

Operating instructions



Temperature control unit blueMaster pro

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Contents

1. Operating concept.....	5
1.1 Buttons.....	5
1.2 Slide switch	5
1.3 Tool data records	6
1.4 Zones, groups and global settings	6
1.5 Restarting the application	6
2. Description of the control unit.....	7
2.1 Front side.....	7
2.2 Pages	8
2.3 Rear view	9
2.3.1 Thermo inputs X1 and X2.....	10
2.3.2 Load outputs X3 and X4.....	11
2.3.3 CAN bus interface X5	12
2.3.4 Serial interface X6.....	12
2.3.5 Ethernet interface X7	13
2.3.6 Peripheral interface X8	13
2.3.7 Lowering/OK interface X9.....	13
2.3.7.1 <i>Lowering</i> function	14
2.3.7.2 <i>Temperature OK</i> function.....	14
2.3.8 Mains connection	14
3. Description of the user interface.....	15
3.1 Start screen	15
3.1.1 Version.....	17
3.2 Continue	17
3.2.1 Thermocouple test.....	18
3.3 Loading the tool.....	20
3.4 Creating a new tool	21
3.4.1 Set-up wizard	22
3.4.1.1 Setup wizard: Basic settings	22
3.4.1.2 Setup wizard: Deselecting zones.....	23
3.4.1.3 Setup wizard: System test	24
3.4.1.4 Setup wizard: Groups	26

3.1.4.5 Set-up wizard: Temperatures	28
3.4.1.6 Finalising the setup wizard	30
3.5 Main view.....	31
3.5.1 Toolbar on the left in the main view	31
3.5.1.1 Status display.....	32
3.5.1.2 Compact view	32
3.5.1.3 Group view	33
3.5.1.4 Detailed view	35
3.5.1.5 Curve Recorder	36
3.5.1.6 Table view.....	39
3.5.2 Toolbar at the top of the main view	39
3.5.3 Toolbar on the right in the main view.....	39
3.5.4 Footer of the main view	40
3.5.5 Zone settings	41
3.5.5.1 Operating modes.....	42
4. Main menu	43
4.1 Tool settings	43
4.1.1 Temperature settings	43
4.1.1.1 Min/max temperatures	43
4.1.1.2 Lowering	44
4.1.1.3 Lifting.....	44
4.1.2 Diagnosis	44
4.1.3 Tool data records	45
4.1.3.1 Current tool	46
4.1.3.2 Tool data sets USB	46
4.1.3.3 Tool data records network.....	47
4.1.4 Selecting the thermocouple type.....	48
4.1.5 Optimisation.....	49
4.2 Operating settings	49
4.2.1 Heat-up function.....	49
4.2.2 Recording	51
4.2.3 OPC UA interface.....	52
4.2.4 Serial interface.....	53

4.2.5 Autostart.....	54
4.2.6 Simulation	54
4.3 Device settings.....	54
4.3.1 Language.....	54
4.3.2 Device properties	55
4.3.4 User administration	55
4.3.5 Network settings	55
4.3.5.1 WiFi	56
4.3.6 VNC Server	56
4.4 Support	57
4.4.1 Assistant.....	57
4.4.2 Help.....	57
4.4.3 Service file	57
4.4.4 Pin assignment.....	58
4.4.5 Snapshot	58
4.4.6 Performance monitor	59
4.4.7 HMI calibration	60
5. Contact us.....	61
List of illustrations	62

Operating instructions blueMaster pro EN

1. Operating concept

In this chapter, we would like to introduce you to the basic operating concept of the blueMaster pro.

1.1 Buttons

The blueMaster pro is operated via buttons on the screen.



Figure 1: Help Button

- All **buttons** on the blueMaster pro are labelled with symbols. If you are unclear about the meaning of a symbol, press the question mark button and you will receive an explanation. If you want to find out more, you can go directly from the explanation to this digital manual.
- **Round buttons are used** to display content. For example, several views can be selected on the main screen and you can decide which is most suitable for your application.
- **Square buttons** trigger actions.
- **Pressed buttons are white** with a blue symbol, **unpressed buttons are blue** with a white symbol

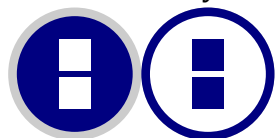


Figure 2: Detail view button
left: inactive, right: active

1.2 Slide switch

- Some settings are controlled via **slide switches**. These are green when they are active and grey when they are inactive.



Figure 3: Slide switch
top: active, bottom: inactive

1.3 Tool data records

- All **changes** that you make **are saved directly to the mould data record**. The mould data record contains the mould name, the set temperatures and times as well as the control parameters that were determined for this mould.

1.4 Zones, groups and global settings

The blueMaster pro distinguishes between

- **Zones**, i.e. individual loads connected to the blueMaster
- **Groups**, which can consist of one or more zones
- **Global** settings that affect all connected zones

If a button acts on a group or globally, this is indicated by an additional symbol on the button.



*Figure 4: Boost button
left: Group, right: global*

1.5 Restarting the application

- Certain changes to settings require a **restart of the application**, i.e. the application with which the blueMaster pro is operated. If this is the case, you will be notified and can decide whether you want to restart now or make the change later.

2. Description of the control unit

This chapter describes the structure of the control unit.

2.1 Front side



Figure 5: Front side of the blueMaster pro

The touch-sensitive screen, which is used to operate the device, is located in the centre of the front of the blueMaster pro. This is part of the HMI (*human machine interface*), which also contains the computer that generates the graphical user interface.

The backlit Günther logo is located at the bottom on the left-hand side. This shows the current status of the device.

On the right-hand side you will find the USB port, which can be used to transfer saved data from the controller. This connection is also used for firmware updates.

The power switch of the blueMaster pro is located next to it. This is illuminated when the device is switched on.

2.2 Pages

The type plate is located on the right-hand side of the blueMaster pro (seen from the front). This shows the serial number and the number of control zones (6, 12, 18 or 24).

The load fuses are accessible from both sides of the appliance and are labelled F1..24. To replace a fuse, the cap of the fuse holder must be unscrewed. Only fuses of type 16 A FF / 250 V (superfast) in the format 6.3 x 32 mm may be used for replacement. Replacement fuses are available as **Günther article 311.0026.00**.

2.3 Rear view

Below is an illustration of the rear of the blueMaster pro.



Figure 6: Rear of the blueMaster pro

The connections on the rear of the blueMaster pro are labelled X1-X7 or X1-X9. On devices with standard assignment, they have the following functions. **The following information does not apply to devices with a special assignment.**

Connection	Function	Execution
X1	Thermal input 1	24-pin industrial plug (pins) in add-on housing with two brackets
X2	Thermal input 2	24-pin industrial plug (pins) in add-on housing with two brackets
X3	Load output 1	24-pin industrial plug (sockets) in add-on housing with two brackets
X4	Load output 2	24-pin industrial plug (sockets) in add-on housing with two brackets
X5	CAN bus	M12 round plug
X6	Serial interface	SUB-D 9-pin Pins
X7	Ethernet interface	RJ45 socket
X8	Ethernet interface 2	RJ45 socket
X9	Lowering/OK interface	5-pin industrial plug in surface-mounted housing with a bracket
(without)	Mains connection	Cable 5 x 4 mm ² (3P+N+PE) with 32 A CEE plug

2.3.1 Thermo inputs X1 and X2

The blueMaster pro expects the incoming signals from thermocouples on the thermo inputs.



Figure 7: Thermal inputs on the rear of the blueMaster pro

The connection diagram is as follows.

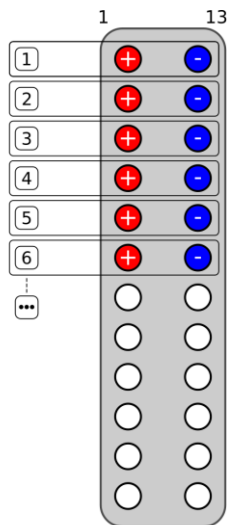


Figure 8: Assignment of the thermal inputs

The following table shows the components of the thermal connection.

Function	Manufacturer article number	Günther article number
Add-on housing	ILME CHI24	152.257
Contact insert	ILME CSHF24	308.0187.00
Coding pen	ILME CR20D	110.223

Günther Heißkanaltechnik uses type L thermocouples as standard, other hot runner manufacturers usually use type J. The thermocouple type must be specified when setting up a new mould.

2.3.2 Load outputs X3 and X4

The loads to be heated are connected to the load outputs. The blueMaster pro is designed exclusively for the operation of resistive loads



Figure 9: Load outputs on the rear of the blueMaster pro

The connection diagram is as follows.

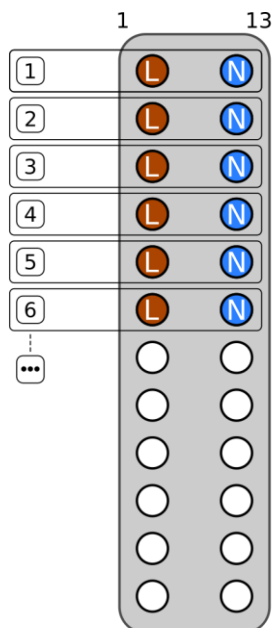


Figure 10: Assignment of the load outputs

The components of the load connection can be taken from the following table.

Function	Manufacturer article number	Günther article number
Add-on housing	ILME CHI24	152.257
Contact insert	ILME CSHF24	308.0187.00
Coding pen	ILME CR20D	110.223

2.3.3 CAN bus interface X5

If a 5-pin M12 round socket is installed here, then the blueMaster is designed for communication via CAN bus. If the socket is not fitted, it can be retrofitted. Please contact [us](#) if you have any questions.

2.3.4 Serial interface X6

The blueMaster pro communicates with injection moulding machines (currently Arburg or Engel) via the serial interface and exchanges target and actual temperatures. For this communication to work, an additional module must be installed and wired in the blueMaster pro. This module can also be retrofitted. Please contact [us](#) if you have any questions.

2.3.5 Ethernet interface X7

An RJ45 socket (Cat 6A) is installed here. The blueMaster pro can be connected to a network via this connection. Alternatively, this connection is used to connect to the injection moulding machine in order to communicate via OPC UA in accordance with Euromap 82.2. In both cases, the blueMaster pro is assigned an IP address by an external DHCP server. Internally, connection X7 is connected to the HMI (*human machine interface*).

2.3.6 Peripheral interface X8

Connection X8 can be assigned a second RJ45 socket or a USB-A connection.

2.3.7 Lowering/OK interface X9

The *blueMaster pro* can exchange information directly with the injection moulding machine via the lowering/OK interface.



Figure 11: Lowering/OK interface of the blueMaster pro

The assignment is as follows.

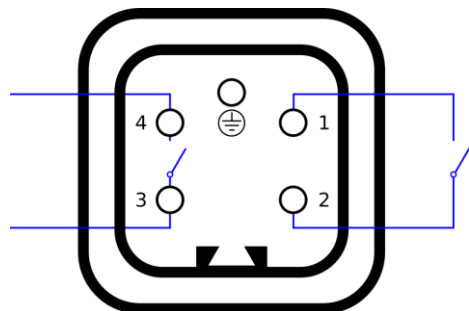


Figure 12: Assignment of the lowering/OK interface of the blueMaster pro

The **lowering** and **temperature OK** functions are realised via this interface.

The components of the lowering/OK interface can be found in the following table.

Function	Manufacturer article number	Günther article number
Add-on housing	ILME CKA 03 I	154.215
Contact insert	ILME CKSHM 04	308.0245.00

2.3.7.1 Lowering function

A potential of 24 V DC is applied between contacts 1 and 2. If the circuit is closed, the *blueMaster pro* lowers the setpoint temperature to the adjustable setback temperature for all zones for which this setting is activated. A potential-free contact of the injection moulding machine is usually connected, which is activated during longer standstill phases of the machine. The set-back temperature is adapted to the respective application and selected so that the processed plastic is not thermally damaged even during longer downtimes.

2.3.7.2 Temperature OK function

Contacts 3 and 4 form a potential-free NO contact (*normally open* switching contact). This closes as soon as and as long as the set temperature is reached in all active zones and no fault is present. The contact may be loaded with a maximum of 230 V / 1 A and is not fused. A freely programmable input/output of the injection moulding machine is usually connected, the switching status of which is integrated as a condition for starting the injection process.

2.3.8 Mains connection

The blueMaster pro is equipped with a 5-core (3L+N+PE) mains connection cable with a cable cross-section of 4.0 mm². A 32A CEE plug is fitted as standard.

If your device is delivered to a country where a different type of plug is used, a suitable plug is included.

3. Description of the user interface

This chapter describes the user interface of the blueMaster pro. The sequence is based on the steps that the user goes through when switching on the device and setting up a tool. You can use the [table of contents](#) to jump directly to the sections that are of particular interest to you.

3.1 Start screen

The start screen appears after switching on and starting up the device. It provides access to basic information about the device and the connected system, allows basic settings to be made and provides an introduction to using the blueMaster pro.

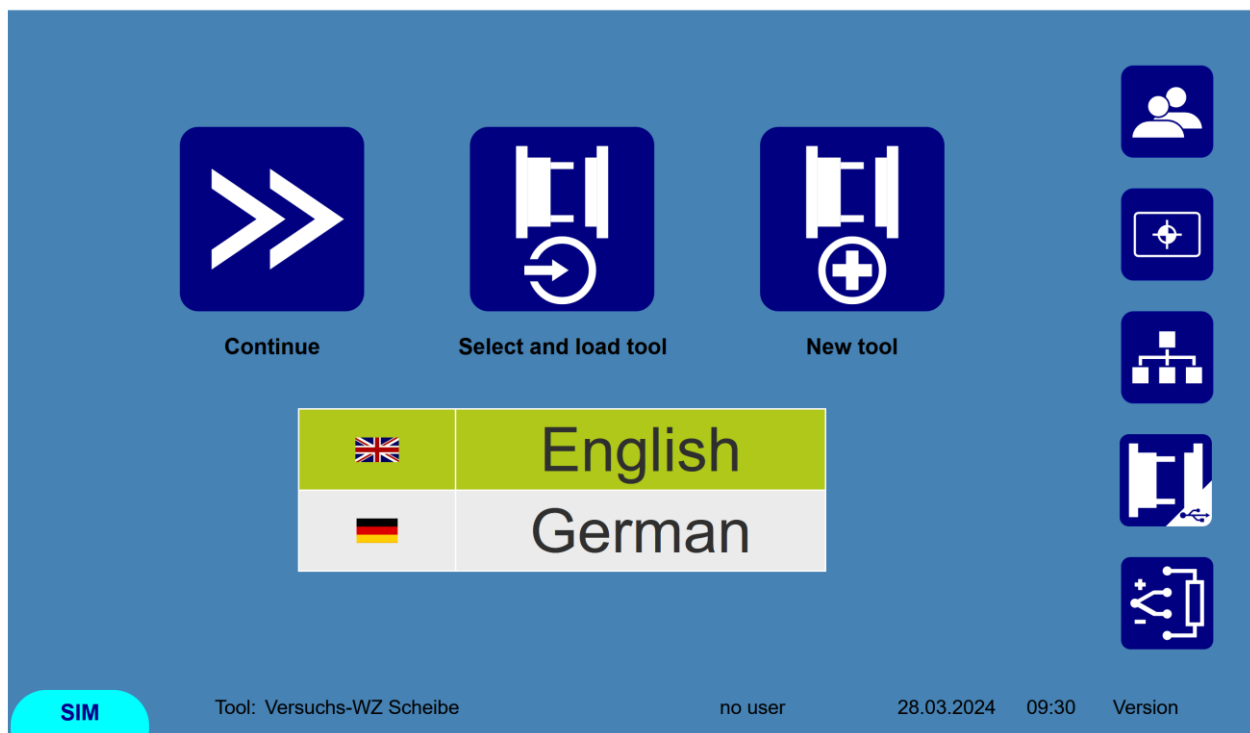


Figure 13: Start screen of the blueMaster pro

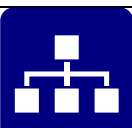
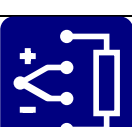
Three buttons are displayed:

- press **Continue** to continue working with the last tool loaded
- press **Select tool and load** to load a tool from the blueMaster pro's internal memory
- press **New tool** to create and set up a new application

The following settings are also available

- **Language selection** via the menu in the centre of the screen

You will find the following buttons on the right-hand side of the screen

Symbol	Meaning	Explanation
	User selection	To log in as a user with extended access rights (setter or administrator), call up this menu.
	HMI calibration	If the screen does not respond correctly to touch, an HMI calibration can be carried out.
	Network settings	Here you can view the current IP address of the device and select whether it is static or automatically assigned.
	Tool data	In this menu, you can transfer tool data from the blueMaster pro to a USB or network drive and vice versa.
	Wiring	Press this button to see the assignment of the load and thermal connections of your blueMaster pro.

