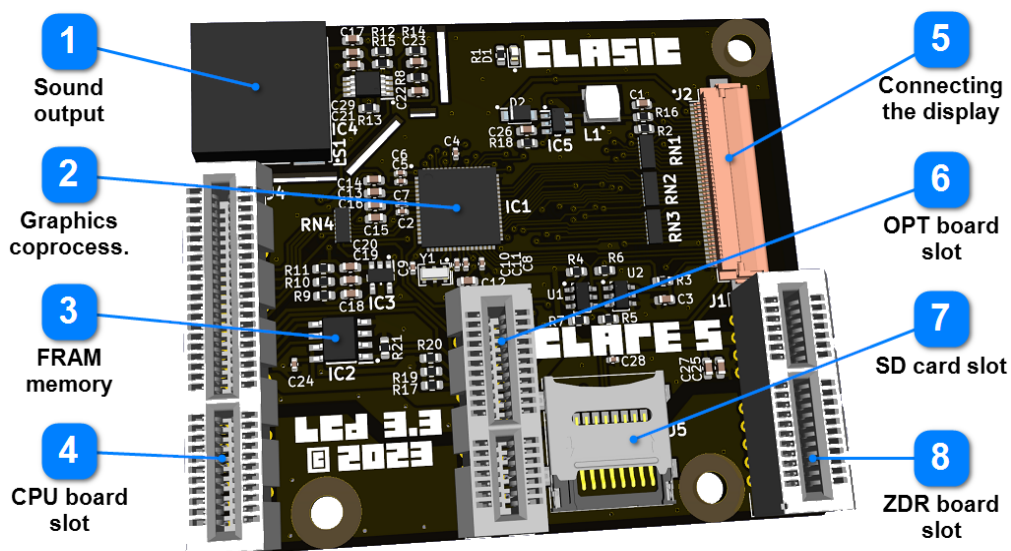
Order codes:

CL5-CPUN - version without communication interface (8-pin terminal block)

CL5-CPUR - version with RS-485 communication interface (12-pin terminal block)

CL5-CPUL - version with LAN (Ethernet) module (8-pin terminal block + RJ45)

4.3. Bus board



The bus board connects all the other controller boards and allows you to connect the display. Additionally, it contains a graphics accelerator and FRAM memory. The PRO version also includes an SD card and an audio output (speaker). In the upper middle, there is a blue LED indicating that the power supply is functioning properly.

1 Sound output

Only the PRO version of the controller is equipped with an audio output. The controller can use sound warnings for the end of a program, an alarm clock, a minute timer, etc.

2 Graphics coprocessor.

The BT817 graphics coprocessor assists the main processor with the display. It is also responsible for communicating with the touch layer and generating audio signals.

3 FRAM memory

The FRAM memory ensures the constant storage of the controller's state in the event of a power failure. After an outage, the previous state is loaded, allowing the controller to continue the interrupted operation.

4 CPU board slot

Connector for inserting the processor board (PCI express x4)

5 Connecting the display

Display connector (FCC 40 pin)

6 OPT board slot

Expansion board connector (PCI express x1)

7

SD card slot

Micro SD card holder with a capacity of up to 32 GB. The PRO version of the controller includes an industrial-grade card with a capacity of 8 GB.

8

ZDR board slot

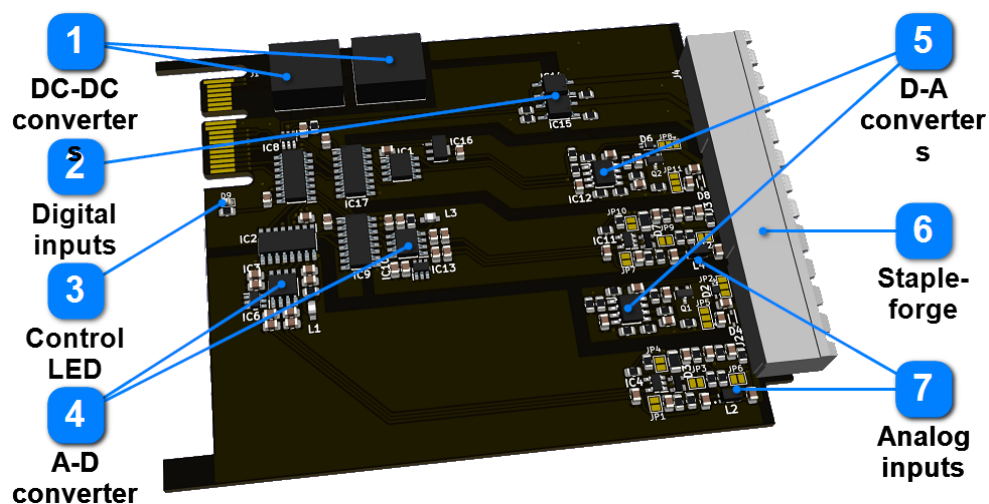
Connector for connecting the power board (PCI express x1)

Order codes:

CL5-LCDS - version without audio output and SD card

CL5-LCDP - version with audio output and SD card (PRO version)

4.4. Expansion board

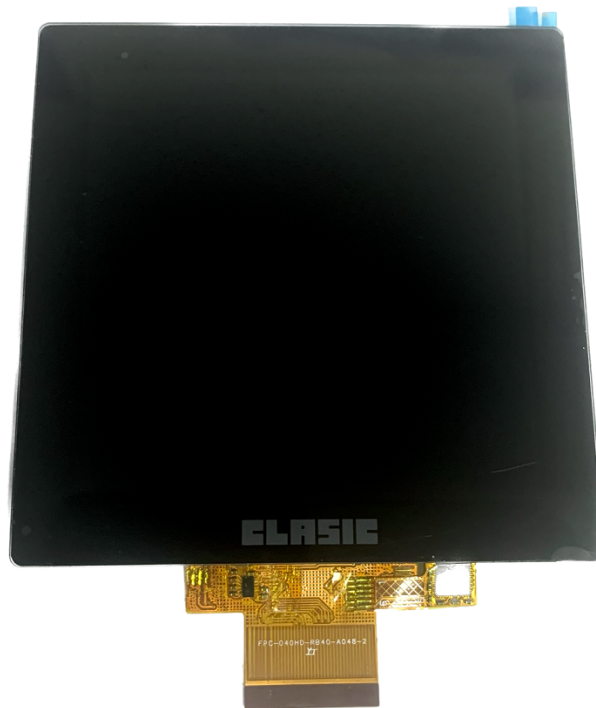


The expansion board serves to increase the number of analog inputs and outputs. It adds two more analog inputs, two analog outputs, and two digital inputs. The analog inputs use a high-precision 22-bit AD converter MCP3550 with integrated noise reduction and a frequency of 12.5 Hz. Each analog input has its own converter. The glow of the control LED guarantees the correct power supply to the board. All inputs and outputs of the expansion board are galvanically isolated.

Order code:

CL5-OPTI

4.5. Controller display



The custom display developed for the CLARE 5 controller offers a high resolution of 720 x 720 pixels on a 4" diagonal (101.6 mm). The TFT display supports 262,144 colors (RGB 18 bits) and has a typical brightness of 300 cd/m². Viewing angles are 85° in all directions. The backlight consists of 10 LEDs with a lifespan of 30,000 hours. In the settings, the image on the display can be rotated as desired. The display has a capacitive touch layer with increased accuracy. Due to the double thickness of the glass compared to similar displays, it has excellent resistance to damage.

Order code:

CL5-DISP

4.6. Box and accessories



The Incabox One plastic box, made of PPO material by the leading Italian manufacturer Italtronic, features reinforced walls. The box provides solid support for all parts of the controller. The packaging of the controller includes the following accessories in addition to the controller itself:

- 1 pc rear plastic wall of the controller
- 2 pcs of fasteners for mounting the box to the panel
- 1-2 pcs of 6-pin terminal blocks (depending on the controller variant)
- 1-6 4-pin terminal blocks (depending on the controller variant)
- 1 pc of microfiber cloth for cleaning the display

Box order code:

CL5-CASE - plastic box of the controller

Accessory order codes:

CL5-BACK - rear plastic wall

CL5-HOLD - box clip

CL5-CON6 - 6-pin terminal block

CL5-CON4 - 4-pin terminal block

CL5-MFIB - microfiber cloth

4.7. Ethernet module



The CLARE 5 controller can optionally include an Ethernet module, which allows the controller to connect to a computer network and access some Internet services. The module is soldered to the processor board at the RS-485 output point. The RJ-45 connector is then placed instead of the terminals **C1 - C4** (see the article [Konektory regulátoru](#)). In that case, the RS-485 communication output can no longer be used.

Module Specifications:

Processor: Cortex-M3, 96MHz, 2MB Flash, 128KB RAM

Interface: 10/100 Base-T Auto-Negotiation

Protection: 2000 V insulation

Protocols: IP, TCP, UDP, DHCP, DNS, HTTP, ARP, BOOTP, AutoIP, ICMP, Web socket, Telnet, FTP, TFTP, uPNP, NTP, SNMP, Modbus TCP

Encryption: TLS, AES 128bit, DES3

Consumption: maximum 0.4 W

Order code:

CL5-LAN1

5. Installation guide

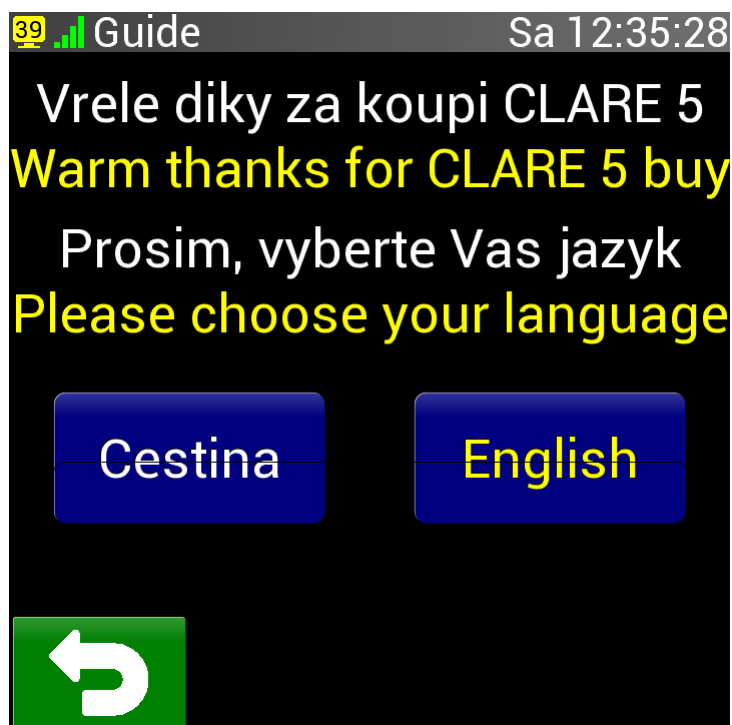


This chapter of the manual describes the individual steps of the installation wizard. The wizard will start automatically if it is a new stand-alone controller. It is also possible to invoke it using Settings (see the article [Factory Guide](#)). After completing the wizard, the controller is ready for use, but it is advisable to check the specific input, regulation, and output settings for the device connected to the controller.

Contents of the chapter Installation guide

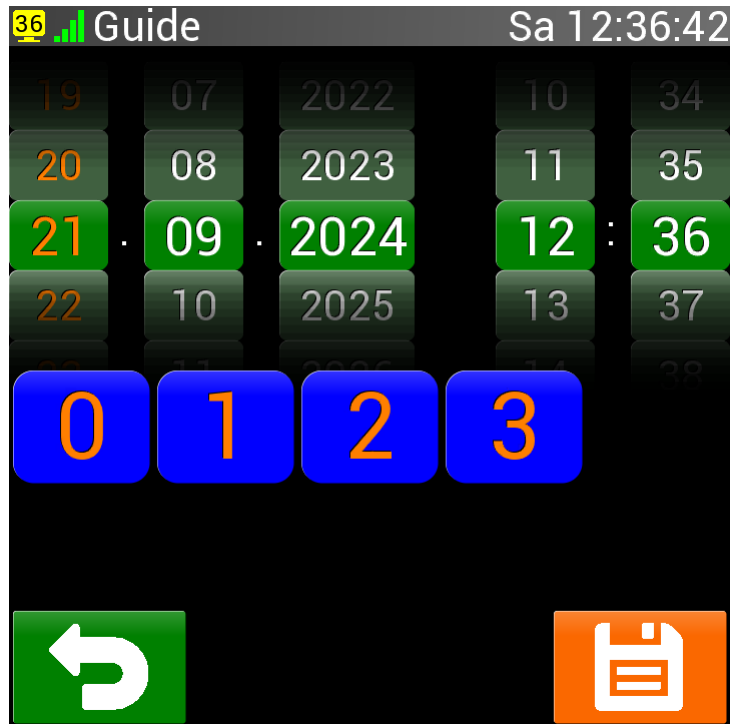
- [Language selection](#)
- [Date and time settings](#)
- [Selection of thermocouple type](#)
- [Setting the maximum temperature](#)
- [Select a level to set](#)

5.1. Language selection



After turning on a new stand-alone controller or calling up the Factory Wizard, this screen will appear. Now, choose the language the controller will use. The language can be changed later in Settings.

5.2. Date and time settings



After pressing the button with the desired language, the following screen will be displayed. On this screen, you can set the current date and time. Values can be entered in two ways:

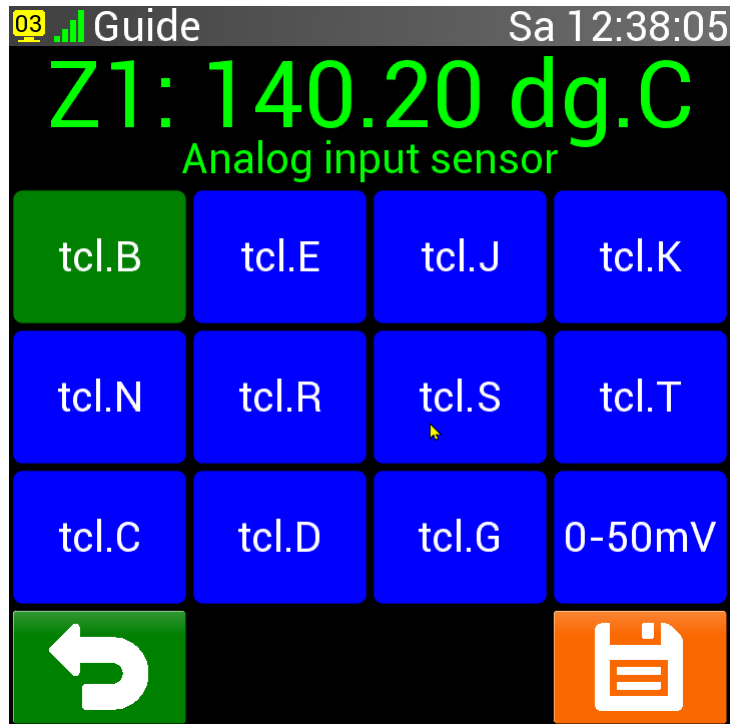
- by turning the appropriate dials at the top of the screen
- by pressing the required digits at the bottom of the screen (the value 2 must be entered as 02)

After entering the current date, press the button in the lower right corner (diskette icon), which saves the date and time.

TIP: Accurate time setting

When the diskette button is pressed, the seconds of the current time are automatically reset. This allows for precise time entry.

5.3. Selection of thermocouple type



This screen will appear immediately after saving the date and time. At this stage of the wizard, it is necessary to select the type of thermocouple (marked on the terminal board as TC). The available types of thermocouples are: B, E, J, K, N, R, S, T, C, D, and G. Detailed information on thermocouples can be found in the appendix. Confirm the selected thermocouple with the diskette button in the lower right corner of the screen.

ATTENTION: Thermocouple type

If the thermocouple type is entered incorrectly, the measured temperature will not be displayed correctly! Incorrect temperature measurement can damage or destroy the connected control device!

5.4. Setting the maximum temperature



After selecting a thermocouple, a new screen will appear. In this step, you need to correctly enter the highest adjustable temperature for the connected device. This parameter will be provided by the documentation or manufacturer of the device. The value can be entered in two ways:

- using the numeric keypad in the middle of the screen
- using the up and down arrows at the bottom of the screen

Confirm the entered maximum temperature by pressing the button with the floppy disk icon.

CAUTION: Maximum temperature

If the maximum temperature is entered incorrectly and the regulation is set at temperatures higher than those allowed for the connected device, it may be damaged or destroyed by overheating! The entered maximum temperature must also not be higher than the maximum allowed temperature for the type of thermocouple selected in the previous step.

5.5. Select a level to set

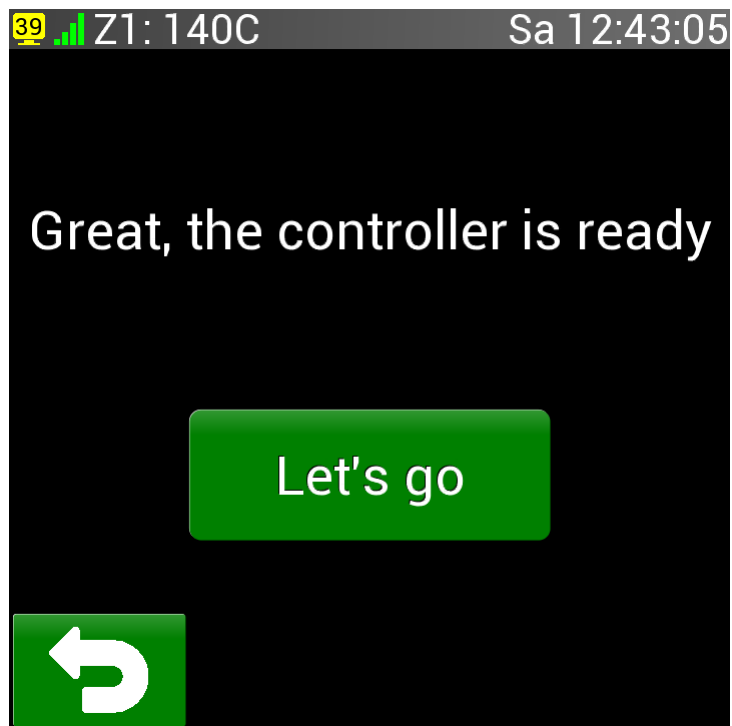


This screen appears in the Installation Wizard after entering the maximum temperature.

In the last step, all that remains is to select one of the four levels for setting the controller. Since the detailed setting of the controller is quite complex, a novice user can choose a lower setting level to make the controller setup easier and clearer. You can also protect the settings with a password, preventing unauthorized access. The selected setting level also determines the accessibility of various controller functions, as shown in the following table:

Setting level	Controller function
L1: Basic	Basic input and output functions of the controller Event history Progress database Manual mode only - one ramp and delay
L2: Profi	Extended input and output functions of the controller Programs and changes while the program is running Basic regulation settings Basic communication settings Progress records
L3: Expert	Custom screens Advanced control settings Correction of thermocouples Network functions
L4: Service	The highest password-protected level Calibration of analog converters Diagnostic functions

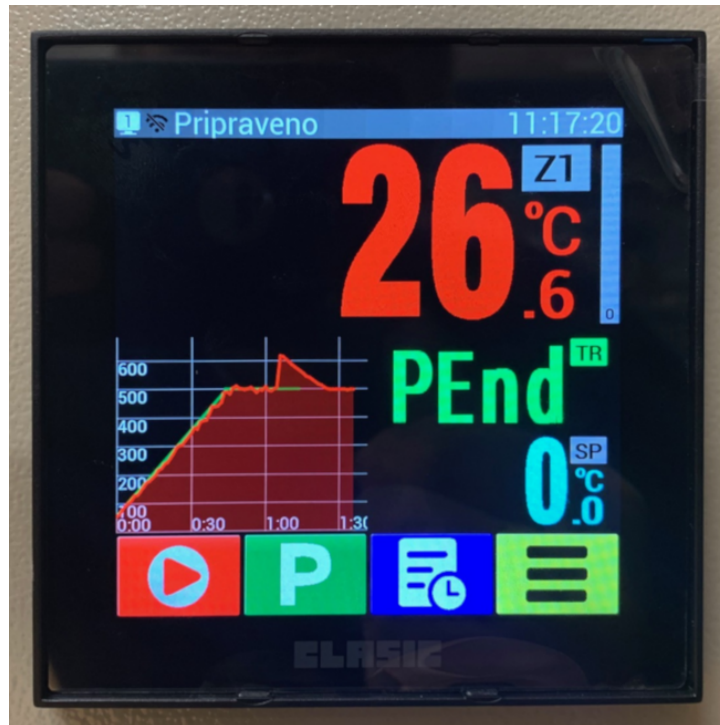
After selecting the setting level, this screen will eventually appear:



This is the end of the guide, as can be seen on the upper status bar, where the label **Guide** is replaced by the current measured temperature.

The controller is thus basically set and, after pressing the button **Let's go**, ready to use.

6. Controller operation



This chapter describes the basic operation of the controller. It covers working with the display in general, controlling the home screen and graphs, explaining error messages, procedures after turning on the power, and finally, operating the simple thermostat mode.

The CLARE 5 controller is equipped with a square 4" (diagonal 10.16 cm, resolution 720 x 720 pixels) LCD display with a touch layer. This display covers almost the entire surface of the front side of the controller, so the controller has no buttons. All control is done by touching the currently displayed buttons or other graphic elements.

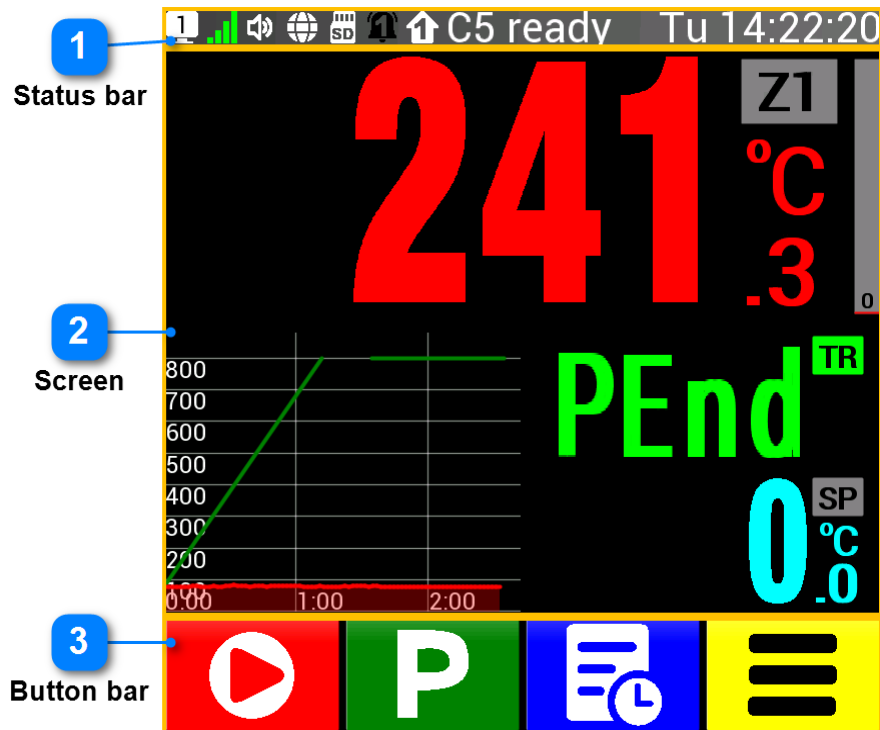
IMPORTANT: Non-functional touch

If the controller does not respond to touch or responds differently than expected, the calibration of the touch layer may have been lost. In this case, perform the calibration according to the article [Touchpad calibration](#).

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- [Chart control](#)
- [Chart settings](#)
- [Error messages](#)
- [Controller after switching on](#)
- [Thermostat mode](#)

6.1. Split display



The display area is divided in most cases into three parts:

1

Status bar

Located at the top of the display, it has a height of 40 points and displays information about the status of the controller. Details can be found in the article [Status bar](#)

2

Screen


Shown in the middle of the display, it occupies most of the display area (height 560 points) and displays various screens for operating the controller. Details can be found in the article [Description of the home screen](#).

3

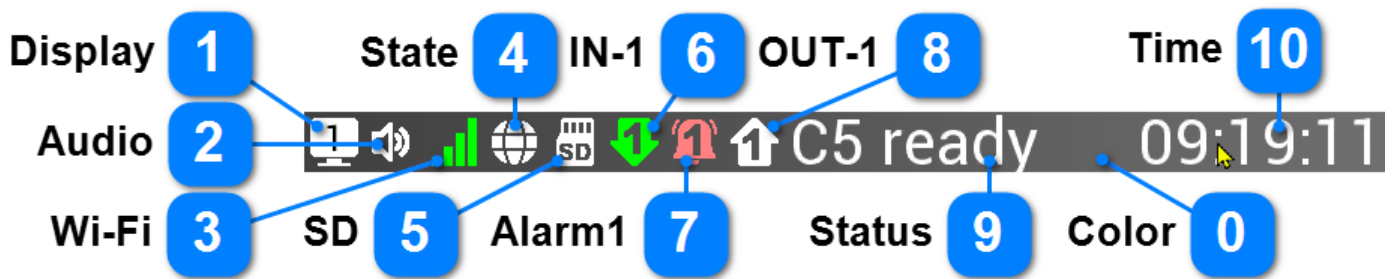
Button bar

Located at the bottom of the display, it has a height of 120 points and displays several buttons (maximum 6) to interact with the controller. Details can be found in the article [Button bar](#)

TIP: Calling up the Menu

If there is no option to enter the Menu on the display (the corresponding button ) , press and hold the screen for 8 seconds (outside the areas where the buttons or the graph are). The Menu screen will then appear, and you can release the press.

6.2. Description of the status bar



The status bar of the controller displays the status of its various components. The basic information is the background color of the bar, which indicates the idle state, running program, delayed start, or controller failure. The bar is highly customizable. Positions 1 - 8 are optional, and none may be shown. The order of the icons in positions 1 - 8 can also be adjusted, allowing for different configurations of the status bar on the controller. Additionally, the configuration allows you to display additional icons (Alarm2 to Alarm5, OUT-2 to OUT-5) or leave certain positions empty. All options can be combined, so, for example, it is possible to display only outputs OUT-1 to OUT-4 on the status bar. The status of the controller (9) is shown immediately after the last displayed icon. Details of the status bar configuration are covered in the article [Status bar](#).

Color

The background color of the status bar indicates one of the four states in which the controller is currently located:

0		gray bar - idle state of the controller
		green bar - running program
		blue bar - waiting for the program to start (delayed start)
		red bar - malfunction (suspended regulation, thermocouple error, etc.)

Display

This icon shows which screen the controller is currently displaying. Predefined main screens are white, user main screens are blue, and other screens are yellow. The displayed number helps to identify the screen in this manual, during technical support, etc.

1	1	Predefined main screen (1 - 4)
	2	User main Screen (1 - 16)
	62	Work screens (1 - 64)

Audio

2

The Audio icon displays the volume of the controller's audio output. The sound output works only in the PRO variant of the controller. If the sound is muted, it will be displayed in black; otherwise, it will be displayed in white with three volume levels.



Sound off



Volume 5 - 33 Volume 34 - 67 Volume 68 - 100

Wi-Fi

Under the WiFi icon, you can find information about the status of the WiFi network. The information includes the WiFi mode (off, AP, Client) and, in the case of a Client, the signal quality between the controller and the selected network.

3



The WiFi network in the controller is turned off



The WiFi network is in AP mode (it is possible to connect to the controller)



The WiFi network is in Client mode but does not have sufficient signal to connect to the selected network



The WiFi network is connected to the selected network (signal quality 1 - 4)

State

4



LAN/485 communication is disabled (black color)



LAN/485 communication is enabled (white color)

SD

This icon shows if an SD (micro SD) card is connected. The micro SD card is connected only in the PRO version of the controller. If the card is not present, the icon is displayed in black; if present, the icon is white. In case of activity (writing and reading from the card), the icon is displayed in green.

5



The micro SD card is not connected.



The micro SD card is connected but not active.



The micro SD card is connected and active.

IN-1

The IN-1 icon shows the status of the IN-1 digital input. If the input is at logic level 0, the color of the icon is light gray, in the case of logic level 1, the icon is green.

6



Input IN-1 is at logic level 0 (OFF)



Input IN-1 is at logic level 1 (ON)

Alarm1

Under the Alarm1 icon, you can find information about the status of alarms. During the configuration, it is possible to choose an alarm number from 1 to 5. Disabled alarms are shown in black, inactive alarms in white, and active alarms change color between pink and red every second.

7



Disabled alarms (still inactive) 1 - 5



Inactive alarms 1 - 5 enabled



Activated active alarms 1 - 5

OUT-1

This icon informs about the status of digital outputs 1 - 5

8



Digital output switched off (still inactive) 1 - 5



Inactive digital output (logic level 0) 1-5



Active digital output (logic level 1) 1 - 5

Status

The status of the controller briefly describes the situation in which the controller is located. These conditions can be:

- **Guide** The controller is in the controller installation wizard mode. In this mode, it is necessary to follow the instructions on the display. More information in the article [Installation Guide](#).
- **Ready** The controller is ready to start the program.
- **Z1: 25°C** When controller does not show the main screen it gives information about the current temperature in zone 1.
- **Thermostat** Thermostat mode - the set temperature is constantly regulated.
- **Prog. 01** alternates with **Mo 09:30** The controller is waiting for the automatic start of the program (delayed start). It shows the program number, day and start time.
- **Manu PG** The manual program is started (one ramp, temperature and delay). In the controller, the manual program is stored as program number 0.
- **P02 B04** The program is already running. The controller displays the number of the executed program and the currently executed program block.
- **Error 3000** An error occurred in the controller. Details can be found in the article [Error messages](#).
- **P02 Pause** The program is suspended. The number of the program being executed is displayed (in the case of manual program P00 is displayed).

9

Time

The last item on the status bar is the current time. It is always aligned with the right edge of the status bar. It is also user-configurable in four versions, each of which can display the date for one second every 10 seconds.

