Operation manual

CE

Ht205

Programmable controller

1 Introduction

Ht205 is a program controller intended for industrial applications.

Operation manual is diveded into the categories describing installation and switching ON of the device, initial setup, description of particular menu levels (user, operation, configuration, service menu and menu for writing a program),…

In the following two paragraphs you will find the list of chapters suitable for reading, if you install and set up the controller fully or you operate it in the supplied equipment.
Read this manual very carefully please, before you start to work with this device.

1.1 How to get the information about the device ... INFO panel

Overview of basic information you can get in INFO panel. More information is available on page *9*.

2 Description of the controller

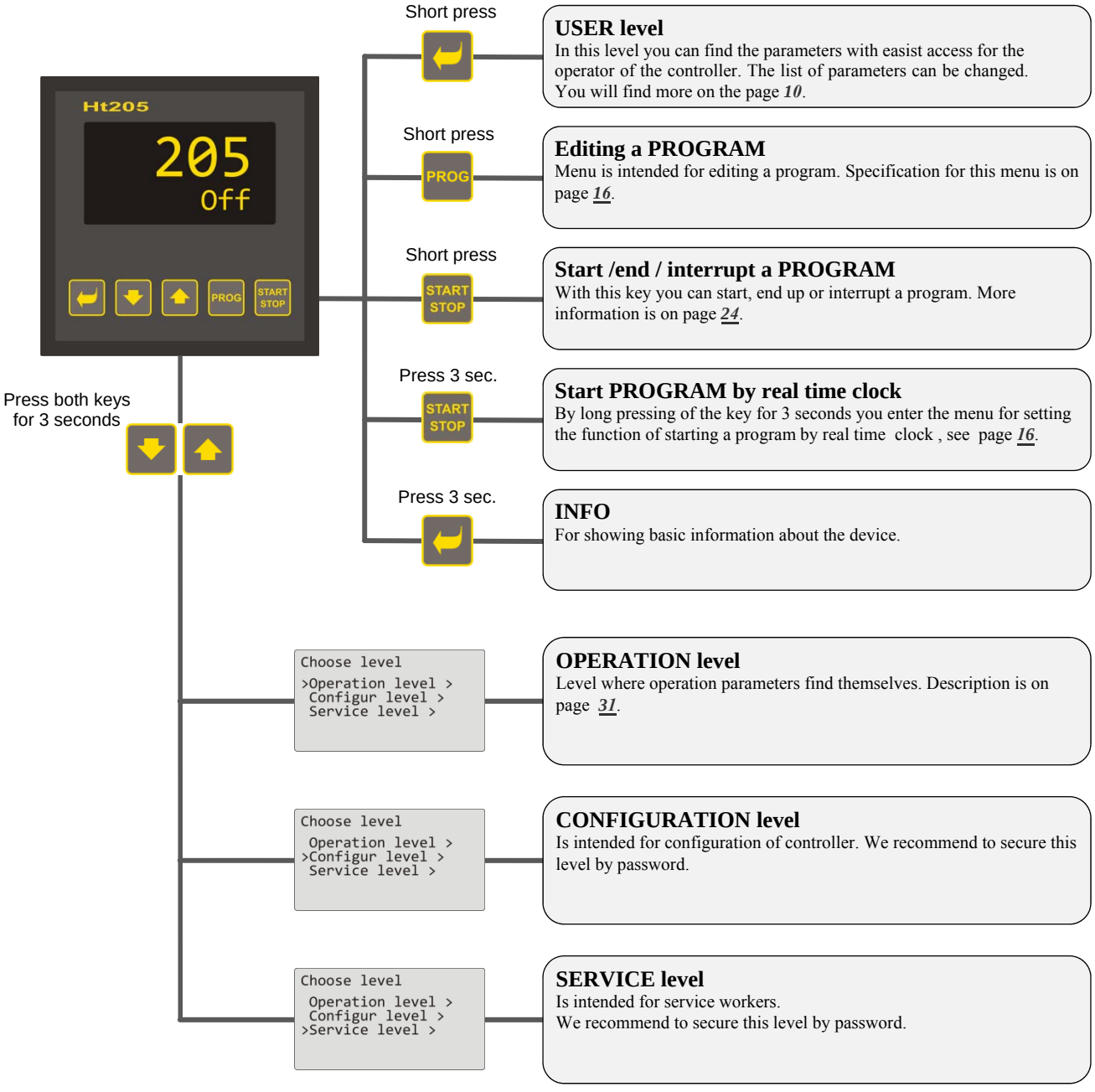
Ht205 is a programmable controller of 96 x 96mm format, for the built into panel. The controller can maintan the set point or it can control the process by the chosen program. You can edit 30 programs in total with 15 steps.The program can be started via keys, digital inputs, communication line or by the real-time clock.

The controller is set up by 5 keys with menu technique, OLED display is used for showing figures.

2.1 Overview of levels, menus

The controller is set up by parameters. For better understanding the parameters are sorted out to groups (levels and menus). **Level** is superior to menu, **menu** is a part of level, for example `Input1 >`, `Output1 >`, `Output2 >`, …).

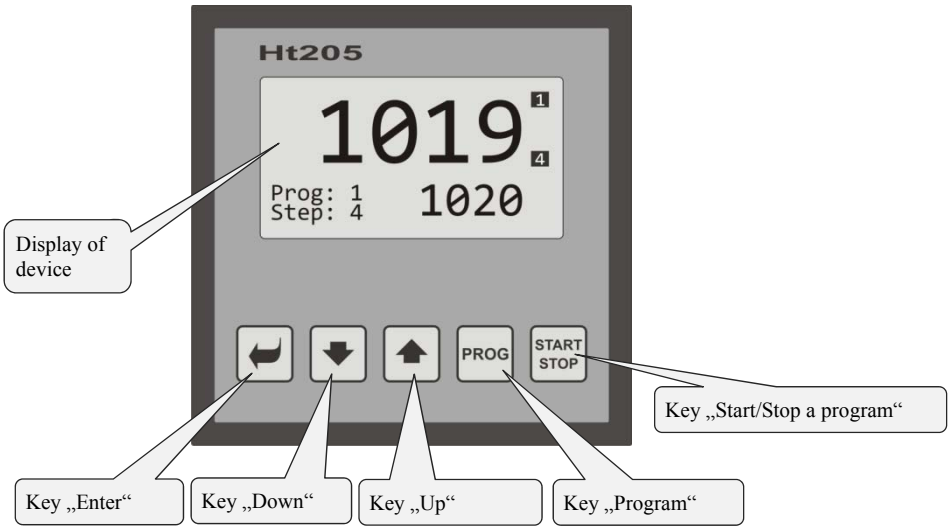
The overview of levels, menus and entering these levels, menus is shown in the following picture:



2.2 Operation of the controller

You can operate and set up the device from the front panel through 5 keys of menu technique.