The entries in the footer are also interactive. Tap on the relevant section:

- **User selection** to access this menu
- **Time and date** to set the blueMaster pro's internal clock
- **Version** for information on the hardware and software version as well as the serial number and IP address of the device

3.1.1 Version

Here you will find

- the **serial number** of the device (BMPxyyyyyyy)
- the **IP address** of the HMI (*human machine interface*). If you have connected the blueMaster pro to a network, call up this IP address to operate it via a browser.
- **Version information** of PLC (*programmable logic controller*: the component of the blueMaster pro that handles the control tasks) and HMI. This can be helpful if there is a problem and you contact our support team.

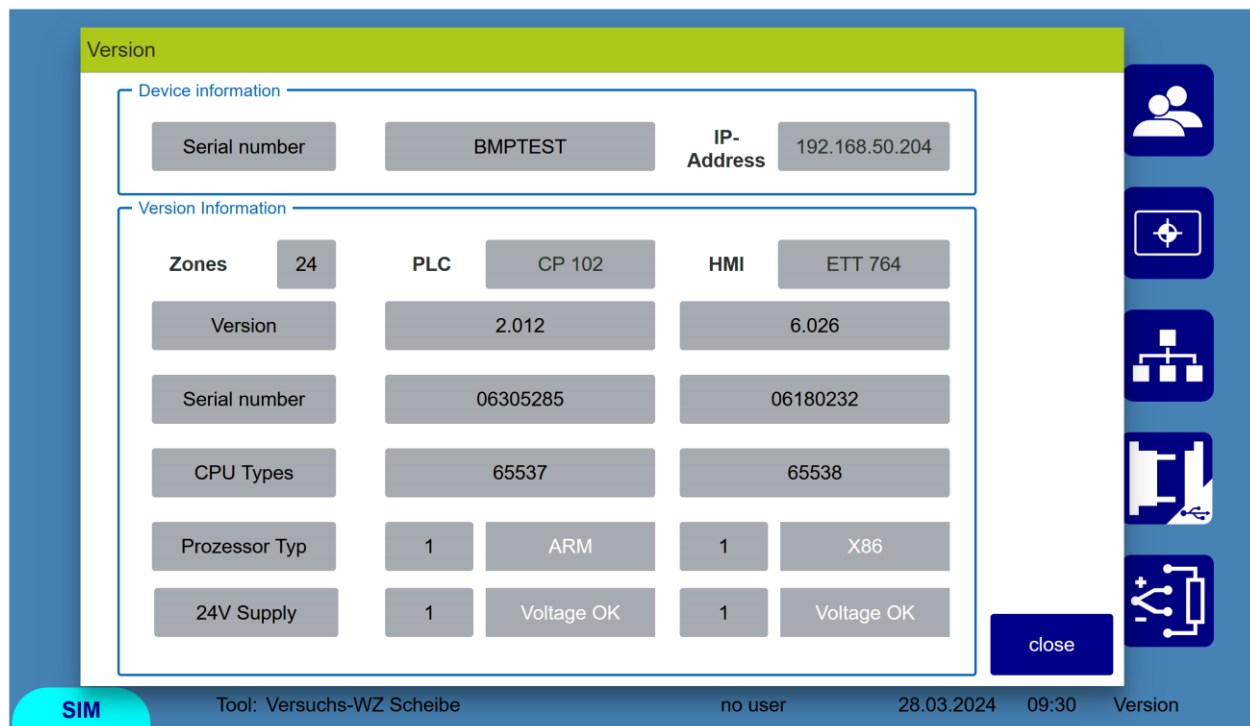


Figure 14: Version screen of the blueMaster pro

3.2 Continue

If you press *Continue* on the [start screen](#), this screen appears. The name of the currently loaded tool and the status (usually *loaded*) are displayed. Press **Continue** again to go to the [thermocouple test](#).

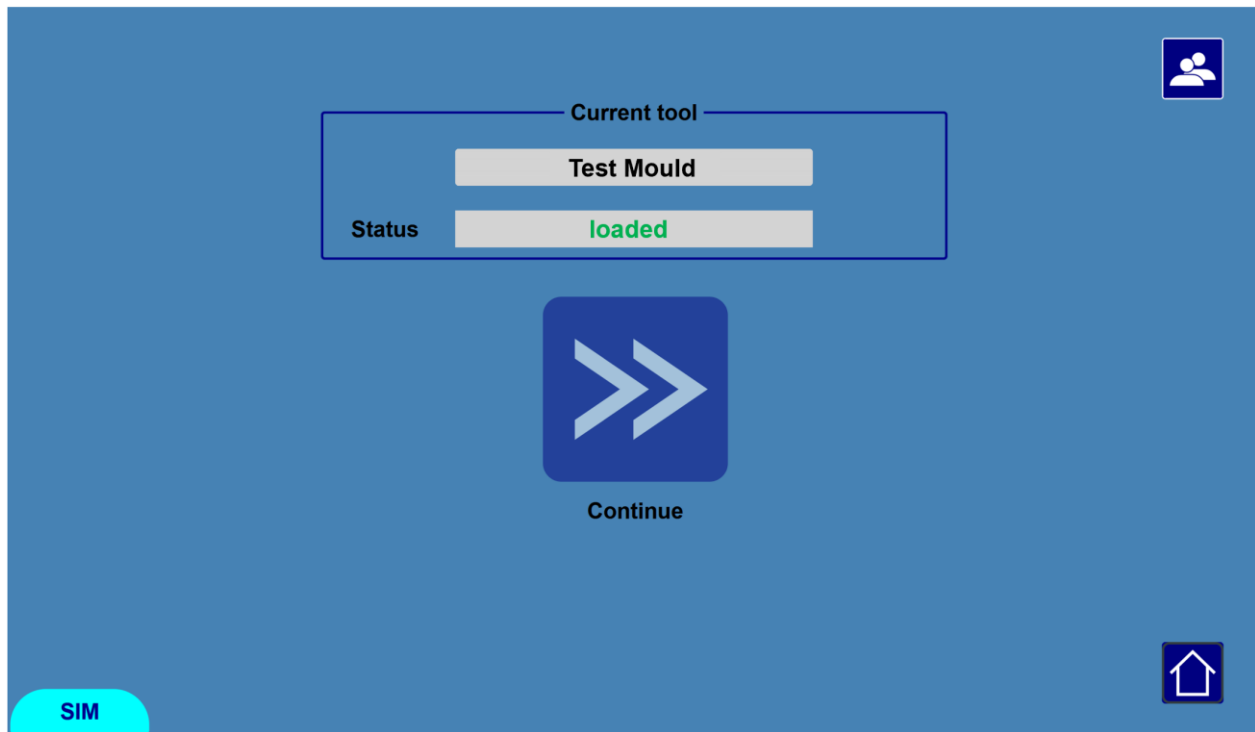


Figure 15: "Continue" screen of the blueMaster pro

If you have entered this screen by mistake, you can use the *Home button* to return to the [start screen](#). At the top right you will find the *User selection* button.

3.2.1 Thermocouple test

The **thermal sensor test** is called up automatically when production is to be continued or a mould is loaded from the memory. It checks whether a thermocouple and a load are available for each zone.



Figure 16: "Thermocouple test" screen of the blueMaster pro

You can - press **continue** to start the thermocouple test - press **back to** return to the menu and load another tool

The test addresses one zone at a time. You can use the two round buttons to choose between the combined view and the table view. In the combi **view**, the result of the currently tested zone is displayed in the top right-hand corner. Click on a **zone tile** to get information about this zone. In the table **view**, you can see the status of all zones at the same time.

The **Global ON** and **Global OFF** buttons are operated automatically and show whether current is currently being output to the connected loads.



Safety note:

The Global OFF button must be pressed before any changes are made to the wiring. It acts on a contactor and disconnects all loads from the power supply simultaneously.

At the top right you will find the *User selection* button.

3.3 Loading the tool

If you press **Select and load tool** on the start screen, this screen appears.

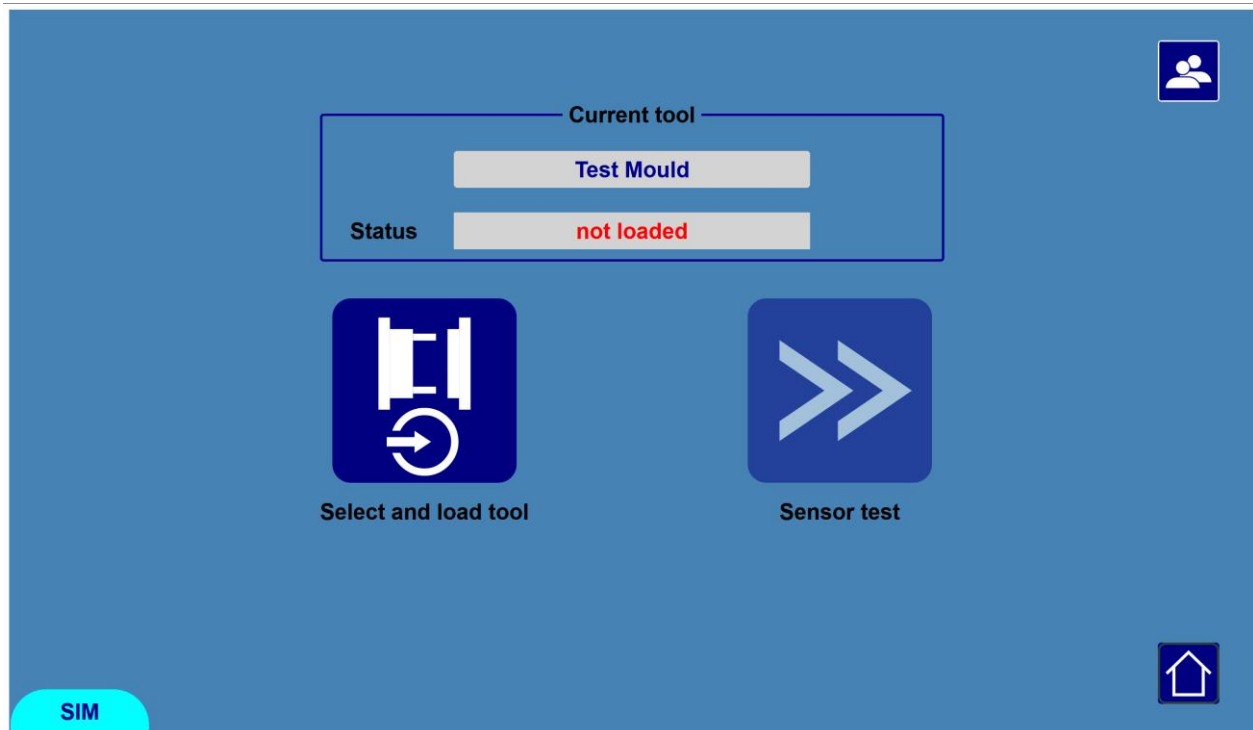


Figure 17: "Load tool" screen of the blueMaster pro

The name of the currently loaded tool and the status (usually *loaded*) are displayed. Press **Select and load tool** again to select and load a tool data set from the internal memory. A window appears in which the desired tool can be selected.

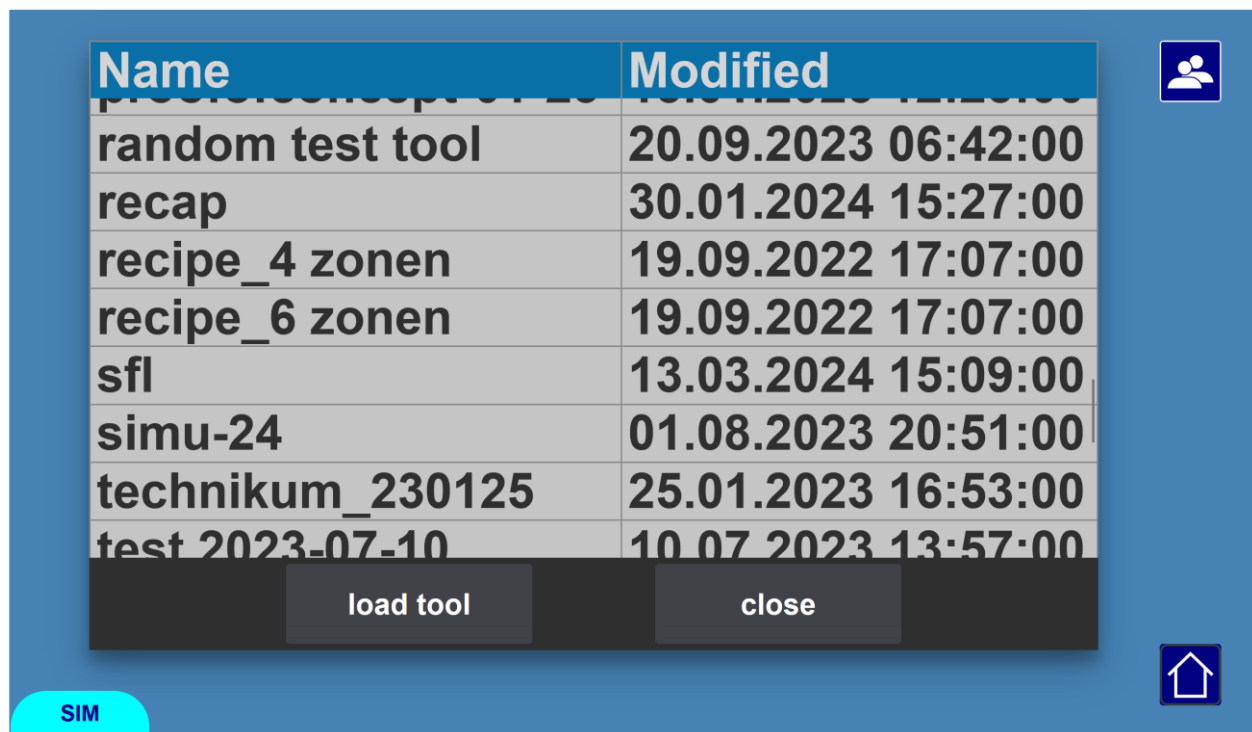


Figure 18: "Select tool" screen of the blueMaster pro

Select the desired tool here and press **Load tool**.

Press the **Thermocouple test** button to continue.

3.4 Creating a new tool

If you press *New tool* on the [start screen](#), this screen appears.