- **WW HH:MM:SS** or **WW DD.MM.YY** e.g. **We 22:15:23** or **We 29.08.23**
- **HH:MM:SS** or date **DD.MM.YY** e.g. **22:15:23** or date **29.08.23**
- **WW HH:MM** or **WW DD.MM** e.g. **We 22:15** or date **We 29.08**
- **HH:MM** or date **DD.MM** e.g. **22:15** or date **29.08**

10

Color of current time:

white = the stopwatch or minute timer app is not running

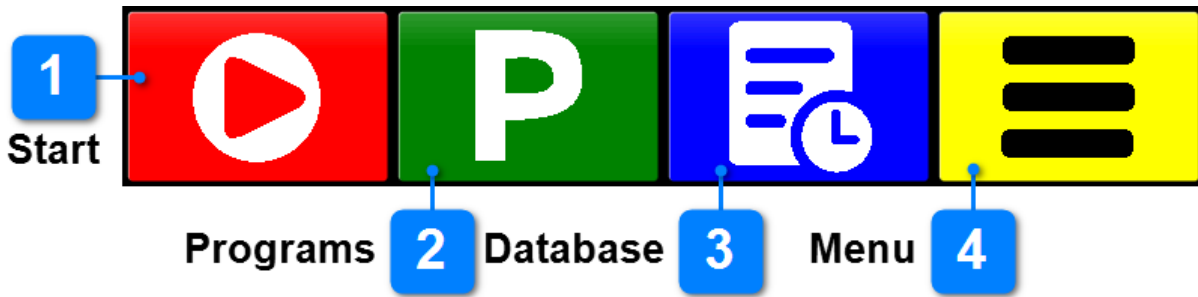
yellow = the stopwatch application is running

blue = the minute timer application is running





green = both the stopwatch and minute timer app are running

red = the countdown of the minute timer app has ended






6.3. Button bar







The button bar is primarily intended to display control buttons that are relevant to the displayed screen. The button bar for each screen is predefined by the manufacturer, except for user screens. The bar can contain 1 to 6 buttons. Buttons can display either the corresponding icon or a short text label. Display in text format can be selected in Display settings. Most buttons will display the appropriate screen when pressed. Some buttons can be held down (e.g., the up and down arrows) to automatically repeat their function. In the following legend, the buttons are shown with both an icon and text.

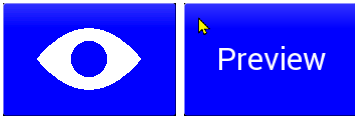
Start	
1	 The Start button you to select and run a specific program in the controller. A screen will appear with the option to select the program number (or parameters in manual mode) and to choose between immediate or delayed start. The button is red by default.
Programs	
2	 With the Programs button it is possible to enter programming mode (if enabled in Settings). Here, you can view, create, or edit all programs in the controller. By default, the button is green.
Database	
3	 Using the Database button, it is possible to switch to the display of the last 200 temperature firings. On this screen, we can then see the details of these firings, including the relevant graph. The button is blue by default.
Menu	
4	 The Menu button brings up a screen with a basic menu of functions and controller settings. The three buttons mentioned earlier are also located on this screen. The settings here are already divided into relevant sections. The button is yellow by default.

All buttons are then described in detail in the appendix [List of all buttons](#). The following is a selection of frequently used buttons:

	Later	Delayed start
	Stop	Stop the program manually
	Pause	Pause the program
	Skip	Skipping a program block
	Manual	Activation of manual mode

	Back	Return to the previous screen
	Next	Next page, more items in the selection
	Up	Increasing the value, scrolling the list
	Down	Decreasing the value, scrolling the list

	Edit	Editing the program
	PGinfo	Editing the program label
	Delete	Deleting the entire program
	Copy	Creating a copy of the program
	Remove	Removing a program block
	Insert	Inserting a program block
	Save	Save the changes made



Preview

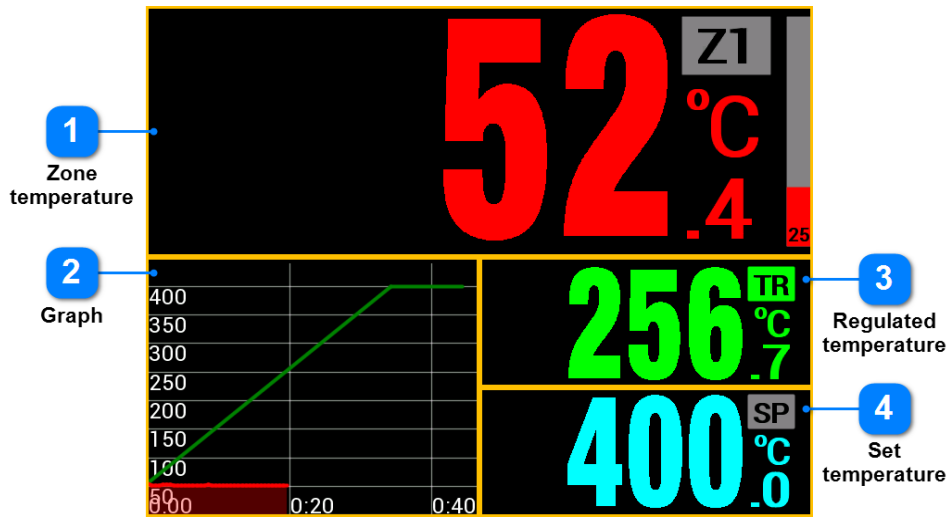
Preview of the created screen, WiFi password



Graph


Program or progress graph

6.4. Description of the default screen



The home screen is the screen that the controller displays after switching on. All other screens can be accessed from this screen. The home screen is fully user-configurable. The controller contains several predefined screens; the default can be selected in Display Settings.

IMPORTANT: Return to the home screen

By pressing the  (Back) button on screens other than the default, the controller will always gradually return to the home screen. The return is also automatic after a certain period of user inactivity (details in the article [home screen activation time](#))

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

Each screen is divided into 16 equally sized positions as shown. Modules are then inserted into these positions, which can occupy a different number of positions. For example, the standard home screen contains four modules, where the largest one (zone temperature) occupies 8 positions (half of the screen area).

1

Zone temperature

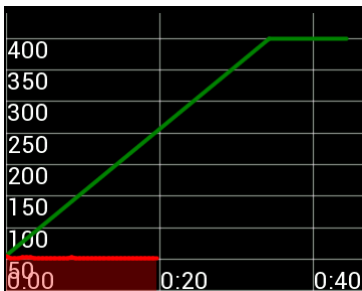
The zone temperature is the most important reading on any temperature controller. Since it occupies the full 8 positions on the standard home screen, the height of the digits displaying the temperature reaches 25 mm. For the zone temperature, it is possible to configure in Settings whether it will be displayed in whole degrees, tenths, or hundredths of a degree Celsius. It is also possible to turn off the label **Z1** indicating that it is zone No. 1. Additionally, the sidebar indicator of the current heating power for this zone can be turned off. The color of the zone temperature can be adjusted in Settings.



2

Graph

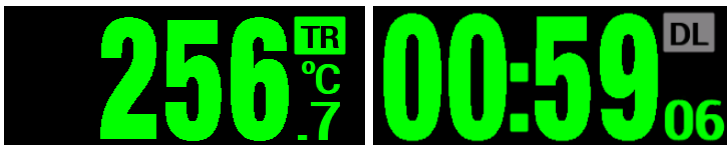
The graph on the standard home screen shows the last temperature run or the current run. The graph displays the green programmed curve (controlled temperature) and the red curve showing the temperature in zone 1. If Module Zoom is enabled, the graph can be enlarged to full screen and viewed in more detail. The graph scales are automatically adjusted so that both the entire program curve and the entire temperature course in the zone can always be seen.



3

Regulated temperature

The regulated temperature expresses the instantaneous value of the temperature to which the controller is trying to adjust the temperature of the zone. As with the zone temperature, the label **TR** can be turned off, and it can be configured whether the temperature will be displayed in whole degrees, tenths, or hundredths of a degree Celsius. The color of the regulated temperature can also be changed in Settings. If the controller program performs a hold on the temperature, the remaining time until the end of the hold is displayed instead of the regulated temperature.



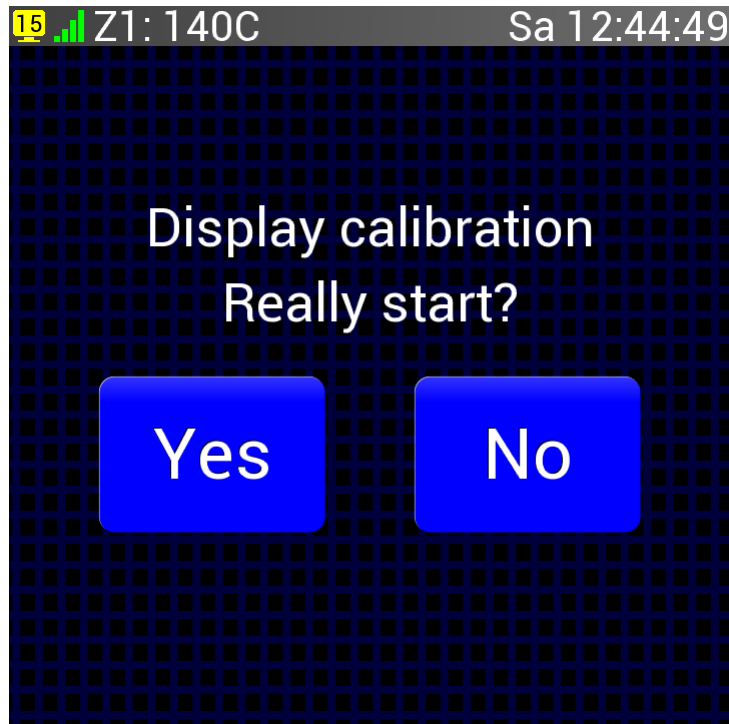
4

Set temperature

The desired temperature expresses the target (end) value of the temperature to which the controller will go in a given step, or the temperature at which it regulates during endurance. As with the zone temperature, the label **SP** can be turned off, and it can be configured whether the temperature will be displayed in whole degrees, tenths, or hundredths of a degree Celsius. The color of the desired zone can be selected in Settings.

400^{SP}
°C
.0

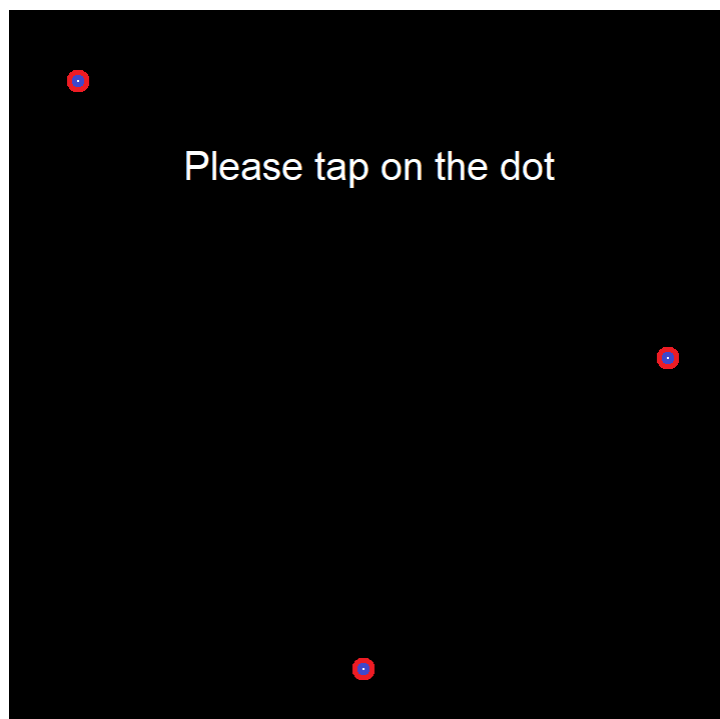
6.5. Touchpad calibration



In case of inability to control the controller or inaccuracy during touch control, it is necessary to calibrate the display by pressing and holding the touch layer for 30 seconds. The hold needs to be done on the screen away from the places where the buttons or graph are. The screen below will then appear.

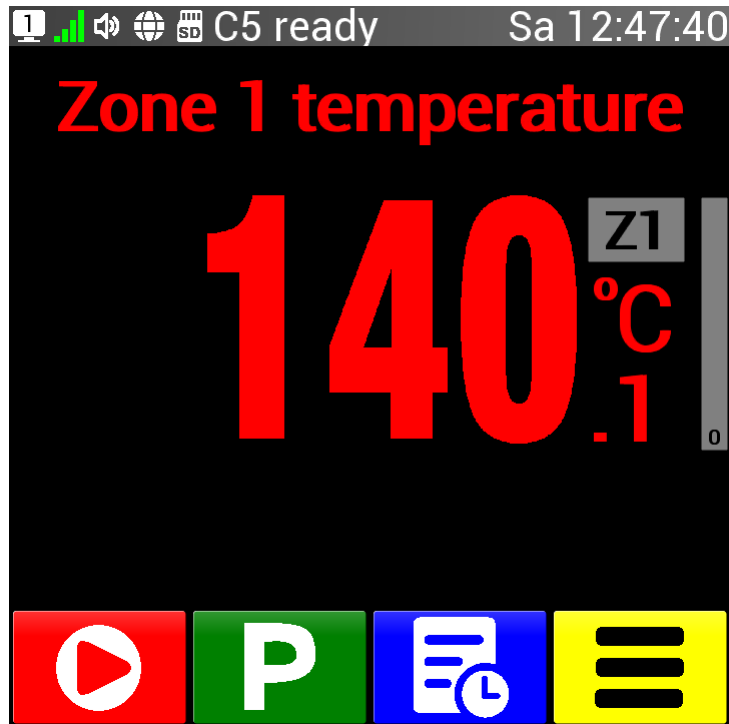
In the case of minor inaccuracies when controlling the controller by touch, it is also possible to invoke the calibration using the following procedure:

In the Display settings, there is the item "Display calibration" (Expert level is required). After selecting it, the opening screen of this article will be displayed. A negative answer will return the controller to Settings; in case of confirmation, this screen will be displayed:

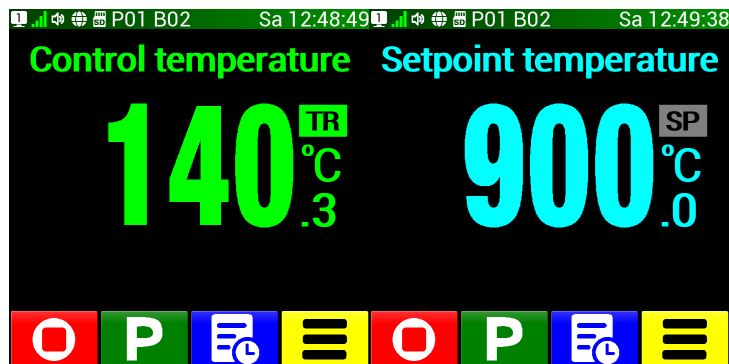


On this screen, 3 calibration points will be displayed in turn (in order from top to bottom), which need to be pressed as precisely as possible. After completing this procedure, the touch layer should work properly.

6.6. Increase area module




All modules described in the article [Description of the home screen](#) can be zoomed across the entire screen. Magnification of the module is done by simply touching the respective module. However, this magnification must be enabled in Settings (Display - Magnification of the module). Zooming in on most modules also brings up their other functions. A tooltip appears when zooming in on the **Zone 1 temperature** module on the home screen. Similarly, it appears for the regulated and desired temperature **Regulated temperature** and **Temperature set** modules.



Returning to the home screen is done simply by touching the enlarged module. The situation is different with the Graph module. Zooming in on it brings up this screen:



It shows an enlarged graph and a series of buttons. More information about controlling this enlarged graph is in the next article [Graph control](#). Press the  (Back) button to return to the home screen..

6.7. Graph control



The graph screen is used to accurately display the programmed temperature curve and the current (or earlier, for waveform database) actual temperature curve. In the basic settings, the program curve is drawn in green and the actual temperature curve in red. The curves can be zoomed to a resolution of 0.01°C and 1 second. The graph can be moved by touch, enlarged, or the button bar can be used to achieve the desired graph display. This large graph screen will appear in the following cases:

- by zooming in on the graph module on the home screen
- by pressing the Graph button in the programming mode screens
- by pressing the left part of the graph on the database screen
- by pressing the Graph button in the progress information (Prog.info)

1 Graph

The graph's area offers more manipulation options through simple one-finger operation:

- shift of temperature curves: scrolling the graph exactly copies the scrolling of the finger on the screen. It is not possible to scroll for too long (2 seconds) because then the zoom function is activated
- zooming of temperature curves: if the graph is touched for more than 2 seconds, it will automatically zoom around the touch point. You can also move your finger while zooming in to refine the location you are zooming in on
- optimal scaling of temperature curves: if you do a quick double-tap on the graph (similar to double-clicking the mouse on a PC), the graph scales are optimized to show both the entire program curve and the entire actual temperature curve

2 Back



Return to the previous screen.

3

Zoom



Manual zoom and shift of the graph.

4

Setup



Predefined axis scales, curves, and graph direction selection. Details can be found in the next article [Graph settings](#).

6.8. Graph settings



The graph settings bring predefined ranges of temperatures and times for faster display of the required graph scales. It offers 8 buttons, 4 for adjusting the temperature range and 4 for adjusting the time range.

- 1** **Y:Tabs**

Y:Tabs Sets the maximum temperature in the graph equal to the maximum adjustable temperature of the controller ([Maximum control temperature](#))
- 2** **Y:Prog**

Y:Prog Sets the maximum temperature in the graph according to the maximum temperature of the program curve (+ 10%)
- 3** **Y:Tmax**

Y:Tmax Sets the maximum temperature in the graph according to the maximum temperature reached in the current (previous) actual temperature curve (+ 10%)
- 4** **Y:Zoom**

Y:Zoom Double zoom of the temperature range according to the center of the graph (e.g. the range 100°C - 500°C changes to 200°C - 400°C). The zoom can be repeated.

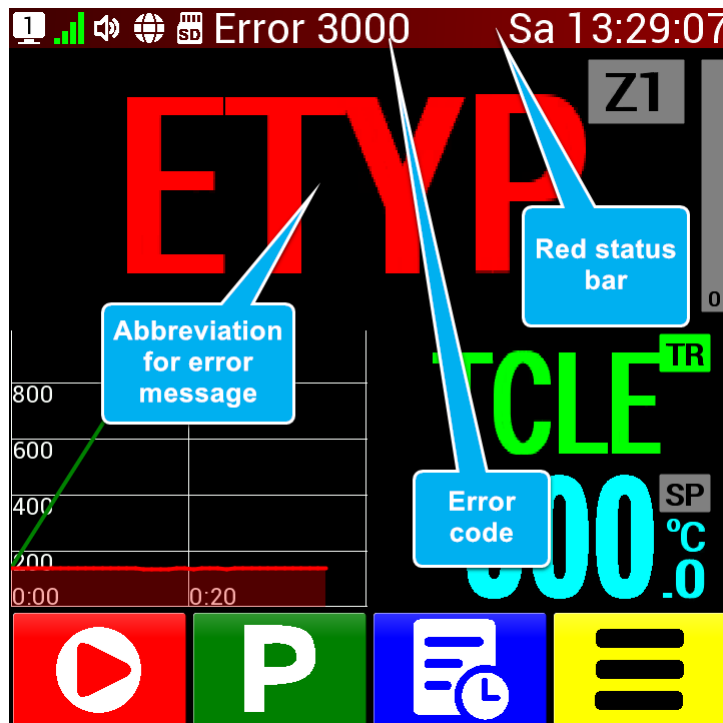
5**X:Prog****X:Prog**Sets the timeline to show the entire program curve (+ 5%)

6**X:Run****X:Run**Adjusts the timeline to show the entire actual curve (+ 5%)

7**X:1/4****X:1/4**Sets the timeline to show the first quarter of the actual curve (26% to be exact)

8**X>Last****X>Last**Sets the timeline to show the last half hour of the actual waveform

6.9. Error messages



The controller can detect various types of malfunctions when reading an analog signal. It differentiates between ADC converter failure, processor or expansion board analog input error, and for thermocouples, it detects exceeding the maximum adjustable value, reversed thermocouple polarity, and often the wrong type of selected thermocouple. Any error will cause the program to stop (if it was started) and prevent the program from starting. The error is evident on the display according to the following indicators:

- the status bar is displayed in red
- an inscription appears in the middle of the status bar **Error** followed by an error code
- a text abbreviation of the error is displayed at the temperature location in the respective zone

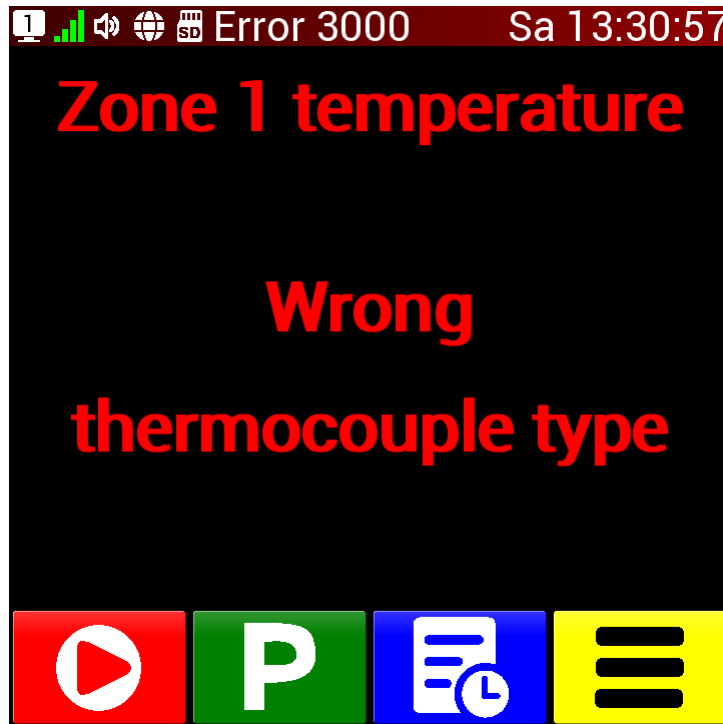
The following table describes the errors:

Error number	Displayed error and description	Error removal
1	ETHI Maximum temperature exceeded	Check the type of thermocouple at the corresponding analog input. Adjust the control constants when controlling near the maximum adjustable temperature. Increase the maximum adjustable temperature if the connected device, type of thermocouple and material allows it
2	EPOL Reverse thermocouple polarity	Rotate the thermocouple for correct polarity
3	ETYP Wrong type of thermocouple	Change the thermocouple type in Settings (Type of analog input Zx) according to the thermocouple actually connected
4	EADC ADC converter error	Analog-to-digital converter error in the processor or expansion board - contact the controller manufacturer (Introduction)

5	ECON Error in the analog part of the input	Error of the analog part of the input in the processor or expansion board - contact the controller manufacturer (Introduction)
---	--	--

The error code in the status bar identifies the error. Each digit of the code corresponds to a zone: the first digit (thousands) belongs to zone 1 (Z1), and the fourth digit (units) belongs to zone 4 (Z4). The actual digit then expresses the error code according to the above error table. For example, code 3000 (pictured above) indicates the wrong type of thermocouple in zone 1.

If it is possible to zoom the module ([Increase area module](#)), then by touching the error message a description of the corresponding shortcut will be displayed (see following picture).



6.10. Controller after switching on



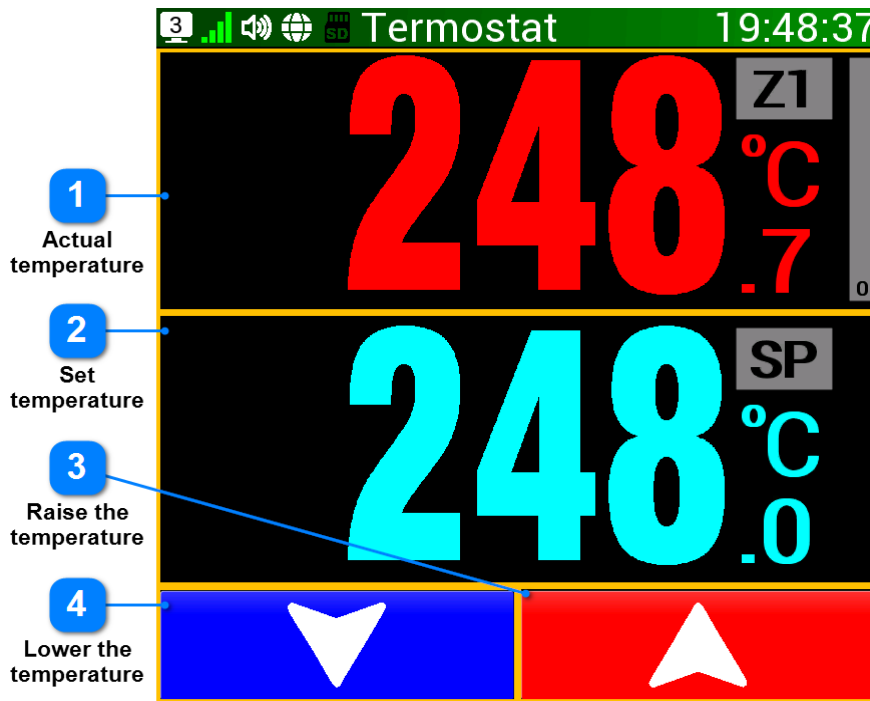
After switching on the controller (or after a power failure), a short animation of the logo with the name of the controller is displayed by default. This animation can be turned off in Settings ([Introductory logo](#)).

At the same time, the controller checks its status and settings. These checks take approximately 1 second. If it detects a problem in the controller's memory, it will use an earlier backup. If the older backup is also corrupted, it will display instructions to initialize the controller.

The controller also checks whether the program has been started and whether there has been a power failure. During the running of the program, it saves information about its status every second so that it can continue the interrupted program in the event of a power failure. The behavior of the controller after a power failure can be influenced in the Settings (article [Continuation on failure](#)). Here, it is possible to choose whether the controller should continue the program after a blackout or set the duration of the power outage until which it will continue. If the blackout is longer than the set time, then the program is terminated immediately after the blackout.

The controller also reads information from the real-time clock circuit, which is backed up by a battery with a lifespan of about 50 years. This clock operation with help of calibration can reach an accuracy of 1 ppm (about 1 second in 11 days) and is unaffected by a power failure.

6.11. Thermostat mode



Thermostat mode is the easiest way to use the controller. The principle is the same as for a room thermostat: the desired temperature is set, and the controller tries to maintain it. For setting, there are only two buttons on the button bar for decreasing or increasing the desired temperature. After a possible power failure, the controller continues to regulate to the last set temperature. Activating Thermostat mode is described in the article: [Thermostat function](#). Deactivation is done via Settings (first you need to activate the Menu screen - see the article [Menu](#)).

1

Actual temperature

The actual temperature in the main zone 1. The color, label **Z1**, the number of decimal places and the bar graph of the current performance can be configured in Settings.

2

Set temperature

The last set temperature (Set Point). The color, label **Z1** and the number of decimal places can be configured in Settings.

3

Raise the temperature

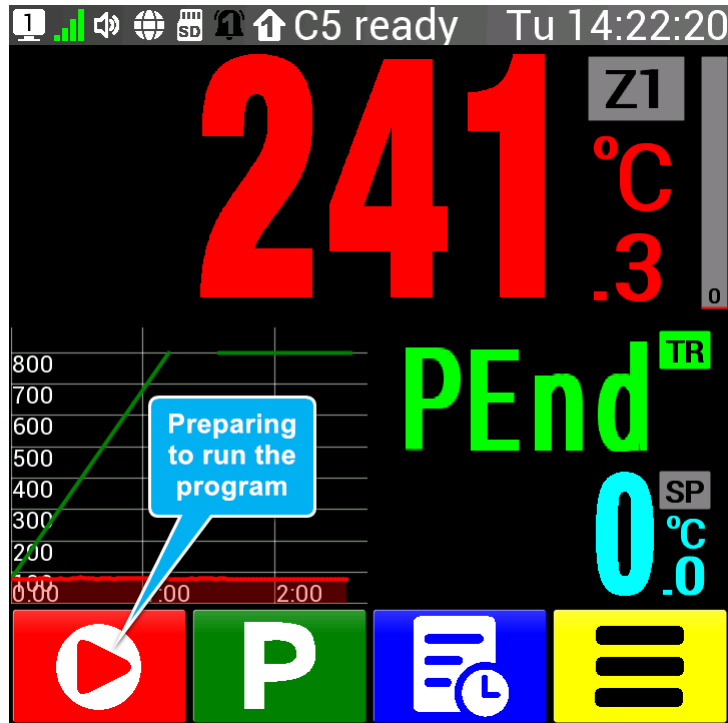
Button to increase the set temperature. It is possible to hold the button to increase the set temperature repeatedly at an accelerated rate. The temperature increase step can be selected in Settings (see the article [Step on temperature change](#)).

4

Lower the temperature

Button to decrease the set temperature. It is possible to hold the button to repeatedly reduce the set temperature rapidly. The temperature reduction step can be selected in Settings (see the article [Step on temperature change](#)).


7. Manual mode



Manual mode is suitable for its simplicity in quickly working with the controller. It is a completely independent and self-sufficient mode that allows the user to perform basic operations with the controller.

In manual mode, one speed of temperature increase, one set temperature, and one delay (duration) at this temperature can be entered. The delay does not have to be time-limited. It is very practical to start the created program at a specified time and to change all parameters while the program is running.

Parameters are entered in a uniform manner, and all parameters remain after switching off the controller until they are re-entered. The order of entering the parameters is arbitrary; it will be aligned automatically after starting the program. The controller first reaches the set temperature with the selected ramp, and then the set delay (endurance) begins.

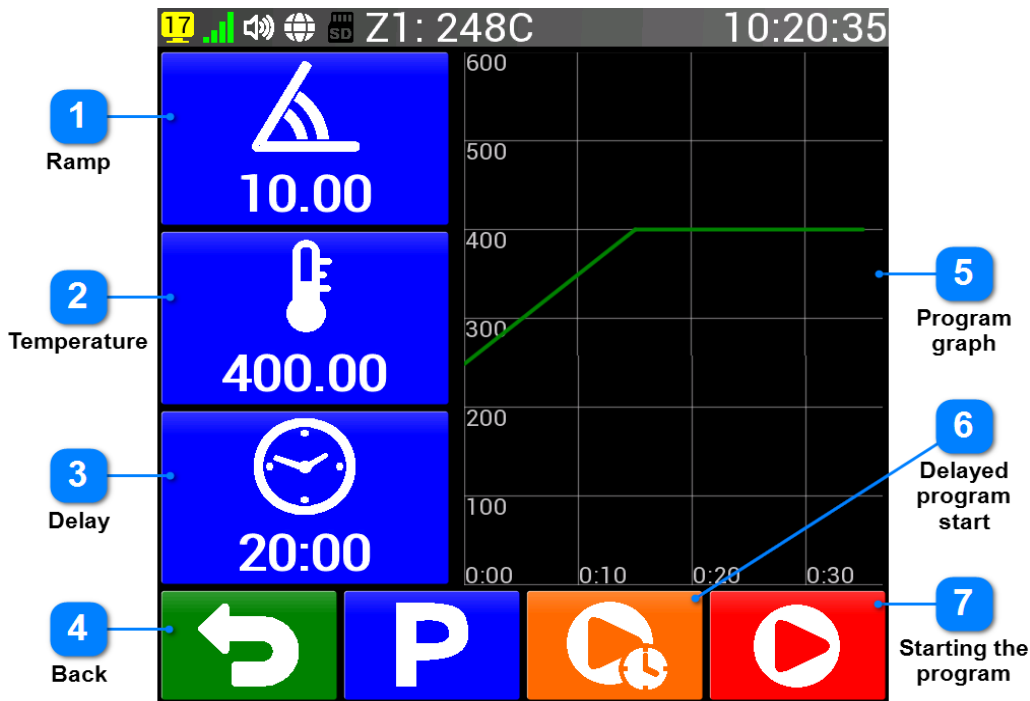
By pressing the  (Back) button repeatedly from any situation, we get to the home screen, which is the basic point for handling the controller.