Appearance of front panel of device

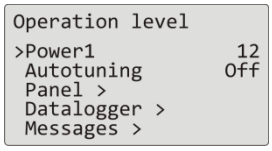


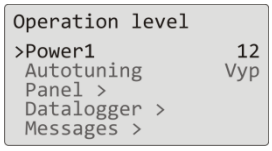
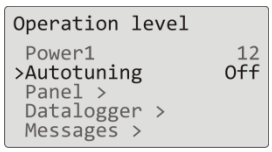
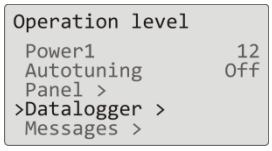
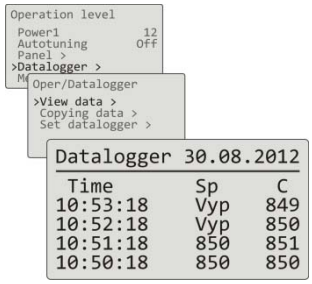
Function of keys:

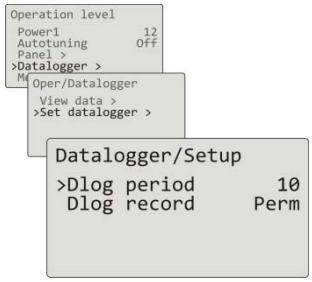
	Key „**ENTER**“ is intended for: • Entering the next menu, • Editing a parameter + saving a new setting of parameter, • By pressing this key for 3 seconds you enter into „INFO“ screen.
	Key „**Down**“ is intended for: • Moving between parameters, • Setting a parameter.
	Key „**Up**“ is intended for: • Moving between parameters, • Setting a parameter.
	Key „**Program**“ is intended for: • Editing a program.
	Key „**Start/Stop a program**“ is intended for: • Starting, interrupting and ending a program (short press), • Setting the start of a program by the real time clock (long press for 3 seconds).
	**Pressing both keys:** • By short pressing both keys you return to the previous level, • By long pressing (3 seconds) you will reach higher levels (operation, configuration, service).

Description how to operate the controller

The description how to operate the device is stated on the parameters of operation level.

<table>
<tr><td> 
</td><td colspan="2">Example of screen for operation level. The list of parameters can differ and it depends on the actual facilities of the device and the set up configuration.

• You browse in menu by keys ▼ and ▲.
• Editing a parameter and confirmation of new setup value is done by the key ↵, parameter is set by the keys ▼ and ▲.
• Change to next menu you can do by the key ↵.
• To return from menu, press the both key-arrows for a short ▼▲.</td></tr>
<tr><td colspan="3">In menu you can find 3 types of parameters:</td></tr>
<tr><td>1.</td><td> 
</td><td>Parameter without editing … for example Power 1 12 shows the actual value of the power. This parametr can not be edited.</td></tr>
<tr><td>2.</td><td> 
</td><td>Parameter for editing … for example Autotuning Off can be edited by the key ↵ . Through the key-arrows you can set a new value and by pressing this key ↵ again this value is written. During editing a parameter the value to be set blinks.</td></tr>
<tr><td>3.</td><td> 
</td><td>Change to next menu … for example Datalogger > . Parameter for the change to next menu is added by the arrow key behind the name. By pressing the key ↵ you enter the next menu.</td></tr>
<tr><td colspan="3">In menu the independent screens can be used, for example:</td></tr>
<tr><td> 
</td><td>Showing data from datalogger.

On this screen you can view the trend of setpoint and process value of the controller depending on time.</td></tr>
<tr><td> 
</td><td>Setting of datalogger.

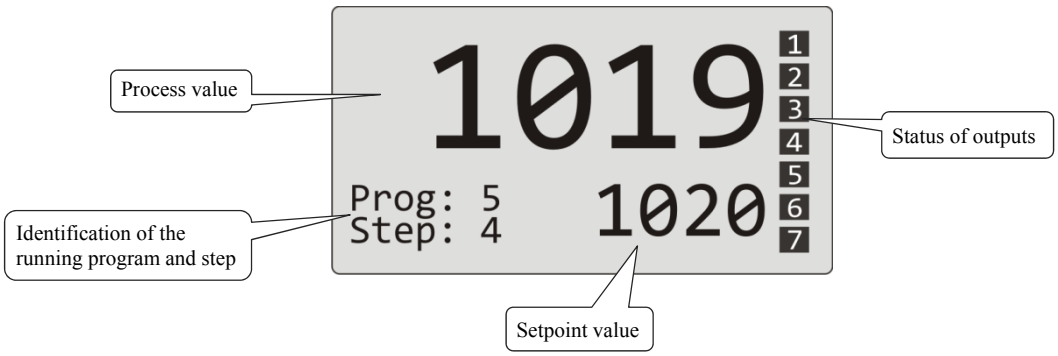
On this screen you can set datalogger.</td></tr>
</table>

2.3 Basic mode of controller

The controller is in Basic mode when powered up (after the initial set-up of the device).
In Basic mode one of the screens can be set…… numerical or graph.