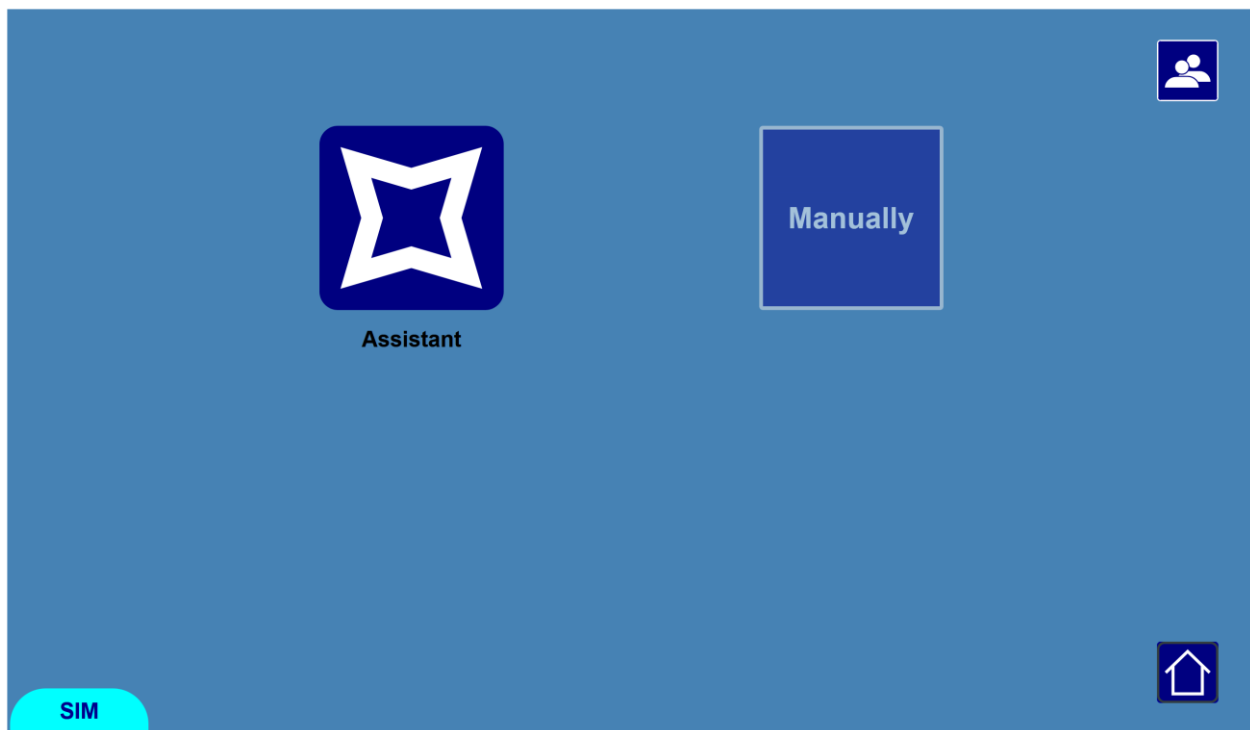


Figure 19: "Create new tool" screen of the blueMaster pro

Press the **Wizard** button to start the [setup wizard](#).

3.4.1 Set-up wizard

The setup wizard supports you when creating a new tool data set. The idea is that you can make all the relevant settings in the wizard and do not have to actively search for the important parameters in menus. The setup wizard consists of several screens that are run through one after the other. Once you have completed the setup wizard, your mould is ready for the first heat-up with the blueMaster pro.

3.4.1.1 Setup wizard: Basic settings

The first screen of the setup wizard asks for basic settings.

Settings

Enter the name of the tool: maximum 20 characters

Enter the upper and lower limits of the processing temperature for the material:

lower limit: °C upper limit: °C

Select the type of the temperature sensor: Typ L Change thermocouple type

SIM ● ○ ○ ○ ○ **>**

Figure 20: Basic settings screen of the setup wizard

Here you can

- **enter the name of the tool** under which the data record is saved.
- enter the **upper and lower limits of the processing temperature**. If the *actual temperature* reaches values outside this range, a warning is triggered.
- **select the thermocouple type**. For Günther hot runner systems, this is usually type L, but type J or type K are also common on the market. If in doubt, check the documentation for the hot runner system if you are not sure. An incorrectly selected thermocouple type can cause massive measurement errors.

Press **continue** (right arrow) to go to the [next screen](#).

3.4.1.2 Setup wizard: Deselecting zones

Next, the *blueMaster pro* checks which zones are connected and whether it finds a thermocouple and a load in each zone. If you know that some zones are not occupied, you can now exclude them from the check.

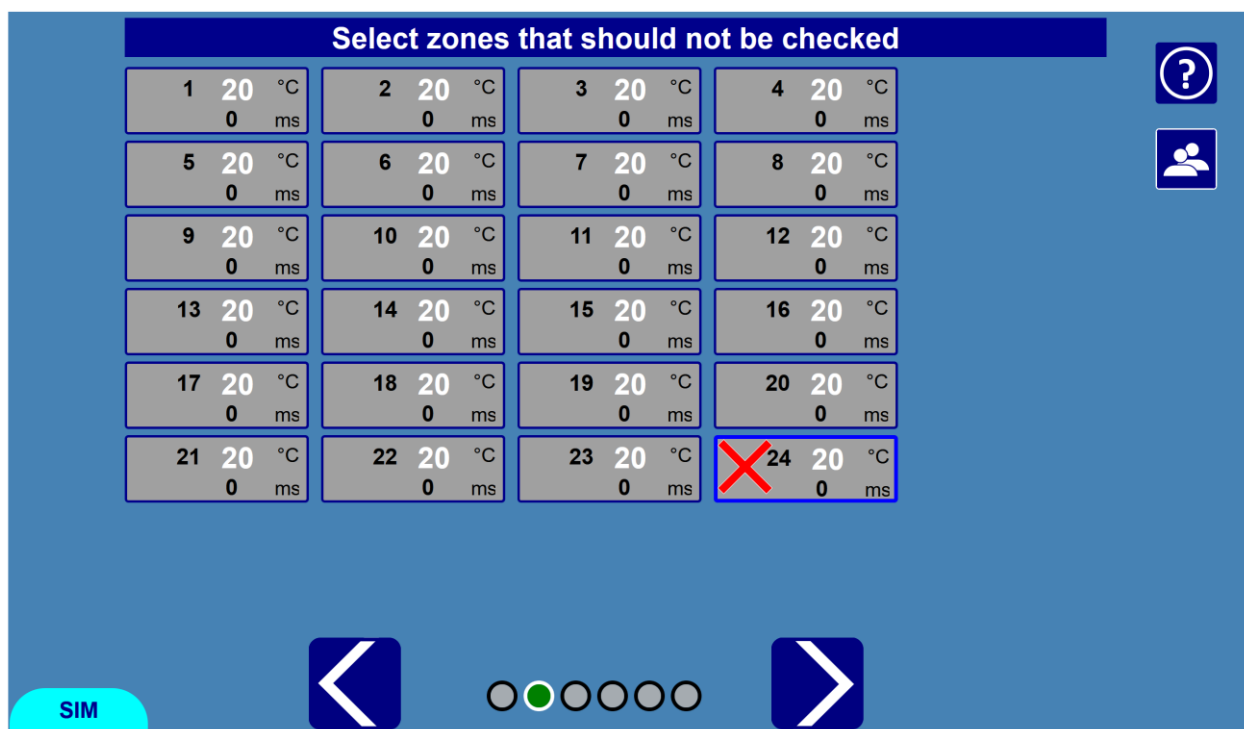


Figure 21: "Deselect zones" screen of the setup wizard

To do this, press on the relevant zone tile until a red cross appears. If you want to select several zones, press the first and last zone.

Once you have made your selection, press **continue** and the **system test** will start automatically.

3.4.1.3 Setup wizard: System test

With the system test, the *blueMaster pro* checks which zones are connected and whether it finds a thermocouple and a load in each case.

To do this, one zone after the other is energised until a temperature rise of 2 °C is reached. The blueMaster also calculates preliminary PID parameters with which it will control the respective load.

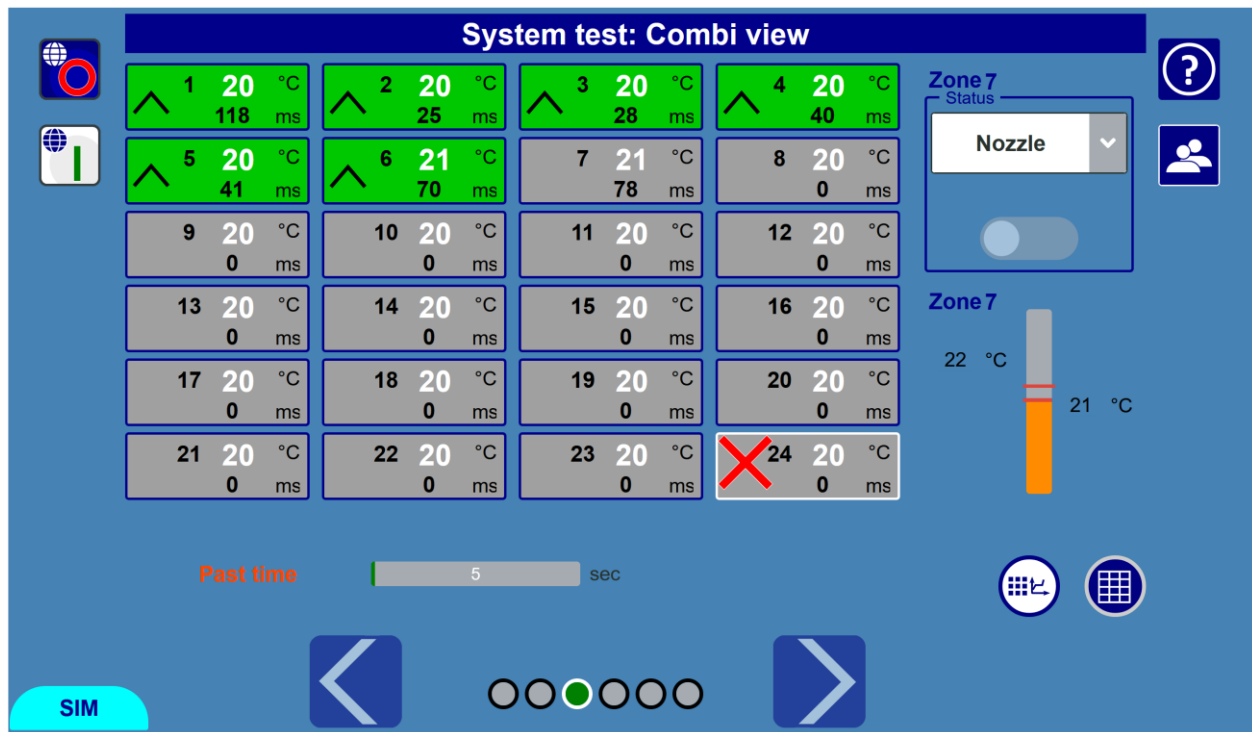


Figure 22: System test screen of the setup wizard

You can

- **Keep** pressing to start the system test
- Press **back** to return to the [previous page of the setup wizard](#)

If you **keep** pressing, a window will appear reminding you of the assignment of your blueMaster pro. Make sure that the cables used match the assignment of your device and press **continue**.

The test addresses one zone at a time. You can use the two round buttons to choose between the combined view and the table view. In the combi **view**, the result of the currently tested zone is displayed in the top right-hand corner. Click on a *zone tile* to get information about this zone. In the table **view**, you can see the status of all zones at the same time.

The **Global ON** and **Global OFF** buttons are operated automatically and show whether current is currently being output to the connected loads.

At the top right you will find the *User selection* button.

At the end of the system test, the result is displayed. If there is an error, you can now rectify it.

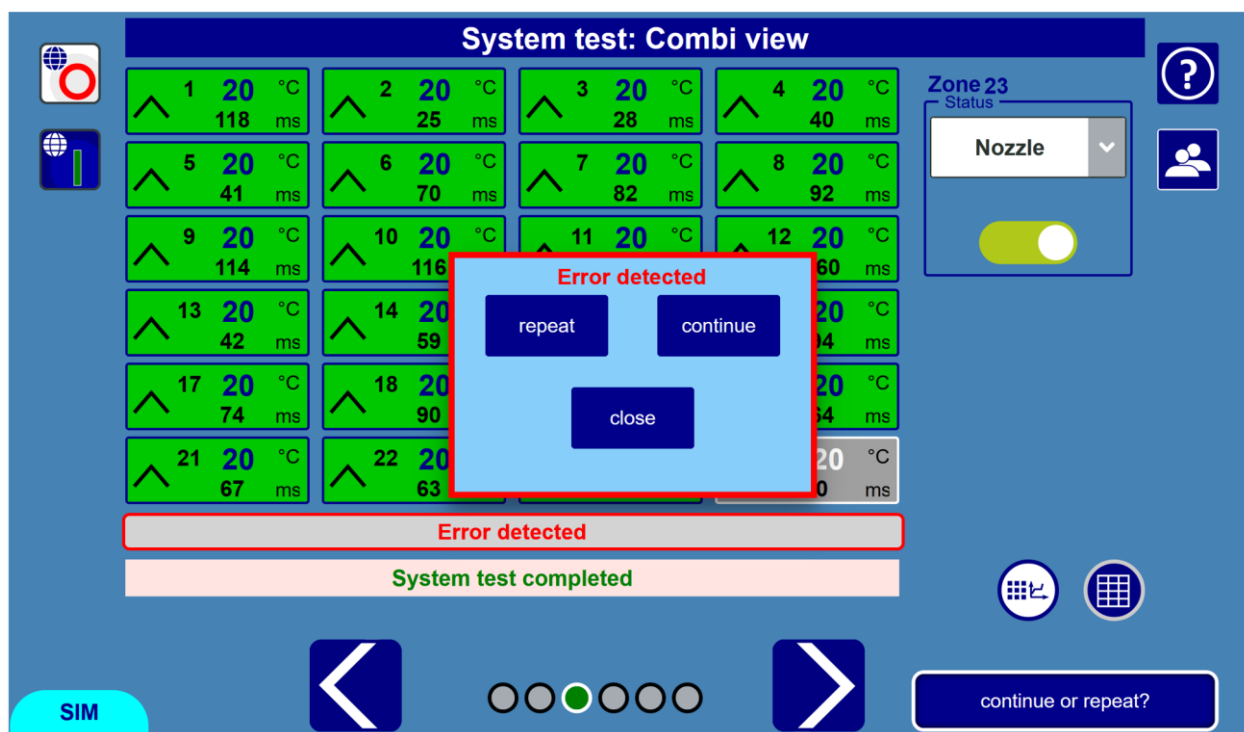


Figure 23: System test screen of the setup wizard with detected error



Safety note:

The Global OFF button must be pressed before any changes are made to the wiring. It acts on a contactor and disconnects all loads from the power supply simultaneously.

Alternatively, you can ignore the error and the corresponding zone will be switched off.

Pressing **continue** to go to the [next screen](#).

3.4.1.4 Setup wizard: Groups

You can summarise the connected zones in groups. This can be useful to facilitate the handling of systems with many loads and especially multi-component systems.

If you *do not* want to create *any* groups, press **next**.



Figure 24: "Groups" screen of the setup wizard

No groups are set up at the start. Press the **button with the - (minus)** to create a group.

In the following view, you can give the group a **name** and assign a **colour**.

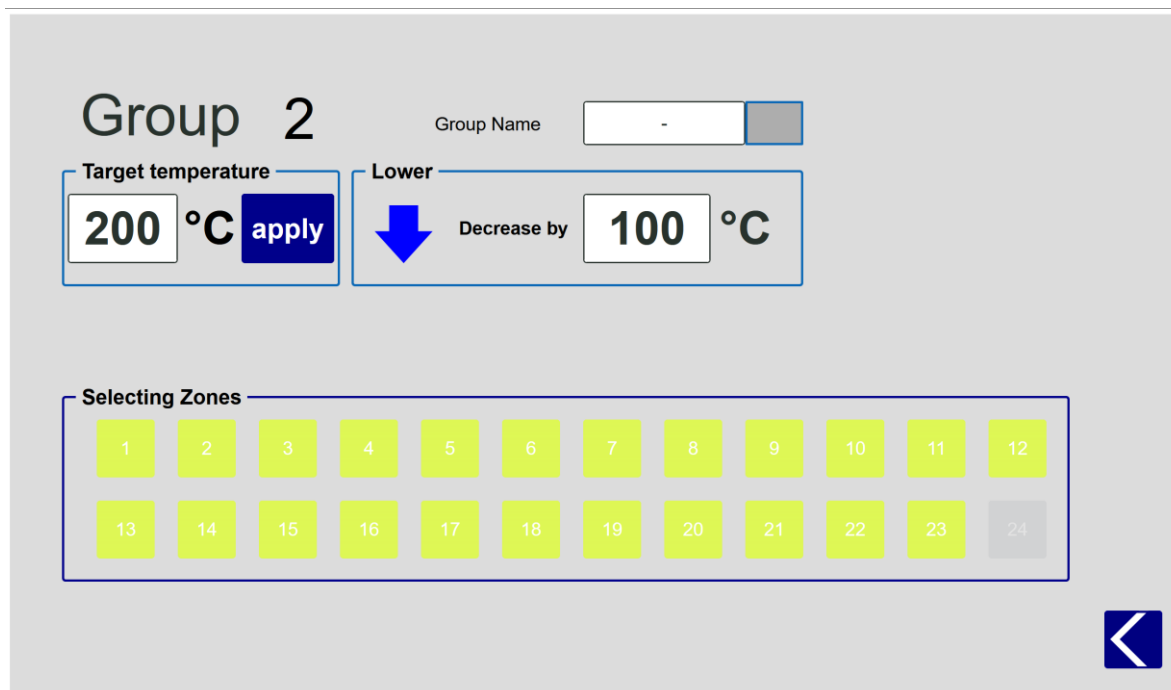


Figure 25: "Set up group" screen of the setup wizard

Finally, you can **select** the **zones** to be assigned to this group. Zones marked in green are already assigned to the current group, zones marked in yellow to another group.