Contents of the chapter Manual mode

- [Preparing to run the program](#)
- [Rate of temperature change](#)
- [Set temperature](#)
- [Temperature delay](#)
- [Delayed start](#)
- [Starting the program](#)
- [Preparing to end the program](#)
- [Change the current ramp](#)
- [Changing the set temperature](#)
- [Changing the current duration](#)
- [Suspension of regulation](#)
- [Skipping a program block](#)

- [Examples](#)

7.1. Preparing to run the program



After pressing the  (Start) button on the home screen, we get to the program launch preparation. On this screen, we see an overview of the parameters of the manual program, which we can modify before starting. Next, a graphical representation of this program and the possibility of starting it or delaying its start.

1 Ramp

With this parameter, it is possible to set the rate of temperature change to reach the set temperature. More information can be found in the article [Rate of temperature change](#).



2 Temperature

Use the Temperature button to enter the set temperature that the controller should reach. More information can be found in the article [Set temperature](#).



3 Delay

The Delay button allows you to set the delay during which the controller will maintain the set temperature. More information can be found in the article [Temperature delay](#).



4

Back

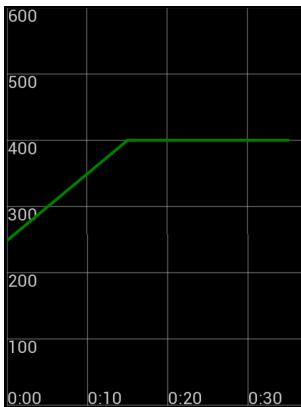


Return to the home screen (without starting the program).

5

Program graph

Graphic representation of the program in manual mode. The program is drawn with a green curve; the graph shows the maximum temperature and the total time of the entire program. The default temperature of the program is the current temperature of zone 1 (the curve is drawn from this temperature). Touching the graph expands it to the entire screen. After another touch, the graph will be displayed again in its original size.



6

Delayed program start



Delayed start is a practical function of the controller, which allows the program to be started only at the time selected by the user. A detailed description can be found in the article [Delayed start](#).

7

Starting the program



This button will confirm all displayed parameters and start the program immediately. The home screen will automatically appear on the display. More information can be found in the article [Starting the program](#).

7.2. Rate of temperature change



After pressing the ramp button on the program launch preparation screen, a universal screen is displayed for entering various values (parameters) of the controller. The rate of temperature change can be entered in the range of 0.00 to 6000.00 °C per minute with accuracy to two decimal places. If we enter a value of **0.00** (also referred to as **Fast**) the change is made immediately, and the controller will therefore heat or cool to the set temperature at the maximum speed achievable in the regulated device. It is not possible to enter a value outside the allowed range. The value can be entered using the numeric keypad or the increase and decrease buttons. The entered value is confirmed with the appropriate button, or it is possible to return to the previous screen without confirmation using the **Back** button.

1

Description of the value

A brief description of the value or parameter that we will enter, with an indication of the units.

Manual ramp speed [°C/min]

2

Value range

Allowed range for entering the rate of temperature change 0.00 to 6000.00 °C/min.

Min: Fast
Max: 6000.00

3


Input value

At this point on the screen, we see the value or parameter that we enter.

50.00

4

Numeric keypad

The numeric keypad, similar to a calculator, allows you to enter the desired value. Button  is used to delete the last digit entered.



5

Back



With this button, we can return to the previous screen while maintaining the original value (parameter).

6

Increase value



Button to increase the rate of temperature change. It is possible to hold the button and thereby increase the set temperature repeatedly at an accelerated rate.

7

Decrease the value



Button to reduce the rate of temperature change. It is possible to hold the button and thereby repeatedly reduce the set temperature rapidly.

8

Confirm



Confirming the entered value and returning to the previous screen - article [Preparing to run the program](#).

7.3. Set temperature



After pressing the temperature button on the program launch preparation screen, a universal screen is displayed for entering various values (parameters) of the controller. The set temperature can be entered in the range of 0.01 to the maximum temperature (according to Settings - article [Maximum control temperature](#)) to two decimal places. It is not possible to enter a value outside the allowed range. The value can be entered using the numeric keypad or the increase and decrease buttons. The entered value is confirmed with the appropriate button, or it is possible to return to the previous screen without confirmation using the **Back** button.

ATTENTION: Set temperature

If the required temperature is entered incorrectly and the regulation is set at temperatures higher than those permitted for the connected equipment or for the heated materials, the equipment or materials may be damaged or destroyed by overheating!

1

Description of the value

A brief description of the value or parameter that we will enter, with an indication of the units.

Manual setpoint temp. [C]

2

Value range

The allowed range for the set temperature is 0.01 to the maximum temperature (according to Settings - article [Maximum control temperature](#)) °C.

Min: 0.01
Max: 1050.00


3**Input value**

At this point on the screen, we see the value or parameter that we enter.



900.00

4**Numeric keypad**

The numeric keypad, similar to a calculator, allows you to enter the desired value. The button  is used to delete the last digit entered.

**5****Back**

With this button, we can return to the previous screen while maintaining the original value (parameter).

6**Increase value**

Button to increase the set temperature. It is possible to hold the button and thereby increase the set temperature repeatedly at an accelerated rate.

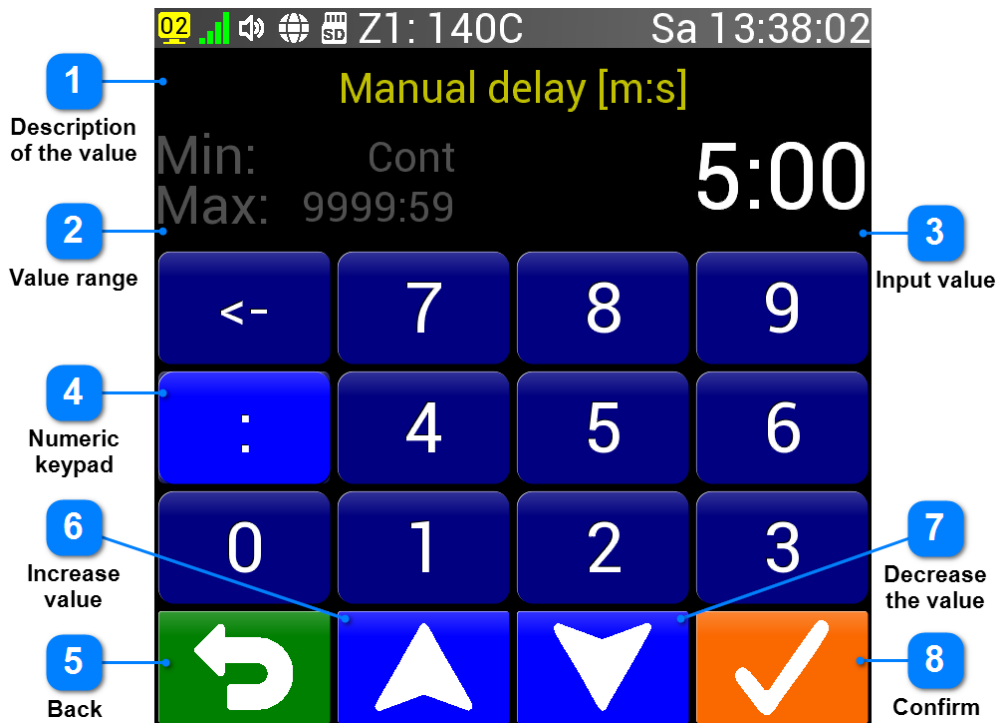
7**Decrease the value**

Button for lowering the set temperature. It is possible to hold the button and thereby repeatedly reduce the set temperature rapidly.

8**Confirm**

Confirming the entered value and returning to the previous screen - article [Preparing to run the program](#).

7.4. Temperature delay



After pressing the delay button on the program launch preparation screen, a universal screen is displayed for entering various values (parameters) of the controller. The desired delay (time of holding at the temperature) can be entered in the range of 0:00 to 9999:59 with an accuracy of one second. If we enter a value of **0:00** (also referred to as **Cont**) the delay will be permanent (the set temperature will be regulated continuously until manual shutdown or a possible malfunction). It is not possible to enter a value outside the allowed range. The value can be entered using the numeric keypad or the increase and decrease buttons. The entered value is confirmed with the appropriate button, or it is possible to return to the previous screen without confirmation using the **Back** button.

1

Description of the value

A brief description of the value or parameter that we will enter, with an indication of the units.

Manual delay [m:s]

2

Value range

The allowed range for entering the desired temperature delay is 1 second to 9999 minutes 59 seconds.

Min: Cont
Max: 9999:59

3


Input value

At this point on the screen, we see the value or parameter that we enter.

5:00

4

Numeric keypad

The numeric keypad, similar to a calculator, allows you to enter the desired value. The button  is used to delete the last digit entered.



5

Back



With this button, we can return to the previous screen while maintaining the original value (parameter).

6

Increase value



Button to increase the desired delay. It is possible to hold the button and thereby repeatedly increase the set delay at an accelerated rate.

7

Decrease the value



Button to decrease the desired delay. It is possible to hold the button and thereby repeatedly reduce the set delay rapidly.

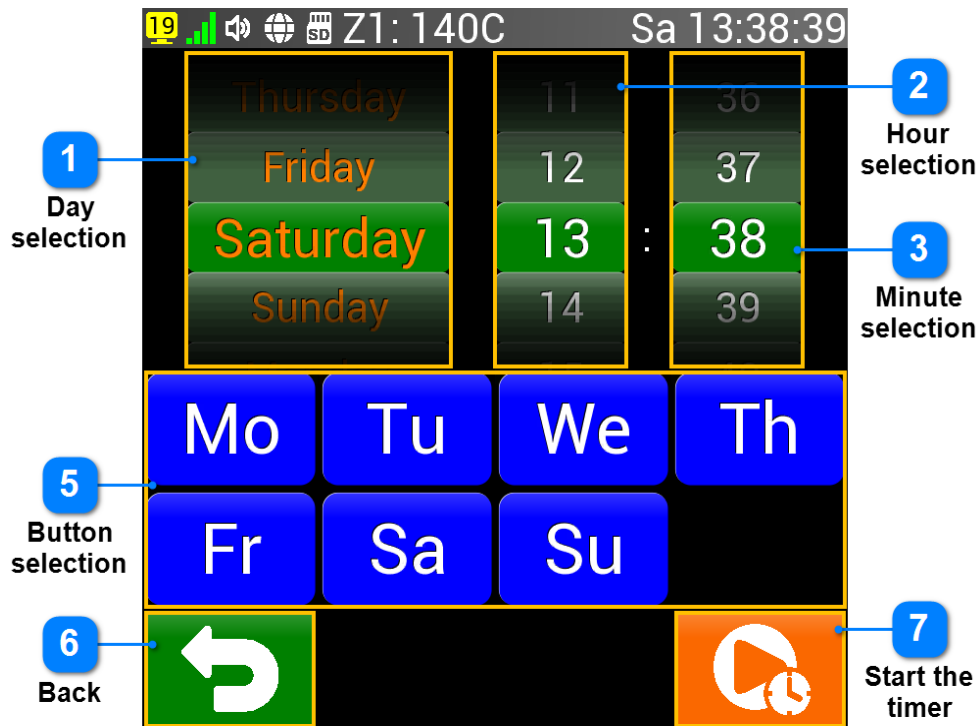
8

Confirm



Confirming the entered value and returning to the previous screen - article [Preparing to run the program](#).

7.5. Delayed start



Delayed start allows you to postpone the start of the selected program to a later time. Shifting is possible up to a week in advance, so you can enter the day of the week, hour, and minute of the start. Entry is possible in two ways. The first is the use of rotating elements (**1-3**), where we select the desired start time by moving these elements. By default, the time can be set in 5-minute increments; in the Settings, there is an option to display the rotating element in steps of 1 minute (article [Step at delayed start](#)).

The second way is to enter the time using the buttons in the Selection area (**5**). Here we enter the time in 24-hour format in the form **0930** for the required time **9:30** (morning). Confirm the entered time with the button **Later** (**7**) or it is possible to return to the previous screen without confirming using the **Back** button.

1

Day selection

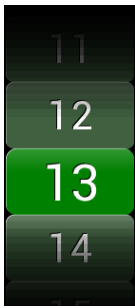
Rotary element for selecting the day of the week. The selected value is displayed in the center in a larger font with a green background.



2

Hour selection

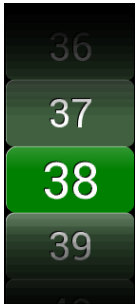
Rotary element for the hour of program start. Range 00-23. The selected value is displayed in the center in a larger font with a green background.



3

Minute selection

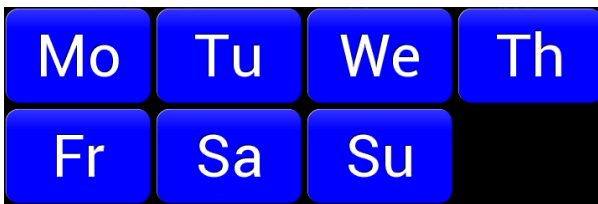
Rotary element for the minute the program starts. Range 00 - 55 (or 00 - 59). The selected value is displayed in the center in a larger font with a green background.



5

Button selection

The area where the buttons for selecting the day and time to start the program are displayed. Range Mon - Sun for the day of the week or digits 0 - 9. Only those digits that can be currently used are displayed.



6

Back



With this button, we can return to the previous screen while maintaining the original value (parameter).

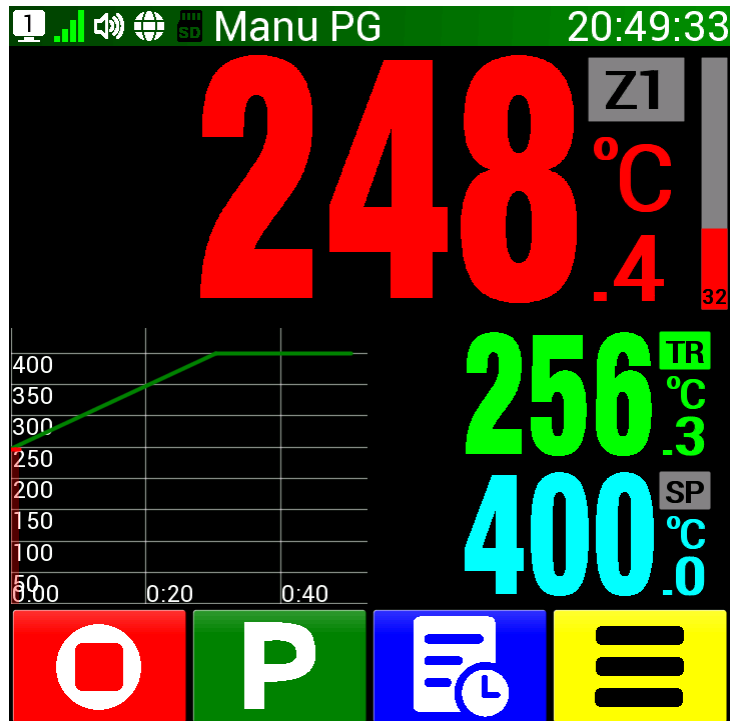
7


Start the timer





Return to the home screen and start the program's delayed start timer.

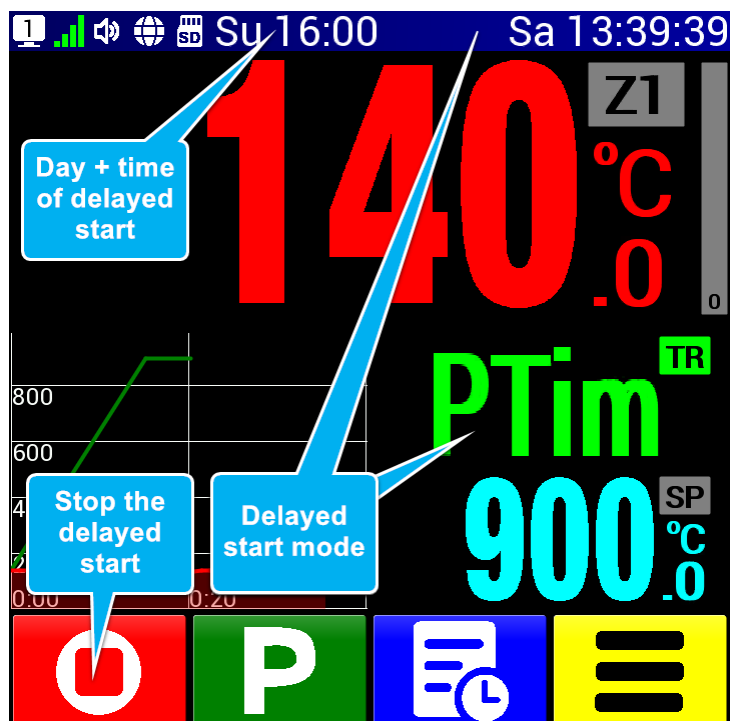
7.6. Starting the program





If the desired day and time of the delayed start occurs or the manual program is directly started with the button  (Start) this screen will appear.


The mode of the running manual program can be recognized by the following indicators:

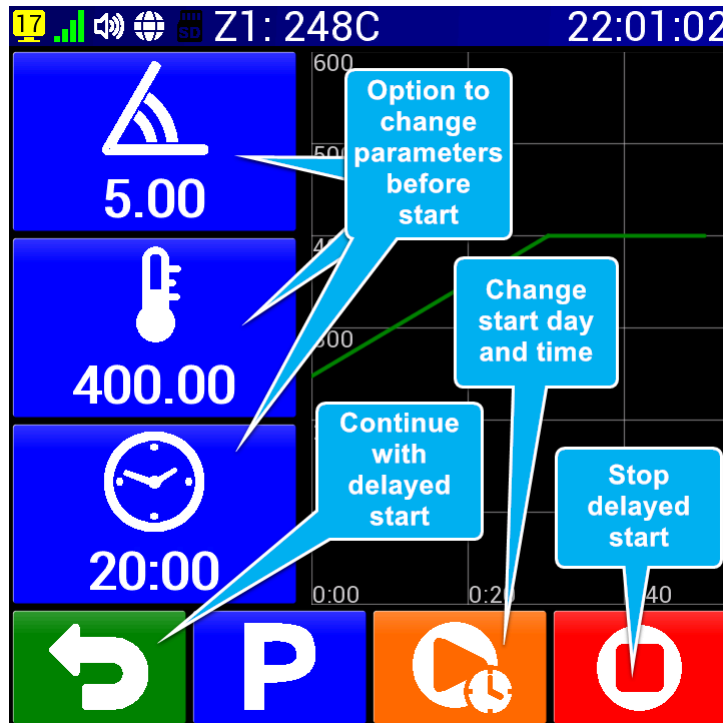
- the status bar is shown in green
- an inscription is permanently displayed in the middle of the status bar **Manu PG**
- the regulated temperature or the time remaining until the end of the temperature delay is displayed in the middle part of the screen
- instead of a button  (Start) a button  (Stop - Stopping the program) is displayed as an option to end the manual program - details in the article [Stop the program](#).



In case we have used delayed start to start the program, this home screen will be displayed. The delayed start mode and waiting for the desired day and time can be seen from these indicators:


- the status bar is displayed in blue
- the inscriptions alternate in the middle of the status bar **Manu PG** and **Su 21:10**, which indicate that the manual program will be started on the appropriate day and time
- a large inscription is displayed at the place of the regulated temperature **Tim** (Program Timer) alerting to a delayed start
- instead of a button  (Start) a button  (Stop - Start stop) is displayed as an option to stop the delayed start.

If we press the button  during delayed start the following screen will appear, similar to the screen for preparing to run the program:

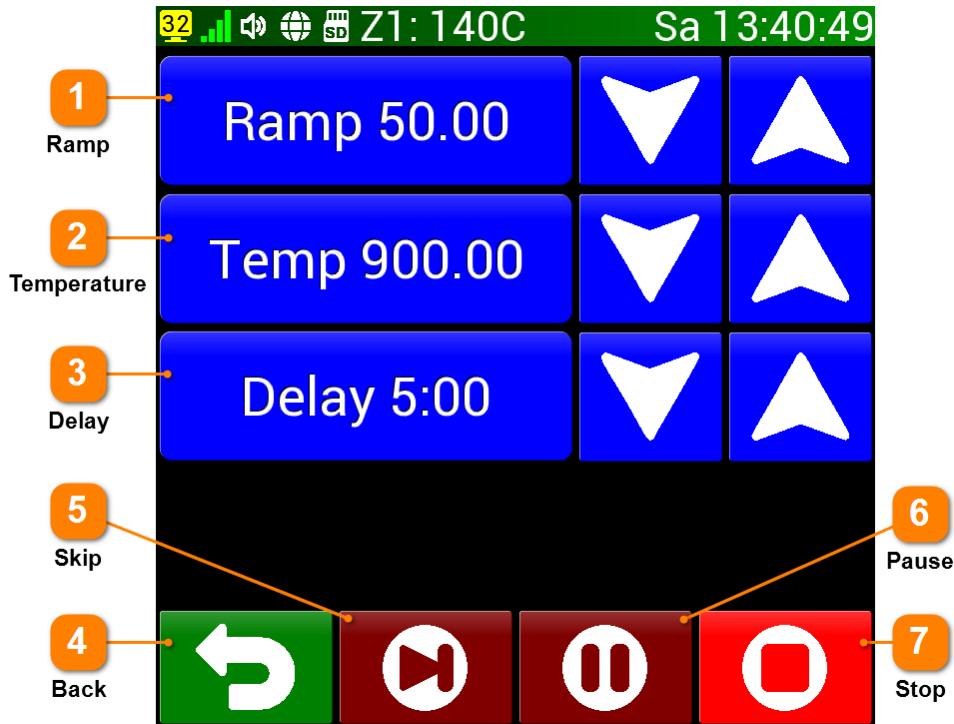






Now we have the possibility to change the parameters of the manual program even before it starts.

- change of temperature ramp rate - see article [Rate of temperature change](#)
- change of the set temperature - see article [Set temperature](#)
- change of delay time at the temperature - see article [Temperature delay](#)
- change of day and time of program start - according to the article [Delayed start](#)

The screen also offers to exit the delayed start mode with a button  (Stop). In that case, the home screen will appear in idle mode - see [Manual mode](#).

7.7. Preparing to end the program



If we press the button on the home screen while the program is running  (Stop - Stopping the program) the screen for preparing to end the program and many other options will appear. However, these options must be enabled in Settings - see articles [Changing the program on the fly](#) and [Option to skip and pause](#). If they are not enabled, only the buttons  (Back) and  (Stop) are displayed. In case of pressing the button  (Stop) the program will be terminated immediately and the home screen will be displayed ([Manual mode](#)).

1

Ramp

Possibility of changing the ramp while the program is running, more information in the article [Ramp change](#)



2

Temperature

The possibility of changing the set temperature while the program is running, more information in the article [Changing the set temperature](#)



3

Delay

Possibility of changing the delay while the program is running, more information in the article [Change delay](#)

Delay 5:00



4

Back



Return to the home screen

5

Skip



Option to skip the block (in the manual program, it either ends the ramp and starts the delay or ends the delay and thus the entire manual program). More information in the article [Skipping a program block](#)

6

Pause



Option to suspend regulation. More information in the article [Suspension of regulation](#)

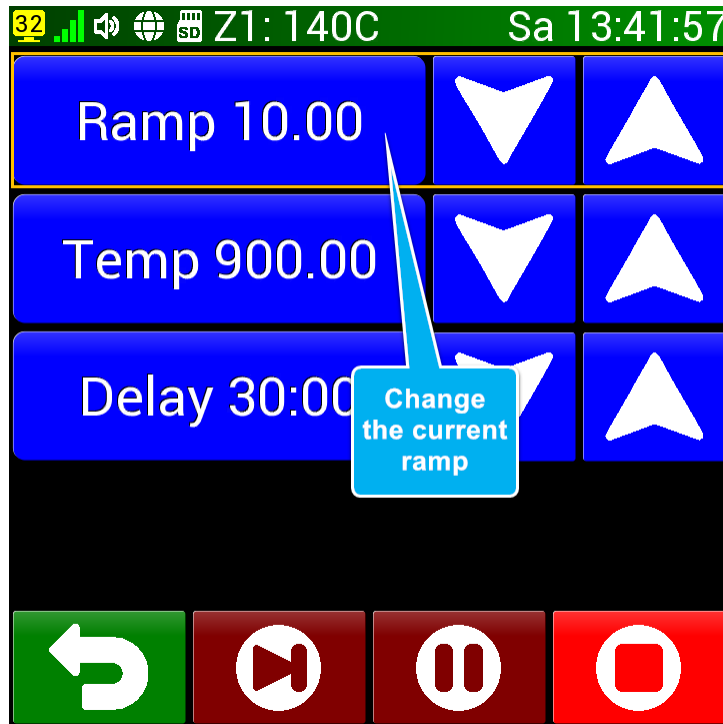
7


Stop






Immediate termination of the program. The controller will return to the home screen

7.8. Change the current ramp

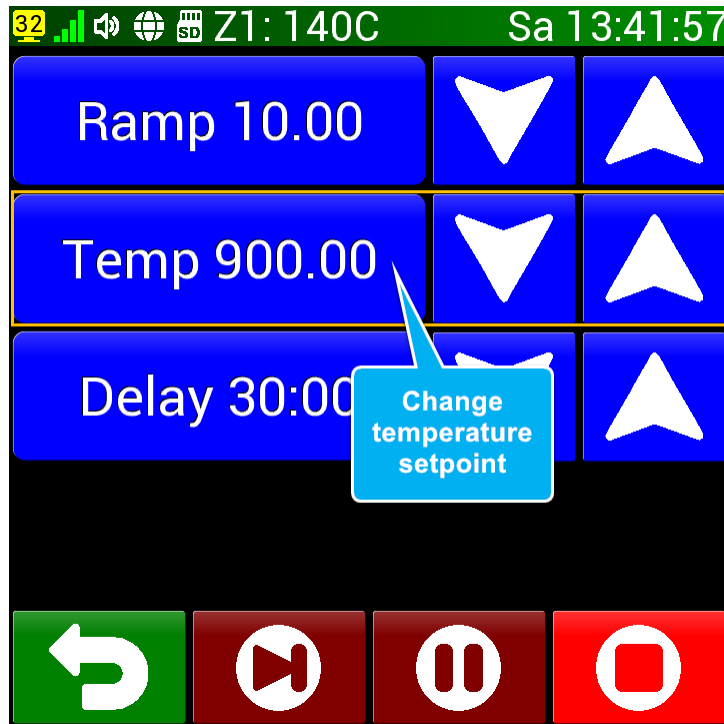



By pressing the button  (Stop) on the home screen while the program is running, we get to the screen for preparing to end the program. If the Settings (article [Changing the program on the fly](#)) allow changing the parameters of the program while it is running, we will see in the upper part of the screen the possibility of changing the current ramp (see upper image).



The ramp can be changed with the arrows  (Up) a  (Down) in the range of 0.01 - 6000.00 °C per minute. The ramp change step after pressing the arrow can be set in Settings (article [Step when changing the ramp](#)).


The second option to change the ramp is to press the button directly labeled **Ramp**, which will bring us to the current ramp entry screen. Here the control is exactly the same as in the previous article [Rate of temperature change](#). The only change is the display of the inscription **Current ramp** instead of **Manual ramp**. Confirm the newly entered rate of temperature change here with the button  (OK) and the controller will start using it immediately.

7.9. Changing the set temperature

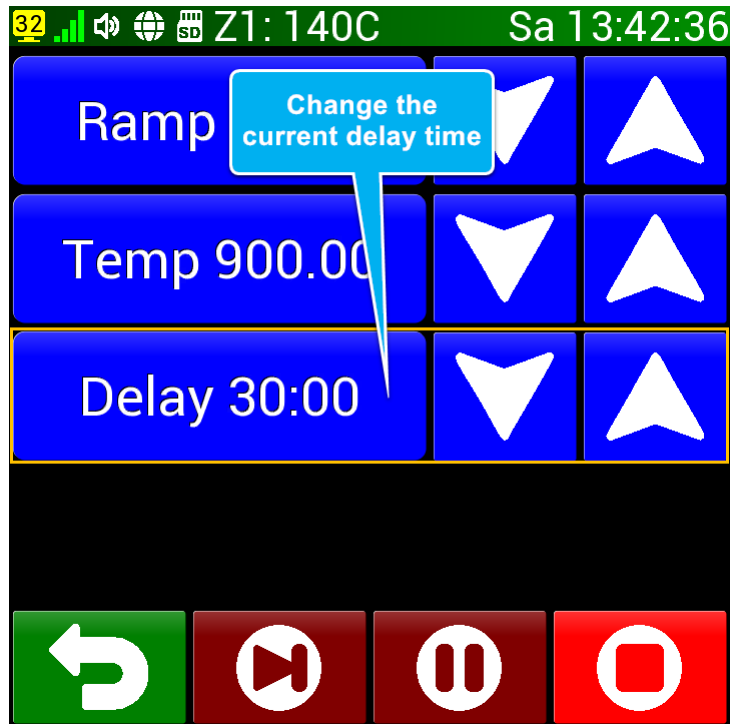



By pressing the button  (Stop) on the home screen while the program is running, we get to the screen for preparing to end the program. If the Settings (article [Changing the program on the fly](#)) allow changing the parameters of the program while it is running, we will see in the upper part of the screen the possibility of changing the current set temperature (see upper picture).



The temperature can be changed with the arrows  (Up) a  (Down) in the range of 0.01 - up to the maximum temperature (according to Settings - article [Maximum control temperature](#)). The step of changing the set temperature after pressing the arrow can be set in Settings (article [Step on temperature change](#)).


The second option to change the set temperature is to press the button directly labeled **Temperature**, which will bring us to the set temperature entry screen. Here the control is exactly the same as in the previous article [Set temperature](#). The only change is the display of the inscription **Current temperature** instead of **Manual temperature**. Confirm the newly set temperature here with the button  (OK) and the controller will start using it immediately.