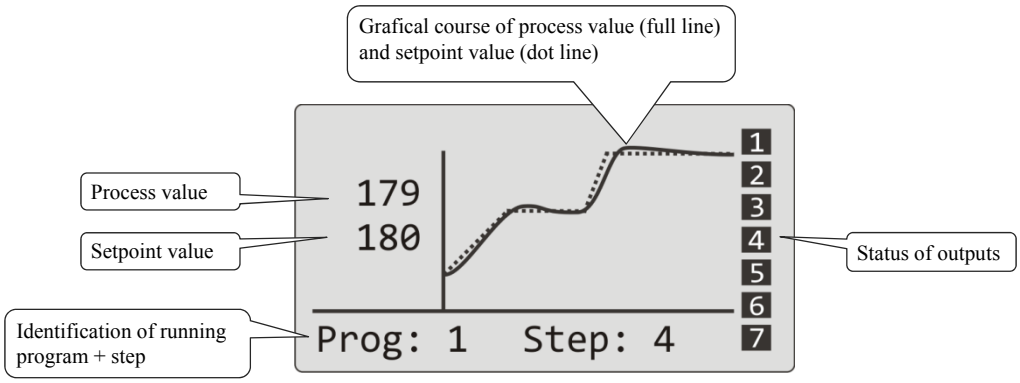
Basic screen - numerical

On numerical screen you can see setpoint and process values, status of all ouputs and the status of the current running program.



Basic screen - graph

On the left side in the screen there are setpoint and process values, in the middle there is a graph, on the right side there are status of outputs of the controller and in the lower part you can see the status of the running program.



Type of screen and parameters of the graph you can set in ***operation level*** (***user level***), menu `Panel >`.

2.4 Information and error messages

Information and error messages are indicated only in basic mode of the controller.

Information messages, upper display

- **----** … error of input sensor or input is not set.

Information messages, lower display

- **Start** … Starting a program by the real time clock.
- **Aut1** … Autotuning of PID parameters for 1. set of PID parameters for heating, **Prop1-A**, **Int1-A**, **Der1-A**.
- **Aut2** … Autotuning of PID parameters for 2. set of PID parameters for heating, **Prop1-B**, **Int1-B**, **Der1-B**.
- **Aut3** … Autotuning of PID parameters for PID parameters for cooling, **Prop2-A**, **Int2-A**, **Der2-A**.
- **GSD** … Indication that proces value is outside the soak band, see page ***30***.
- **Stop** … Indication that the program is stopped, see page ***27***.
- **Wait** … Indication that the program is stopped and waiting for confirmation by digital input.
- **OutFrz** … Indication that the control outputs are frozen by digital input. The outputs are switched OFF, memory of integral and derivate remains.
- **OutOff** … Indication that the control outputs are switched OFF by digital input. Memory of integral and derivate is deleted.

Error messages, lower display

If there is a error message indicated then the control outputs are switched OFF, the event outputs are switched OFF, the alarm output is activated

- **Error1** … indicates the error in the configuration setting of the device. The error can be solved by re-start in some cases and by new setting of all parameters, re-start of parameters can be performed in service level. This operation can be performed only by an experienced user. If the trouble persists, contact your supplier.

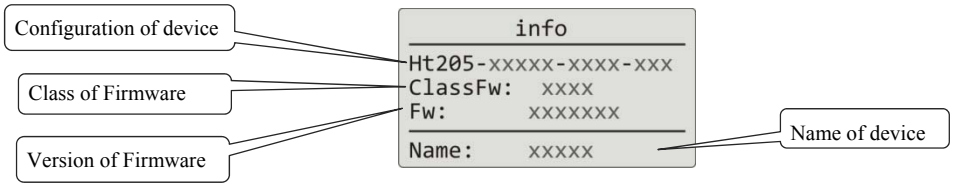
- **Error3** … error in input A/D converter. It can be caused for example by too low temperature and excessive humidity or by damage of convertor by extensive input signal with high amplitude. Switch the controller OFF and ON again. If the problem persists, contact your supplier.

2.5 INFO panel

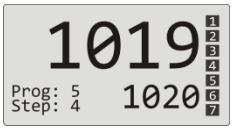
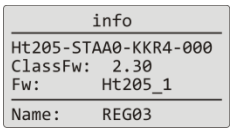
INFO panel provides you with the basic information about the device:

- Configuration of the controller,
- Class of firmware of the device (2.30 to 2.39 for Ht205-S),
- Version of firmware of the device,
- Name of the device (it can be chosen in ***configuration level***, menu **Systém >**).

Appearence of „INFO“ panel



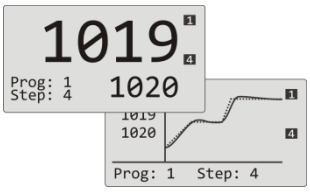
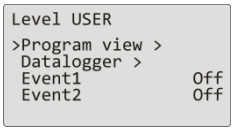
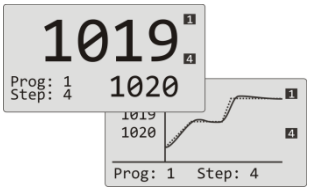
Enter to „INFO“ panel:

	The controller is switched ON, it can be in BASIC mode or in any other menu.
	By pressing the key ↵ for 3 seconds, until you can see panel „INFO“.

3 User level

User level enables access for the most used parameters and menus of the controller.
The list of parameters/menus as well as their sequence can be selected.
As a maximum there can be placed 12 parameters/menus in user menu.

How to enter user level

	The controller is in Basic mode. **To enter the user level, press shortly the key ↵.**
	Example of screen for user level with parameters/references: • **Program view >** … change into menu for the indication of program status, • **Datalogger >** … change into menu for operation of datalogger, • **Event1** … showing / setting of 1. event output, • **Event2** … showing / setting of 2. event output. The technique for setting menu is the same in all the device. Description can be found on page 5.
	**To return into basic menu.** To return into basic menu, press shortly the both keys ↓ ↑. If the device is not being set for a while, it will return into basic menu itself after 60 seconds.