Change the assignment by clicking on the **zone number**.

Press the **left arrow** to return to the group overview. For an active group, the number highlighted in blue now shows you how many zones are assigned to this group. Press the **down arrow** button to expand the group and see the assigned zones.

Press **next** to go to the **next step**

3.1.4.5 Set-up wizard: Temperatures

The penultimate screen of the set-up wizard contains settings for the heating function and for lowering and raising the temperature.

The **heating function** describes how the *blueMaster pro* brings the connected zones up to the setpoint temperature.

Lowering is relevant for longer downtimes and is intended to prevent thermal damage to the material in the hot runner.

Boost is used to thermally open closed gates.

Figure 26: Temperatures screen of the setup wizard

3.4.1.5.1 Heating function

You can set several parameters for the heating function, the diagram below illustrates their function.

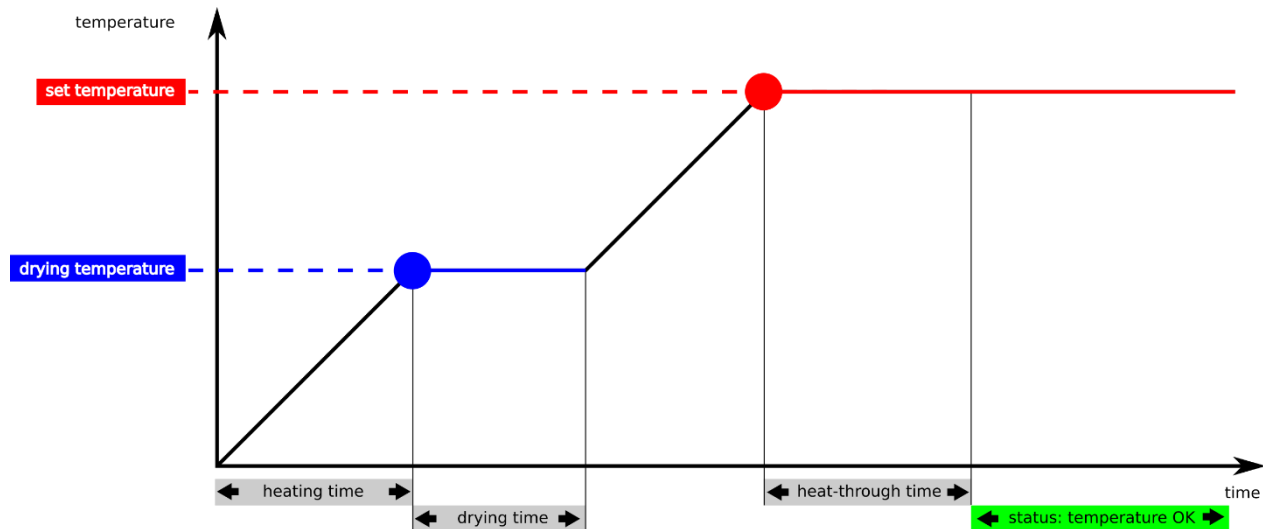


Figure 27: The heating function explained

3.4.1.5.1.1 Heat-up value

The **heat-up value** [°C or °F; default: 105 °C] is the first temperature that is approached by all zones. This is typically above 100 °C so that the residual moisture in conventional heating elements is driven out. The heat-up value applies uniformly to all zones.

Technical background: Conventional heating elements have heating coils that are coated with hygroscopic material (e.g. magnesium oxide). This coating absorbs moisture during storage. If the heating element is heated very quickly, the moisture turns into gas and can destroy the heating element. To prevent this, all heating elements are brought to the **heating level** and remain there for the duration of the holding time. BlueFlow heaters are encased in a glass ceramic and are not hygroscopic. However, distribution heaters are generally conventional heating elements.

3.4.1.5.1.2 Holding time

The **hold time** [min; default: 5 min] expires as soon as all zones have reached the heat-up value.

Technical background: Conventional heating elements have heating coils that are coated with hygroscopic material (e.g. magnesium oxide). During storage, this coating absorbs moisture, which is referred to as hygroscopic behaviour. If the heating element is heated very quickly, the moisture turns into gas and can destroy the heating element. To prevent this, all heating elements are brought to the heating level and remain there for the duration of the **holding time**. BlueFlow heaters are encased in a glass ceramic and are not hygroscopic. However, distribution heaters are generally conventional heating elements.

3.4.1.5.1.3 Heating through time

The **heating through time** [min; default: 5 min] expires as soon as all zones have reached the set temperature. If the tolerance window is left during the hold time or heating through time, the process stops and only starts again when the zone is back within the tolerance window.

Technical background: The **heating time** ensures that the set temperature prevails throughout the hot runner system and that the plastic contained has reached the molten state everywhere.

3.4.1.5.2 Set-back temperature

The **setback temperature** is an absolute value [°C or °F] to which the setpoint temperature of all zones is reduced when the **setback function** is activated.

To do this, either a button can be pressed or the corresponding **input** can be activated. The lowering temperature should be selected so that the material in the hot runner is not thermally damaged even during longer standstill phases.

You can also select whether only the nozzles should be lowered.

3.4.1.5.3 Lifting

Boosting is a temporary increase in the setpoint temperature by a specific **temperature amount** [°C or °F] that can be set here.

The boost is activated via a button on the basic screen. Whether a zone participates in the boost can be selected in the zone menu.

A typical application is increasing the nozzle temperatures after restarting a mould in order to open the gates. The **duration of the increase** controls the time after which all zones are automatically returned to the set temperature.

You can also select whether only the nozzles should be raised.

3.4.1.6 Finalising the setup wizard

To complete the setup wizard, you must **save** the **tool**; you have already defined the name at the beginning.

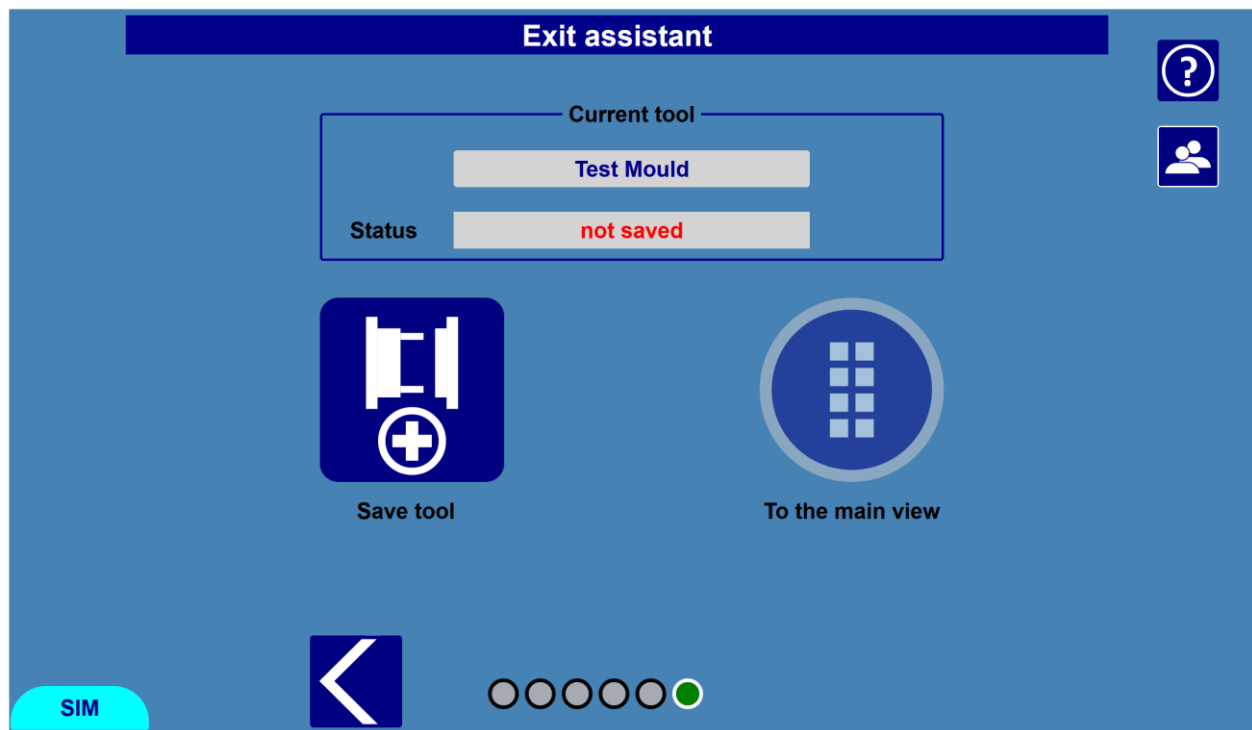


Figure 28: "Save tool" screen of the setup wizard

Then press the button **for the main view**.

3.5 Main view

The main view is the view from which the blueMaster pro is mainly operated and in which information on the current operating status can be seen. There are various display and operating elements in the main view, which are explained below.

- [Toolbar left](#)
- [Top toolbar](#)
- [Toolbar on the right](#)
- [Active elements in the footer](#)

3.5.1 Toolbar on the left in the main view

The toolbar on the left-hand side contains the following displays and settings.

- [Status display](#)
- [Compact view](#)
- [Group view](#)
- [Detailed view](#)
- [Curve recorder](#)
- [Table view](#)

The following applies: all views have equal rights. Settings in one view also take effect in all others. Select the view that is most suitable for your application and provides you with the necessary information.

3.5.1.1 Status display

- the **status display**. It shows the current status of the system in colour. If a time is currently running out (e.g. [hold time](#) or [heating through time](#)), this is shown by a rotating green ring.

The status display can assume the following states:

Colour	Meaning	Ready for injection
green	Everything in order	Yes
yellow	Planned deviation from the setpoint temperature	no
red	Unplanned deviation	no

The blueMaster pro communicates its readiness for injection via the [lowering/OK interface](#) of the injection moulding machine.

3.5.1.2 Compact view

In the compact view, all relevant information on the status of the connected system can be seen at a glance:

Zone tiles are displayed, the colour of which indicates the operating status.

The tile on the left shows the current status of the zone:

- Green for target value reached
- orange for a planned deviation, always with an additional icon (raising, lowering, heating)
- Red for an unplanned deviation (= malfunction)

The number of the respective zone is also displayed.

The tile on the right shows the current operating mode:

- Grey when the zone is inactive
- Grey when the zone is in monitor mode + icon
- Purple when tuning is active + icon
- Turquoise if the zone is in master mode + icon
- Khaki, if the zone is in positioning mode + icon
- Green if the zone is in regular operation

The actual value, setpoint and unit [°F, °C, %] are also displayed.

3.5.1.3 Group view

If you have created groups using the [setup wizard](#), you can view and control or change them here.

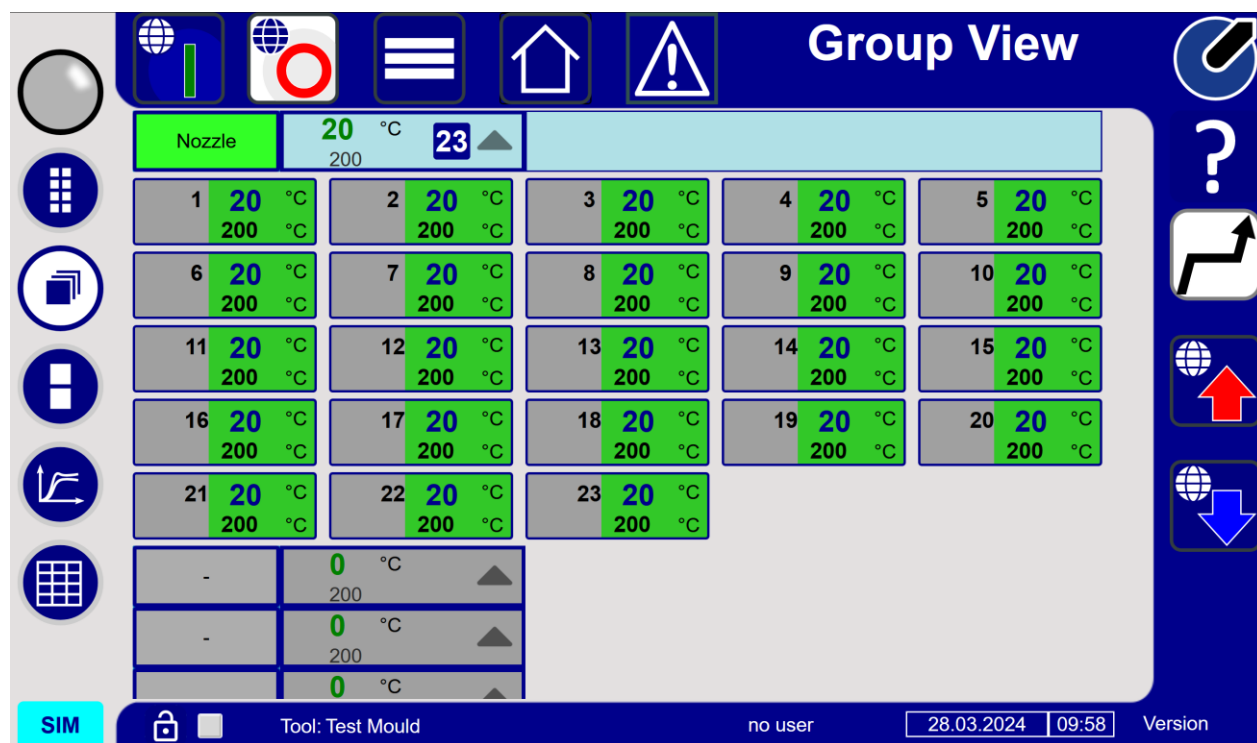


Figure 29: Group view screen

3.5.1.3.1 Operating the group view

A total of ten memory locations are available for groups. Each group has a (freely editable) name and a colour, which are shown on the far left. The number with a blue background shows how many zones are assigned to this group. Click on the **down arrow** to expand the group. You can now see which zones are assigned to the group and their respective set and actual temperatures as well as the status.

You can use the **Group ON/OFF**, **Group Boost** and **Group Lower** buttons to act on the zones contained in the group. You can also set a general **temperature** for the group. If different temperatures were previously stored for the zones, the previous setting will be overwritten.

Press the **zone tile** of any zone to access the zone settings. Use the *Group view* button to return.

3.5.1.3.2 Create groups

To create a **new group**, press the **button with the - (minus)**, you will be taken to the **group details**.

In the following view, you can give the group a **name** and assign a **colour**.