7.10. Changing the current delay

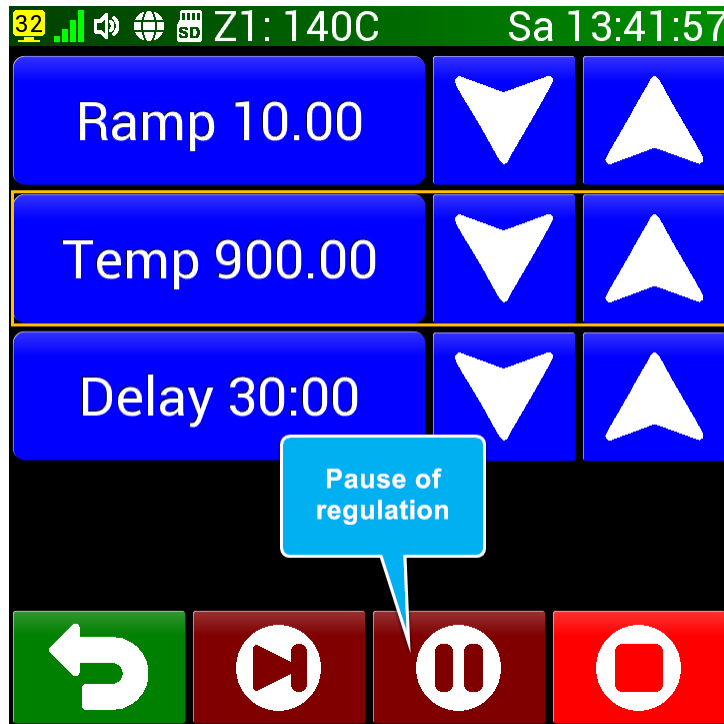



By pressing the button  (Stop) on the home screen while the program is running, we get to the screen for preparing to end the program. If the Settings (article [Changing the program on the fly](#)) allow changing the parameters of the program while it is running, we will see in the upper part of the screen the possibility of changing the current delay time at the set temperature (see upper picture).


The delay can be changed with the arrows  (Up) and  (Down) in the range 0:01 - 9999 minutes 59 seconds. The step of changing the delay after pressing the arrow can be set in Settings (article [Step when changing the delay](#)).

The second option to change the delay time is to press the button directly labeled **Delay**, which will bring us to the current delay entry screen. Here the control is exactly the same as in the previous article [Temperature delay](#). The only change is the display of the inscription **Current delay** instead of **Manual delay**. Confirm the newly entered delay time here with the button  (OK) and the controller will start using it immediately. If we specify a time **0:00**, we change any delay time to constant delay (**Cont**).

7.11. Suspension of regulation

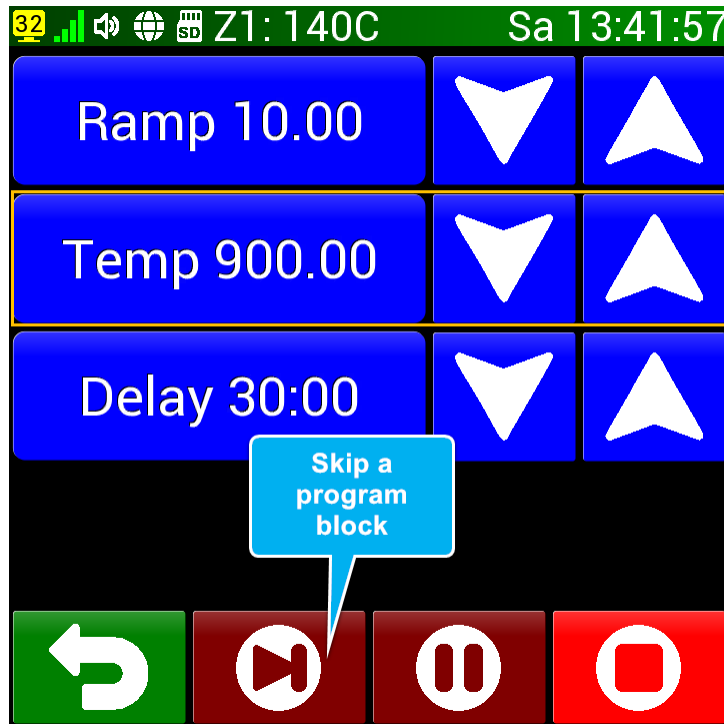



By pressing the  (Stop) button on the home screen while the program is running, we are taken to the screen for preparing to end the program. If in option to pause (suspend regulation) is enabled in Settings (article [Option to skip and pause](#)), a corresponding brown button will appear in the button bar (see the top image).



If we press the  (Pause) button, regulation is suspended. The status bar will turn red and if we return to the home screen, we will see **P02 Pause** displayed in the status bar (or P00 for a manual program). If a ramp is in progress, the regulated temperature will stop changing. If a delay is in progress, the delay time will be suspended. The controller will maintain the last regulated temperature during the suspension. In the event of a power failure, the suspension remains active and must be manually turned off.

The suspension is turned off by pressing the  (Pause) button again on the program exit preparation screen (see the top image).


7.12. Skipping a program block



By pressing the  (Stop) button on the home screen while the program is running, we are taken to the screen for preparing to end the program. If the option to skip (a program block) is enabled in Settings (article [Option to skip and pause](#)), a corresponding brown button will appear in the button bar (see the top image).

If we press the  (Skip) button, a confirmation button  (OK) will appear in the button bar for 5 seconds, replacing the Pause button.



If we press the  (OK) button before it disappears, the controller will end the current program block and begin executing the next one. If a ramp is running in the manual program, the set temperature will start to be regulated immediately, and the delay at this temperature will begin counting down. If there is already a delay in the manual program, the program will end.



7.13. Examples

IMPORTANT: The starting point of the examples

All examples are based on the home screen. For examples **M01 - M08** the controller is at rest (gray status bar), in others the program is already running (green status bar)





Example M01

We would like to check the set temperature (ramp and delay).

1. With a button  (Start) we get to the launch preparation screen
2. We check the set temperature in the left part of the screen
3. We return to the home screen with the button  (Back)





Example M02

We want to set a delay of 120 minutes (without starting the program).

1. With a button  (Start) we get to the launch preparation screen
2. With the button  (Delay) we go to enter a manual delay
3. Enter the value **120** using numbers or arrows
4. Confirm the value with the button 
5. We return to the home screen with the button  (Back)









Example M03

We want to reach a temperature of 900°C.

1. With a button  (Start) we get to the launch preparation screen
2. With the button  (Temperature) we go to the temperature setting
3. Enter the value **900** using numbers or arrows
4. Confirm the value with the button 
5. Start the regulation with the button  (Start)









Example M04

We want to constantly regulate the temperature of 1100°C and turn it off ourselves after a certain time.

1. With a button  (Start) we get to the launch preparation screen
2. With the button  (Temperature) we go to the temperature setting
3. Enter the value **1100** using numbers or arrows
4. Confirm the value with the button 
5. With the button  (Delay) we go to enter a manual delay
6. Enter the value **0** using numbers or arrows
7. Confirm the value with the button  In the case of a delay, an inscription appears instead of the time **Cont**
8. Start the regulation with the button  (Start)
9. Now the regulation is in progress, which we interrupt after a certain time with the button  (Stop)
10. On the program stop screen, confirm the stop again with the button  (Stop)
11. This exits the manual program and displays the home screen



Example M05

We need to reach a temperature of 1000°C at a rate of 4°C/min and hold the temperature for 1 hour.

1. With a button  (Start) we get to the launch preparation screen
2. With the button  (Temperature) we go to the temperature setting
3. Enter the value **1000** using numbers or arrows
4. Confirm the value with the button 
5. With the button  (Ramp) we go to enter a manual delay
6. Enter the value **4** using numbers or arrows
7. Confirm the value with the button 
8. With the button  (Delay) we go to enter a manual delay
9. Enter the value **60** using numbers or arrows (input is in minutes)
10. Confirm the value with the button 
11. Start the regulation with the button  (Start)









Example M06

We want to execute the same program as last time.

1. With a button  (Start) we get to the launch preparation screen
2. Since we do not need to change any parameters, we confirm the launch with the button  (Start)













Example M07

Tomorrow (Thursday) at 4:00 p.m. we want to start the already set manual program.

1. With a button  (Start) we get to the launch preparation screen
2. The parameters are pre-set, we go to setting the delayed start time with the button  (Later)
3. Press the button  for the program to run on Thursday
4. We press the buttons one by one     which will set the start time to 4:00 p.m
5. Confirm the delayed start by pressing the button  (Later)



Example M08

On Tuesday morning at 8:30, we want to regulate to 600°C and maintain this temperature until the program is stopped manually.

1. With a button  (Start) we get to the launch preparation screen
2. With the button  (Temperature) we go to the temperature setting
3. Enter the value **600** using numbers or arrows
4. Confirm the value with the button 
5. With the button  (Delay) we go to enter a manual delay
6. Enter the value **0** using numbers or arrows
7. Confirm the value with the button  In the case of a delay, an inscription appears instead of the time **Cont**
8. The parameters are now set, we move on to setting the delayed start time with the button  (Later)
9. Press the button  for the program to run on Tuesday
10. We press the buttons one by one     which sets the start time to 8:30 in the morning
11. Confirm the delayed start by pressing the button  (Later)





Example M09

A program has been started by mistake and we want to close it immediately.

1. Press the button on the home screen  (Stop)
 2. On the screen for stopping the program, confirm the stop again with the button  (Stop)





Example M10

We want to reduce the temperature rise rate in the already running program to 3.5°C per minute

1. Press the button on the home screen  (Stop)
 2. With the button  (Ramp) we move on to entering the newly required speed of temperature rise
 3. Enter the value **3.5** using numbers (and decimal point) or arrows
 4. Confirm the value with the button 
 5. We return to the home screen with the button  (Back)
-





Example M11

In the already running program, we want to change the set temperature to 700 °C.

1. Press the button on the home screen  (Stop)
 2. With the button  (Temperature) we go to change the set temperature
 3. Enter the value **700** using numbers or arrows
 4. Confirm the value with the button 
 5. We return to the home screen with the button  (Back)
-







Example M12

We need to extend the delay by 20 minutes in an already running program.

1. Press the button on the home screen  (Stop)
 2. With the button  (Delay) we move on to entering the delay time at the set temperatures
 3. Use numbers or arrows to enter a value 20 minutes longer than what is currently displayed
 4. Confirm the value with the button 
 5. We return to the home screen with the button  (Back)
-





Example M13

We would like to pause a running program and resume it after a certain period of time.

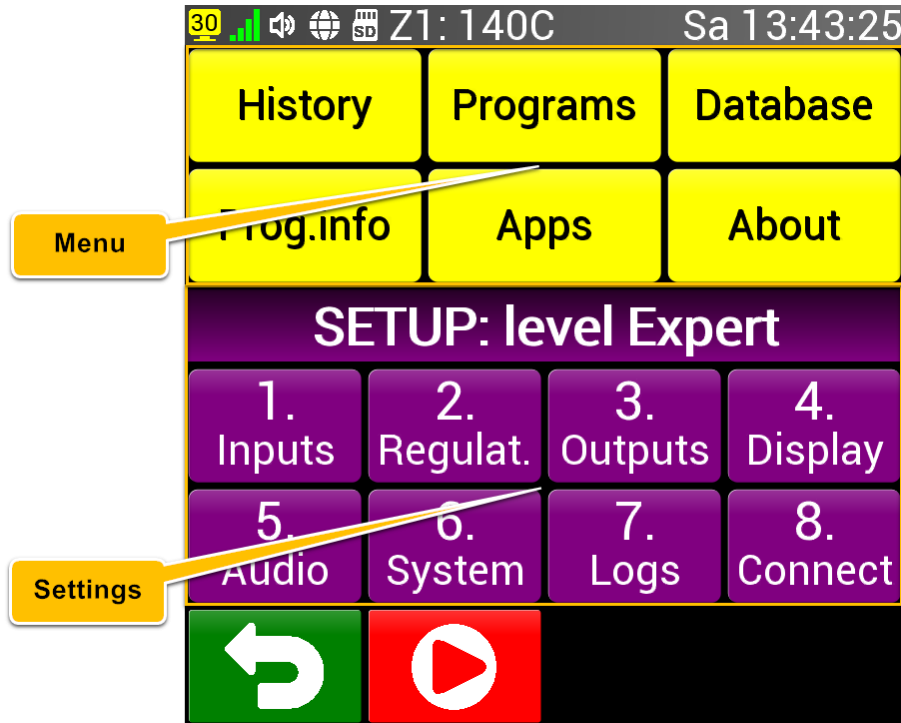
1. Press the button on the home screen  (Stop)
 2. Pause the program with the button  (Pause), the status bar turns red
 3. We return to the home screen with the button  (Back)
 4. After a certain time on the home screen, we press the button  (Stop)
 5. Start the program again with the button  (Pause), status bar green
 6. We return to the home screen with the button  (Back)
-


Example M14

We want to skip the currently executed ramp in the running manual program.

1. Press the button on the home screen  (Stop)
2. Press the button  (Skip), a confirmation button will appear next to it for 5 seconds
3. Confirm skipping the block with the button  (OK), the ramp will be skipped and the delay will begin
4. We return to the home screen with the button  (Back)

8. Menu



The menu is actually a signpost to the different options of the controller outside of the home screen. We can get to the Menu from the home screen by pressing  (Menu). If this button is not on the home screen, it is possible to bring up the screen by pressing and holding the display where there is no button or graph for 8 seconds. The menu at the top shows 6 buttons that link to other screens, which will be described in detail later. The lower purple part of the Menu shows individual Settings sections, which will be described in another chapter. The button bar then allows you to return to the home screen and start or stop the program.

History - here you can view a list of events that have recently occurred in the controller.

Database - contains the 200 most recent courses that were performed in the controller, including graphs.

Prog.info - information screen about the ongoing (completed) program.

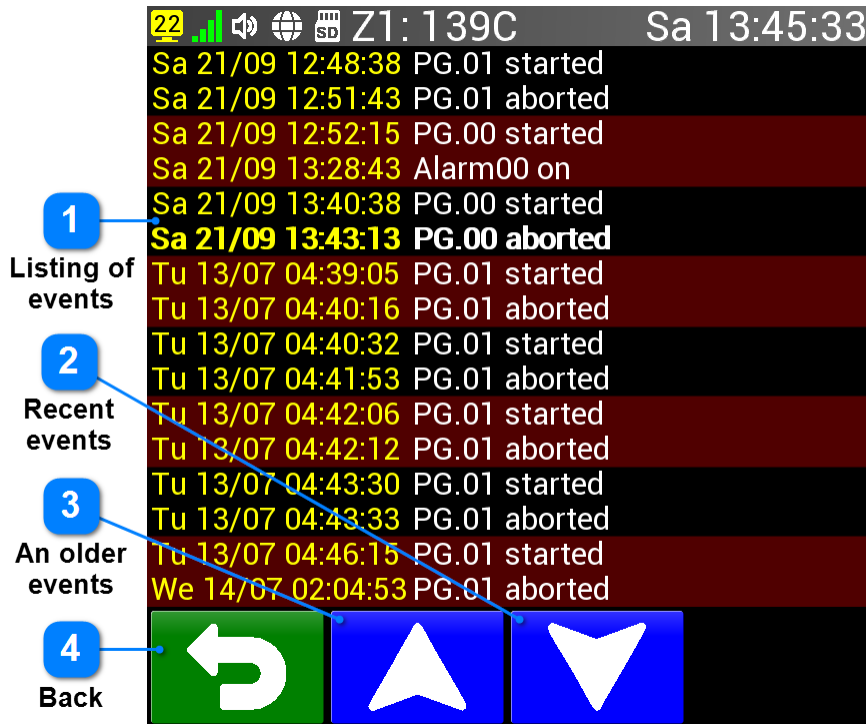
Application - Calculator, Stopwatch, Alarm and Message and more.

About - information about the CLARE 5 controller.

Contents of the chapter Menu

- [Listing of events](#)
- [Progress overview](#)
- [Information screen](#)
- [Application](#)
- [Controller information](#)

8.1. Listing of events



The event listing is a chronological listing of the time and events that occurred in the controller. When this screen is opened, the last event is always shown in bold on the last line. The listing can be moved either by moving your finger up / down or by pressing the appropriate buttons for older and newer events. The list of events will be expanded in future versions of the controller.

1

Listing of events

The time when the event occurred is displayed in the left part of the listing. The relevant event will then be displayed in white on the right

- PG.00 started - the program was started (manually or by delayed start)
- PG.00 ended - the program was regularly ended
- PG.00 stopped - the program was stopped by the user
- PG.00 interrupted - the program was interrupted due to the occurrence of an error
- PG.00 failure - a power failure occurred, the time after the failure is displayed
- BL.01 started - the time when a certain program block was started
- Alarm 1 on - the alarm has been activated - details in the article [Alarms](#)
- Alarm 1 off - the alarm has been deactivated - details in the article [Alarms](#)

2

Recent events



Shows the 16 most recent events (or the oldest if the most recent ones are already shown)

3

An older events



Shows 16 older events (or the most recent if the oldest is already shown)

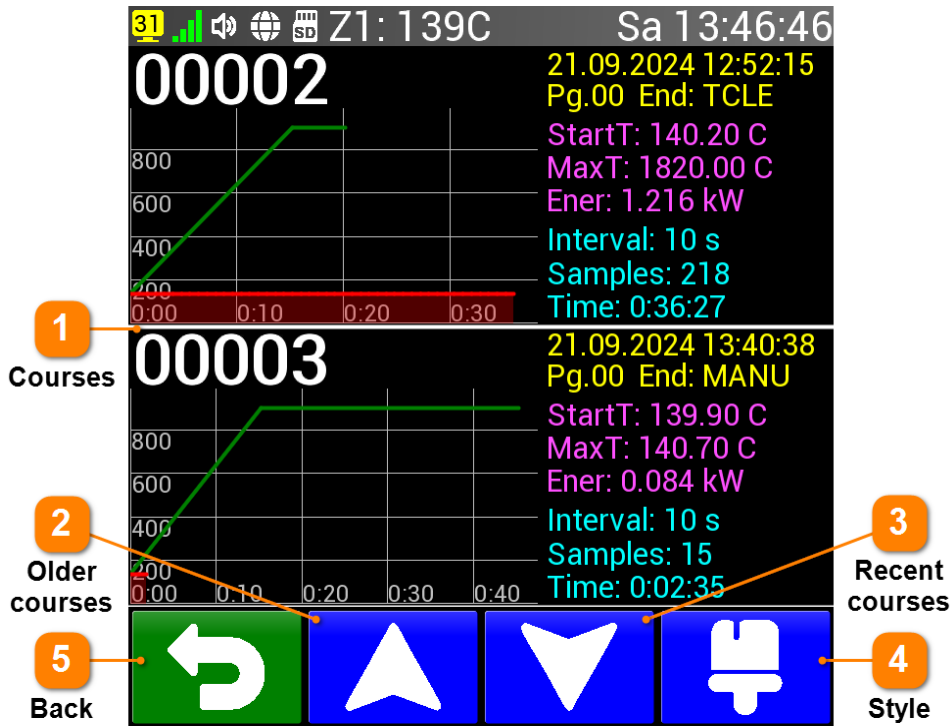
4

Back



Return to the previous screen

8.2. Progress overview

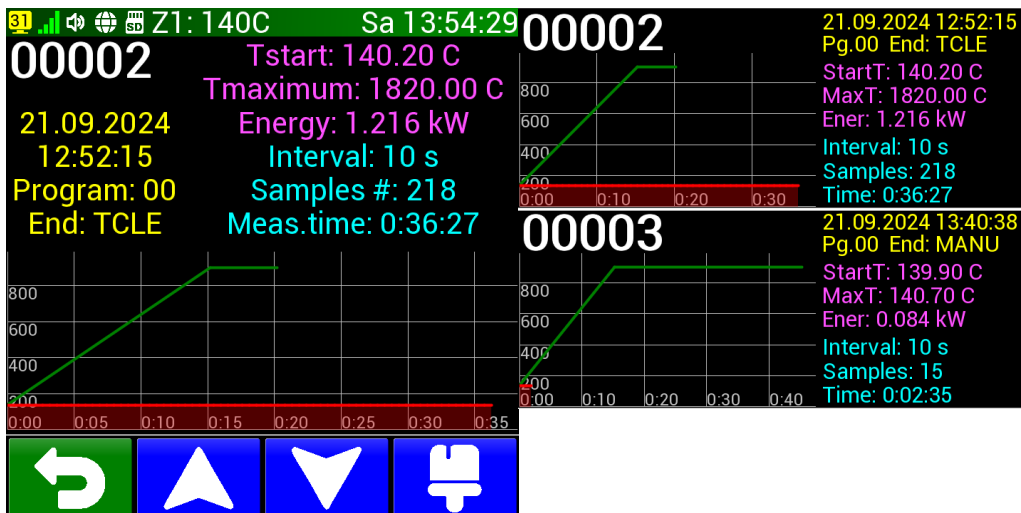


The trend overview offers a list of the last 200 trends, basic information about these trends, including a graph. We can choose the display style for 1, 2, 4 and 8 waveforms at once. Each course has its own sequence number, and after entering the course overview, the last course (it may be currently underway) is automatically displayed. We can move between the courses either by moving the finger up / down (except for the left part of the graph) or by pressing the appropriate buttons for older and newer events. By pressing the left part of the graph, it is possible to enlarge the graph across the entire screen - see article [Graph control](#).

1

Courses

In the 8-progress display style, only the serial number of the progress, date, time, program number and the method of its termination are displayed. The other styles also display the initial temperature, maximum temperature reached, power consumption, sampling interval, number of samples and total run time. In style 1 or 2 of the progress, the relevant graph is also displayed, which can be viewed in more detail on the entire screen by touching the left part (under the serial number of the progress).



Z1: 140C		Sa 13:53:17		Z1: 139C		Sa 13:53:57	
00001	21.09.2024 12:48:38 Pg.01 End: MANU Tst: 140.25 C Int: 10s	MxT: 140.85 C Sm: 18	Ener: 0.055 kW Tim: 0:03:05	00005	13.07.2021 04:40:32 Pg.01 End: MANU		
00002	21.09.2024 12:52:15 Pg.00 End: TCLE Tst: 140.20 C Int: 10s	MxT: 1820.00 C Sm: 218	Ener: 1.216 kW Tim: 0:36:27	00006	13.07.2021 04:42:06 Pg.01 End: MANU		
00003	21.09.2024 13:40:38 Pg.00 End: MANU Tst: 139.90 C Int: 10s	MxT: 140.70 C Sm: 15	Ener: 0.084 kW Tim: 0:02:35	00007	13.07.2021 04:43:30 Pg.01 End: MANU		
00004	21.09.2024 13:51:49 Pg.00 End: ---- Tst: 139.80 C Int: 10s	MxT: 140.50 C Sm: 8	Ener: 0.049 kW Tim: 0:01:28	00008	13.07.2021 04:46:15 Pg.01 End: MANU		
				00009	14.07.2021 02:05:38 Pg.03 End: MANU		
				00010	14.07.2021 02:06:28 Pg.01 End: MANU		
				00011	14.07.2021 02:06:53 Pg.03 End: MANU		
				00012	14.07.2021 02:08:04 Pg.01 End: MANU		



2

Older courses



Displays older waveforms (or newest if there are already 200 waveforms in the list)

3

Recent courses



Displays newer waveforms (or oldest if there are already 200 waveforms in the list)

4

Style



Button to change display style. Toggles between displaying 1, 2, 4 or 8 waveforms simultaneously

5

Back





Return to the previous screen

8.3. Information screen

Code	Parameter	Value
TR	Temper. control	491.24 C
SP	Temper. setpoint	900.00 C
DL	Delay time	0:00:00
RM	Ramp speed	50.00 C/m
PB	Program blok	P00 B02
MO	Average power	70.0 %
PS	Program time	00:07:01
PE	Program till end	00:38:11
BS	Blok time	00:07:01
BE	Blok till end	00:08:11
EP	Energy program	0.243 kWh
EC	Energy counter	5711 kWh

Callouts:

- 1 Program information
- 2 Graph
- 3 Program preview
- 4 Back

The information screen provides detailed information about the current progress (running program). It clearly displays 12 relevant information, their abbreviations and current values. With a button  (Graph) it is possible to display the graph of the current progress with the and button  (Preview) program information.

1 Program information

12 current information about the current progress is displayed:

- TR** Control temperature, value in hundredths of °C
- SP** Set temperature, value in hundredths of °C
- DL** Delay time, HH:MM:SS or CONT format for continuous delay
- RM** Temperature change rate in °C/min or FAST for maximum speed
- PB** Number of the executed program and block
- MO** Average heating power in tenths of a percent
- PS** Time since program start (progress) in HH:MM:SS format
- PE** Time until the end of the program (progress) in HH:MM:SS format
- BS** Time since the start of the current block in HH:MM:SS format
- BE** Time until the end of the current block in HH:MM:SS format
- EP** Energy consumed during this process
- EC** Total energy consumed

2 Graph



Displaying the progress graph - details in the article [Graph control](#)

3

Program preview



Information about the ongoing program. In manual mode, it displays the parameters of the manual program ([Preparing to run the program](#)) and in the programming mode displays a list of the running program ([Program editing](#)).

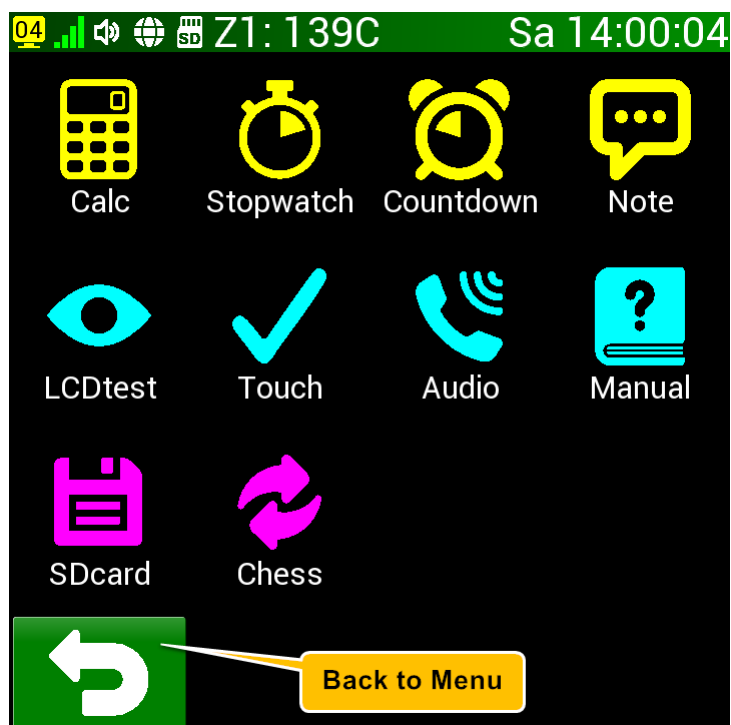
4

Back



Return to the previous screen

8.4. Application



On this screen, we find a number of small applications that expand the possibilities of the controller. Here we find a simple calculator, a stopwatch and a minute minder, an application for messages or notes. Then an application for checking the LCD display, touch layer, audio output. There is also a link to the controller manual (only functional in the PRO version) and a chess application. If the stopwatch or minute label is yellow, it means that the respective timer is running.

Chapter contents manual mode

- [Calculator](#)
- [Stopwatch](#)
- [A minute](#)
- [Message](#)
- [LCD test](#)
- [Touch](#)
- [Sound](#)
- [Manual](#)

8.4.1. Calculator



1

Delete calculation

Write description here...

2

Delete the last digit

Write description here...

3

Back

Write description here...

The calculator is an application for the simplest mathematical calculations. Control is the same as on the usual calculator, in the current version it only works with whole numbers. The currently used operator will turn yellow. Button **C** deletes the entire calculation, button **<->** only the last digit from the entry or result.

When defining a custom screen, it is possible to place a module with a Calculator button on it. Zooming in on this module (touching on it) will display this Calculator application.

8.4.2. Stopwatch





Stopwatch is a simple application to measure a certain time interval. The application allows you to pause the measured time. The stopwatch works even when the controller is switched off. The maximum achievable time is 100 hours (exactly 99:59:59). The dial can be displayed in digital or analog form. The time in the status bar is yellow when the stopwatch is running, or green if the minute hand is running at the same time.

When defining your own screen, it is possible to place a module with a Stopwatch button on it or a module that directly displays the stopwatch dial. Zooming in on these modules (touching them) will bring up this Stopwatch app.



1 Dial

The dial shows the current time on a stopwatch. It can be analog style (0 - 12 hours) or digital style (0 - 100 hours) which is shown in the following article Minute

2 Start Pause

An icon is displayed at rest  (Start), the icon is displayed while the stopwatch is running  (Pause)

3 Stop Reset

The icon is displayed at rest  (Reset), the icon is displayed while the stopwatch is running  (Stop)

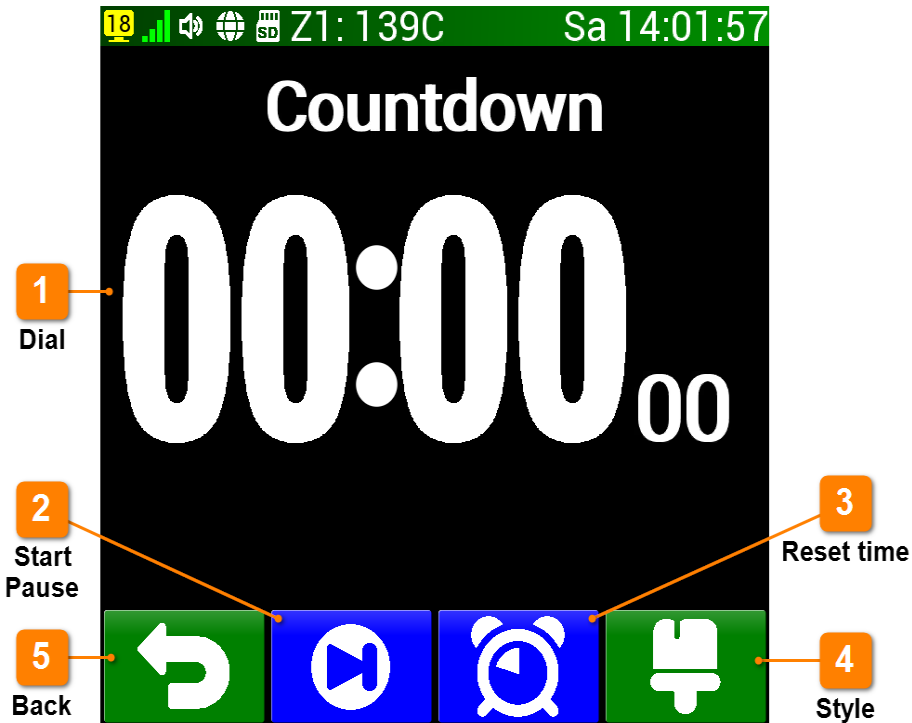
4 Style

Switching analog and digital stopwatch styles

5 Back

Back to previous screen

8.4.3. Countdown



The Countdown application is used to measure the specified time. The app allows you to pause the running time. The timer works even when the controller is switched off. The maximum time that can be entered is 9999 minutes and 59 seconds. The dial can be displayed in digital or analog form. The time in the status bar is blue or green when the minute is counting down, if the stopwatch is running at the same time. After the specified time expires, the time in the status bar flashes red. Any touch on the screen (after 5 seconds from timeout) will turn off the flashing.

When defining your own screen, it is possible to place a module with a Countdown button on it or a module that directly displays the minute mind face. Zooming in on these modules (touching them) will display this Minute app.