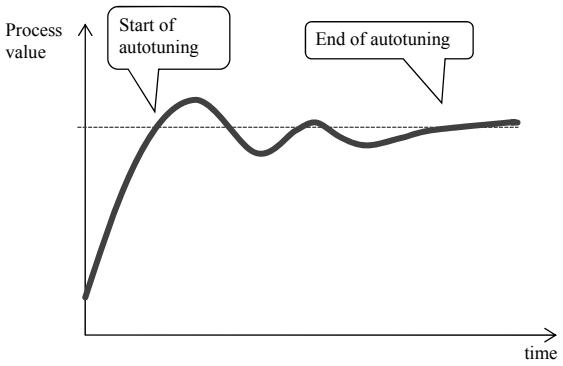
Overview of all possible parameters / menus of user level

In user level the following parameters/menus can be placed:

- **Language >** … menu for setting of language,
- **Program view >** … menu of indication about the program status,
- **Program edit >** … menu for editing the current running step of the program,
- **Power1** ▫▫▫▫▫▫ … indication of the actual power on 1. control output,
- **Power2** ▫▫▫▫▫▫ … indication of the actual power on 2. control output,
- **Power prog** ▫▫▫▫▫▫ … indication of the consumed energy for the last firing (data read from energy meter),
- **Power total** ▫▫▫▫▫▫ … indication of the total consumed energy (data read from energy meter),
- **Alarm Off** ▫▫▫▫▫▫ … switching OFF of the permanent alarm,
- **Autonuning** ▫▫▫▫▫▫ … starting / stopping of Autotuning of PID parameter,
- **Event1** ▫▫▫▫▫▫ … showing (program running) / setting (program not running) 1. event output,
- **Event2** ▫▫▫▫▫▫ … showing (program running) / setting (program not running) 2. event output,
- **Event3** ▫▫▫▫▫▫ … showing (program running) / setting (program not running) 3. event output,
- **Event4** ▫▫▫▫▫▫ … showing (program running) / setting (program not running) 4. event output,
- **Panel >** … menu for setting of basic screen of the controller,
- **Datalogger >** … menu for operation of datalogger with process values,
- **Messages >** … menu for news,
- **Clock >** … menu for setting of the real time clock.

3.1 Autotuning – automatic setting of PID parameters

The controller is fitted with the function that sets automatically PID parameters for heating and cooling.



When in autotuning mode, on lower display it blinks heading:

- **Aut1** … controller sets the parameters **Prop1-A**, **Int1-A**, **Der1-A** for heating.
- **Aut2** … controller sets the parameters **Prop1-B**, **Int1-B**, **Der1-B** for heating.
- **Aut3** … controller sets the parameters **Prop2-A**, **Int2-A**, **Der2-A** for cooling.

Procedure of starting autotuning:

- Control output must be set for PID controlling or 3-way step controlling.
- Autotuning can be started with the parameter **Autotuning** = **Ht** (setting of parameters for heating) or **Autotuning** = **Cl** (setting of parameters for cooling). Parameter **Autotuning** can be found in ***operation level*** or in ***user level***.
- The controller explores the characteristics of system from switching ON/OFF on the output and determines optimal PID parameters. It can cause an overshoot.
- During the autotuning on lower display you can view the blinking message (**Aut1**, **Aut2**, **Aut3**).
- After the autotuning is finished, new PID parameters are written and the information message stops blinking.

3.2 Datalogger of process values

Datalogger of process values saves:

- date (DATE) and time (TIME) of the logs,
- set point (SP1) and process (C1) values of the controller Ht205,
- max. 7 process values from SLAVE controllers (C2 to C8), controllers must be connected to communication line Comm1 or Comm2 and system „Master – Slave“ must be set,
- energy consumption measured by energy meter EM24 (E), energy meter must be connected to communication line Comm1,
- number of the running program (PROG).

Maximum number of logs is 500.

Data can be viewed on display or they can be transmitted through the communication line or LAN interface to PC.

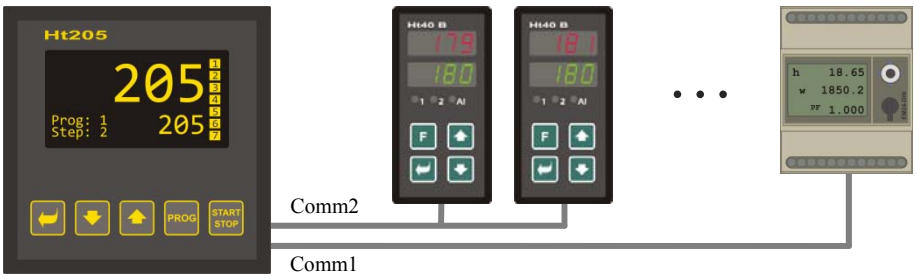


Table of process values transmitted from Ht205

	A	B	C	D	E		K	L	M
1	DATE	TIME	SP1	C1	C2	…	C8	E	PROG
2	05.02.2013	08:55:12	180	179	179		181	44863.2	1
3	05.02.2013	08:54:12	176	175	174		175	44841.9	1
4	05.02.2013	08:53:12	172	172	170		172	44836.4	1
	…								

Date of log

Time of log

Set point value of Ht205

Process value of Ht205

Process value of 1. slave controller (Ht40B)

Process value of 7. slave controller (Ht40B)

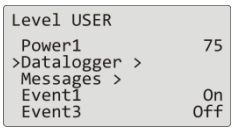
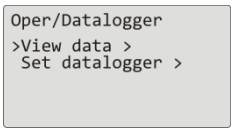
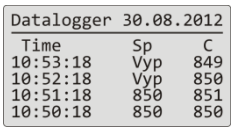
Energy consumption from meter EM24

Number of running program

Table is illustrative and it can contain all the stored values.

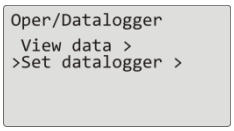
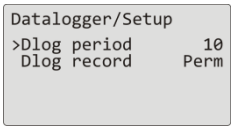
Showing stored values from datalogger on display

Datalogger can show values in ***operation level*** or (if it is set) in ***user level***, menu **Datalogger >** according to the following procedure:

	Enter into ***user level*** (***operation level***) and choose the item **Datalogger >**, confirm.
	In menu **Oper/Datalogger** choose the item **View data >**, confirm.
	It opens menu with stored data: • In upper part you can read date of log (valid for 1st line of shown data), • In lower part you can read time of log, set point and process values.