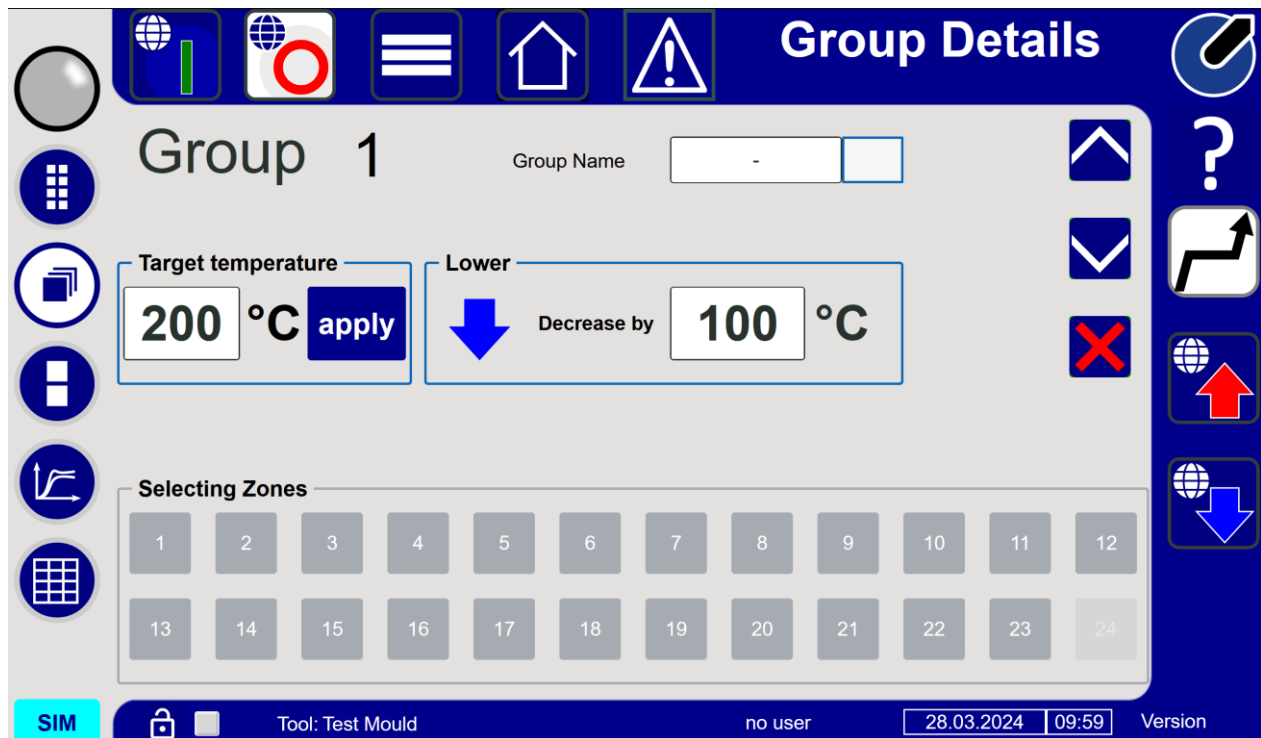


Figure 30: "Set up group" screen

Finally, you can **select** the **zones** to be assigned to this group. Zones marked in green are already assigned to the current group, zones marked in yellow to another group.

Change the assignment by clicking on the **zone number**. If you select a zone, it is given a blue frame. Press again to confirm the assignment to the current group. Any assignments to other groups will be overwritten.

If you want to assign several zones at once, select the first and last zone so that the zones in between are also selected.

To select several individual zones without selecting the zones in between, start with the zone with the highest number.

Press the **left arrow** to return to the group overview. For an active group, the number highlighted in blue now shows you how many zones are assigned to this group. Press the **down arrow** button to expand the group and see the assigned zones.

3.5.1.3.3 Change group

To change a **group**, press the **button with the name of the group** and you will be taken to the group details.

In this menu, you can make settings that affect this group. You can scroll between the groups using the **arrow up** and **arrow down buttons** on the right. The **Cross** button

cancels all settings for this group. You can change the **name** and colour **of the** group using the input fields at the top right.

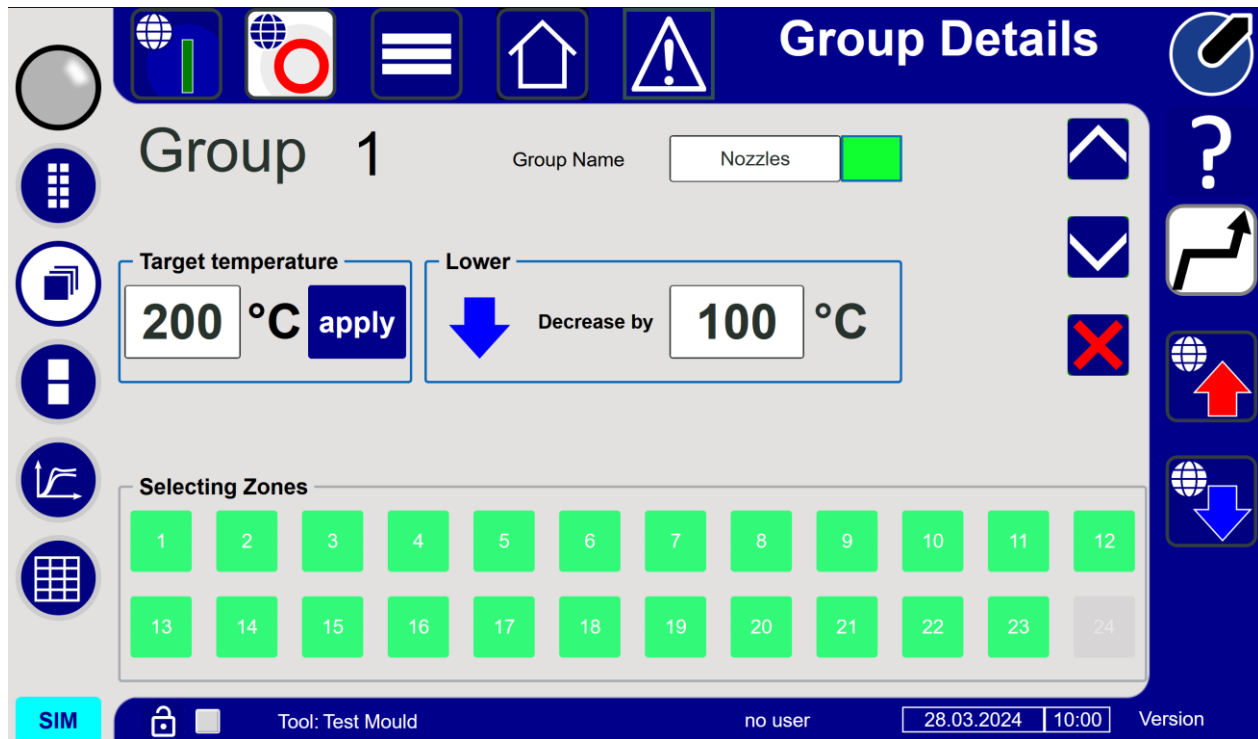


Figure 31: "Set up group" screen

Below you can **select** the **zones** that should be assigned to this group. Zones marked in green are already assigned to the current group, zones marked in yellow are assigned to another group.

Change the assignment by clicking on the **zone number**. If you select a zone, it is given a blue frame. Press again to confirm the assignment to the current group. Any assignments to other groups will be overwritten.

If you want to assign several zones at once, select the first and last zone so that the zones in between are also selected.

To select several individual zones without selecting the zones in between, start with the zone with the highest number.

Press the **left arrow** to return to the group overview. For an active group, the number highlighted in blue shows you how many zones are assigned to this group. Press the **down arrow** button to expand the group and see the assigned zones.

3.5.1.4 Detailed view

The **detailed view** offers more information on the individual zones than the [compact view](#).

Zone tiles are displayed, with the zone number (fixed, cannot be changed) and the name of the zone (can be changed in the zone menu) in the header. Below this are two fields whose colour indicates the operating status:

The tile on the left shows the current status of the zone:

- Green for target value reached
- orange for a planned deviation, always with an additional icon (raising, lowering, heating)
- Red for an unplanned deviation (= malfunction)

The number of the respective zone is also displayed.

The tile on the right shows the current operating mode:

- Grey when the zone is inactive
- Grey when the zone is in monitor mode + icon
- Purple when tuning is active + icon
- Turquoise if the zone is in master mode + icon
- Khaki, if the zone is in positioning mode + icon
- Green if the zone is in regular operation

The actual value, setpoint and unit [°F, °C, %] are also displayed.

The current actuating value [%], the current power consumption of the zone [W] and the current current consumption of the zone [A] are displayed in the **footer of the zone tile**.

3.5.1.5 Curve Recorder

The **curve recorder** can be used to display the course of the actual temperature of selectable zones.

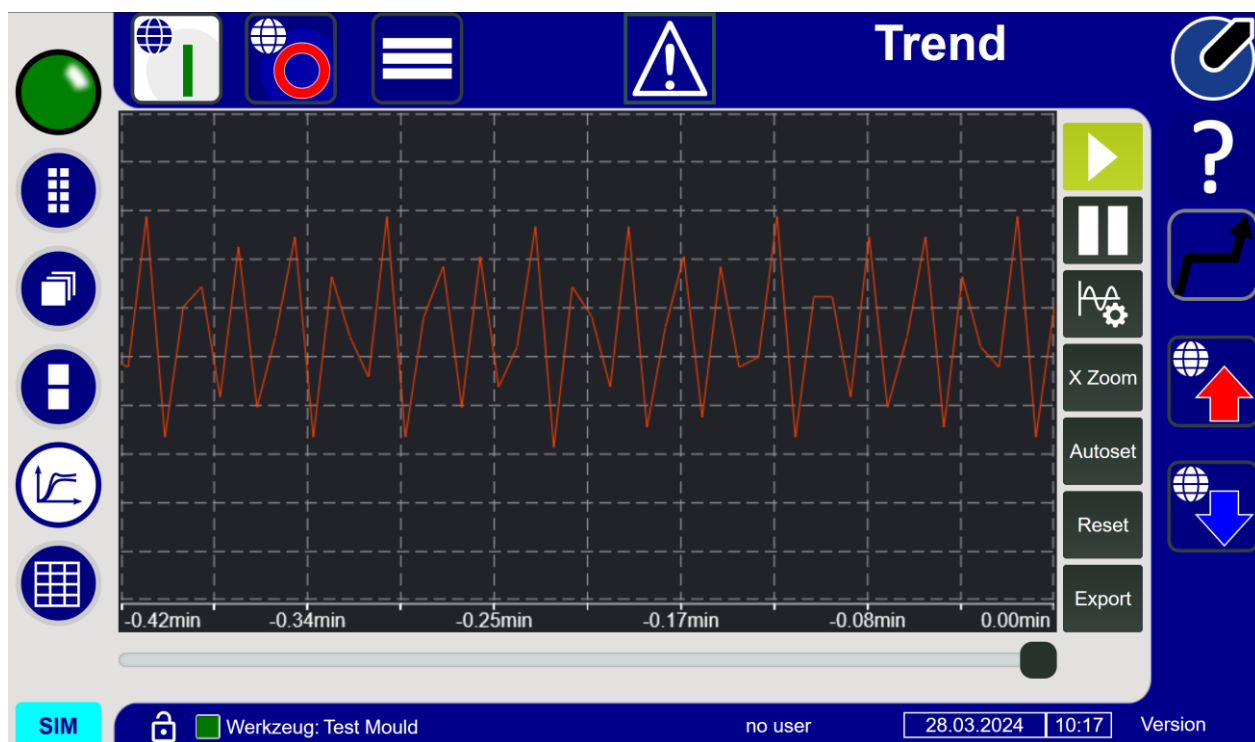
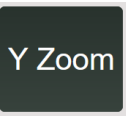
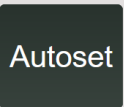
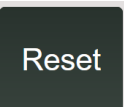
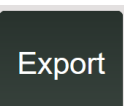


Figure 32: "Curve Recorder" screen

The curve recorder offers the following buttons

Symbol	Meaning	Explanation
	Start recording	When the button is active, data is saved and available for export.
	Pause recording	Interrupts the recording
	Settings	Access to setting options for the curve recorder
	Y Zoom	Tap to switch between the zoom for Y-axis and X-axis. Zooming with two-finger gestures on the display.

	Autoset	Automatically scales the display so that the minimum and maximum values are shown.
	Reset	Resets the scaling to the default value, so that the entire scale is visible.
	Export	Creates a CSV file of the data since the start of recording (max. 2 hours).

3.5.1.5.1 Channel legend

The Settings button takes you to the Channel selection window. Each zone of the control is displayed as a channel of the curve recorder.

The Channel selection window allows you to select the zones to be displayed and assign them a color.

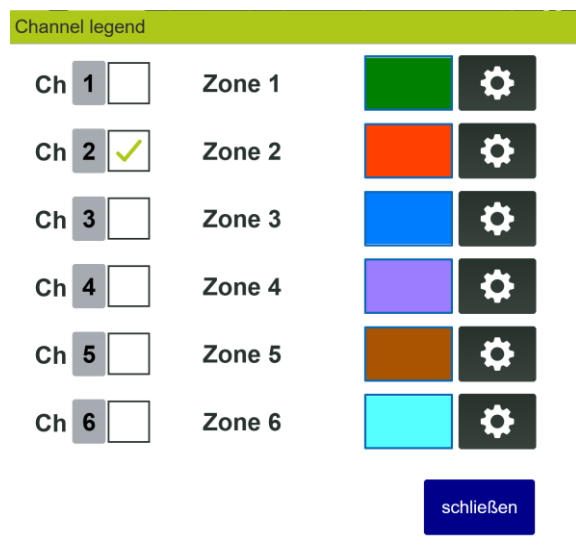


Figure 33: Window "Channel legend"

The cogwheel button takes you to further setting options for each channel.

3.5.1.5.2 Channel properties

The scale for this channel can be selected in the first tab. If the values of several zones are to be compared with each other, a common scale is recommended. If you want to compare zones 1-3, select "Own" as the scale for zone 1 and "Zone 1" for all others.

In the second tab, you will find setting options for the color and thickness of the line as well as the name of the channel.

In the last tab, you can set the position of the zero line. This is useful if two curves overlap and you want to view the course of both curves in parallel.

3.5.1.6 Table view

The scrollable **table view** almost completely dispenses with graphical processing of the information. The following can be read

- Status of the zone (coloured)
- Actual temperature [°C]
- Current actuating value of the zone [%]
- The recognised type of load [nozzle, connection, distributor]
- Group to which a zone is assigned

Press the *zone number* to access the [zone settings](#). Press the group number to access the [group settings](#).

3.5.2 Toolbar at the top of the main view

You will find the following buttons in the top toolbar

- **Global ON:** acts on a contactor. If the button is activated, all active zones are supplied with power.
- **Global OFF:** acts on the same contactor. If the switching surface is activated, all zones are disconnected from the power supply.
- **Home:** Takes you directly back to the [home screen](#)
- **Menu:** Opens the [main menu](#)
- **Faults and warnings:** Is highlighted in red if there is a fault or warning. You can then press the button to obtain further information.
- **Help:** Press the Günther symbol to call up the help function.

3.5.3 Toolbar on the right in the main view

In the right-hand toolbar you will find the buttons

- **Heat-up function** Here you can manually activate or deactivate the heat-up function. For the function itself and the setting options, please see the explanations [here](#).
- **Global boost** If you press this button, a boost is triggered. You can find the corresponding settings [here](#) in the menu. You can set whether a zone takes part in the global boost in the zone menu.
- **Global lowering** If you press this button, a lowering is triggered. You can find the corresponding settings [here](#) in the menu. You can set whether a zone participates in the global lowering in the zone menu.

3.5.4 Footer of the main view

Some important information is displayed in the footer. These displays are also buttons that take you to the relevant settings.

- [Active tool](#)
- [Logged in user](#)
- Time and date
- [Version](#)

3.5.5 Zone settings

If you click on the zone tile in the [detail view](#), [group view](#) or [compact view](#), you will be taken to the zone settings. You can also get here by clicking on a zone number in the [table view](#).

In this menu, you can make settings that affect this zone. You can scroll between the zones using the *arrow up* and *arrow down* buttons on the right.