1

Dial

The dial shows the current time on a stopwatch. It can be digital style (0 - 66 hours) or analog style (0 - 12 hours) which is shown in the previous Stopwatch article



2

Start Pause

The icon is displayed at rest  (Start), an icon is displayed while the minute is running  (Pause)

3

Reset time

The icon is displayed at rest  (Time), an icon is displayed while the minute is running  (Reset)

4

Style

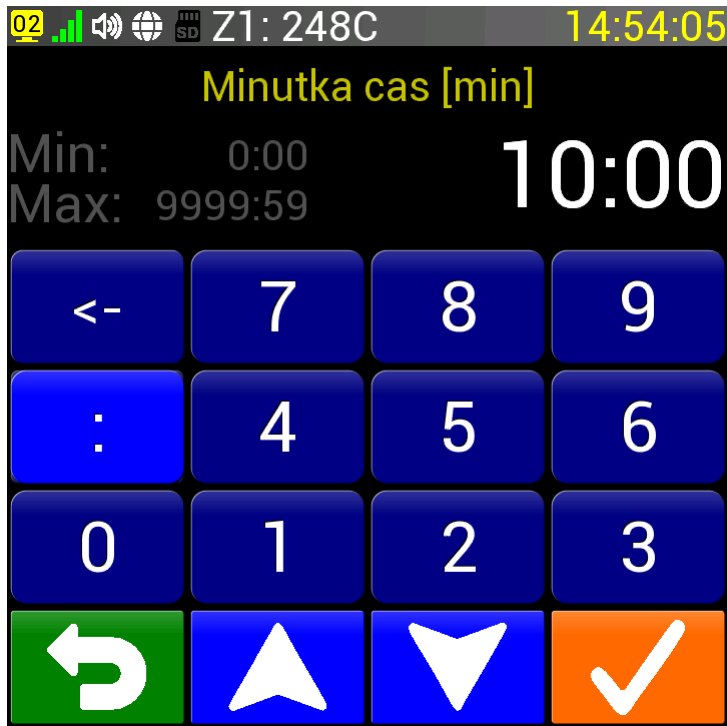
Switching between analog and digital style of the minute hand

5

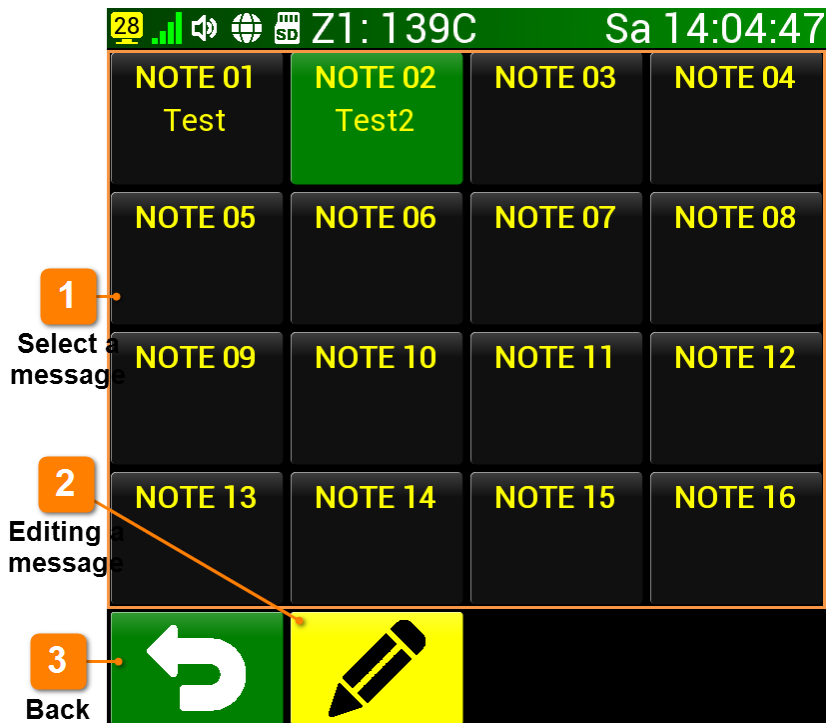
Back

Back to previous screen


After pressing the icon  (Time) screen will appear for entering the time the minute will count down.



8.4.4. Message



The Message application is used to save texts (notes). These can be for your own use or can be used as a message for the controller operator. It is possible to create up to 16 messages in total, each message can contain up to 63 characters. The selection of a message is done directly on the screen, where you can see a preview of all the messages. The selected message has a green background. When defining a custom screen, it is possible to place a module with a Message button or a Notes module that directly displays the selected message. Zooming in on these modules (touching them) will display this Message app.

If we want to edit the message, we use the button . The following message input screen will appear.



1

Message text

This is where the edited message is displayed, which can be up to 63 characters long

2

Keys

Area for displaying keys either in T9 format (older phones), where characters are entered by repeatedly pressing the appropriate number, or qwerty, when a classic keyboard is displayed



3**T9 or qwerty**

Button to switch T9 or qwerty keyboard format



4**Delete**

This button deletes the last entered character

5**Space**

Button to insert a space between characters

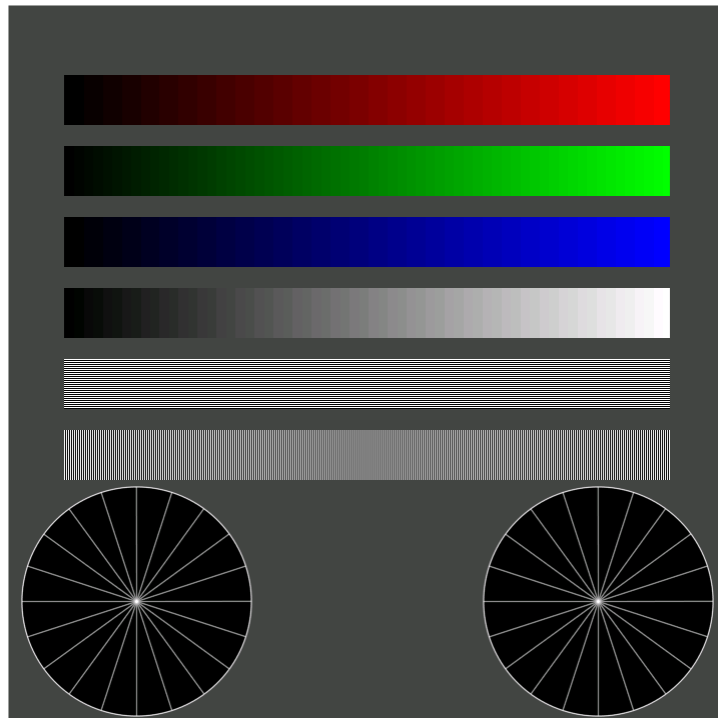
6**Save**

Saving the entered message in the controller's memory

7**Back**

Return to the previous screen

8.4.5. LCD test

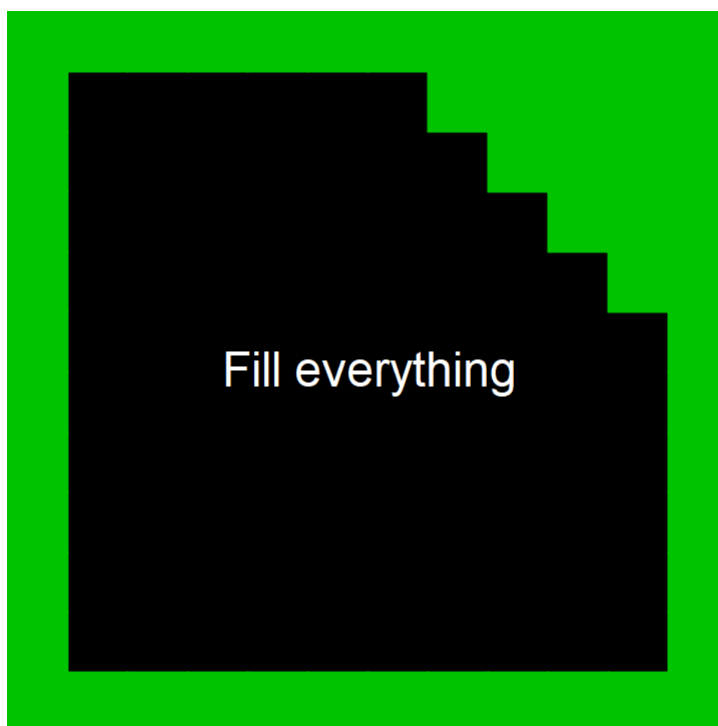


A simple application to verify the quality and function of the display. After starting the application, a red area will appear over the entire screen. Here it is possible to verify that all the red points of the display (518,400 points) are lit. After touching any part of the display, green dots will appear, and after another touch, all blue dots will appear. Thus, it is possible to verify all 1,555,200 luminous points that the display contains. After touching the blue screen, the image above will be displayed, where it is

possible to check the brightness component of all three primary colors and the correct setting of the image placement on the display.

After another touch, the display is finally initialized. If it ever happens that the controller does not correctly display some graphic element (large font, icon, etc.), then initializing the display will correct this problem.

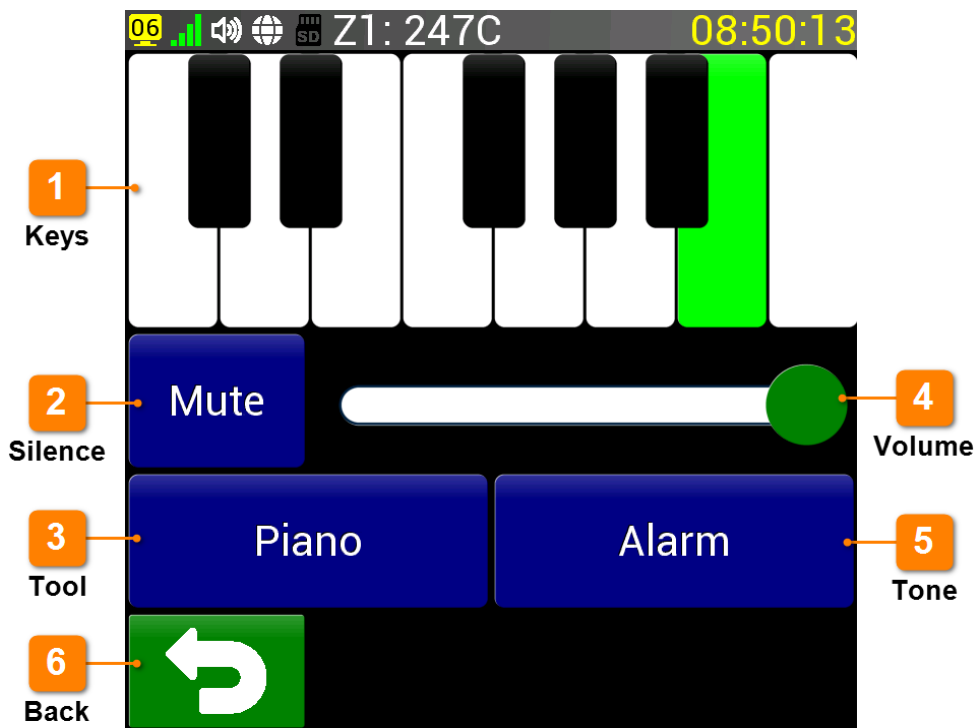
8.4.6. Touch



The Touch application helps with checking and setting the touch layer, which is necessary for controlling the controller. The entire display is divided into 144 identical squares (12 x 12), which need to be checked by touch. Just move your finger across the display and green squares will gradually appear, showing that the touch is working in the given place. If all the squares are filled, the touch layer works correctly in all places and the screen returns to the app selection.

If it is not possible to color some places on the display green (mostly the edges), it is necessary not to touch the display for 10 seconds, the Touch application will end and the application selection screen will be displayed. Now it is advisable to calibrate the display carefully (Article [Touchpad calibration](#)) and then perform the touch layer test again.

8.4.7. Sound



The Sound application is used to control the sound output of the controller in the PRO version. It allows you to choose from several instruments and tones, adjust the volume and pitch within one octave.

-
- 1

Keys

Keys for different pitches within one octave. The currently pressed key is highlighted in green.

 - 2

Silence

Audio mute button (sets volume to 0%)

 - 3

Tool

Selection of the instrument to be played on the keys. Options are: Piano, Chimes, MusicBox, Bell, Harp, Xylophone, Tuba, Glockenspiel, Organ, Trumpet

 - 4

Volume

Slider for adjusting the sound output volume

 - 5

Tone

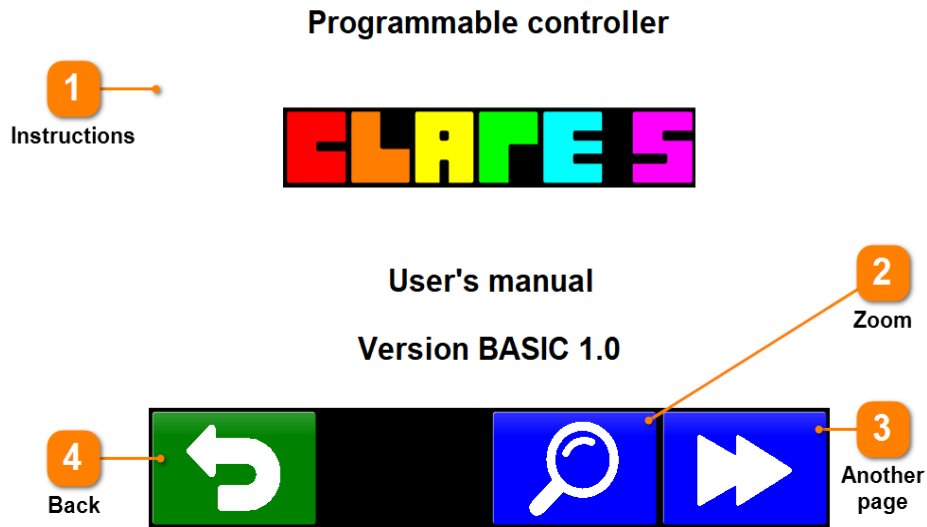
Button for selecting the tone that will be played on the keys. Options are: Alarm, Warble, Carousel, Square, Sine, Sawtooth, Triangle, Beeping



 - 6

Back

Return to the previous screen

8.4.8. Manual




The PRO version of the controller allows you to view the instructions for the controller on its screen. The instructions are loaded from the SD card, which is included only in the PRO version. The instructions can be enlarged by pressing the button  (Magnifier) and scroll to the next page with the button  (Other).

- 1

Instructions


Place to display (this) controller manual. The page can be scrolled up and down with your finger, or even to the sides when zooming in on the page.
- 2

Zoom




Zooming in or zooming out of the displayed manual page to the controller
- 3

Another page



Go to the next page of the controller manual
- 4

Back



Return to the previous screen

8.5. Controller information



On this screen we can find information about the configuration of the controller, contact the manufacturer and enter the screen with the manual for the controller. The information is scrolled automatically, it is possible to speed up the display of others by moving your finger up / down or by pressing the appropriate buttons. Scrolling can also be paused or restarted by simply touching the information.

1

System information

Information about the manufacturer is displayed in yellow (address, links to the Internet)

The following items are displayed in white:

- firmware version and date
- controller hardware version
- free capacity of the SD card (in the case of the PRO version)
- WiFi connection information (MAC, IP address, gateway and mask)
- LAN connection information (MAC, IP address and gateway)

2

Move up



Moves information up half the screen (previous information)

3

Move down



Moves information half a screen down (following information)

4

Manual



Transition to the controller manual screen

5

Back



Return to the previous screen



8.6. Examples

IMPORTANT: The starting point of the examples

All examples are based on the home screen. For examples **M15 - M21** the controller is at rest (gray status bar), in others the program is already running (green status bar)





Example M15

We would like to look at the latest events in the controller.

1. With a button  (Menu) we get to the controller menu (if this button is not available, press on the home screen the place where there is no graph or buttons for 8 seconds).
2. Press the button **History** and we will review the latest events
3. Double-press the button to return to the home screen  (Back)



Example M16

We would like to look at the penultimate course and display its graph.

1. With a button  (Menu) we get to the controller menu (if this button is not available, press on the home screen the place where there is no graph or buttons for 8 seconds).
2. By pressing the button **Database** we'll get to the list of the last progress
3. If no graph is displayed on the screen, by pressing the button  (once or twice) we change the display style to show the graph
4. If the penultimate progress is not already displayed, by pressing the button  we will move the listing to it
5. Press the left part of the graph to display the graph of the penultimate course
6. We return to the home screen by pressing the button three times  (Back)



Example M17

We want to find out what was the power consumption of the last run.

1. With a button  (Menu) we get to the controller menu (if this button is not available, press on the home screen where there is no graph or buttons for 8 seconds)
2. Press the button **Prog.info** and we find out the corresponding consumption under the item Energy program
3. Double-press the button to return to the home screen  (Back)



Example M18

We would like to find out which firmware version the controller is using.

1. With a button  (Menu) we get to the controller menu (if this button is not available, press on the home screen where there is no graph or buttons for 8 seconds)
2. Press the button **ABOUT CLARE**. Use the arrows or move your finger to find information about the firmware version (above the yellow contact for the manufacturer)
3. Double-press the button to return to the home screen  (Back)





Example M19

We want to find out what IP address the controller uses (it must be connected to the network).

1. With a button  (Menu) we get to the controller menu (if this button is not available, press on the home screen where there is no graph or buttons for 8 seconds)
2. Press the button **ABOUT CLARE**. Use the arrows or move your finger to find information about the IP address (WIFI or LAN)
3. Double-press the button to return to the home screen  (Back)



Example M20

We need to look at the manual and enlarge the desired page (PRO version only).

1. With a button  (Menu) we get to the controller menu (if this button is not available, press on the home screen where there is no graph or buttons for 8 seconds)
 2. Press the button **ABOUT CLARE** and then the button  (Help)
 3. Use the arrow to navigate to the desired page and then press the button 
 4. Return to the home screen by pressing the button three times  (Back)
-



Example M21

We want to find out what was the power consumption of the last run.

1. With a button  (Menu) we get to the controller menu (if this button is not available, press on the home screen where there is no graph or buttons for 8 seconds)
 2. Press the button **Prog.info** and we find out the corresponding consumption under the item Energy program
 3. Double-press the button to return to the home screen  (Back)
-




Example M22

We want to find out what the currently set ramp (rate of temperature change) is.

1. With a button  (Menu) we get to the controller menu (if this button is not available, press on the home screen the place where there is no graph or buttons for 8 seconds)
 2. Press the button **Prog.info** and we find out the corresponding consumption under the item Energy program
 3. Double-press the button to return to the home screen  (Back)
-



Example M23

We want to look at the set parameters of the manual mode.

1. With a button  (Menu) we get to the controller menu (if this button is not available, press on the home screen where there is no graph or buttons for 8 seconds)
 2. Press the button **Prog.info** and then the button 
 3. We find out the parameters and return to the home screen by pressing the button three times  (Back)
-

Example M24

We need to find out how long the program has been running.

1. With a button  (Menu) we get to the controller menu (if this button is not available, press on the home screen the place where there is no graph or buttons for 8 seconds)
2. Press the button **Prog.info** and we find out at the item **PS** (Program time) duration of the program.
3. Double-press the button to return to the home screen  (Back)

9. Programming mode



Programming mode allows incomparably greater variability than manual mode. Getting to know it will allow us to use most of the functions of the controller effectively. In the programming mode, even very complex thermal processes can be programmed, for example for weeks in advance.

We enter the programming mode by pressing the button **P** (Programs) on the home screen of the controller. If the home screen does not have this button, it can be called up [Menu](#) and select a button in it **Programs**. Programming mode can also be blocked using Settings ([System - Enable programs](#)). It is possible to return to the previous screen (Home screen or Menu) using the button **↶** (Back). In programming mode, we have 99 programs available, each of which can contain 99 program blocks. These blocks are filled chronologically after the program is started. Each block always contains the selected function and its possible parameters. Programs can also be combined. For better clarity, programs can be marked with a label or displayed in graphic form. In this manual, we first describe working with entire programs, then with individual blocks. Next, the program change is explained and, finally, a series of concrete examples.

Contents of the chapter Programming mode

- [Program selection](#)
- [Starting the program](#)
- [Program description](#)
- [Program chart](#)
- [Program deletion](#)
- [A copy of the program](#)
- [Program editing](#)
- [Program block selection](#)
- [Starting from the block](#)
- [Editing block command](#)
- [Block insertion](#)

- [Deleting a block](#)
- [Save program changes](#)
- [Examples](#)

9.1. Program selection



After pressing the button **P** (Programs) or buttons **Programs** in [Menu](#) we will get to the program selection.

The controller has 99 programs available, labeled 01 to 99. The program can be selected by rotating the list of programs, using the up and down arrows, or by directly entering the program number.

1

List of programs

The program can be selected with the rotary control with the list of programs. The list can be scrolled with your finger or let it scroll automatically by constantly touching the top or bottom of the rotary control. The selected program has a green background and a larger font. If the program number and any label is yellow, it is a free program. In the case of red color, it is a currently running program.

2

Move down

With this button, we move the list of programs down to higher program numbers. If the button is held for a longer time, scrolling automatically speeds up. Program number 99 cannot be moved further.

3

Move up

Use the down button to move the list of programs up to the lower program numbers. If the button is held for a longer time, scrolling automatically speeds up. Program number 01 cannot be moved further.

4

Program number



Displays the number of the currently selected program. If this number (button) is pressed, the screen for directly entering the program number is activated, see below.

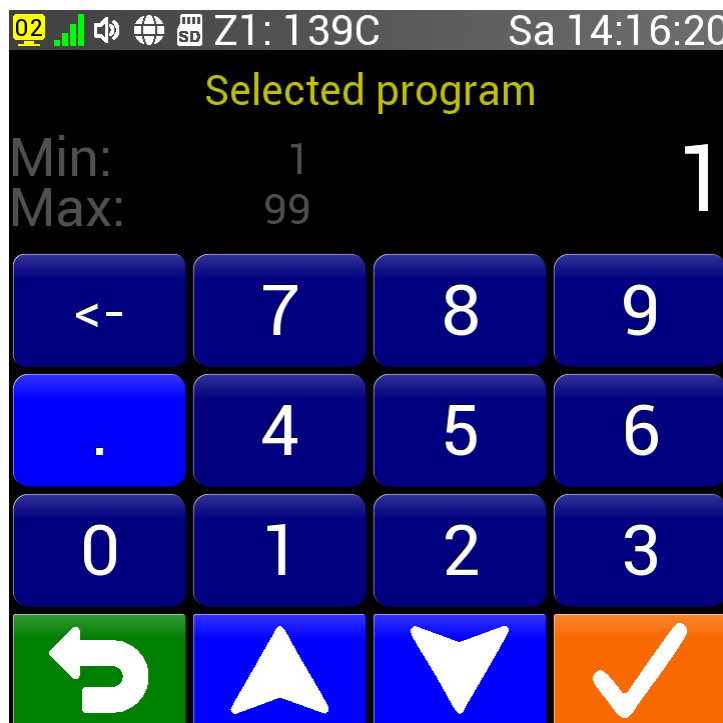
5**Program description**

In the case of a used (not empty) program, the basic characteristics of the program are written here: the maximum temperature, the number of program blocks and the expected duration of the program. If the program is not used, only information about the free status is displayed.

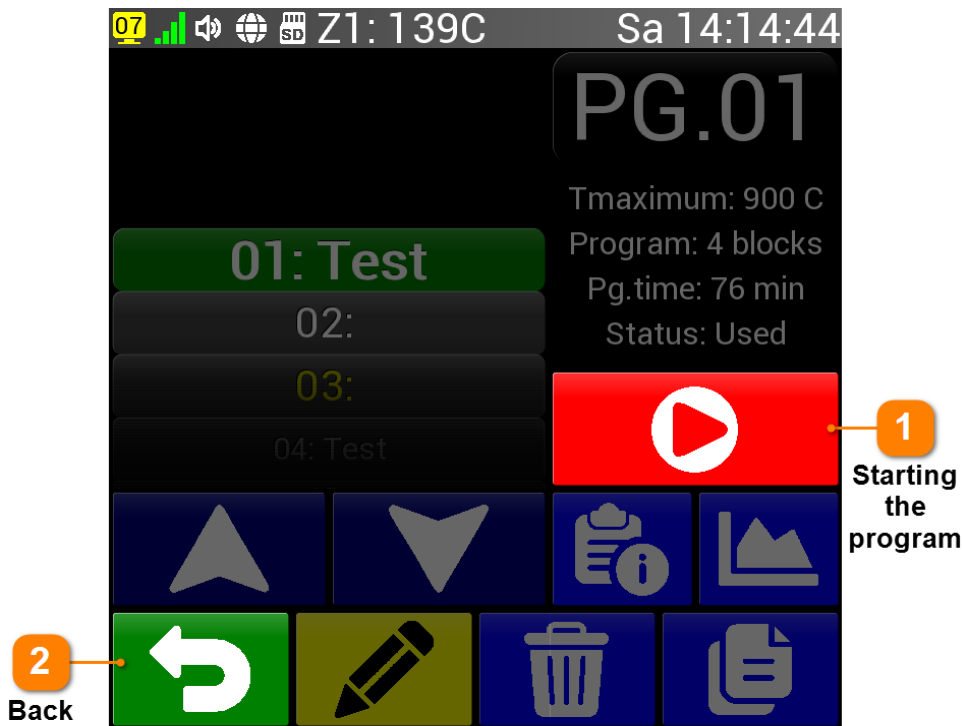
6**Back**



Return to the previous screen

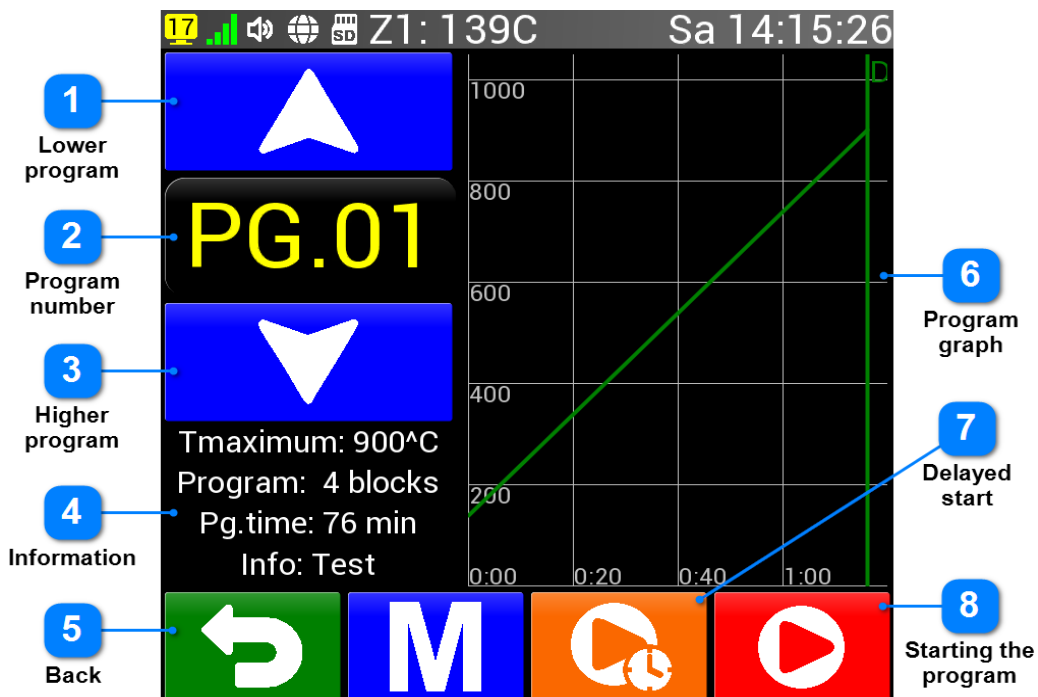
If the Program number button is pressed, the following screen will appear, where you can enter the desired program number. When the button is pressed  (Back) the original program number remains valid when the button is pressed  the entered program number is confirmed, the controller returns to the previous screen and the list of programs moves to the program with the entered number.



9.2. Starting the program



If we select a program that is not free (empty) in the previous article, a button to start the program will appear. If we do not want to start the program and want to leave the programming program, we use the button  (Back). When using the button  (Start) the following preparation screen for starting the program will appear:



1

Lower program

Selecting a program with a lower number than the currently selected one. The program must be used. If there is no longer a used program with a lower number, the used program with the highest number is selected.

2**Program number**

Number of the currently selected program. Information and a graph are displayed for this program.

3**Higher program**

Selecting a program with a higher number than the currently selected one. The program must be used. If there is no longer a used program with a higher number, the used program with the lowest number is selected.

4**Information**

Here we find basic data about the selected program: maximum temperature, number of blocks and expected program time and program description.

5**Back**

Back to previous screen

6**Program graph**

Graphic display of the selected program. When you click on this graph, the graph expands across the entire screen, when you press it again, it goes back.

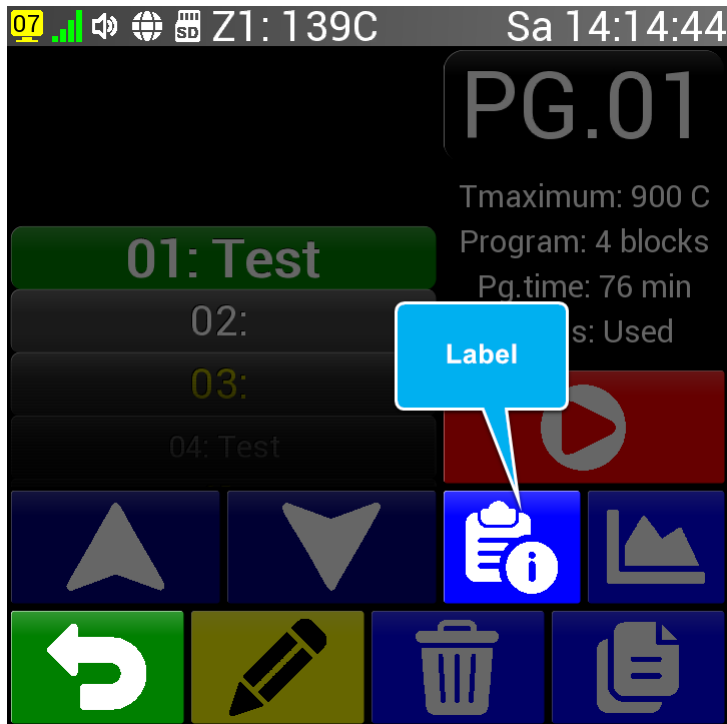
7**Delayed start**

Possibility of delayed start of the program. More information in the article [Delayed start](#).