Setting of datalogger with measured values

You can choose for the datalogger the following items – **period for one log and condition for storing data**.
You can set this in menu **Datalogger >** by the following procedure:

	Enter menu **Datalogger >**, you will find this in ***user level*** or ***operation level***. Go to menu **Set dataloggeru >**.
	In menu you will find 2 parameters: • **Dlog period** … it defines period of logging in seconds (range 10 to 600 seconds). • **Dlog record** … it defines condition for logging (**Off** … logging is OFF, **Prog** … logging only when program runs, **Alarm** … logging only when alarm is active, **Perm** … permanent logging).

3.3 Datalogger of messages (about the activity of the device)

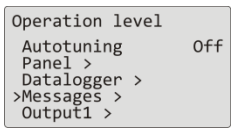
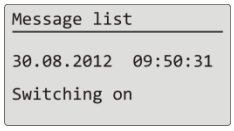
Device stores the messages about its activities and operation (switching ON, start and end of the program, change in parameters of operation and configuration level, restart of parameters, …) in the memory of datalogger for messages. These messages can be shown on display.

Maximum number of logs is 200.

The messages can be shown on the display or they can be transmitted through communication line or LAN interafce to PC.

Showing messages on display

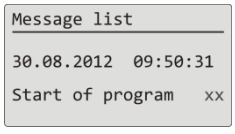
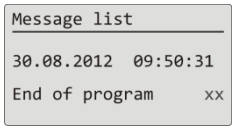
The list of messages can be shown in ***operation level*** or (if it is set in the device) in ***user level***, menu `Messages >`, according to the following procedure:

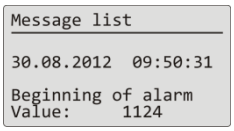
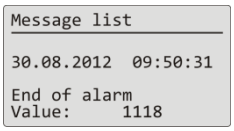
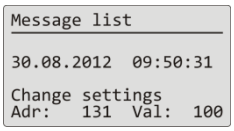
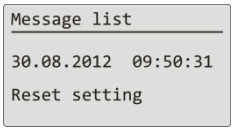
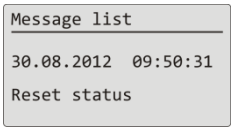
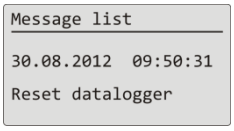
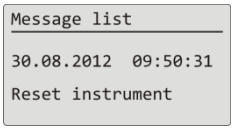
	Enter ***operation level*** (***user level***), choose menu `Messages >` and confirm.
	It opens up menu with the list of messages. You can browse the particular messages by the arrow keys.

Overview of messages stored by the device

Overview of all messages and their displaying is in the following table, the meaning of single columns, is as follows:

- **Message** … name of the message.
- **Showing** … appearence of the message on display including date and time of creating message.
- **Description** … describing data about the message.

Message	Showing	Description
Switching ON of the device		Date and time of switching ON of device.
Start of program		Date and time of starting a program. xx … number of the running program.
End of program		Date and time of end of the program. xx … number of the ended prorgam.
Interruption of program		Date and time of the program interruption. xx … number of the program interrupted.

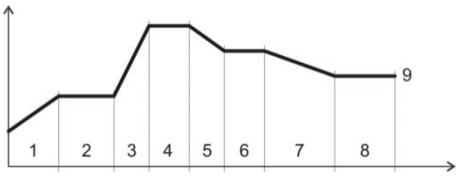
Beginning of alarm		Date and time of alarm start + process value At the start of the alarm.
End of alarm		Date and time of alarm end + process value At the end of the alarm.
Change in settings		Date, time and number of register (Adr) and new value (Hodn) of parameter. List of registers can be found in the description of the communication line.
Reset of setting		Reset of parameters in operation and configuration levels.
Reset of programs		Reset of all programs.
Reset of status		Reset of status (status in the course of program, energy consumption of the actual program, status in counters for errors in writing, reading of convertor, …).
Reset datalogger		Deleting all the dataloggers (data, messages and ambient temperature).
Reset instrument		Reset of all parameters, programs, dataloggers, status.

4 Program

Program manages the requested course of the controlled value (temperature).

In chapter „Program“ you can find the information about:

- Principals of programming,
- writing / editing program,
- start, interruption and ending of program,
- running a program,
- setting parameters connected with the program.