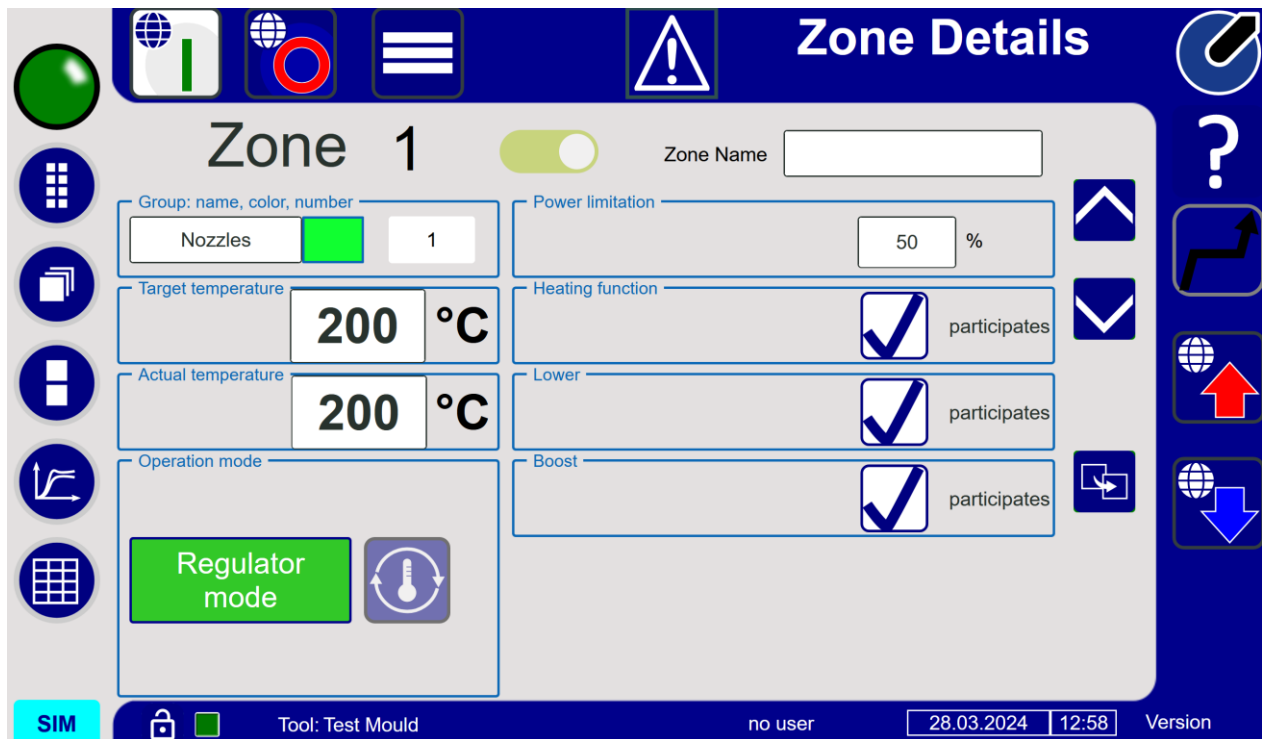


Figure 34: Zone settings screen

At the top you will see the **zone number** and the **name of the zone**. This can be edited and is displayed in the [detailed view](#).

The group name, colour and number are only displayed. To change them, please call up the [group settings](#).

Below this you will find the current **target and actual values**, and at the bottom the **operating mode**.

The **maximum output power of the zone** can be limited on the right. The value entered is the value that the *blueMaster* determined during the system test and considers appropriate. When heating up to the set temperature, this value is automatically checked and adjusted if necessary.

If you make manual changes to the power limitation, temperature fluctuations may occur in this zone. In this case, please call up the **Optimisation** menu item in the main menu and follow the instructions there.



You can use the **Copy** button to copy settings from this zone to other zones. You can select which settings are to be transferred.

3.5.5.1 Operating modes

A zone can be set to one of four operating modes:

- **Control mode (standard):** A setpoint temperature is specified in °C or °F. The controller outputs current to the load in order to reach the setpoint temperature. In doing so, it constantly compares the actual temperature with the setpoint temperature and changes the current output so that both temperatures are as equal as possible.
- **Control mode:** the controller outputs an adjustable amount of current as a percentage. The actual temperature of the zone is not taken into account.
- **Master mode:** the actual temperature is not considered. Instead, the zone is supplied with the same output power as a selectable master zone.
- **Monitor mode:** only the actual temperature of the zone is displayed, but no power is output.

4. Main menu

Press the Menu button to access the main menu.



From here you have access to all blueMaster pro settings, depending on your current user level. The settings are divided into four categories

- [Tool settings](#)
- [Operating settings](#)
- [Device settings](#)
- [Support](#)

For each category, you will find a scrollable row of icons that lead you to setting options.

Some menu items are only accessible to users who are logged in as setters or administrators.

4.1 Tool settings

In the Tool settings section, you will find everything that directly affects the currently loaded tool.

- [Temperature settings](#)
- [Diagnosis](#)
- [Tool data sets](#)
- [Select thermocouple type](#)
- [Optimisation](#)

4.1.1 Temperature settings

The temperature settings are divided into three categories.

- [Min/max temperatures](#)
- [Lowering](#)
- [Lifting](#)

4.1.1.1 Min/max temperatures

You can influence the following parameters in the **Min/Max temperatures** section:

- **Maximum temperature** [°C or °F]: If the actual temperature of a zone exceeds this value, an error message is issued and the power output is switched off.

- **Tolerance window** [°C or °F]: The tolerance window is an amount of temperature above and below the target temperature. As long as the temperature of a zone is within the range of the target *temperature +/- tolerance window*, the blueMaster considers this to be the *target temperature reached*. If all zones are within the tolerance window, the blueMaster sets the **Temperature OK output**. Example: with a setpoint temperature of 250 °C and a tolerance window of 10 °C, the *Temperature OK output* is active as long as the temperature of the zone is between 240 and 260 °C. Even within the tolerance window, the blueMaster continues to attempt to adjust to the setpoint temperature (250 °C in the example).
- **Minimum target temperature** [°C or °F]: The lower limit that is permitted as the setpoint temperature.
- **Maximum temperature for system test** [°C or °F]: The upper limit that a zone may reach during the system **test**. For thermally sensitive materials, a value should be selected here at which any material residues remaining in the hot runner are not damaged.

4.1.1.2 Lowering

Lowering is relevant for longer downtimes and is intended to prevent thermal damage to the material in the hot runner.

- The **setback temperature** is an absolute value [°C or °F] to which the setpoint temperature of all zones is reduced when the function is activated. To do this, either a button can be pressed or the **corresponding input** can be activated. The reduction temperature should be selected so that the material in the hot runner is not thermally damaged even during longer standstill phases.
- You can also select whether **only the nozzles** should be lowered.

4.1.1.3 Lifting

Boosting is a temporary increase in the setpoint temperature by a specific *temperature amount* [°C or °F], which can be set here.

The boost is activated via a button on the basic screen. Whether a zone participates in the boost can be selected in the zone menu. A typical application is increasing the nozzle temperatures after restarting a mould in order to open the gates.

- The **duration of the increase** [min] controls the time after which all zones are automatically regulated back to the setpoint temperature.
- You can also select whether **only the nozzles** should be raised.

4.1.2 Diagnosis

Every system that is connected to the blueMaster runs through a **diagnosis** at the beginning. This happens when a new mould is set up or one is loaded from the memory.

If necessary, this can be called up again manually via the *Diagnostics menu item*.

The blueMaster interrupts the currently running control and switches off the output power. The diagnostics can be started using the *Perform diagnostics* button.

The test addresses one zone at a time and shows the result of the currently tested zone in the top right of the *combi view*. Press on a zone tile to obtain information on this zone. In the *table view*, you can see the status of all zones at the same time.

4.1.3 Tool data records

In this menu, you can manage your tool data sets, transfer them to external storage devices (USB, network) or import them from there.

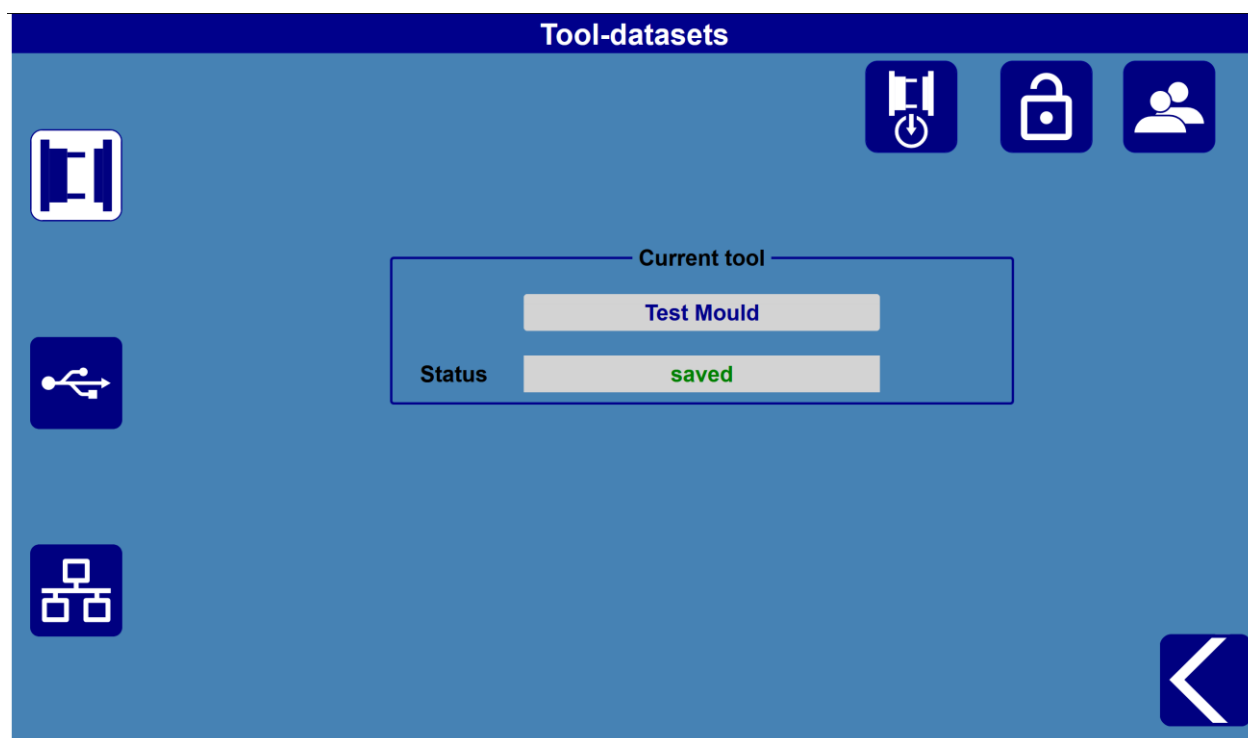
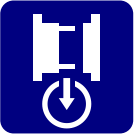


Figure 35: Menu "Tool datasets"

On the left-hand side of the screen you will find three buttons that you can use to call up sub-items:

4.1.3.1 Current tool

Here you can see the name and status of the currently loaded tool. The buttons at the top right take you to the following functions

Symbol	Meaning	Explanation
	Save tool	Save the current tool in the blueMaster pro's internal memory.
	Write protection	Activate or deactivate write protection for the current tool. Write-protected tools cannot be changed.
	User selection	Call up this item to log in as a setter or administrator.

4.1.3.2 Tool data sets USB

In this menu, you can load a tool data set from or save it to a USB memory device. To do this, connect the USB memory device to the USB port on the **front** of the blueMaster pro.

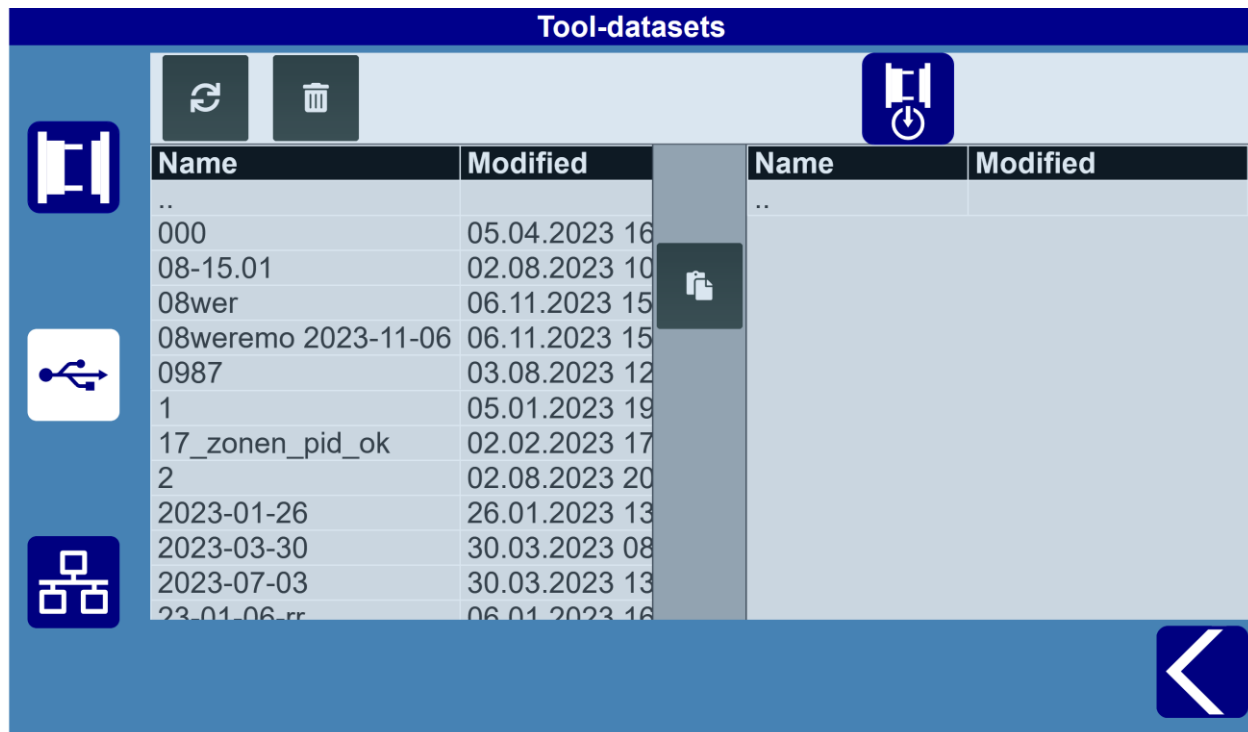


Figure 36: "Tool data sets USB" screen

On the left you can see the internal memory of the blueMaster pro, on the right the contents of the connected USB memory.

You can use the buttons to

- Refresh view
- Delete tool
- Copy tool

4.1.3.3 Tool data records network

In this view, you can load a tool data set from a network storage device or save it to one. To do this, connect the blueMaster pro to the network where the memory is located via [port X7](#).

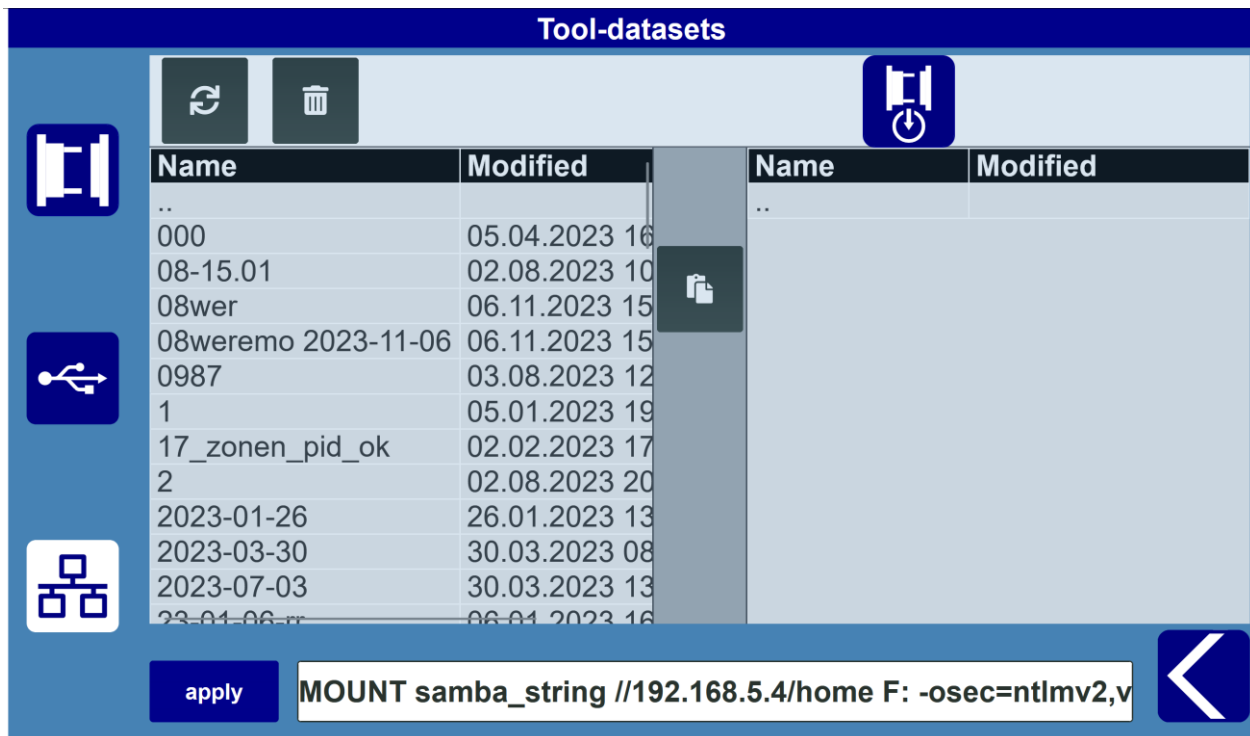


Figure 37: "Tool data sets network" screen

On the left you can see the internal memory of the blueMaster pro, on the right the content of the connected network memory.