8**Starting the program**

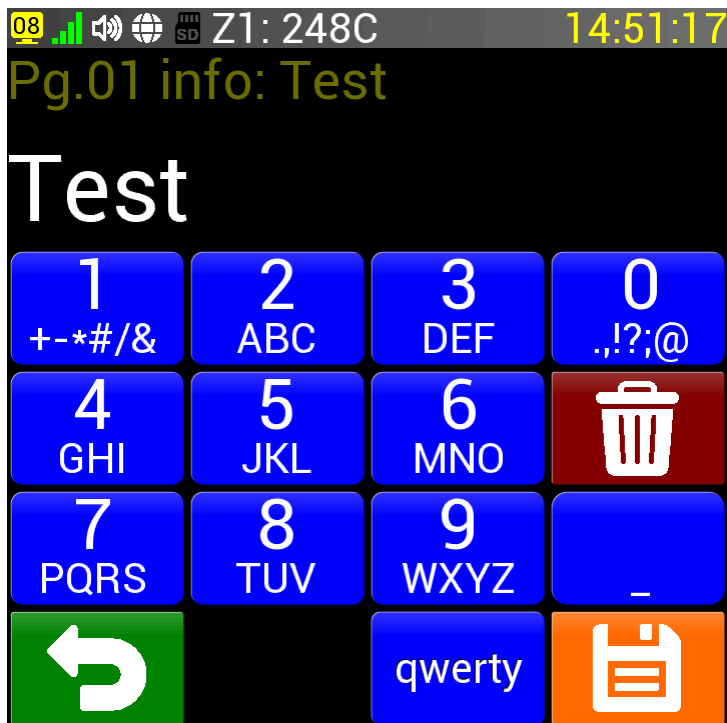
Starting the program. The home screen will appear and the controller will start executing the selected program.

9.3. Program description



The program label is used to identify the program as well as its serial number. Each program can be marked with any text of up to 39 characters. The beginning of the program description can also be seen in the list of programs next to the program number. Therefore, it is advisable that the beginnings of the labels are different for clarity.


After pressing the Label button, this screen will appear:

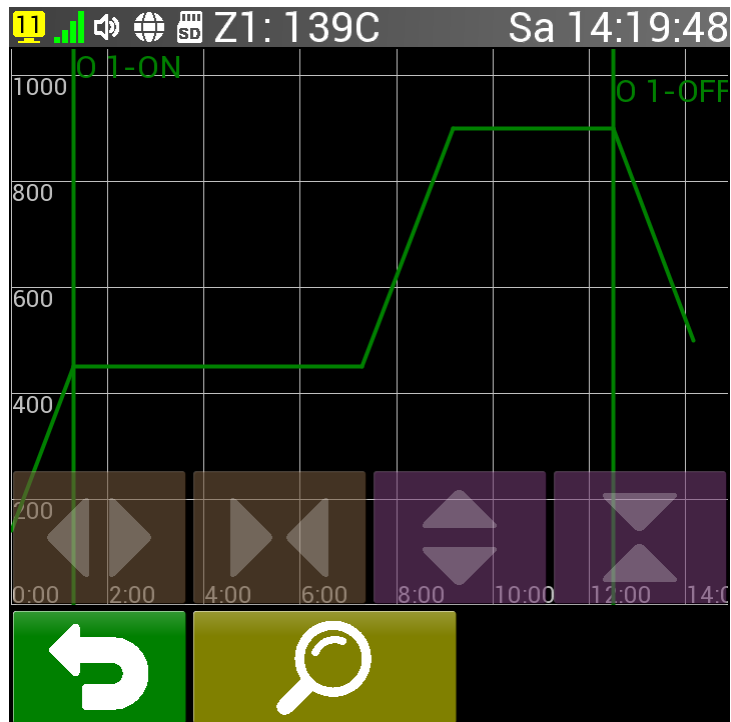



You can enter your own description here. The keyboard can be switched to T9 or qwerty mode. Entering text is more convenient in qwerty mode, but requires very precise keystrokes. Text is limited to 39 characters. For more details on entering text, see the article [Message](#).

9.4. Program graph

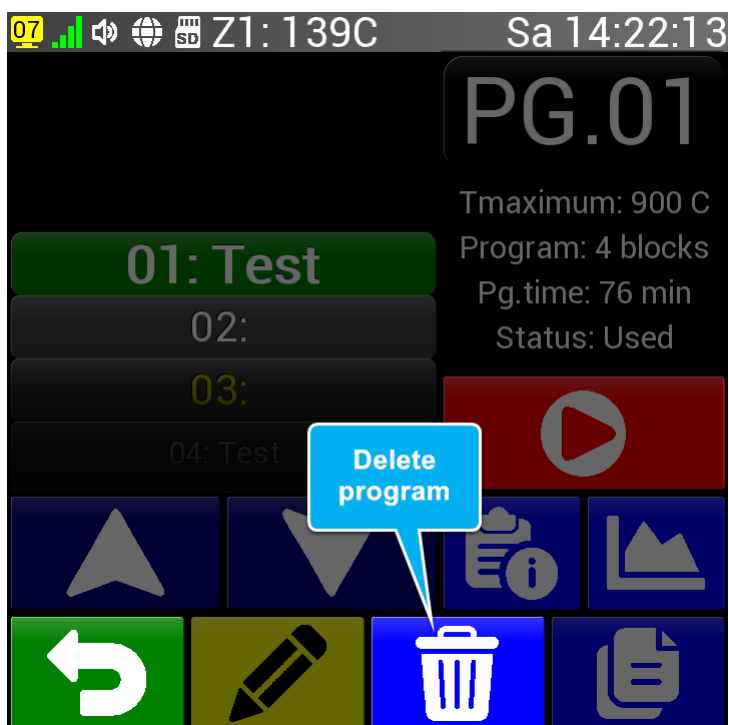



The selected program can also be displayed in graphic form. If the program is empty, this function (Graph button) is not available. After pressing the button  (Graph) the following screen will appear:



The graph plots the dependence of the temperature on the time of the selected program and displays important blocks in the program with vertical lines with a description. The graph can then be controlled in the same way as in the previous article [Graph control](#). With a button  (Back) we return to the selection (number) of the program.

9.5. Program deletion

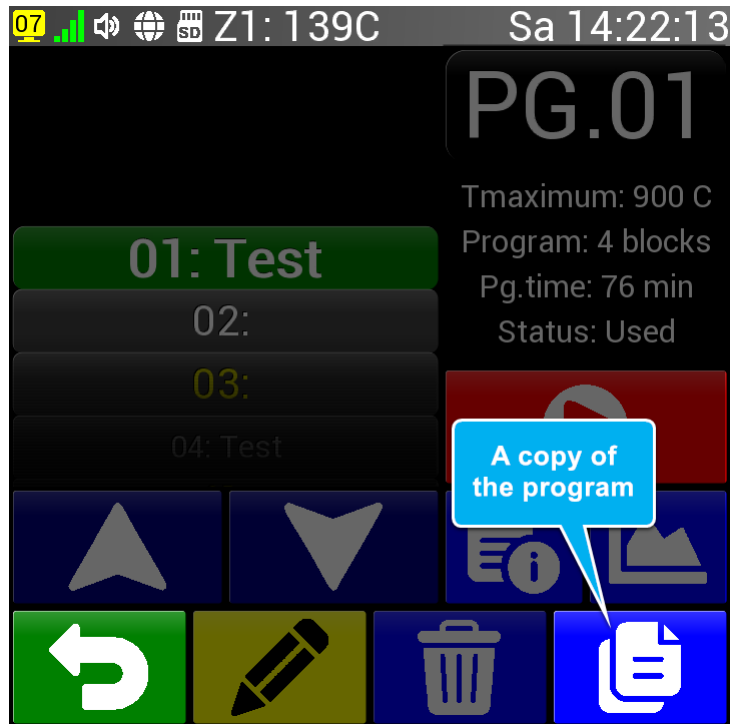



Sometimes it is necessary to delete a program, for example to free it for a completely different program. If the program is empty, this function (Delete button) is not available. After pressing the button  (Delete) a red button to confirm the operation will appear instead of program information in the right part of the screen.

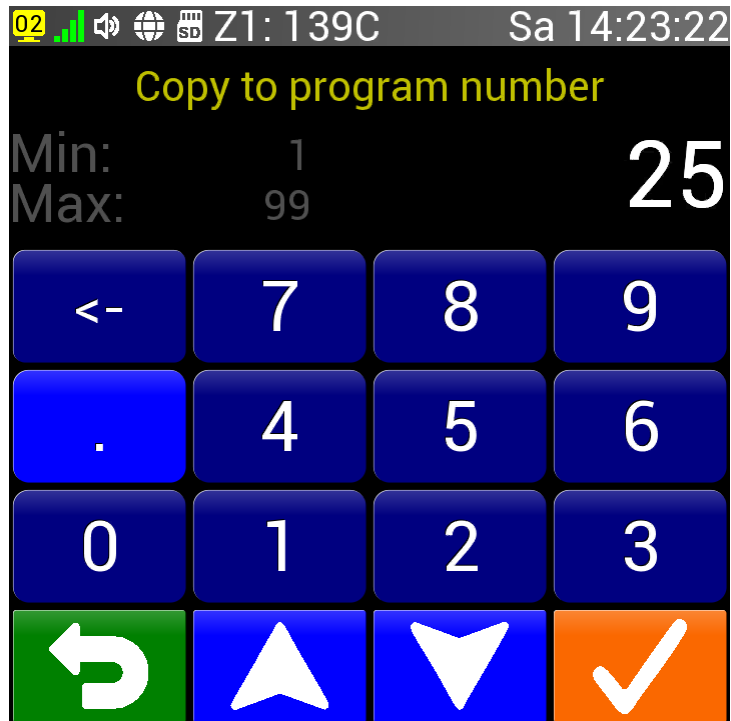




The button gradually disappears and after about 5 seconds it disappears and the program information appears again. If the button is pressed during these 5 seconds, the selected program will be deleted. The program can also be deleted by writing the command End in the first block of the program. The deleted program becomes empty (yellow font).

9.6. A copy of the program



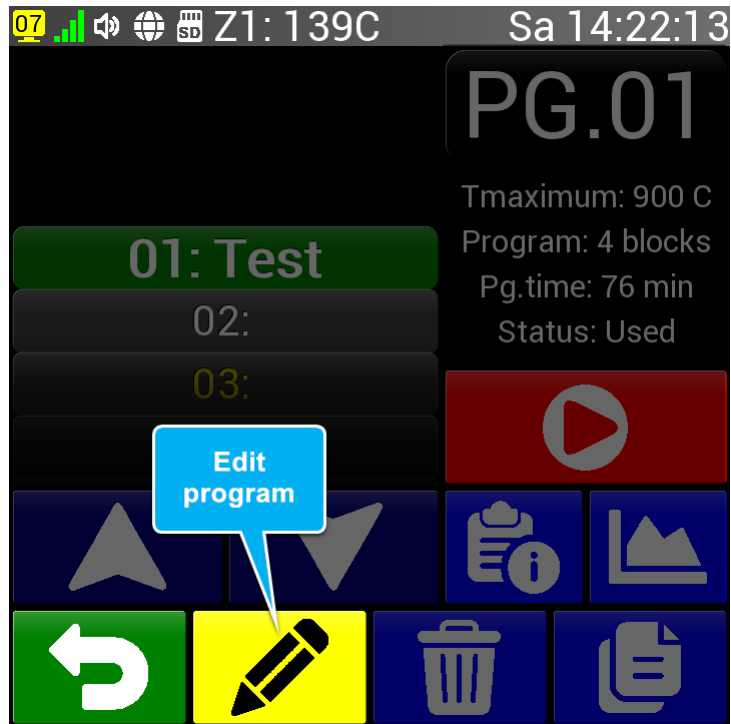
It is also possible to copy the selected program to another position and thus facilitate the creation of another program that does not differ much from the original program. If the program is empty, this function (the Copy button) is not available. After pressing the button  (Copy) the following screen will appear:




On this screen, we enter the program number (position) to which we want to copy the previously selected program. With a button  (Back) we return to the previous screen without copying the program, it is actually canceling the copy operation. Button  (OK) on the other hand confirms the copying and the program is copied to the specified position. At the same time, it returns to the previous screen and moves the list of programs to a new position. This will facilitate its possible

further editing.

9.7. Program editing



We can create a new program or modify an already created program using the button  (Treatment). After pressing it, the following similar screen for managing program blocks will appear:



The screen for managing blocks is very similar to the screen for working with programs. Here we can select a specific block in the list of program blocks, enter a label and display the program graph, insert or delete a block, and last but not least, there is a button for editing the selected block or starting the program from a specific block. We will describe these functions in the following articles.

9.8. Program block selection



The controller has available for each program 99 blocks labeled 01 to 99. A block can be selected by rotating the list of blocks, using the up and down arrows, or by directly entering the block number.

1

List of blocks

A block can be selected with a rotary control with a list of blocks. The list can be scrolled with your finger or let it scroll automatically by constantly touching the top or bottom of the rotary control. The selected block has a green background and a larger font.

2

Move down

With this button, we move the list of blocks down to higher block numbers. If the button is held for a longer time, scrolling automatically speeds up. Block number 99 cannot be moved further.

3

Move up

Use the down button to move the list of blocks up to lower block numbers. If the button is held for a longer time, scrolling automatically speeds up. Block number 01 cannot be moved further.

4

Block number

Displays the number of the currently selected block. If this number (button) is pressed, the screen for directly entering the block number is activated, see below.

5



Program description

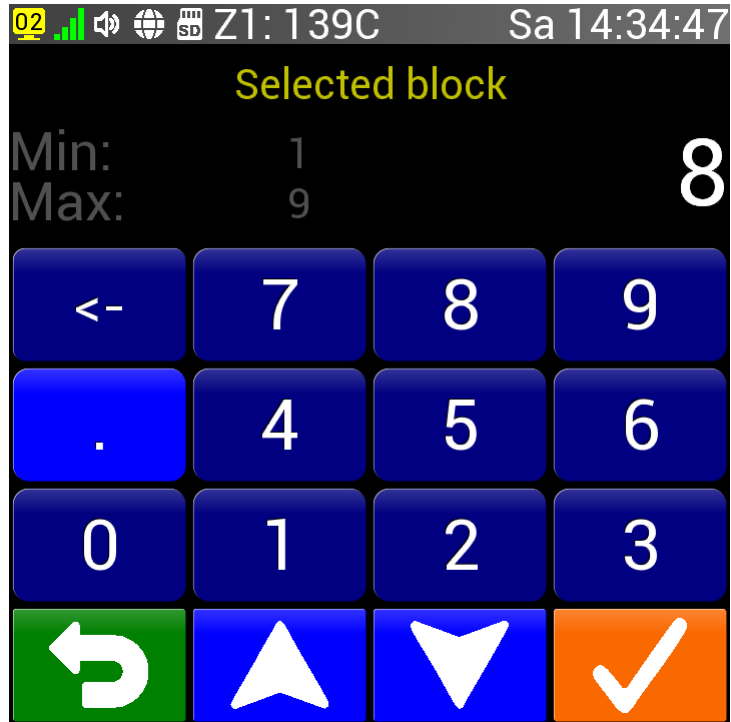
The basic characteristics of the entire program are listed here: the maximum temperature, the number of program blocks and the expected duration of the program. The information is automatically updated with any changes.



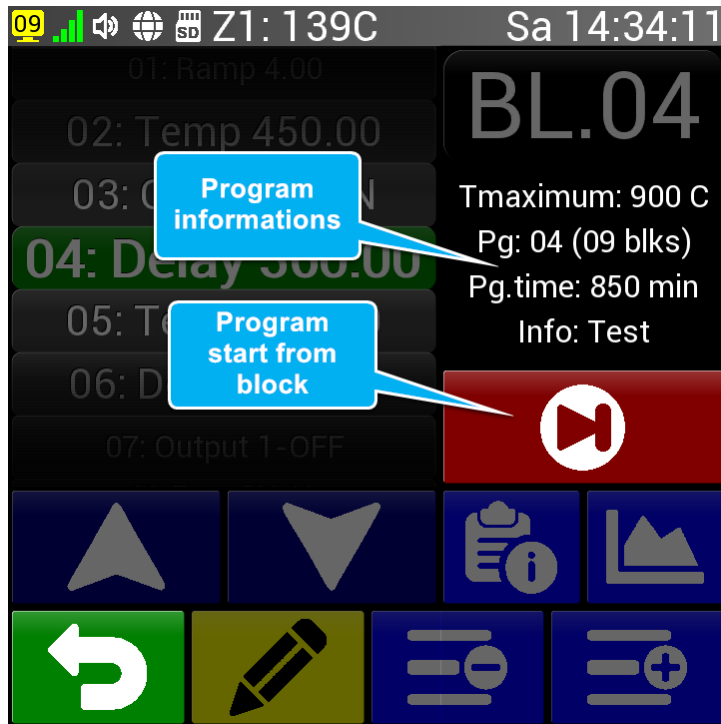
Back

Return to the previous screen



If the Block Number button is pressed, the following screen will appear where you can enter the desired block number. When the button is pressed  (Back) the original block number remains valid when the button is pressed  the entered block number is confirmed and the controller returns to the previous screen and shifts the list of blocks to the entered block.



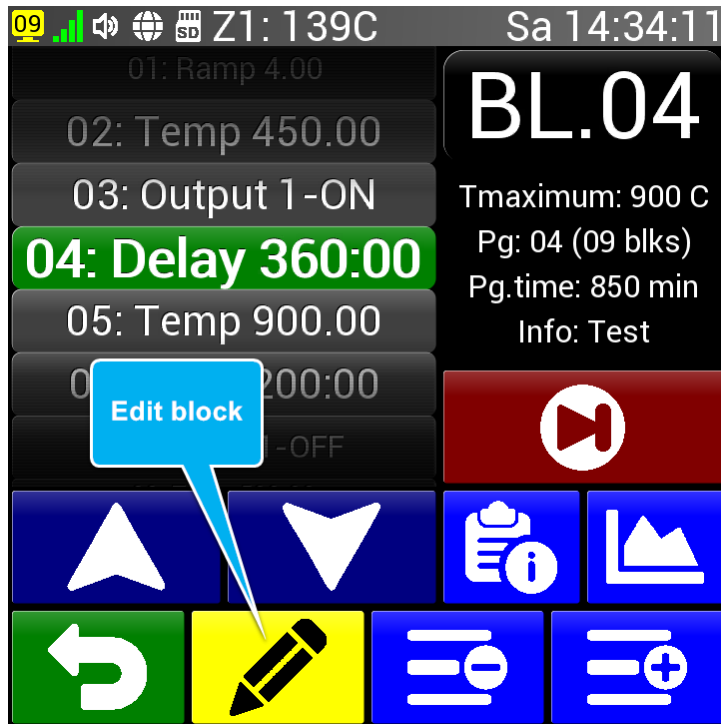
9.9. Starting from the block




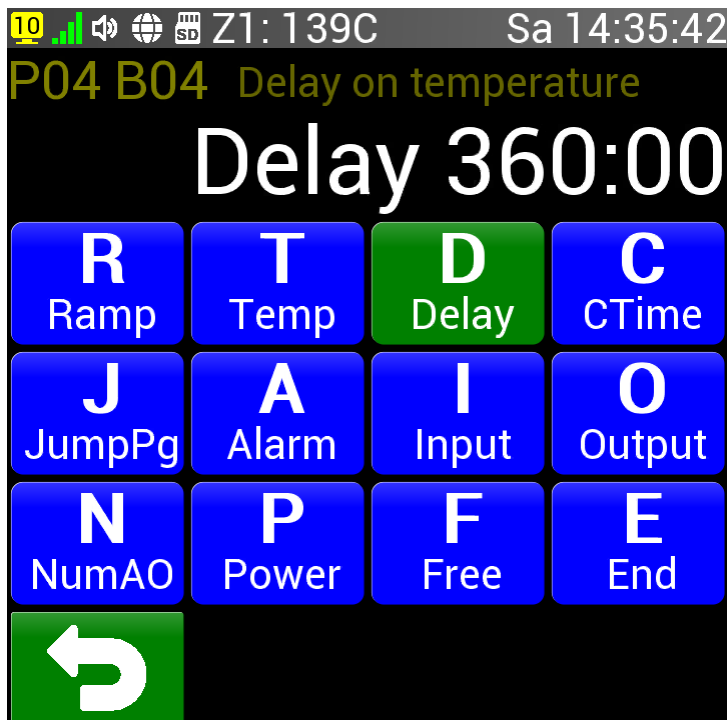
There may be cases when we want to start the program only from a certain point (block). For this case, the Start program from block button is used. This function is available (button display) if it is in Settings (article [Option to skip and pause](#)) allowed to skip blocks. Furthermore, this button is not displayed for the first (standard program launch) and the last block. If the program is changed in the same place, the button for saving the program will preferentially appear (article [Save program changes](#)).

To exit the management of program blocks, we use the button  (Back). When using the button  (Skip), a confirmation button will appear in place of the program information (same as [Program deletion](#)). The button gradually disappears and after about 5 seconds it disappears and the program information appears again. If the button is pressed during these 5 seconds, the selected program will start from the currently selected block. All parameters for the previous blocks (outputs, ramp speed) are set as if the program was executed from the beginning. The controller will automatically return to the home screen and the controller starts executing the program from the selected block.

9.10. Editing block command



Each program in the CLARE controller is created from blocks. Using the button  (Edit) we can change the command of the currently selected block or add a block (if we are on a block with the End command). After pressing it, the following command selection screen will appear:



The first three basic commands are also used in manual mode. In programming mode, it is also possible to stack them one after the other. The CasNT command is just another form of the Ramp command. The SkokPg command can be used to extend the number of blocks in a program or for a common end for several programs. With the Alarm command, it is possible to synchronize the program with real time. The Input command allows you to wait for a certain state on the controller's digital input. The Vystup, CisAO and Vykon commands are used to set the controller outputs during

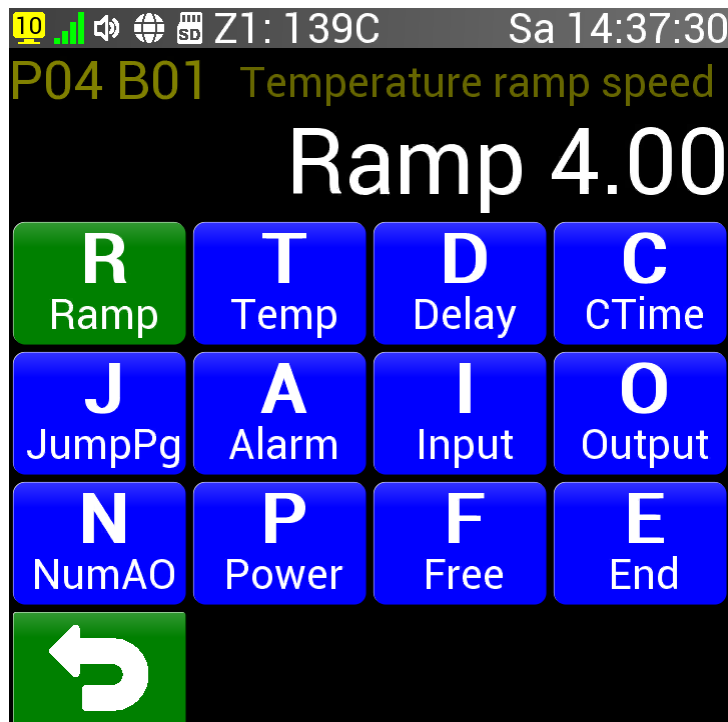
the program. The Free command is automatically skipped and the End command terminates the program.

The commands are described in detail in the following articles.

Contents of the subchapter Editing block command

- [Command R \(Ramp\)](#)
- [Command T \(Temp.\)](#)
- [Command D \(Hold On\)](#)
- [C command \(CasNT\)](#)
- [Command J \(JumpPg\)](#)
- [Command A \(Alarm\)](#)
- [Command I \(Input\)](#)
- [Command O \(Output\)](#)
- [Command N \(CisAO\)](#)
- [Command P \(Performance\)](#)
- [Command F \(Free\)](#)
- [Command E \(End\)](#)

9.10.1. Command R (Ramp)





- Command **R = Ramp** used to set the rate of temperature change.
- The set rate of temperature change applies to all further increases and decreases in temperature until the next change with the C (CasNT) or R (Ramp) command.
- The ramp speed after starting the program is taken from the manual mode (Article [Rate of temperature change](#)).
- At ramp speed **0.00** is displayed **Fast** which means that the controller reaches the temperature as quickly as possible.
- When changing the speed of the ramp to a certain temperature, it is necessary to enter the ramp first and then the block with the temperature.
- The equivalent of this command is a command **CasNT** (article [C command \(CasNT\)](#)), which instead

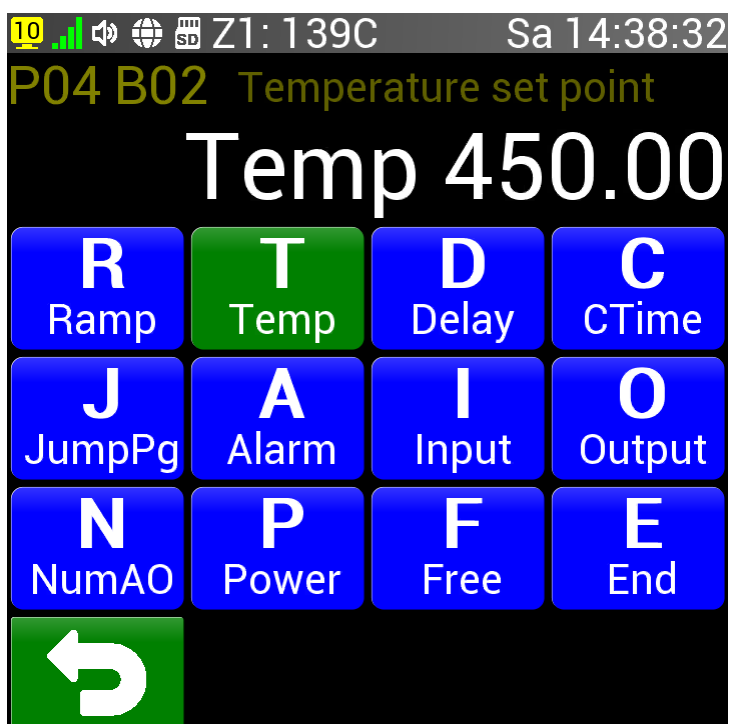
of the rate of temperature change in degrees Celsius per minute, specifies the time in which the temperature is to be reached.

After pressing the button with the R (Ramp) command, the screen for entering the desired speed value will appear.



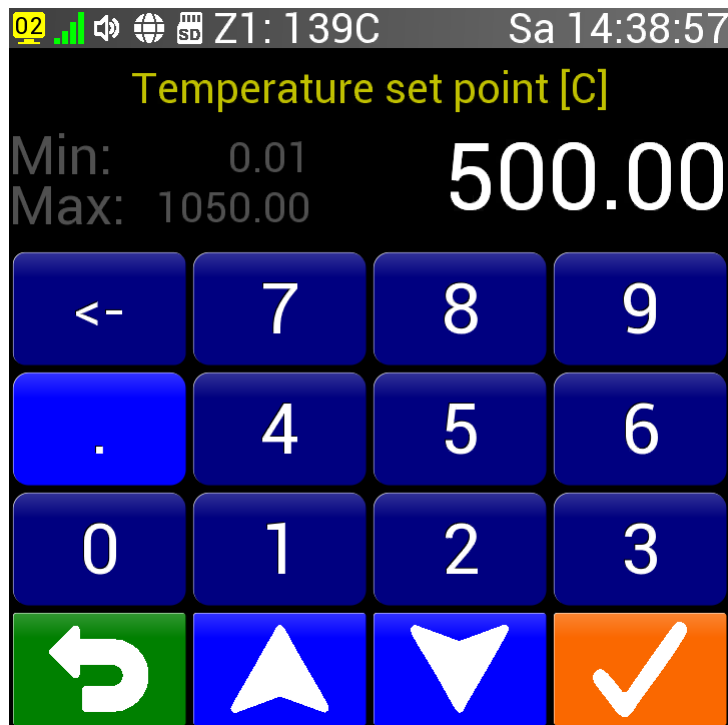
- Ramp range: 0.01°C/min to 6000.00°C/min or Fast (as fast as possible).
- The value can be entered using the numeric keypad or the up and down arrows.
- If we hold the up or down button, the value will change faster and faster.
- An incorrectly entered value cannot be confirmed with the button  (OK).
- With a button  (Back) we cancel the addition or change of the block.



9.10.2. Command T (Temp.)



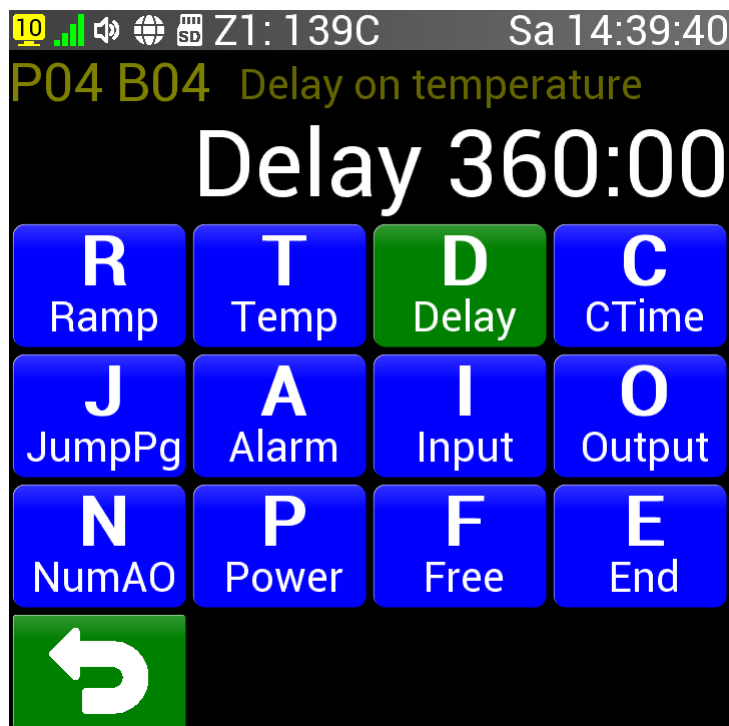
- Command **T = Temp.** used to set the required temperature for regulation (abbreviation SP = Set Point).
- This command is also described in the article [Set temperature](#) in manual mode.
- The controller will approach this temperature at the speed specified by the command **Ramp** (article [Command R \(Ramp\)](#)).
- Depending on the settings, the controller will wait until the actual temperature reaches the set temperature or will continue the program immediately after reaching the set temperature with the temperature regulated.
- Command for new temperature change rate **Ramp** must be entered before the command **Temperature**

After pressing the button with the T (Temp.) command, the screen for setting the desired temperature will appear.



- Temperature range: 0.01°C to maximum temperature according to setting (Article [Maximum control temperature](#)).
- The value can be entered using the numeric keypad or the up and down arrows.
- If we hold the up or down button, the value will change faster and faster.
- An incorrectly entered value cannot be confirmed with the button  (OK).
- With a button  (Back) we cancel the addition or change of the block.