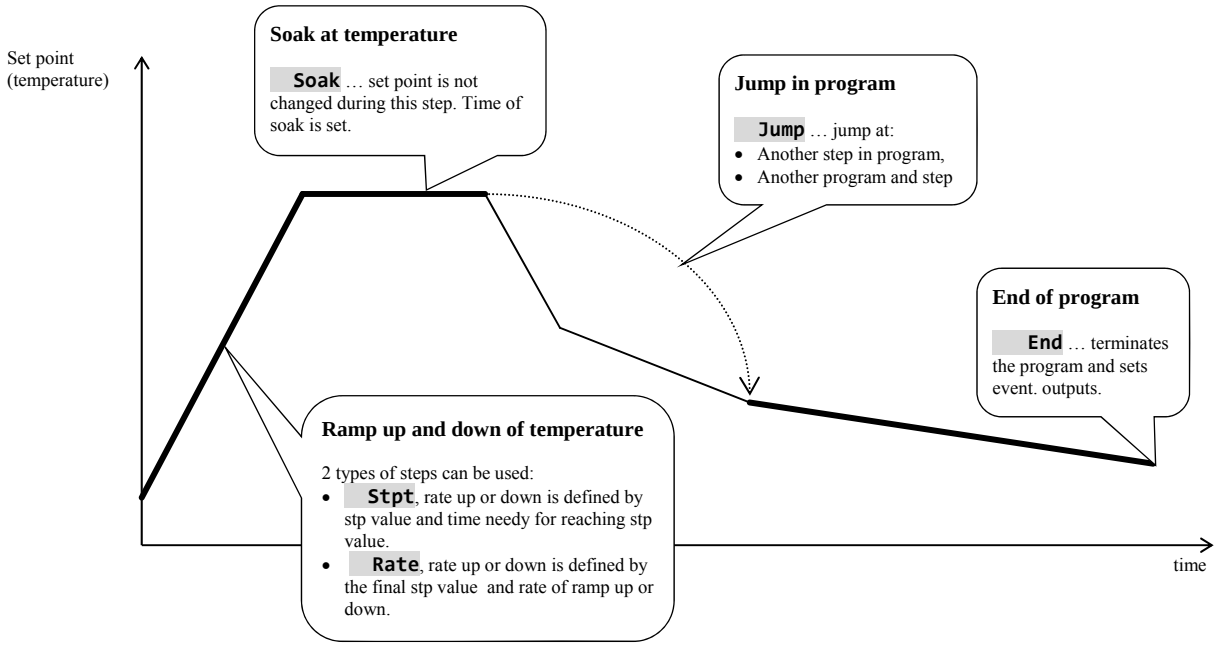
4.1 How to create a program

Program consists of single steps that goes one after another (program starts with the step 1, continues with step 2, …).
Program is ended up with the step „ **End**“.
You can edit as many as 30 programs numbered with 1 to 30 and each program can consist of maximum 15 steps

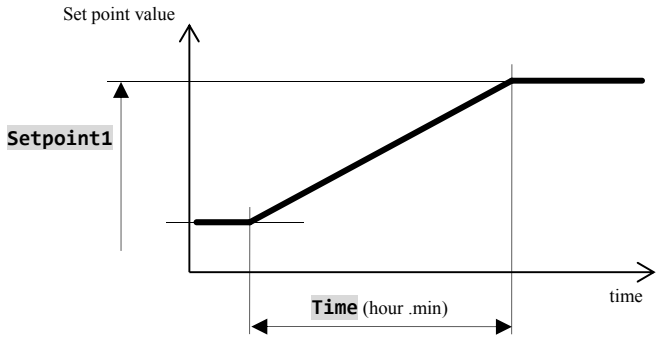
Types of steps

The following picture shows all types of steps that you can use for editing:

- Ramp up (down) to the temperature, „ **Stpt**“, „ **Rate**“
- Soak at the temperature, „ **Soak**“
- Jump at another program and step „ **Jump**“,
- End of the program, „ **End**“.



Stpt ... ramp up or down of stp value defined by time

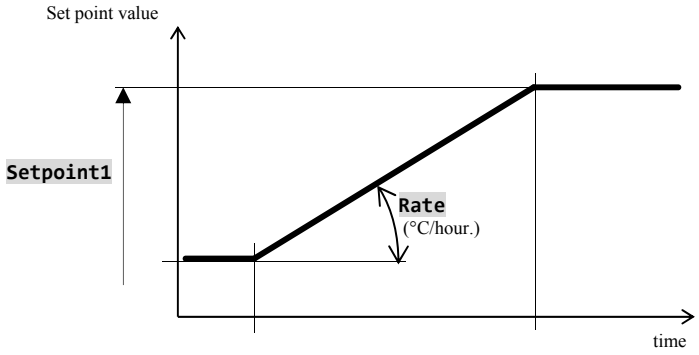


- Initial set point of the step **Stpt** is the same as the final set point value of preceding (former) step.
- I n case of starting a program the initial set point value is equal to the process value.
- Time of step is maximum 99 hours 59 minutes.

The summary of parameters of the step **RaCas**:

Display	Meaning
Setpoint1	**Final set point value**.
Time	**Time needy for reaching set point value**, is stated in format [hours:minutes].
GuarSoak	**GSD function,** see page *28*.
Wait	**Waiting of program**. Program will wait for the confirmation by the digital input. Parameter is shown only when **Dig. input_** = **Wait**.
Event1	**State of the event output 1.** Parameter is displayed only when **Output4** = **Event1**.
Event2	**State of the event output 2.** Parameter is displayed only when **Output5** = **Event2**.
Event3	**State of the event output 3.** Parameter is displayed only when **Output6** = **Event3**.
Event4	**State of the event output 4.** Parameter is displayed only when **Output7** = **Event4**.

Rate ... ramp up or down of set point value defined by rate

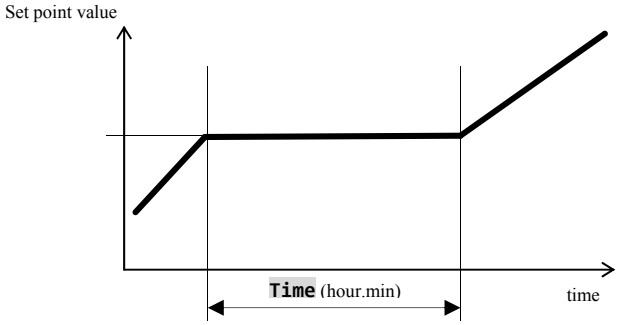


- Initial of set point value of the step „**Rate**“ is the same as the final set point of the preceeding (former) step.
- In case of starting a program the initial set point value is equal to the process value.
- Duration of step is not limited.

The summary of parameters of the step **RaRych**:

Display	Meaning
Setpoint1	**Final set point value**.
Rate	**Rate of ramp up to the set point value is stated in [°C/hour]**.
GuarSoak	**GSD function,** see page *28*.
Wait	**Waiting of program**. Program will wait for the confirmation by the digital input. Parameter is shown only when **Dig. input_** = **Wait**.
Event1	**State of the event output 1.** Parameter is displayed only when **Output4** = **Event1**.
Event2	**State of the event output 2.** Parameter is displayed only when **Output5** = **Event2**.
Event3	**State of the event output 3.** Parameter is displayed only when **Output6** = **Event3**.
Event4	**State of the event output 4.** Parameter is displayed only when **Output7** = **Event4**.