You can use the buttons to

- Refresh view
- Delete tool
- Copy tool

A network storage device is mounted as a drive via a command in the *input line*.

4.1.4 Selecting the thermocouple type

The **thermocouple type** can be changed via this menu item. This is also queried when a new mould is created.

Technical background: The thermoelectric effect is utilised for temperature measurement using thermocouples. This means that a material-specific voltage is generated along the length of a metallic conductor as soon as one end of the conductor is heated. Various thermocouple types are standardised, Günther hot runner systems generally use type L, but type J or type K are also common on the market. If in doubt, check the documentation for the hot runner system if you are not sure. An incorrectly selected thermocouple type can cause massive measurement errors.

4.1.5 Optimisation

This menu item takes you to the semi-automatic optimisation of the control parameters for your currently loaded tool.

In principle, the blueMaster pro should determine an optimum set of parameters during the system tests and the heating process so that the temperature remains at a stable level during the process. If this is not successful and fluctuations occur during standstill, i.e. without the influence of material throughput in the hot runner system, optimisation can provide a remedy.

Attention:

The optimisation causes selected zones to oscillate and determines improved control parameters by adjusting this oscillation. It is strongly recommended that the process is interrupted and the target temperatures are lowered to a safe level. Depending on the inertia of the load, the optimisation of a nozzle takes a few seconds to minutes, that of a manifold up to 20 minutes. As the user, you must ensure that the material in the hot runner is not subjected to unacceptable thermal stress during this time.

Select the zones for which optimisation is to be carried out and press **continue**.

4.2 Operating settings

In the **operating settings** section, you will find everything that concerns the function of the control unit and is not directly related to the currently loaded tool.

In detail, these are

- [Heat-up function](#)
- [Recording](#)
- [OPC UA interface](#)
- [Serial interface](#)
- [Autostart](#)
- [Simulation](#)

4.2.1 Heat-up function

The **heating function** describes how the blueMaster brings the connected zones up to the setpoint temperature.

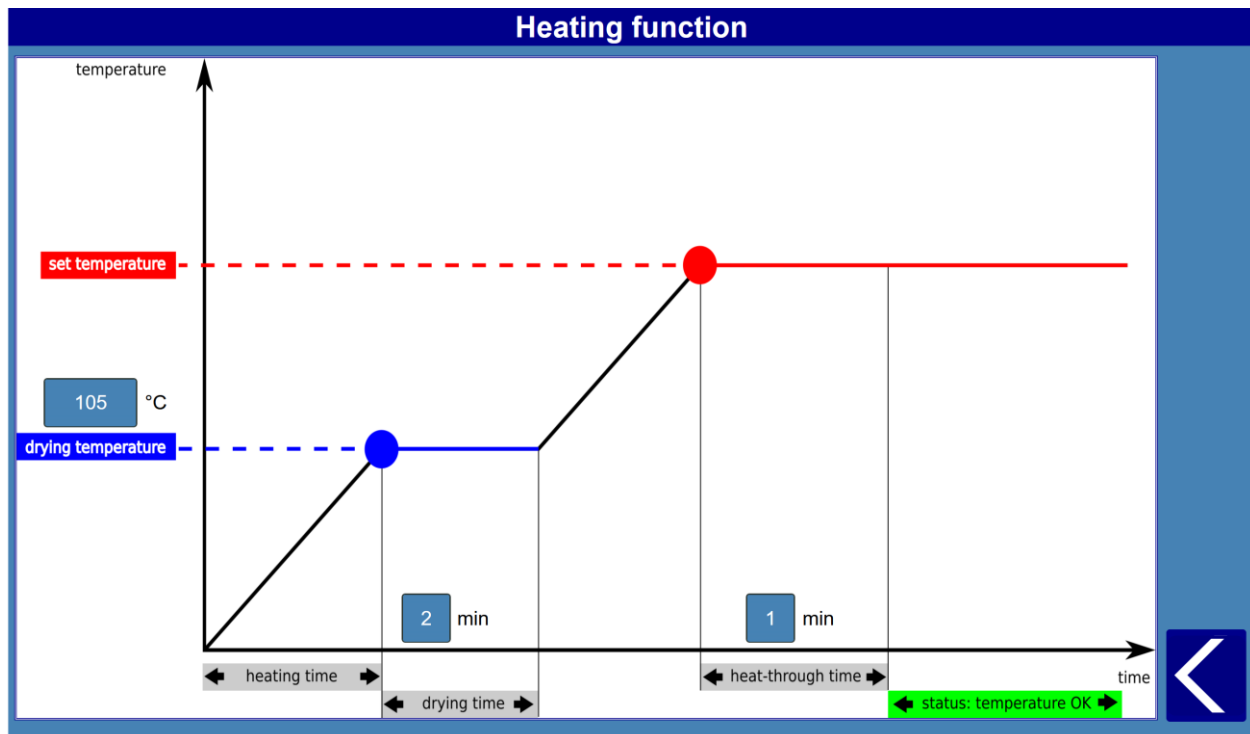


Figure 38: "Heating function" screen

- The **heat-up value** [°C or °F; default: 105 °C] is the first temperature that is approached by all zones. This is typically above 100 °C so that the residual moisture in conventional heating elements is driven out. The heat-up value applies uniformly to all zones.

Technical background: Conventional heating elements have heating coils that are coated with hygroscopic material (e.g. magnesium oxide). This coating absorbs moisture during storage. If the heating element is heated very quickly, the moisture turns into gas and can destroy the heating element. To prevent this, all heating elements are brought to the heating level and remain there for the duration of the holding time. BlueFlow heaters are encased in a glass ceramic and are not hygroscopic. However, distribution heaters are generally conventional heating elements.

- The **hold time** [min; default: 5 min] expires as soon as all zones have reached the heat-up value.

Technical background: Conventional heating elements have heating coils that are coated with hygroscopic material (e.g. magnesium oxide). During storage, this coating absorbs moisture, which is referred to as hygroscopic behaviour. If the heating element is heated very quickly, the moisture turns into gas and can destroy the heating element. To prevent this, all heating elements are brought to the heating level and remain there for the duration of the holding time. BlueFlow heaters are encased in a glass ceramic and are not hygroscopic. However, distribution heaters are generally conventional heating elements.

- The **heating through time** [min.; default: 5 min] expires as soon as all zones have reached the set temperature. If the tolerance window is left during the hold time or heating through time, the countdown stops and only starts again when the zone is back within the tolerance window.

The heating time ensures that the set temperature prevails throughout the entire hot runner system and that the plastic contained has reached the molten state everywhere.

4.2.2 Recording

The temperature curves recorded by the **curve recorder** can be called up under this menu item.

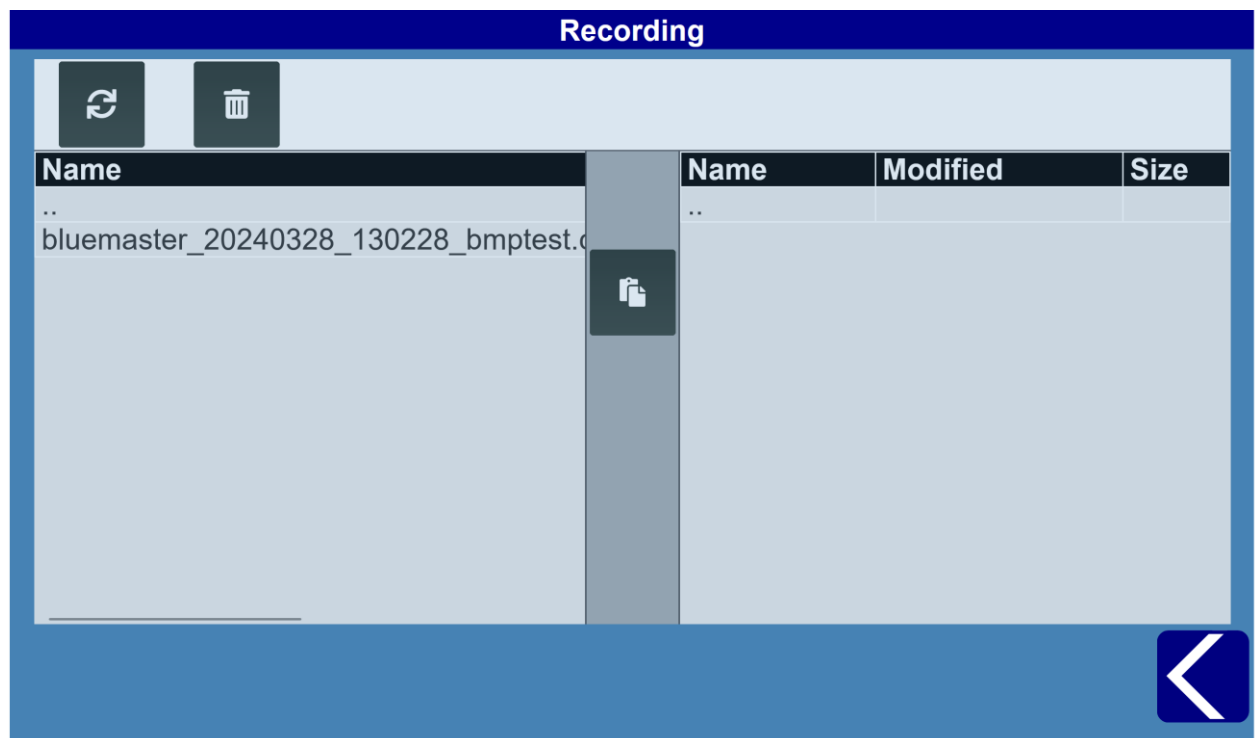


Figure 39: "Recording" screen

The **curve recorder** can be used to display the course of the actual temperature of selectable zones. As soon as the Start recording button is pressed, the measurement data is saved internally.

The data is stored as a CSV file and can be opened with a spreadsheet programme.

Connect a USB memory device to the USB port on the front of the blueMaster to transfer data from the internal memory.

On the left you can see the internal memory of the blueMaster pro, on the right the contents of the connected USB memory.

You can use the buttons to

- Refresh view
- Delete file
- Copy file

4.2.3 OPC UA interface

The blueMaster pro can be connected to an injection moulding machine via an OPC UA interface in accordance with Euromap 82.2. Use the [Ethernet interface X7](#) on the back of the device for this.

If the OPC UA interface is activated, the target temperatures are set on the injection moulding machine and transferred to the blueMaster pro. Therefore, some functions of the blueMaster pro are not accessible when the OPC UA interface is activated.

To activate the OPC UA interface, press the slide switch.

To establish a connection via OPC-UA, proceed as follows:

- Establish a network connection between the injection moulding machine and blueMaster pro
- Call up the network settings of the blueMaster pro
- Activate DHCP so that the controller obtains its IP address from the injection moulding machine
- On the injection moulding machine, activate the IP address assignment to external devices for the network adapter to which the blueMaster pro is connected. If in doubt, refer to the manual for the injection moulding machine.
- Select the communication protocol (Euromap 82.2) on the injection moulding machine
- Set the number of control units and control zones on the injection moulding machine

4.2.4 Serial interface

With the serial interface, it is possible to have the temperatures specified by the injection moulding machine (IMM), while the blueMaster ensures that these target temperatures are reached. This interface has long been built into Günther hot runner controllers and is also known as the **20 mA current loop interface** or **TTY interface**. Communication between the blueMaster and IMM is established via the [serial interface X6](#). To do this, the correct parameters must be set for your specific SGM make.

If the interface is active, a *TTY* message is displayed in the [main view](#). This is highlighted in colour and thus shows you

Red	blueMaster pro does not receive any signals from the injection moulding machine via the TTY interface
Yellow	blueMaster pro receives signals from the SGM via the TTY interface, but ignores them. This occurs when the blueMaster pro is still running the heating function, but the SGM is already specifying target temperatures.
Green	blueMaster pro receives signals from the SGM via the TTY interface and converts them.

The screenshot displays the 'TTY interface' configuration screen, divided into two main sections: 'Protocol settings' and 'Interface settings'.

Protocol settings:

- No protocol:** Indicated by a green circle.
- ARBURG:** Indicated by a white circle. Below it, the 'device-address' is set to '0', 'Start' is '0', and 'end' is '0'.
- ENGEL:** Indicated by a white circle.

Interface settings:

- Interface:** Set to '_TTY' (dropdown menu).
- Daten-Bit:** Set to '_8_' (dropdown menu).
- Baudrate:** Set to '_4800' (dropdown menu).
- Parity:** Set to 'EVEN' (dropdown menu).
- Stop bit:** Set to '_1_' (dropdown menu).
- Status:** Indicated by a red circle.

A blue back arrow button is located in the bottom right corner of the interface settings section.

Figure 40: "TTY interface" screen

Please select your injection moulding machine manufacturer in the *protocol settings* and check the *interface settings* using the following table.

SGM manufacturer	Interface	Data bit	Baud rate	Parity	Stop bit
Arburg	TTY	8	4800	even	1
Engel	TTY	8	4800	none	1

For Arburg machines, the *device address* can also be set; this should always be "0", *start* and *end* are purely display fields.

4.2.5 Autostart

If you activate the Autostart option, the blueMaster pro starts with the last mould loaded the next time it is switched on, skips the thermocouple test and starts heating up. This function is useful, for example, if the controller is connected to a socket on the injection moulding machine and should start heating up automatically when the machine is switched on.

4.2.6 Simulation

Here you can activate the simulation, which is intended for demonstrating the blueMaster pro. When the simulation is activated, the blueMaster pro displays a load and a thermocouple on all available control zones and reacts to your inputs, but no power output takes place.

4.3 Device settings

Under **Device settings** you will find the basic settings for your blueMaster pro.

In detail, these are

- [Language](#)
- [Device properties](#)
- [User administration](#)
- [Network settings](#)

4.3.1 Language

You can select the screen language of the blueMaster pro under this menu item. In addition to the menu texts, the help and the manual are also displayed in the selected language. If the language you require is not available, [please contact us](#).

4.3.2 Device properties

Here you will find

- the **serial number** of the device (BMPxxxxxyyyy)
- the **IP address** of the HMI (*human machine interface*). If you have connected the blueMaster pro to a network, call up this IP address to operate it via a browser.
- **Version information** of PLC (*programmable logic controller*: the component of the blueMaster pro that handles the control tasks) and HMI. This can be helpful if there is a problem and you contact our support team.

4.3.4 User administration

In this menu, you can view all currently created user accounts on this blueMaster pro and change their settings, provided you have the appropriate authorisation level.

4.3.5 Network settings

Under this menu item you can make settings and display the current IP address.