9.10.3. Command D (Delay)



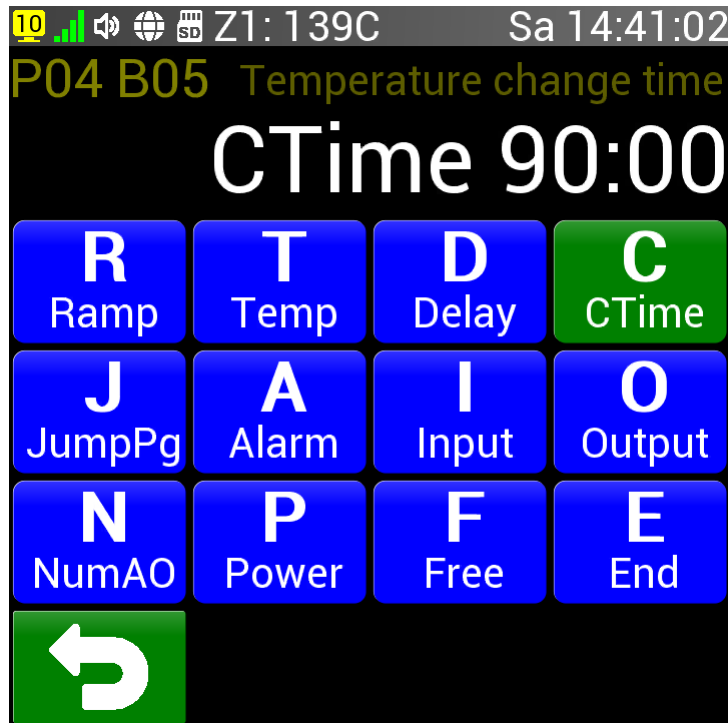
- Command **D = Delay** is used to set the dwell time at the currently regulated temperature.
- This command is also described in the article [Temperature delay](#) in manual mode.
- When entering the dwell time **0:00** will be displayed **Cont** which means the delay will be infinite.
- If it is set **Cont** temperature, the program must be switched off manually or it will be interrupted in the event of a fault.

After pressing the button with the D (Delay) command, the screen for setting the delay time will appear.



- Delay time range: 0:01 to 9999:59 (min:sec) or Cont (infinite delay).
- The value can be entered using the numeric keypad or the up and down arrows.
- If we hold the up or down button, the value will change faster and faster.
- An incorrectly entered value cannot be confirmed with the button  (OK).
- With a button  (Back) we cancel the addition or change of the block.

9.10.4. Command C (CasNT)



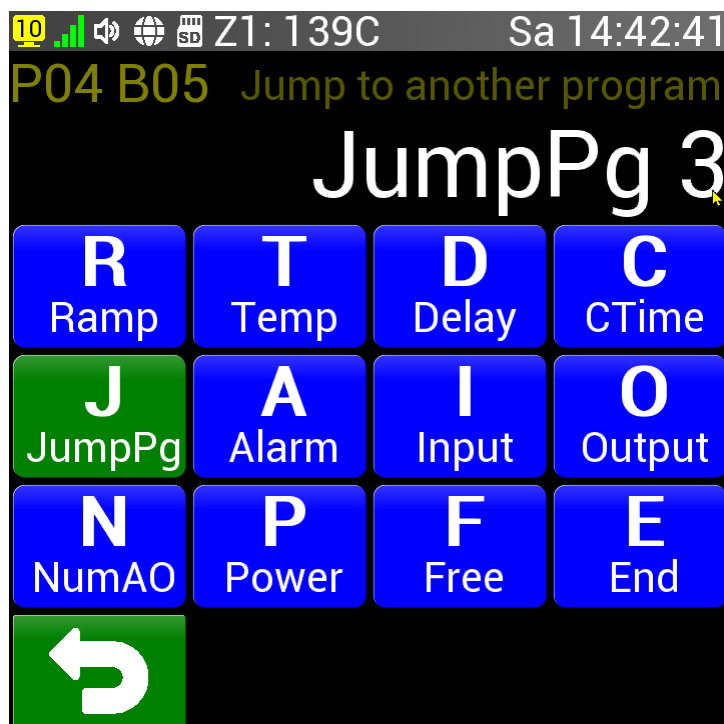
- Command **C** = **CasNT** serves to set the time to reach the temperature.
- The set time to reach the temperature applies to all further increases and decreases in temperature until the next change with the C (CasNT) or R (Ramp) command.
- When starting the program, the rate of temperature change is taken from the manual mode ([Rate of temperature change](#)).
- If the required time to reach the temperature is required, it is necessary to enter the time first and then the block with the temperature.
- The equivalent of this command is a command **Ramp** (article [Command R \(Ramp\)](#)), which instead of the time to reach the temperature, directly sets the rate of temperature change in degrees Celsius per minute.

After pressing the button with the command C (CasNT), the screen for entering the time to reach the temperature will appear.



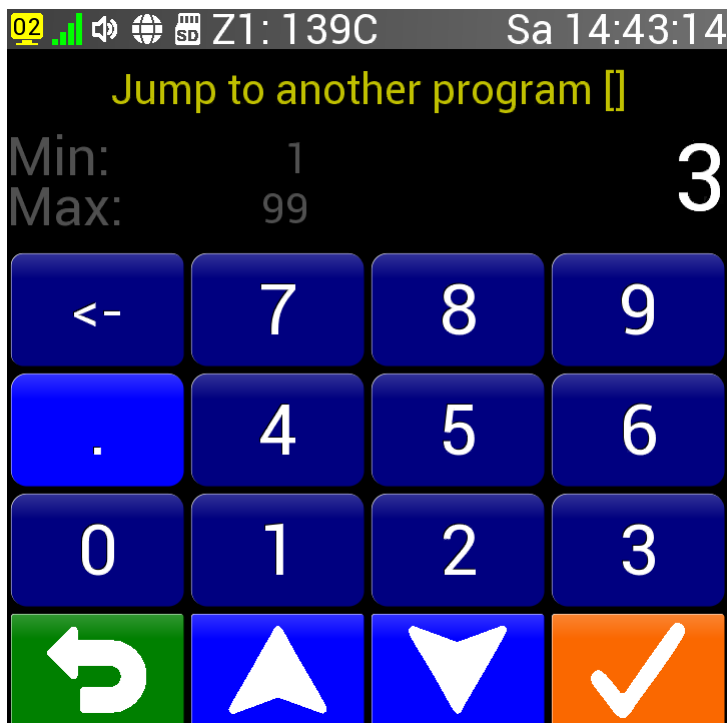
- Range of time to reach temperature: 0:01 to 9999:59 (min:sec).
- The value can be entered using the numeric keypad or the up and down arrows.
- If we hold the up or down button, the value will change faster and faster.
- An incorrectly entered value cannot be confirmed with the button (OK).
- With a button (Back) we cancel the addition or change of the block.



9.10.5. Command J (JumpPg)



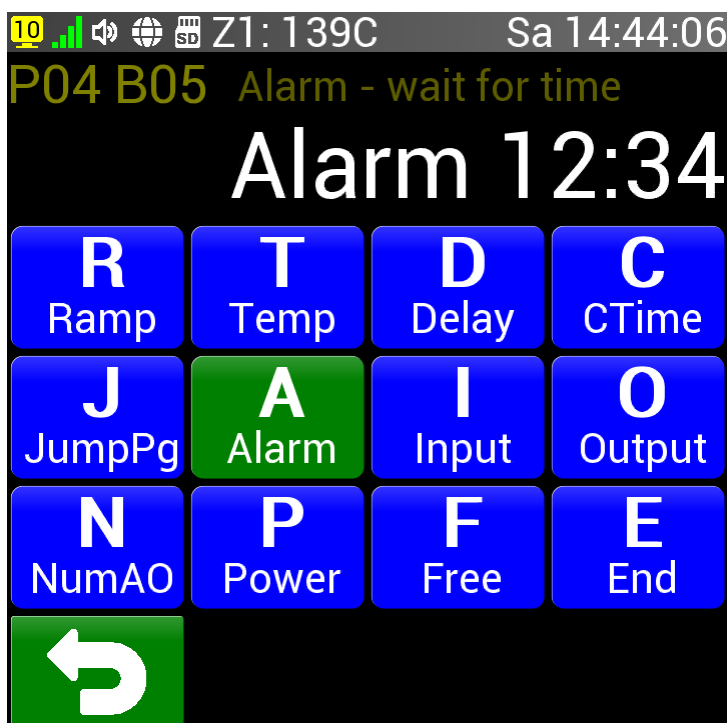
- Command **J = JumpPg** used to jump to the beginning of another (or the same) program.
- In case we are writing a long program where 99 blocks are not enough, with this command we can jump to the next program and continue writing the program here.
- Another use is the constant repetition of the same program, which has a use in some cases.
- The command can also be used for the common end of several programs in which we will use this command.

After pressing the button with the command J (JumpPg), the screen for entering the program number will appear.



- Program number range is 1 - 99.
- The value can be entered using the numeric keypad or the up and down arrows.
- If we hold the up or down button, the value will change faster and faster.
- An incorrectly entered value cannot be confirmed with the button  (OK).
- With a button  (Back) we cancel the addition or change of the block.

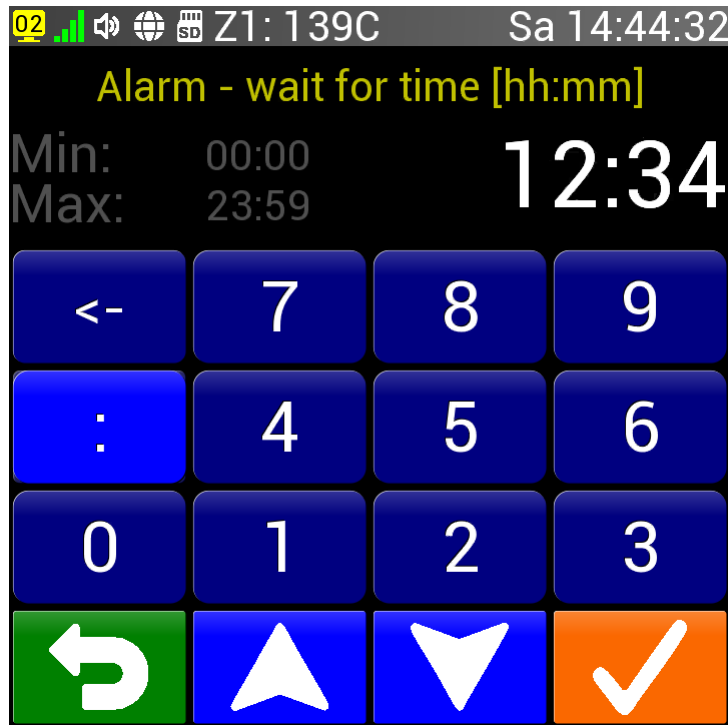
9.10.6. Command A (Alarm)





- Command **A = Alarm** is used to wait for the specified real time.

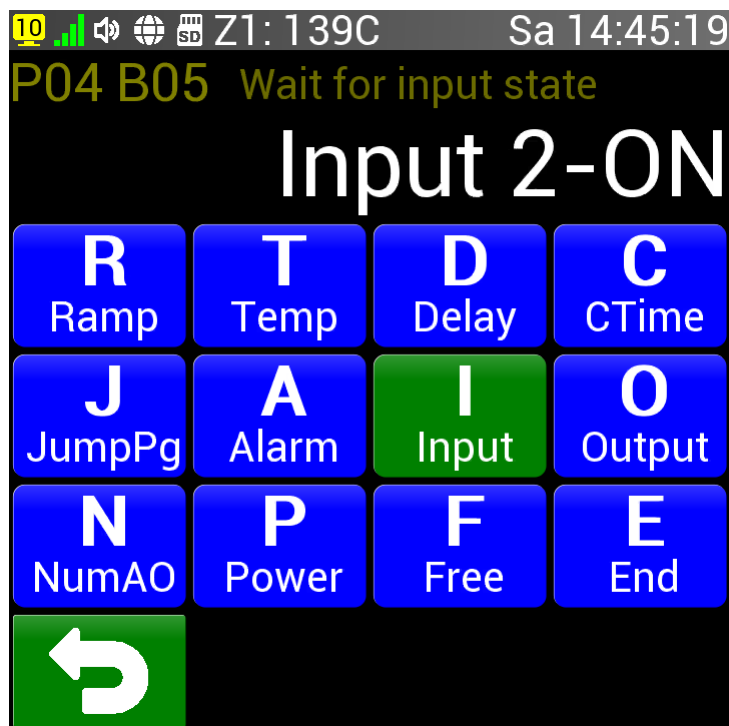
- With this command we can synchronize the program with real time. For example, due to a change in the ramp speed or a power failure, the program may not follow the times in the program curve exactly.
- When executing this command, the controller waits for the specified time in hours and minutes.
- While waiting, the last set temperature is regulated (as with the delay [Příkaz D \(Vyrz\)](#)).
- With the help of the command, it is possible to program the long-term, time-accurate operation of the device.

After pressing the button with the command A (Alarm), the screen for entering the hours and minutes will appear.



- The range of the A (Alarm) command parameter is 00:00 to 23:59 (hours : minutes).
- The value can be entered using the numeric keypad or the up and down arrows.
- If we hold the up or down button, the value will change faster and faster.
- An incorrectly entered value cannot be confirmed with the button  (OK).
- With a button  (Back) we cancel the addition or change of the block.

9.10.7. Command I (Input)





- Command **I = Input** is used to wait for the specified status of the digital input of the controller.
- If the command is used right away in the first block of the program, the execution of the program will practically be conditional on the state of the digital input (this can be, for example, a start permission signal from the superior system).
- The OFF state corresponds to a logical 0 at the input, the ON state corresponds to a logical 1 at the input.
- During the program, the controller can then react to other stimuli (waiting for the damper to open, etc.).
- While waiting, the last set temperature is regulated (as with the delay [Command D \(Delay\)](#)).
- If the selected digital input is not present on the controller, the controller ignores this command.

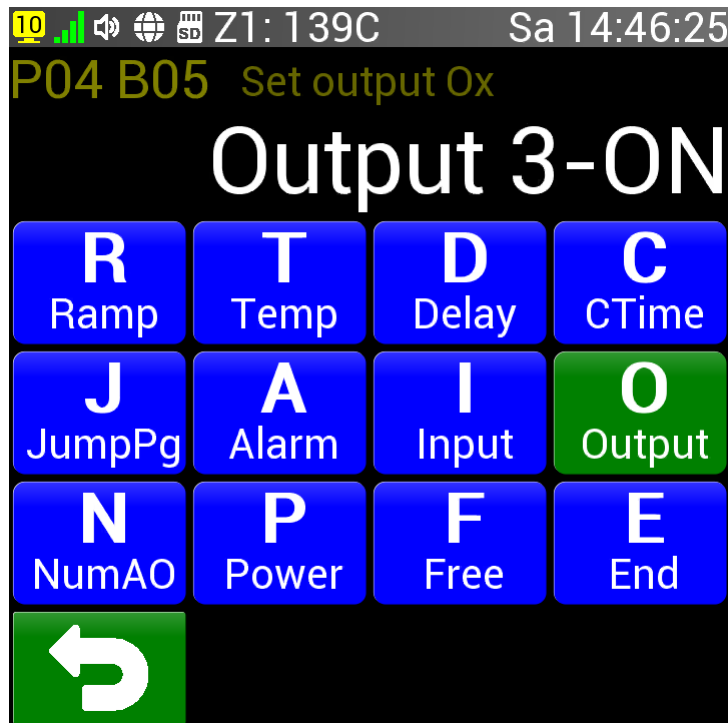
After pressing the I (Input) button, the screen for entering the number and the desired input status will appear.



- The range of the input number is 1 to 5 and the status can be ON or OFF.

- The value can be entered using the numeric keypad or the up and down arrows.
- If we hold the up or down button, the value will change faster and faster.
- An incorrectly entered value cannot be confirmed with the button  (OK).
- With a button  (Back) we cancel the addition or change of the block.

9.10.8. Command O (Output)



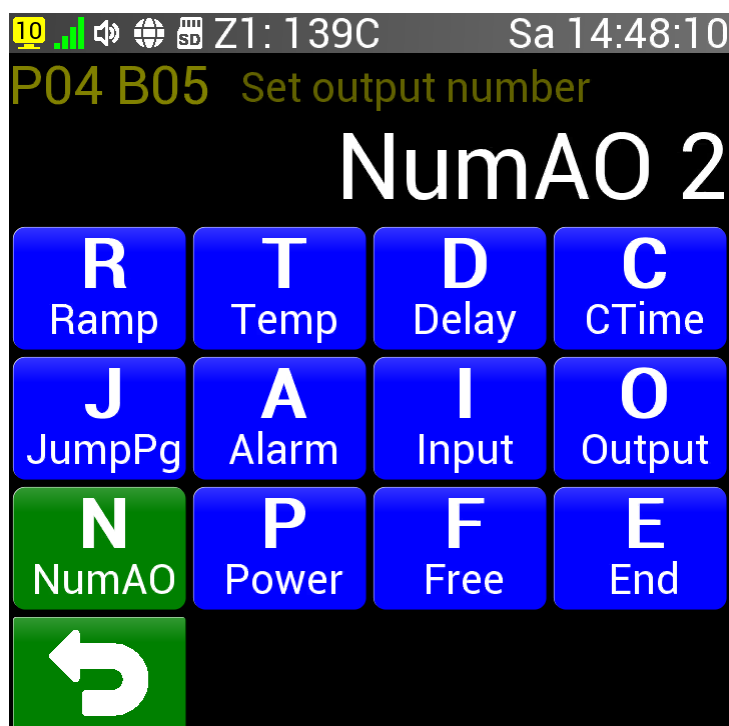
- Command **O = Output** enables control of the digital outputs of the CLARE controller.
- Peripherals such as a fan, damper, siren, etc. can be connected to the digital outputs.
- The outputs are controlled by switching relays (3 A / 240 V), of which there can be up to 5 in the controller itself.
- When the program is switched off or just started, all program outputs are in the OFF state.
- The OFF state corresponds to a logical 0 at the output, the ON state corresponds to a logical 1 at the output.
- A function other than the program output can be assigned to the outputs (alarm, contactor, etc., see article [Ox digital output mode](#)), then the set output status is ignored in the program.
- If the selected digital output is not present in the controller, the command will not appear on the controller terminals.

After pressing the O (Output) button, a screen for entering the number and desired output status will appear.



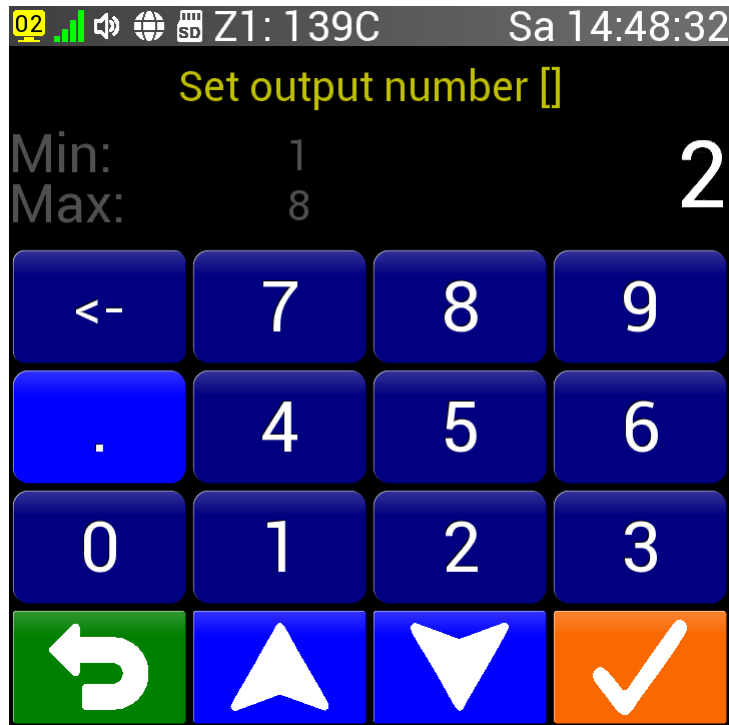
- The output number range is 1 to F and the status can be ON or OFF.
- The value can be entered using the numeric keypad or the up and down arrows.
- If we hold the up or down button, the value will change faster and faster.
- An incorrectly entered value cannot be confirmed with the button (OK).
- With a button (Back) we cancel the addition or change of the block.



9.10.9. Command N (CisAO)



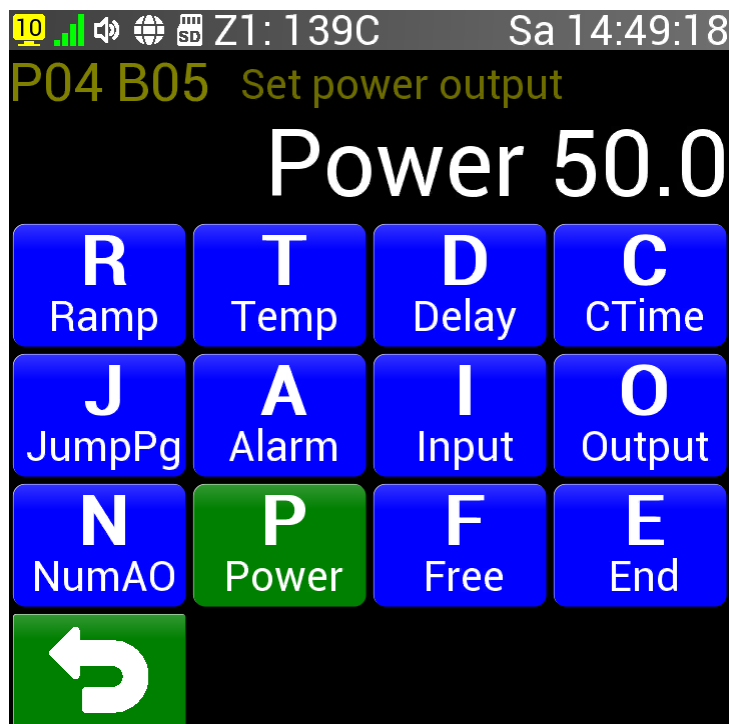
- Command **N = CisAO** allows you to select the analog output for other blocks with power settings.
- Peripherals such as a fan, damper, etc. can be connected to the analog outputs, and with this command we select which output we will work with.
- There can be up to 4 analog outputs (voltage or current - see article [Controller connectors](#)).
- When the program is currently running, analog output No. 1 is preset.

After pressing the N (CisAO) button, the screen for entering the analog output number will appear.



- The analog output number range is 1 - 8.
- The value can be entered using the numeric keypad or the up and down arrows.
- If we hold the up or down button, the value will change faster and faster.
- An incorrectly entered value cannot be confirmed with the button  (OK).
- With a button  (Back) we cancel the addition or change of the block.

9.10.10. Command P (Power)





- Command **P = Power** allows you to select the analog output for other blocks with power settings.
- There can be up to 4 analog outputs (voltage or current - see article [Controller connectors](#)).
- The selection of the analog output that we will set is done using [Command N \(CisAO\)](#).

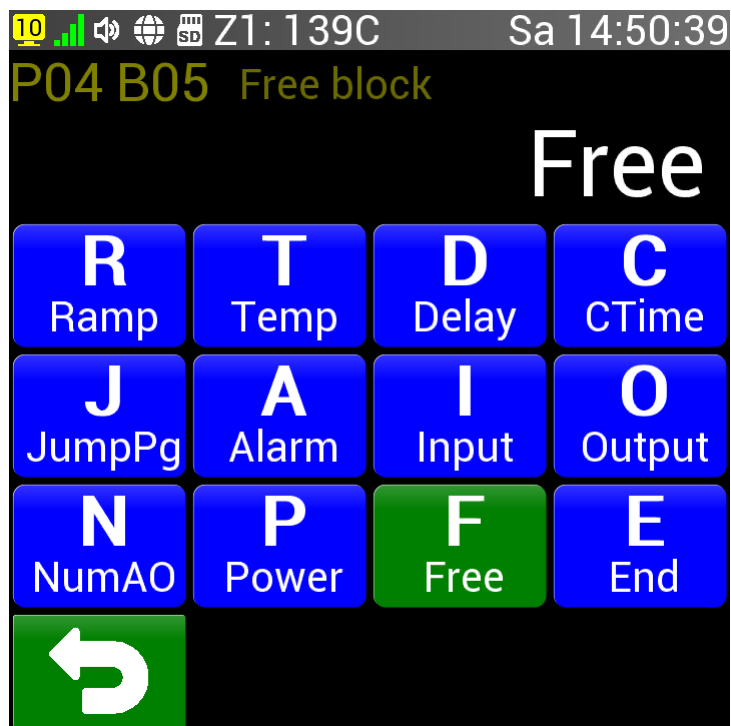
- If the analog output is selected in the heating mode, the P (Power) command sets the maximum heating power, which will not be exceeded until the next power setting. When entering **Auto** the maximum heating power is calculated by default according to the Settings (article [Maximum performance at 0°C](#) and so on).
- If the analog output is in cooling mode, the P (Power) command will set the output exactly to the specified value. When entering **Auto** automatic cooling regulation will take place.
- When the analog output is set to Program mode, the output is set exactly according to the entered value. The entered value **Auto** in this case it assigns a power of 0.0 to the output.

After pressing the P (Power) button, the screen for entering the value for the analog output will appear.




- The analog output value range is **0.0-100.0** (percent) or **Auto** (corresponds to 100.1%).
- If we have set the value to 0.0 (just press the 0 button after entering this screen), then instead of the delete button, the Auto button will appear, with which we can directly set the Auto value.
- The value can be entered using the numeric keypad or the up and down arrows.
- If we hold the up or down button, the value will change faster and faster.
- An incorrectly entered value cannot be confirmed with the button  (OK).
- With a button  (Back) we cancel the addition or change of the block.

9.10.11. Command F (Free)

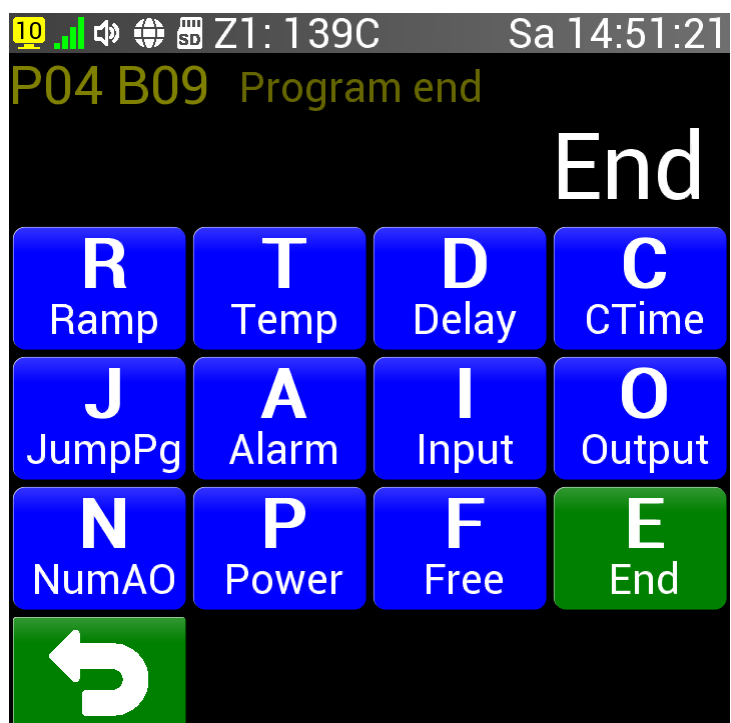


- Command **F = Free** allows you to insert an empty block into the program.
- This command can be used, for example, if we want to add a block to the program over time or temporarily delete a block.
- While the program is running, the block with the command F (Free) is only skipped.

After pressing the F (Free) key, the empty block is written into the program and the previous screen is displayed.

With a button  (Back) we cancel the addition or change of the block and return to the previous screen.


9.10.12. Command E (End)



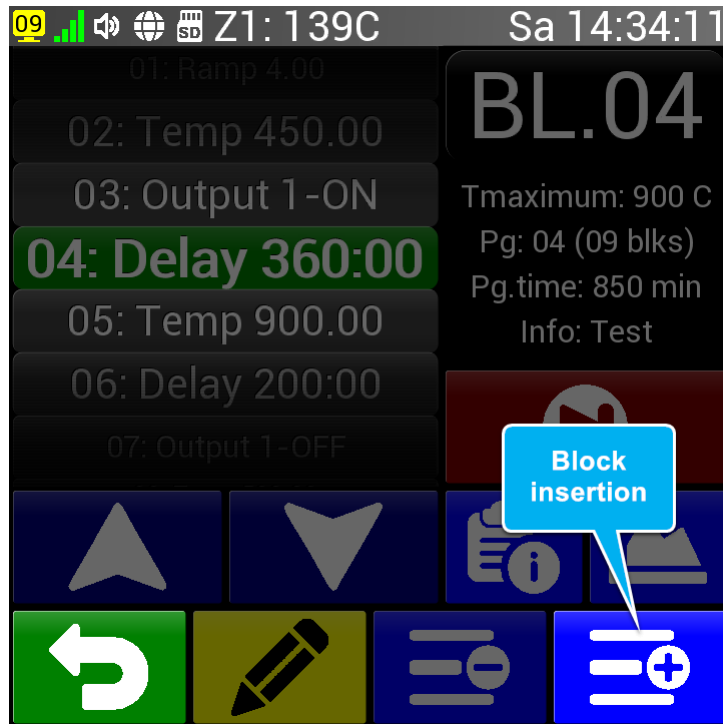
- Command **E = End** terminates the program.


- When writing a program, the end block is automatically moved to the last position of the program.
- When the E (End) command is inserted into the first block of the program, the entire program is deleted and becomes empty.
- If a statement is inserted in the middle of a program, all blocks after it are deleted.
- While the program is running, this command terminates the program.

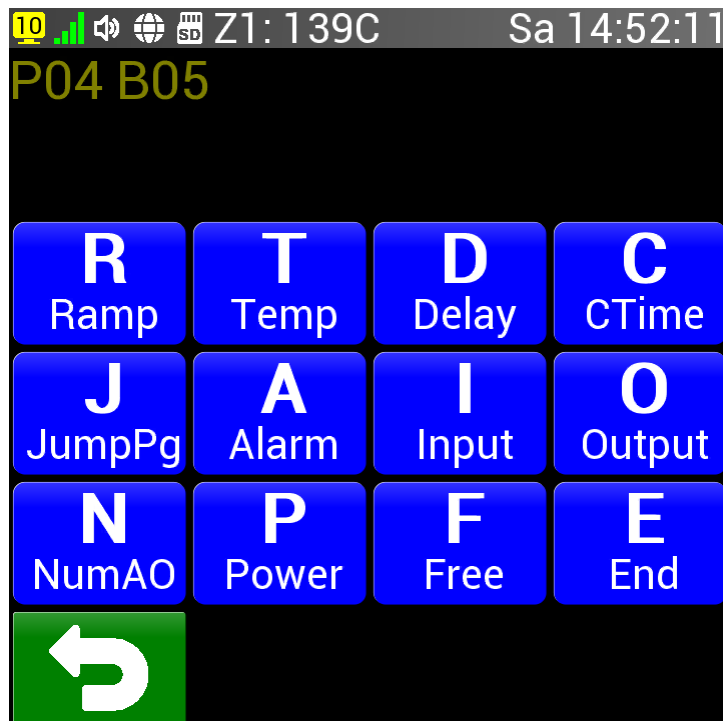
After pressing the E (End) button, the program end block is written and the previous screen is displayed.