Soak ... soak on temperature



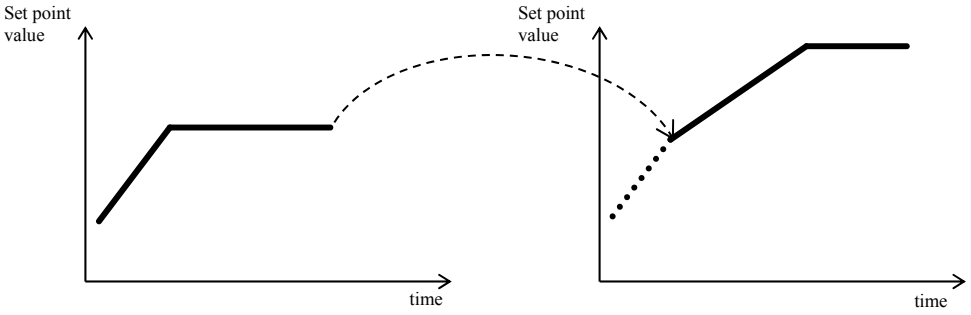
- Set point value of the step **Soak** is the same as the final STP of previous step.
  In case of starting a program the set point value is equal to the process value.
- Time duration of step is maximum 99 hours 59 minutes.

The summary of parameters for the step **Vydrz**

Display	Meaning
Time	**Time of soak** is stated in format [hours:minutes].
GuarSoak	**GSD function**, see page *28*.
Wait	**Waiting of program**. Program will wait for the confirmation by the digital input. Parameter is shown only when **Dig. input_** = **Wait**.
Event1	**State of the event output 1.** Parameter is displayed only when **Output4** = **Event1**.
Event2	**State of the event output 2.** Parameter is displayed only when **Output5** = **Event2**.
Event3	**State of the event output 3.** Parameter is displayed only when **Output6** = **Event3**.
Event4	**State of the event output 4**. Parameter is displayed only when **Output7** = **Event4**.

Jump ... jump in program

Step **Jump** enables to jump over in another **Step** in program or at another **Program** and step **Step**.



You can not jump-loop to the step that you are on in that case the program will be ended up.

The summary of parameters for the **Skok**:

Display	Meaning
Jump Prog	**The number of the program which you want to jump at.**
Jump Step	**The number of the step that you want to jump at.**

End ... ending a program

Step „**End**“ will end up the program and will set up event outputs.

The summary of parameters for the „**End**“:

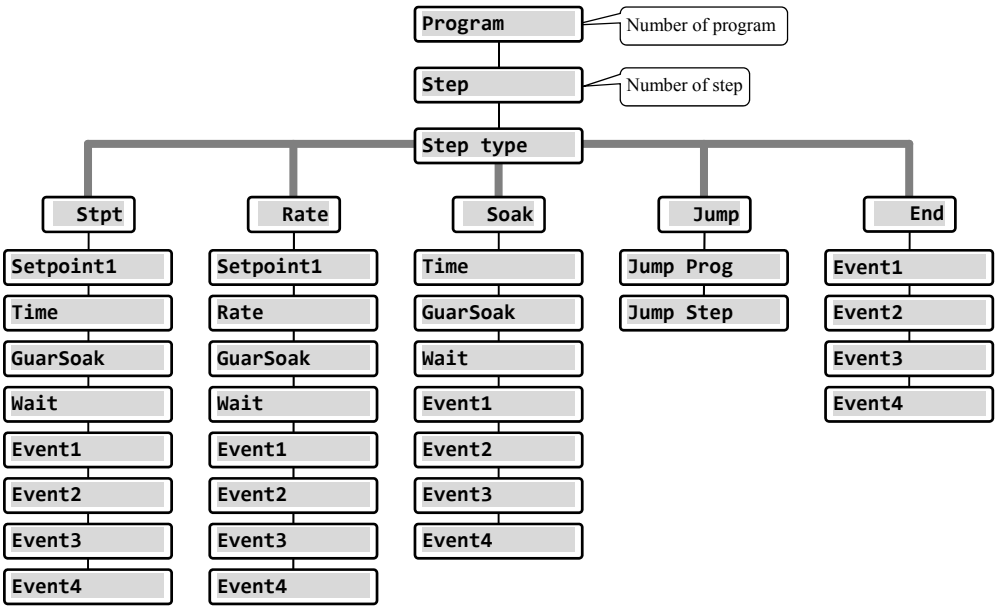
Display	Meaning
Event1 ▫▫▫▫▫▫	**State of event output 1 after ending a program.** Parameter is displayed only when **Output4** = **Event1**.
Event2 ▫▫▫▫▫▫	**State of the event output 2 after ending a program.** Parameter is displayed only when **Output5** = **Event2**.
Event3 ▫▫▫▫▫▫	**State of event output 3 after ending a program.** Parameter is displayed only when **Output6** = **Event3**.
Event4 ▫▫▫▫▫▫	**State of the event output 4 after ending a program.** Parameter is displayed only when **Output7** = **Event4**.

4.2 Writing/editing a program

Menu for writing/editing a program is intended for:
- Writing/editing a new program,
- Viewing a program that has already been edited,
- Change of some parameters in the program already edited.

To enter the menu for **editing a program** from **basic mode** press the key PROG.
To return from menu for **editing a program** to basic mode press the both keys ▼ ▲.
If the device is not being set up, it will return to basic mode after 60 seconds itself.

The overall menu for **editing a program** is illustrated in the following picture:



- Parameters **Event1** to **Event4** are shown only in case when particular outputs are set up as event outputs (outputs 4 to 7).
- Type of the step **Stpt** is displayed only in case if it is allowed (**Ramp type** = **Stpt** or **Ramp type** = **Both**).
- Type of the step **Rate** is displayed only in case if it is allowed (**Ramp type** = **Rate** or **Ramp type** = **Both**).