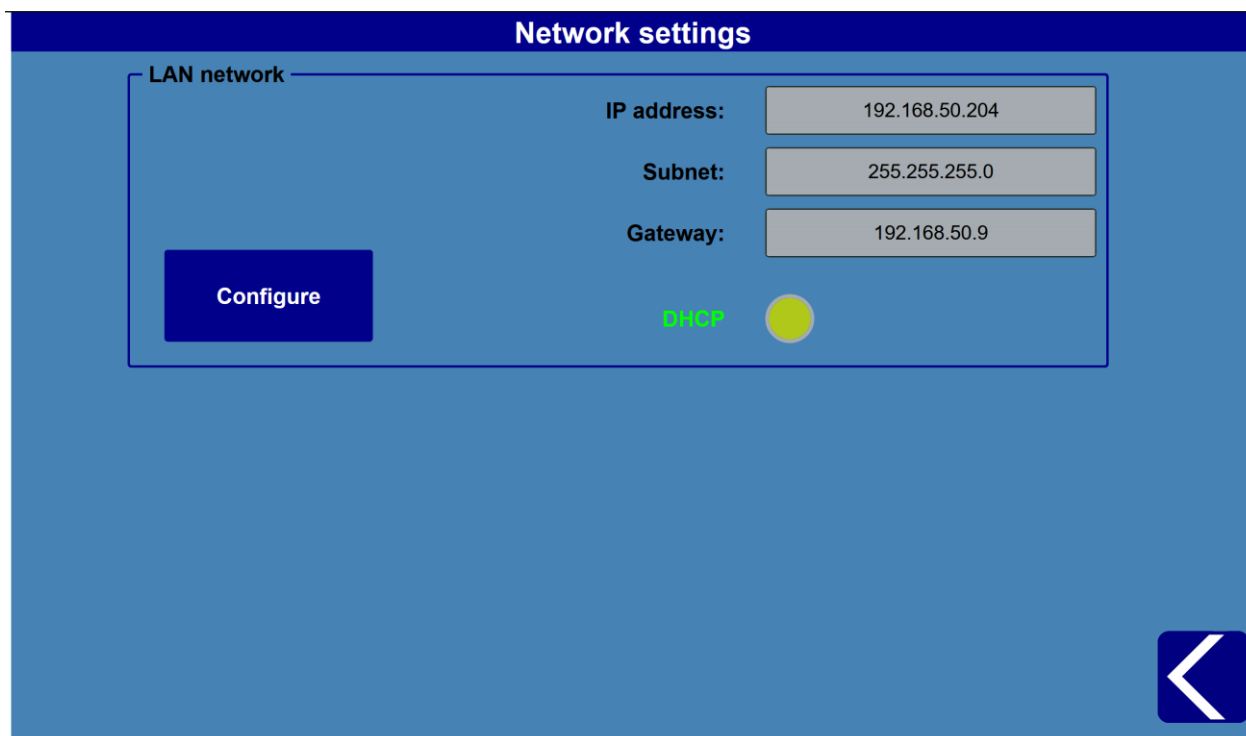


Figure 41: Network settings screen

The **IP address** is technically that of the **HMI** and the one via which the blueMaster pro can be reached from outside. The IP address is usually assigned by the DHCP server of the network in which the blueMaster pro is integrated.

Press **configure** to change the displayed settings.

You can activate DHCP, in which case the blueMaster pro is automatically assigned an IP address by the network's DHCP server. Or you can deactivate DHCP, in which case you must specify the IP address, subnet mask and default gateway manually.

In principle, the blueMaster pro can be integrated into a local network (LAN) and can then be accessed via the specified IP address. If you call up the IP address in a browser, you have full access to all blueMaster pro settings.

This is useful, for example, for checking the status of a production plant from the control centre.

As access via the network takes place in a separate instance, the screen content is not mirrored. If you call up the blueMaster pro from the control centre and change the screen page, this is not reflected on the blueMaster pro display. However, if you switch off the control system from the control centre or load another tool, this is also implemented on the device.

Attention:

Remote access via LAN is at your own risk.

4.3.5.1 WiFi

A WiFi stick is available as an accessory for the blueMaster pro, which is plugged into the USB port on the front of the device. The article number is 311.0120.00.

If you plug the WiFi stick into the blueMaster pro, the name of the network (SSID) and the password that you can use to connect to the device will be displayed.

4.3.6 VNC Server

VNC stands for *Virtual Network Computing* and describes a standard for transferring the screen content of one computer to another.

To use this function, proceed as follows

- Establish a network connection between the injection moulding machine and blueMaster pro
- The injection moulding machine usually provides the DHCP server so that the blueMaster pro is assigned an IP address
- Activate VNC
- Call up the IP address of the controller via the injection moulding machine. The procedure for this differs from manufacturer to manufacturer; if in doubt, refer to the manual for the injection moulding machine.

When connected via VNC, the screen content of the blueMaster pro is mirrored on the display of the injection moulding machine. If the machine operator changes the menu page, this change is also made on the blueMaster pro display.

4.4 Support

The Support section contains settings relating to help, assistance and service.

The individual menu items are

- Set-up wizard
- Help
- Service file
- Pin assignment
- Snapshot
- Performance monitor
- HMI calibration

4.4.1 Assistant

Here you can call up the [setup wizard](#) from the main menu to create a new tool.

Please note: The temperature control will be cancelled and you will be taken directly to the start page of the setup wizard.

4.4.2 Help

Use this menu item to call up the blueMaster pro digital manual.

4.4.3 Service file

If the *blueMaster* is not working properly, please [contact](#) us.

In order to get an idea of the problem, we may ask you to send us a **service file**. The current settings and any errors are stored in this file.

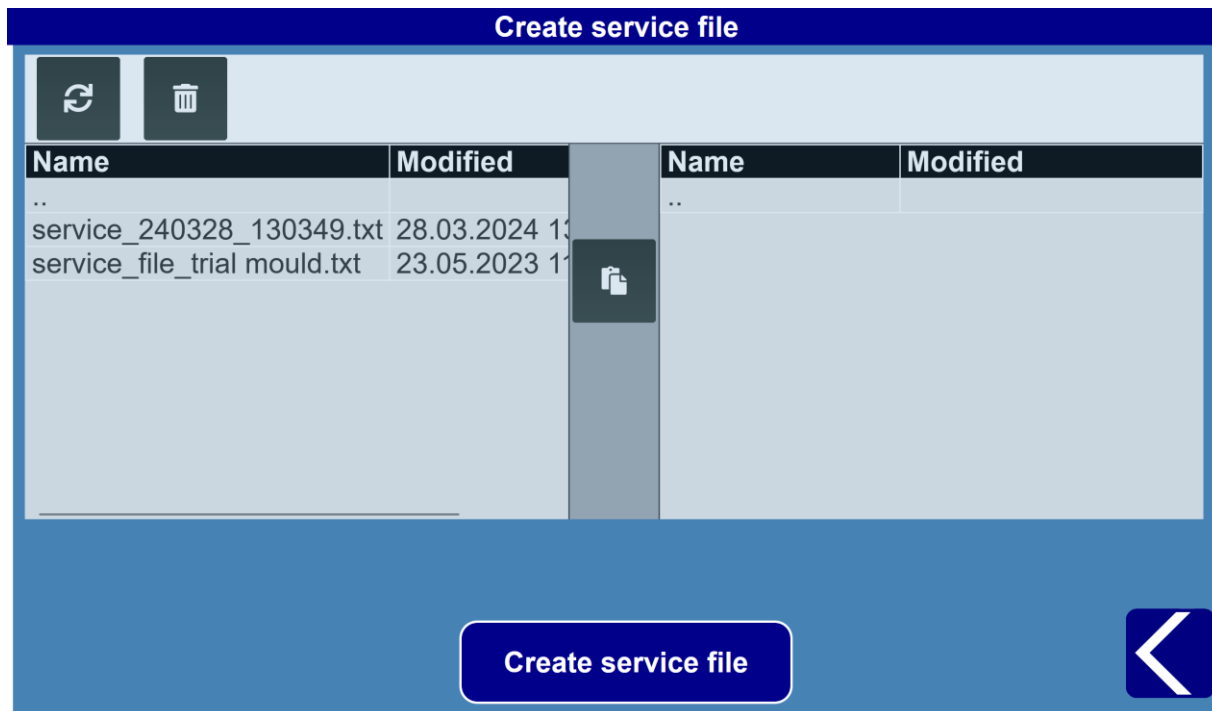


Figure 42: "Service file" screen

Connect a USB memory device to the USB port on the front of the blueMaster pro and press the **Create service file** button.

You can use the buttons to

- Refresh view
- Delete file
- Copy file

Send us the service file and we can help you quickly.

4.4.4 Pin assignment

In addition to the standard assignment on separate 24-pin connectors for load (sockets on the blueMaster pro) and thermo (pins on the blueMaster pro), we also offer the blueMaster pro in other assignment variants according to customer requirements.

If you call up the menu item *Pin assignment*, the assignment of your blueMaster pro is displayed as a PDF file.

4.4.5 Snapshot

Use the Snapshot function to record the screen content. To do this, you need to insert a USB memory device into the USB port on the front of the device.

If you select the menu item, a small window will appear that you can position as you wish. If you press the camera symbol, a screenshot is taken and automatically exported via USB.

If you tap on the cross above the camera symbol, you end the snapshot function and can remove the USB memory.

4.4.6 Performance monitor

The power monitor provides information on the current actuating variable [%] or power [W] of a control zone.

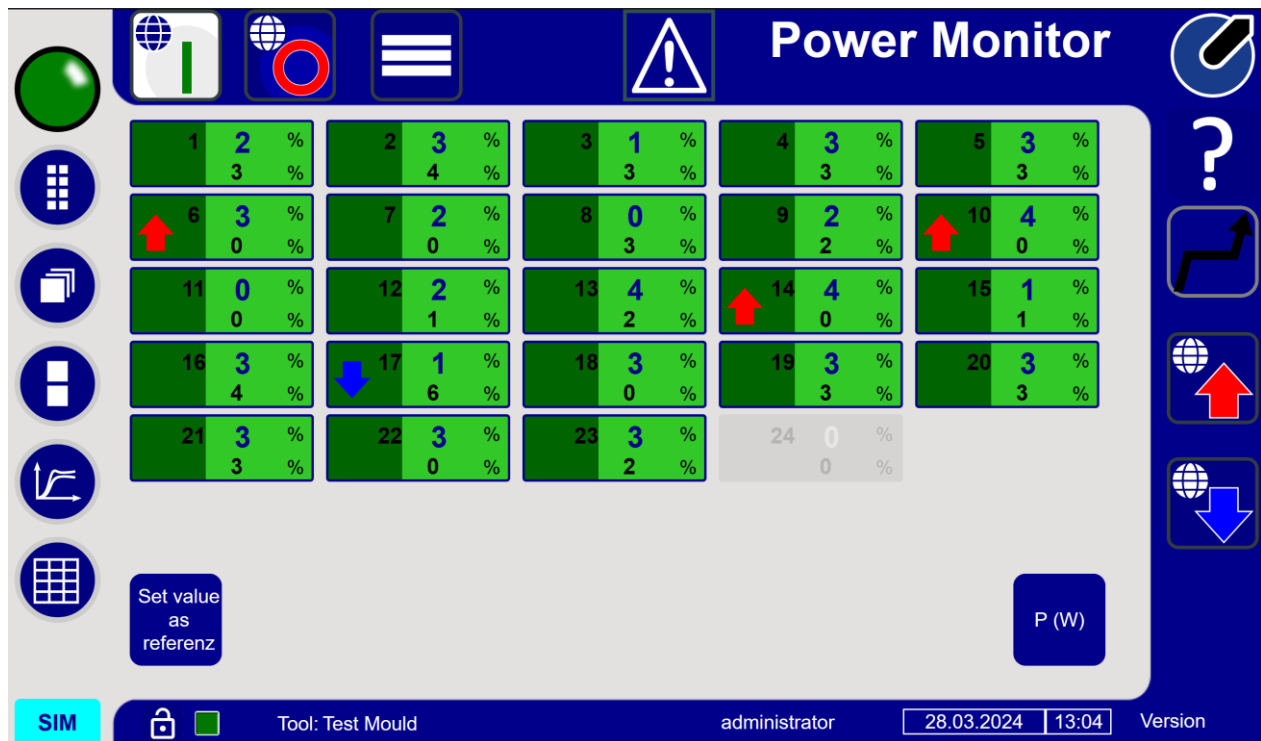


Figure 43: "Performance monitor" screen

If you tap on a zone, a window opens. Here you can set the following

- The reference value for this zone. Together with the tolerance field (see below), it forms the range in which the control value or power should lie, otherwise a warning is issued.
- a time factor [0..360 s], over which the average value is formed, so that short-term power peaks do not lead directly to a warning
- a tolerance field (the entry is the amount by which the actual value may deviate from the reference value. A reference value of 10 and a tolerance of 5 result in a permissible range of 5..15).

The power monitor only records values when the system is ready to spray and is therefore not distorted by heating.

A deviation upwards or downwards is visualised by an arrow.

The Set value as reference button can be used to adopt the current value of all zones as a reference.

You can access the performance monitor by tapping on the indicator light at the top left.

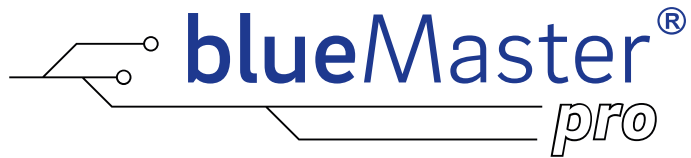
4.4.7 HMI calibration

The HMI (Human Machine Interface) contains the touch-sensitive screen of the blueMaster pro and a computer for providing the graphical user interface.

The screen is calibrated at the factory. If you notice deviations between the point at which you touch the screen and the point at which a button is activated, calibrating the display can help.

Attention: The current control is cancelled and the application is restarted.

5. Contact us



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List of illustrations

Figure 1: Help Button.....	5
Figure 2: Detail view button left: inactive, right: active	5
Figure 3: Slide switch top: active, bottom: inactive	5
Figure 4: Boost button left: Group, right: global.....	6
Figure 5: Front side of the blueMaster pro.....	7
Figure 6: Rear of the blueMaster pro.....	9
Figure 7: Thermal inputs on the rear of the blueMaster pro.....	10
Figure 8: Assignment of the thermal inputs.....	10
Figure 9: Load outputs on the rear of the blueMaster pro	11
Figure 10: Assignment of the load outputs	12
Figure 11: Lowering/OK interface of the blueMaster pro.....	13
Figure 12: Assignment of the lowering/OK interface of the blueMaster pro	13
Figure 13: Start screen of the blueMaster pro	15
Figure 14: Version screen of the blueMaster pro.....	17
Figure 15: "Continue" screen of the blueMaster pro	18
Figure 16: "Thermocouple test" screen of the blueMaster pro	19
Figure 17: "Load tool" screen of the blueMaster pro.....	20
Figure 18: "Select tool" screen of the blueMaster pro.....	21
Figure 19: "Create new tool" screen of the blueMaster pro.....	22
Figure 20: Basic settings screen of the setup wizard	23
Figure 21: "Deselect zones" screen of the setup wizard	24
Figure 22: System test screen of the setup wizard.....	25
Figure 23: System test screen of the setup wizard with detected error	26
Figure 24: "Groups" screen of the setup wizard.....	27
Figure 25: "Set up group" screen of the setup wizard.....	27
Figure 26: Temperatures screen of the setup wizard	28
Figure 27: The heating function explained.....	29
Figure 28: "Save tool" screen of the setup wizard	31
Figure 29: Group view screen.....	33
Figure 30: "Set up group" screen.....	34
Figure 31: "Set up group" screen.....	35
Figure 32: "Curve Recorder" screen.....	37
Figure 33: Window "Channel legend"	38
Figure 34: Zone settings screen	41
Figure 35: Menu "Tool datasets"	45
Figure 36: "Tool data sets USB" screen.....	47
Figure 37: "Tool data sets network" screen	48
Figure 38: "Heating function" screen.....	50
Figure 39: "Recording" screen.....	51
Figure 40: "TTY interface" screen	53
Figure 41: Network settings screen	55
Figure 42: "Service file" screen	58
Figure 43: "Performance monitor" screen.....	59