With a button  (Back) we cancel the addition or change of the block and return to the previous screen.

9.11. Block insertion



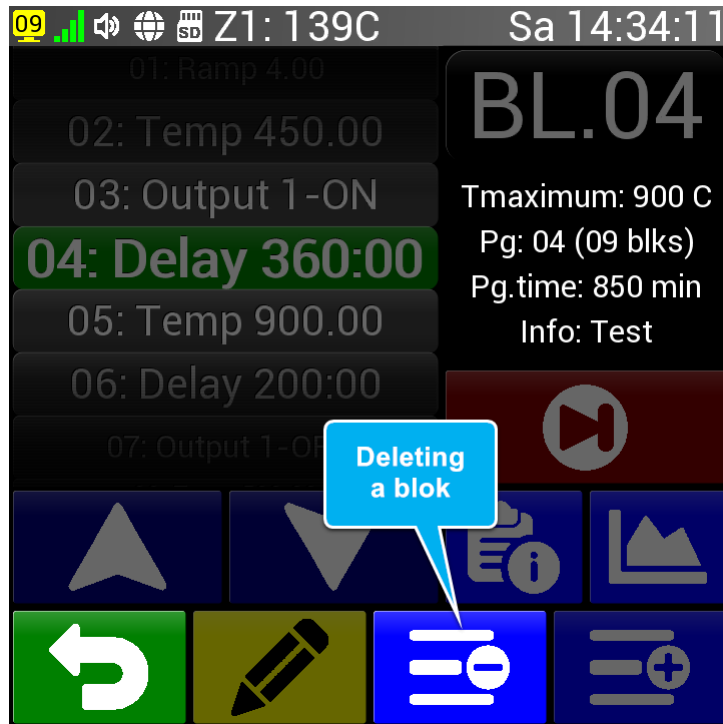
If we need to modify the program by inserting a block with a command between two previously programmed blocks, we use a button  (Insert). The new block will be placed at the position (number) of the currently selected block. This, together with other following blocks, will move one position further (the number will increase by one). The button is not visible if the program is empty or if the program already has 99 blocks and it is not possible to add more. If this button is pressed, the following screen will appear:





All the functions that the insertable block can contain are available on this screen. If we change our mind about inserting a block (another command), we can return to the previous screen using the button  (Back). Otherwise, by pressing the appropriate button, we choose which command we

want to insert into the program. In case we choose **F: Free** or **E: The end**, the command is inserted into the program and the previous screen is displayed. If we choose another command, the screen for setting the parameter of this command will appear (see previous articles). After confirmation, the command is inserted into the program and we return directly to the screen for managing blocks in the program.

9.12. Deleting a block

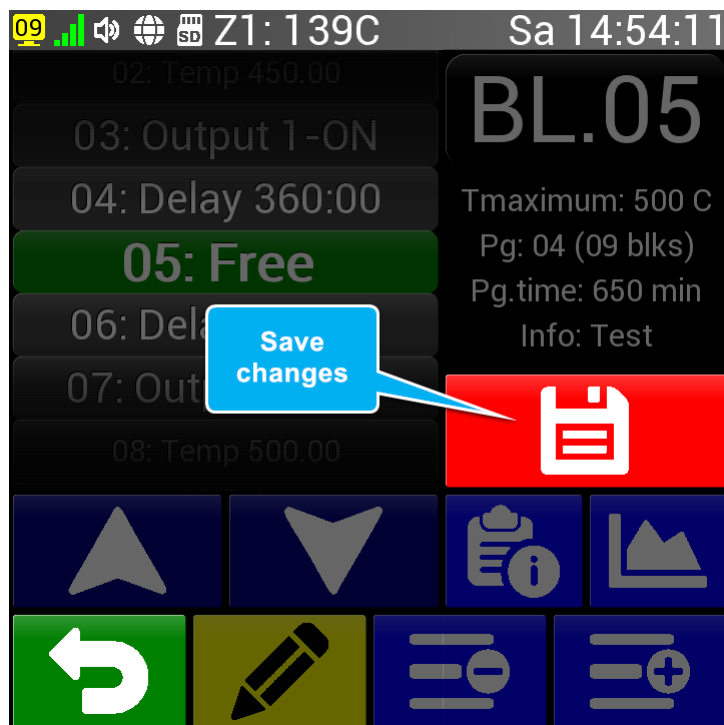



When editing a program, it is sometimes necessary to delete a certain block. This is what the button is for (Remove) which deletes the currently selected block. The last block (with the End  command) cannot be deleted, so the button does not even appear. After pressing the button  (Remove) a red button to confirm the operation will appear instead of program information on the right side of the screen.



The button gradually disappears and after about 5 seconds it disappears and the program information appears again. If we press the button during these 5 seconds, the selected block will be deleted and all other blocks will have their number reduced by one.

9.13. Save program changes



After modifying the program, it is necessary to save the program in the memory of the controller. This is what the button is for  (Save), which is automatically displayed when a change is made in the program. After pressing this button, the changed program is saved and the button disappears. If we do not save the program, then the changes made will be lost in the following cases:

- in the programming mode, we select another program
- we leave the programming mode
- a power failure occurs




9.14. Examples

IMPORTANT: The starting point of the examples

All examples are based on the home screen.





Example P01

We would like to select and run program 3.

1. Press the button to enter the programming mode  (Programs)
2. Select the PG.03 program using the rotary control or the arrows
3. With the button  (Start) we go to the startup screen (if the program is not empty)
4. Again with the button  (Start) to confirm the launch of the program




Example P02

We need to label program 3 with our own label.

1. Press the button to enter the programming mode  (Programs)
2. Select the PG.03 program using the rotary control or the arrows
3. With the button  we go to the screen for entering the label
4. Use the qwerty or T9 button to select the keyboard that suits us better and enter our description
5. Confirm the entry of the label with the button  (OK), this will also write the label into the controller's memory
6. In the program listing, we can already see our label next to the program number
7. Press the button to return to the home screen  (Back)





Example P03

We request to display the graph of program number 3.

1. Press the button to enter the programming mode  (Programs)
2. Select the PG.03 program using the rotary control or the arrows
3. With the button  we will display the graph of this program
4. Double-press the button to return to the home screen  (Back)




Example P04



We need to copy program number 3 into program number 5.

1. Press the button to enter the programming mode  (Programs)
2. Select the PG.03 program using the rotary control or the arrows
3. With the button  we go to the program copy screen
4. Use the arrows or numbers to enter **5** (the program we want to copy to)
5. Confirm the entry with the button  (OK), the program is copied and written into the controller's memory
6. Press the button to return to the home screen  (Back)

Example P05




We need to delete program number 3.

1. Press the button to enter the programming mode  (Programs)
2. Select the PG.03 program using the rotary control or the arrows
3. With the button  we will start the program deletion process. A large confirmation button will appear 

4. If we really want to delete the program in time, we confirm it with the button 
 5. The program is deleted along with its description, and in the information we see that it is now free
 6. Press the button to return to the home screen  (Back)
-










Example P06

We want to see program number 5.

1. Press the button to enter the programming mode  (Programs)
 2. Select the PG.05 program using the rotary control or the arrows
 3. With the button  we will display the list of blocks of this program
 4. Use the up and down arrows or the rotary control to view the entire program
 5. We return to the home screen by pressing the button twice  (Back)
-





Example P07

We need to create a new program number 3 (now free). We would like to enter a delay of 120 minutes at a temperature of 1000°C, which we will reach as quickly as possible.

1. Press the button to enter the programming mode  (Programs)
 2. Select the PG.03 program using the rotary control or the arrows
 3. With the button  we will display the list of blocks of this program (so far only the command End)
 4. Press the button again  and select the first command **R (Ramp)**
 5. By pressing a number **0** the rate of temperature change is displayed **Fast**, which we confirm with the button  (okay)
 6. The next command will be temperature - we select the command **T (Temp.)**
 7. Use the numbers or arrows to set the value **1000.00** and confirm with the button  (okay)
 8. The last command will be a delay - we select the command **D (Delay)**
 9. Use the numbers or arrows to set the value **120:00** and confirm with the button  (okay)
 10. By button  (Back) we return to the listing of program blocks
 11. We will check the entered blocks **01 Ramp Fast, 02 Temperature 1000.00** and **03 Delay 120:00**
 12. Save the program in the controller's memory by pressing the button 
 13. We return to the home screen by pressing the button twice  (Back)
-



Example P08





In an hour we would like to start program number 3.

1. Press the button to enter the programming mode  (Programs)
 2. Select the PG.03 program using the rotary control or the arrows
 3. With the button  (Start) we go to the startup screen (if the program is not empty)
 4. Use the button to set the time for the delayed start  (Later)
 5. Move the rotary clock forward one hour or enter the desired time with the buttons
 6. Confirm the delayed start by pressing the button  (Later), the home screen will appear
 7. Here on the now blue status bar we can see the program number and the time it will start
-

Example P09







For program number 3, we would like to change the delay to 60 minutes.

1. Press the button to enter the programming mode  (Programs)
2. Select the PG.03 program using the rotary control or the arrows
3. With the button  we will display the list of blocks of this program
4. Use the rotary control or the arrows to select the block with a delay that we want to fix

5. Press the button again  and select the marked command **D (Delay)**
6. Use the numbers or arrows to set the value **60:00** and confirm with the button  (okay)
7. Save the program change in the controller's memory by pressing the button 
8. We will return to the home screen by pressing the button twice  (Back)





Example P10

Program number 8 is very long, block number 99 can no longer be overwritten.

1. Press the button to enter the programming mode  (Programs)
2. Select the PG.08 program using the rotary control or the arrows
3. With the button  we will display the list of blocks of this program
4. Select block number 98 using the rotary control, arrows or entering the block number
5. Press the button  and select the command **J (JumpPg)**
6. The original block 98 must be rewritten in the new program, whose number we now enter
7. Enter the program number that is free (empty) and confirm with the button  (okay)
8. Save the program change in the controller's memory by pressing the button 
9. We return to the home screen by pressing the button twice  (Back)
10. We can continue writing the program on the entered free program

Example P11

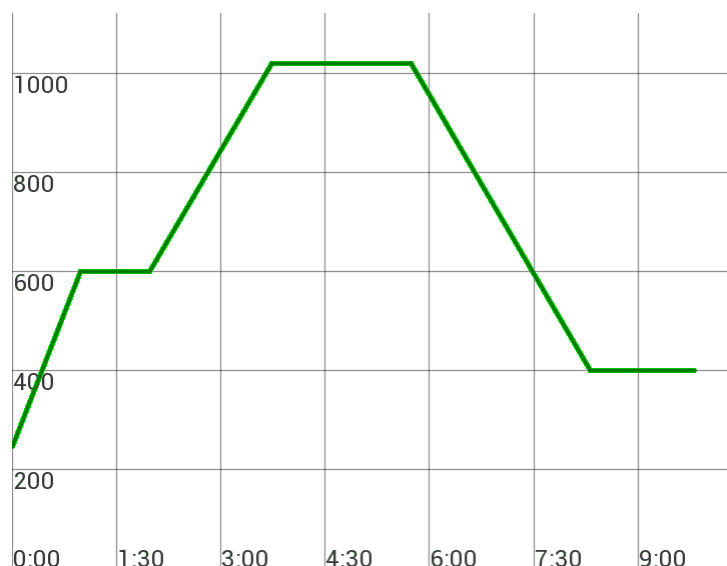
We request to run program number 8 only from the fifth block.

1. Press the button to enter the programming mode  (Programs)
2. Select the PG.08 program using the rotary control or the arrows
3. With the button  we will display the list of blocks of this program
4. Select block number 5 using the rotary control, arrows or entering the block number
5. Press the button  (Jump) to start the program from the selected block
6. A large confirmation button will appear , by pressing which we confirm the launch
7. The controller will move to the home screen, the status bar will be green (running program)














Example P12

We need to program the temperature course given by the graph. We will use the free program

1.











- Ramp 6°C/min to 600°C, a delay of 60 minutes
- Ramp 4°C/min to 1020°C, delay here 120 minutes
- Ramp 4°C/min to 400°C, a delay of 90 minutes

1. Press the button to enter the programming mode  (Programs)
2. Select program PG.01 with the rotary control or arrows
3. With the button  we will display the list of blocks of this program (so far only the command End)
4. Press the button again  and select the command **R (Ramp)**
5. Use the numbers or arrows to set the value **6.00** and confirm with the button  (okay)
6. The next command will be temperature - we select the command **T (Temp.)**
7. Use the numbers or arrows to set the value **600.00** and confirm with the button  (okay)
8. Then there is a delay - we select the command **D (Delay)**
9. Use the numbers or arrows to set the value **60:00** and confirm with the button  (okay)
10. Now we select the command **R (Ramp)**
11. Use the numbers or arrows to set the value **4.00** and confirm with the button  (okay)
12. The next command will be the temperature - we select the command **T (Temp.)**
13. Use the numbers or arrows to set the value **1020.00** and confirm with the button  (okay)
14. Next, there will be a delay again - we select the command **D (Delay)**
15. Use the numbers or arrows to set the value **120:00** and confirm with the button  (okay)
16. Since the steepness of the down ramp is the same as in the previous ramp, we do not need to enter it again
17. Next comes the last temperature - we select the command **T (Temp.)**
18. Use the numbers or arrows to set the value **400.00** and confirm with the button  (okay)
19. The last command will be the third delay - we select the command **D (Delay)**
20. Use the numbers or arrows to set the value **90:00** and confirm with the button  (okay)
21. Save the program in the controller's memory by pressing the button 
22. We return to the home screen by pressing the button twice  (Back)
















Example P13

We require the most accurate start-up with a ramp of 1°C/min to a temperature of 150°C (we will limit the power consumption of the device to 15%). We will use the free program number 4.

1. Press the button to enter the programming mode  (Programs)
2. Select program PG.04 with the rotary control or arrows
3. With the button  we will display the list of blocks of this program (so far only the command End)
4. Press the button again  and select the first command **R (Ramp)**
5. Use the numbers or arrows to set the value **1.00** and confirm with the button  (okay)
6. The next command will be setting the maximum power - we select the command **P (Power)**
7. Use the numbers or arrows to set the value **15.0** and confirm with the button  (okay)
8. The last command will be the temperature - we select the command **T (Temp.)**
9. Use the numbers or arrows to set the value **150.00** and confirm with the button  (okay)
10. Save the program in the controller's memory by pressing the button 
11. We return to the home screen by pressing the button twice  (Back)

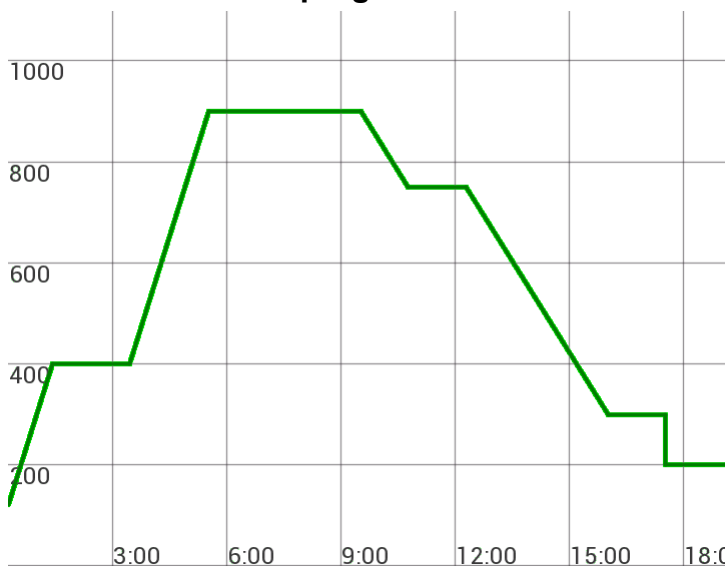
Example P14

We want to maintain a temperature of 1180°C every day from 6:00 a.m. to 6:00 p.m., and 400°C at night. We require the controller to reach temperature in one hour in the morning. We will use the free program 2.

1. Press the button to enter the programming mode **P** (Programs)
2. Select the PG.02 program with the rotary control or arrows
3. With the button  we will display the list of blocks of this program (so far only the command End)
4. Press the button again  and select the command **C (CasNT)**
5. Use the numbers or arrows to set the value **60:00** and confirm with the button  (okay)
6. The next command will be temperature - we select the command **T (Temp.)**
7. Use the numbers or arrows to set the value **1180.00** and confirm with the button  (okay)
8. Press the button again  and select the command **A (Alarm)**
9. Use the numbers or arrows to set the value **18:00** and confirm with the button  (okay)
10. Press the button again  and select the first command **R (Ramp)**
11. By pressing a number **0** the rate of temperature change is displayed **Fast**, which we confirm with the button  (okay)
12. The next command will be the temperature - we select the command **T (Temp.)**
13. Use the numbers or arrows to set the value **400.00** and confirm with the button  (okay)
14. Press the button again  and select the command **A (Alarm)**
15. Use the numbers or arrows to set the value **5:00** and confirm with the button  (okay)
16. We press the button  and select the command **J (JumpPg)**
17. Enter the program number **2** (infinite loop) and confirm with the button  (okay)
18. Save the program in the controller's memory by pressing the button 
19. We return to the home screen by pressing the button twice  (Back)



















Example P15

We need to program the cycle specified by the graph. The cycle will be carried out daily from six o'clock in the morning, after the end of the cycle the maintenance temperature will be 200°C. We will use program number 9.



- Ramp 4°C/min to 400°C, here a delay of 120 minutes
- Ramp 4°C/min to 900°C, here a delay of 240 minutes
- In 75 minutes at 750°C, a delay of 90 minutes here
- With a ramp of 2°C/min to 300°C, a delay of 90 minutes

1. Press the button to enter the programming mode **P** (Programs)
2. Select the PG.09 program using the rotary control or the arrows

3. Press the button again  and select the command **A (Alarm)**
4. Use the numbers or arrows to set the value **6:00** and confirm with the button  (okay)
5. Press the button again  and select the command **R (Ramp)**
6. Use the numbers or arrows to set the value **4.00** and confirm with the button  (okay)
7. The next command will be the temperature - we select the command **T (Temp.)**
8. Use the numbers or arrows to set the value **400.00** and confirm with the button  (okay)
9. Then there is a delay - we select the command **D (Delay)**
10. Use the numbers or arrows to set the value **120:00** and confirm with the button  (okay)
11. The ramp is the same (4 °C/min), there is no need to enter it
12. The next command will be the temperature - we select the command **T (Temp.)**
13. Use the numbers or arrows to set the value **900.00** and confirm with the button  (okay)
14. Next, there will be a delay again - we select the command **D (Delay)**
15. Use the numbers or arrows to set the value **240:00** and confirm with the button  (okay)
16. Now we select the command **C (CasNT)**
15. Use the numbers or arrows to set the value **75:00** and confirm with the button  (okay)
16. The next command will be the temperature - we select the command **T (Temp.)**
17. Use the numbers or arrows to set the value **750.00** and confirm with the button  (okay)
18. Then there is a delay - we select the command **D (Delay)**
19. Use the numbers or arrows to set the value **90:00** and confirm with the button  (okay)
20. Now we select the command **R (Ramp)**
21. Use the numbers or arrows to set the value **2.00** and confirm with the button  (okay)
22. The next command will be temperature - we select the command **T (Temp.)**
23. Use the numbers or arrows to set the value **300.00** and confirm with the button  (okay)
24. Next, there will be a delay again - we select the command **D (Delay)**
25. Use the numbers or arrows to set the value **90:00** and confirm with the button  (okay)
26. Now we select the command **R (Ramp)**
27. By pressing a digit **0** the rate of temperature change is displayed **Fast**, which we confirm with the button  (okay)
28. Next comes the last temperature - we select the command **T (Temp.)**
29. Use the numbers or arrows to set the value **200.00** and confirm with the button  (okay)
30. We select the command **J (JumpPg)**
31. Enter the program number **9** (infinite loop) and confirm with the button  (okay)
32. Save the program in the controller's memory by pressing the button 
33. We return to the home screen by pressing the button twice  (Back)











TIP: Simplified program entry

A simplified way of writing this program might look, for example, like this:
a6:00, r4, t400, d120, t900, d240, c75, t750, d90, r2, t300, d90, rF, t200, j9.

Example P16

We need to 1100°C at a rate of 5°C/min and then a continuous delay. During the temperature increase, the damper on the digital output O4 must be opened. We will use the free program 7.

1. Press the button to enter the programming mode  (Programs)

2. Select the PG.07 program using the rotary control or the arrows
 3. Press the button again  and select the command **O (Output)**
 4. Use the numbers or arrows to set the value **4-ON** and confirm with the button  (okay)
 5. Press the button again  and select the command **R (Ramp)**
 6. Use the numbers or arrows to set the value **5.00** and confirm with the button  (okay)
 7. The next command will be the temperature - we select the command **T (Temp.)**
 8. Use the numbers or arrows to set the value **1100.00** and confirm with the button  (okay)
 9. We press the button again  and select the command **O (Output)**
 10. Use the numbers or arrows to set the value **4-OFF** and confirm with the button  (okay)
 11. Next, there will be a delay again - we select the command **D (Delay)**
 12. By pressing a number **0** a delay is displayed **Cont**, which we confirm with the button  (okay)
 13. Save the program in the controller's memory by pressing the button 
 14. We return to the home screen by pressing the button twice  (Back)
-

10. Attachments

10.1. List of all screens

Screens



Predefined home screens

- 01 Standard
- 02 CLARE-4
- 03 Thermostat
- 04 MalyGraf
- 05 PGlist
- 06 Message



User home screens

01-16 The user creates these screens himself (details in the article [Custom screens](#))



Work screens

- 02 Universal screen for entering values
- 03 Multi-option screen (analog input, alarms)
- 04 Overview of applications
- 05 Test of digital outputs
- 06 Sound output test
- 07 Program management
- 08 Text input screen
- 09 Management of blocks in the program
- 10 Command selection for the program block
- 11 Full screen graph with controls
- 12 PID tests
- 13 Firmware update
- 14 Selecting an item in the settings
- 15 Display calibration query
- 16 Management of external modules
- 17 Program launch screen
- 18 Stopwatch and minute hand
- 19 Delayed start
- 20 Selecting a predefined color
- 21 RGB color selection
- 22 History (event log)
- 23 Managing custom screens
- 24 Display your own screen
- 25 Selecting several options at the same time
- 26 Selection from 16 predefined graphs
- 27 Graph configuration
- 28 A selection of 16 messages
- 29 Selecting a module for your own screen
- 30 Menu
- 31 Database of older courses
- 32 Changes while the program is running
- 33 Introduction logo
- 34 Selecting a button for a custom screen

- 35 Calculator
- 36 Real time settings
- 37 Program information
- 38 Information about the controller
- 39 Guide
- 40 Setting level selection
- 41 Password for service mode
- 42 Controller configuration management
- 43 Confirmation of configuration change
- 44 Watchdog test
- 45 Memory test
- 46 Calibration of transducers
- 47 Configuration of analog inputs and outputs
- 48 Configuration of digital inputs and outputs
- 49 Displaying nearby WiFi networks
- 50 Chess
- 51 Flash memory monitor
- 52 Tests of DAC converters
- 53 Display tests
- 54 Factory reset
- 55 Selection of HW tests
- 56 Touchpad Tests
- 57 WiFi connection tests
- 58 Ambient temperature test
- 59 SD card test
- 60 Manual on SD card
- 61 LAN interface tests
- 62 Configuring the status bar
- 63 Choice of 10 user alarms
- 64 Setting the alarm

10.2. List of examples

Manual mode

[M01](#): We would like to check the set temperature (ramp and delay).

[M02](#): We want to set a delay of 120 minutes (without starting the program).

[M03](#): We want to reach a temperature of 900°C.

[M04](#): We want to constantly regulate the temperature of 1100°C and turn it off ourselves after a certain time.

[M05](#): We need to reach a temperature of 1000°C at a rate of 4°C/min and hold the temperature for 1 hour.

[M06](#): We want to execute the same program as last time.

[M07](#): Tomorrow (Thursday) at 4:00 p.m. we want to start the already set manual program.

[M08](#): On Tuesday morning at 8:30, we want to regulate to 600°C and maintain this temperature until the program is stopped manually.

[M09](#): A program has been started by mistake and we want to close it immediately.

[M10](#): We want to reduce the temperature rise rate in the already running program to 3.5°C per minute

[M11](#): In the already running program, we want to change the set temperature to 700 °C.

[M12](#): We need to extend the delay by 20 minutes in an already running program.

[M13](#): We would like to pause a running program and resume it after a certain period of time.

[M14](#): We want to skip the currently executed ramp in the running manual program.

Menu

[M15](#): We would like to look at the latest events in the controller.

[M16](#): We would like to look at the penultimate course and display its graph.

[M17](#): We want to find out what was the power consumption of the last run.

[M18](#): We would like to find out which firmware version the controller is using.

[M19](#): We want to find out what IP address the controller uses (it must be connected to the network).

[M20](#): We need to look at the manual and enlarge the desired page (PRO version only).

[M21](#): We want to find out what was the power consumption of the last run.

[M22](#): We want to find out what the currently set ramp (rate of temperature change) is.

[M23](#): We want to look at the set parameters of the manual mode.

[M24](#): We need to find out how long the program has been running.

Programming mode

[P01](#): We would like to select and run program 3.

[P02](#): We need to label program 3 with our own label.

[P03](#): We request to display the graph of program number 3.

[P04](#): We need to copy program number 3 into program number 5.

[P05](#): We need to delete program number 3.

[P06](#): We want to see program number 5.

[P07](#): We need to create a new program number 3 (now free). We would like to enter a delay of 120 minutes at a temperature of 1000°C, which we will reach as quickly as possible.

[P08](#): In an hour we would like to start program number 3.

[P09](#): For program number 3, we would like to change the delay to 60 minutes.

[P10](#): Program number 8 is very long, block number 99 can no longer be overwritten.

P11:We request to run program number 8 only from the fifth block.

P12:We need to program the temperature course given by the graph. We will use the free program 1.

P13:We require the most accurate start-up with a ramp of $1^{\circ}\text{C}/\text{min}$ to a temperature of 150°C (we will limit the power consumption of the device to 15%). We will use the free program number 4.

P14:We want to maintain a temperature of 1180°C every day from 6:00 a.m. to 6:00 p.m., and 400°C at night. We require the controller to reach temperature in one hour in the morning. We will use the free program 2.

P15:We need to program the cycle specified by the graph. The cycle will be carried out daily from six o'clock in the morning, after the end of the cycle the maintenance temperature will be 200°C . We will use program number 9.

P16:We need to 1100°C at a rate of $5^{\circ}\text{C}/\text{min}$ and then a continuous delay. During the temperature increase, the damper on the digital output O4 must be opened. We will use the free program 7.

10.3. Settings

Hardware (connectors):

Digital inputs	OPT-DI:	OPT-DI2:	EXT-DI1:	EXT-DI2:
Digital outputs	INT-R1:	INT-R2:	INT-R3:	INT-R4:

Analog inputs	INT-TC:	INT-AI2:	OPT-AI3:	OPT-AI4:
Analog outputs	INT-AO1:	INT-AO2:	OPT-AO3:	OPT-AO4:

1. Inputs

Input mode	I1:	I2:	I3:	I4:
------------	-----	-----	-----	-----

	Z1	Z2	Z3	Z4
Type of entry				
Minimum (cal. 0 mV)				
Maximum (cal. 40 mV)				
Format				
Displacement				
Filter				
Correction				
Temperature T1				
dT1 correction				
Temperature T2				
dT2 correction				
Temperature T3				
dT3 correction				
Temperature T4				
dT4 correction				
Temperature T5				
dT5 correction				
Coefficient a				
Coefficient b				
Coefficient c				
Coefficient d				

2. Regulation

Thermostat function		Skip and pause	
Program changes on the fly		Ramp limitations	
Step temperature change		Max. heating rate	
Changing the ramp step		Max. cooling rate	
Change delay step		Outage: continue	

Accurate program curve		Max. downtime	
Ramp tolerance		Ramp after blackout	

	Z1	Z2	Z3	Z4
Regulation type				
Position hysteresis				
Hysteresis range				
PID component P				
PID component I				
PID component D				
PID period				
PID2 set				
PID1 temperature				
PID2 component P2				
PID2 component I2				
PID2 component D2				
PID2 period 2				
PID2 temperature				
Melt down				
Performance at T=0°C				
Performance at Tmax/2				
Performance at Tmax				

3. Outputs

	AL.1	AL.2	AL.3	AL.4	AL.5
Turn on					
Source:					
Compare with:					
Lower limit:					
Alarm mode:					
Upper limit:					
Delay:					
Activity:					
Exit:					
Polarity:					
Blocking:					

	AL.6	AL.7	AL.8	AL.9	AL.A
Turn on					
Source:					
Compare with:					

Lower limit:					
Alarm mode:					
Upper limit:					
Delay:					
Activity:					
Exit:					
Polarity:					
Blocking:					

	O1	O2	O3	O4	O5
Output mode					
Selected zone					
Selected alarm					
Pulse period					
Controller power					

	P1	P2	P3	P4
Output mode				
Regulated zone				
Output type				
PWM				
Pulse width				
Controller performance				

4. Display

Status bar - date:	1:	2:	3:	4:
Time:	5:	6:	7:	8:

Introductory logo		LCD brightness during the day	
Magnification of module		LCD brightness at night	
Selecting the main screen		Lower LCD brightness	
Buttons with icons		Lower LCD brightness after time	
Performance at zone		Screen saver	
Value labels		Time saver	
Changing zones		Main screen after	
Pressure sensitivity		Display rotation	

RG temperature regulation		MI average zones	
SP set temperature		PG program	
TA ambient temperature		P1 output 1	
Z1 zone 1 temperature		P2 output 2	
Z2 zone 2 temperature		P3 output 3	

Z3 zone 3 temperature		P4 output 4	
Z4 zone 4 temperature		MO output diameter	

5. Sound

Enable sound		A minute of ringing	
Volume		Alarm ring time	
Default minute			

6. System

Language		Enable programs	
Setting level		Allow changing programs	
Maximum temperature		Password for settings	
		Turn the clock 5 minutes	

7. Record

Sampling interval			
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8. Connection

Wi-Fi mode		Module log	
WiFi client network name		Number of slave zones	
WiFi client network password		Protocol address	
WiFi DHCP disabled		Enable NTP	
WiFi IP address		NTP server	
WiFi IP mask		NTP port	
WiFi IP gateway		NTP time zone	
Wi-Fi IP DNS		LAN module web	
LAN/RS485 module		LAN web port	
RS485: Baud		LAN DHCP disabled	
RS485: Data bits		LAN IP address	
RS485: Parity		LAN IP gateway	
RS485: Stop bits		LAN IP DNS	

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