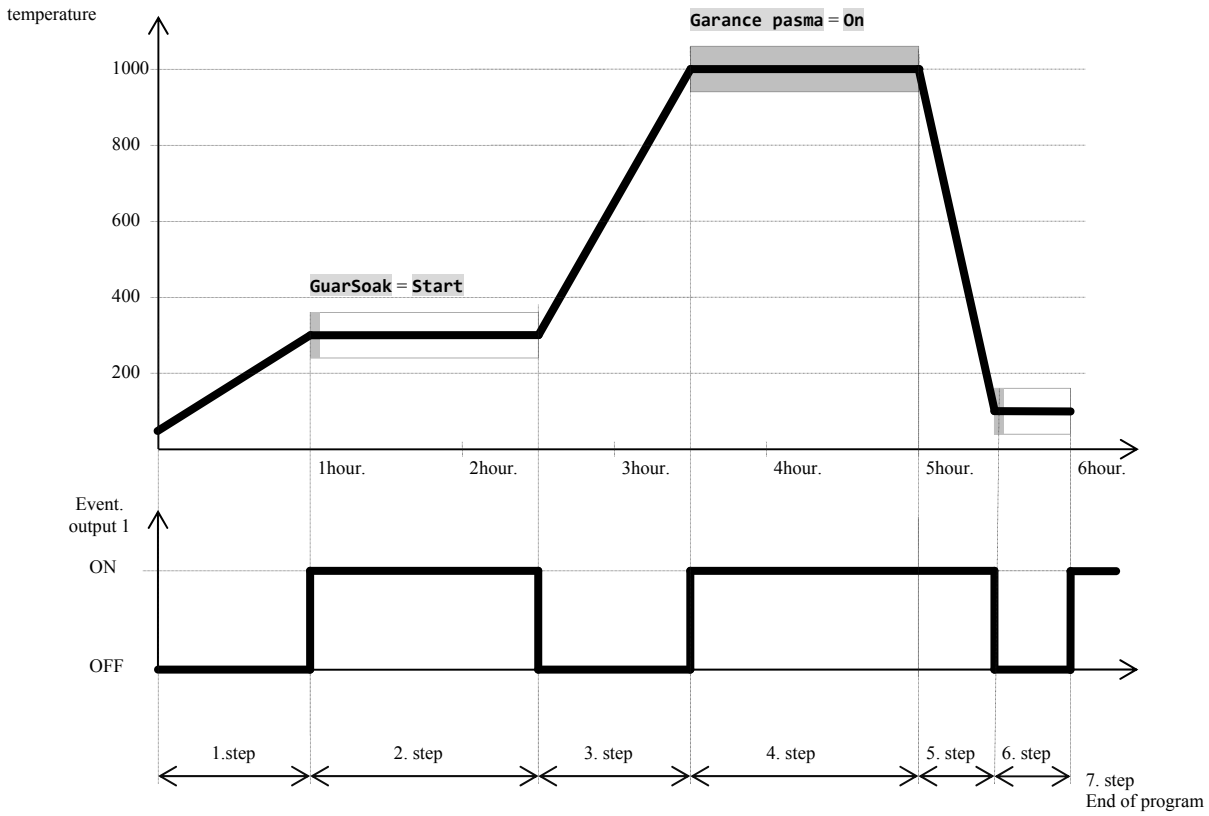
Important:

At each change of parameter **Ramp type** (you will find in ***configuration level***, menu **Program**), we recommend to check again all the written/edited programs.

Writing a program will be detailed in the following example.

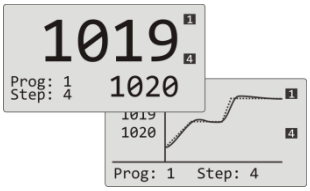
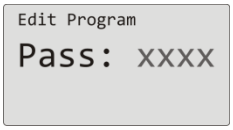
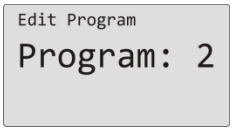
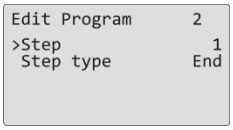
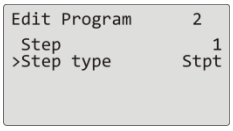
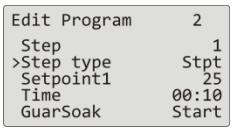
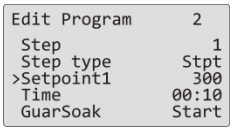
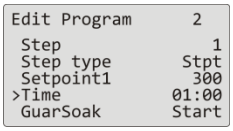
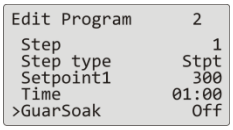
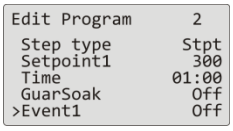
Example how to write a program

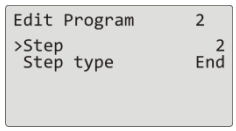
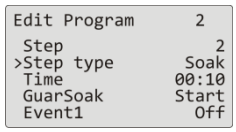
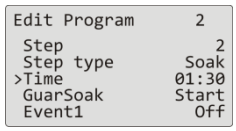
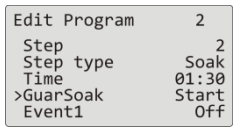
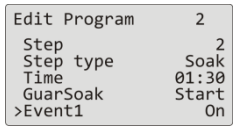
- Write the program into the controller that is shown in the following picture and described in the table.
- You will write the program to the position 2 (program number 2).
- In configuration level the output 4 is set up as event (**Output4** = **Event1**), both types of steps for ramp UP/DOWN are allowed (**Ramp type** = **Both**).



Program number 2												
Step	Step type	Setpoint 1	Time	Rate	GuarSoak	Wait	Jump Prog	Jump Step	Event1	Event2	Event3	Event4
1	Stpt	300	01:00		Off				Off			
2	Soak		01:30		Start				On			
3	Rate	1000		700	Off				Off			
4	Soak		01:30		On				On			
5	Stpt	50	00:30		Off				On			
6	Soak		00:30		Start				Off			
7	End								On			

Writing a program into controller

	The controller is in basic mode (numerical or graphic screen). Press the key „**PROG“** (PROG), it will appear the screen **Edit Program**.
	If the access for writing a program is secured with the password, it will appear the screen with the request for entering a password. Password should be typed with help of arrow keys and confirm with the key „**ENTER**“. If the access is not secured with the password, it will appear the following screen for chosing a program.
	With help of arrow keys you can choose the number of the requested prorgam (2) and confirm with the key „**ENTER**“.
	In upper line there is a number of edited program. In second line there is a number of the actaul step. Leave 1 for the number of the step and with help of arrow keys go to parameter **Step type**. Press the key „**ENTER**“ for editing a parameter. The value of the parameter starts to blink.
	With help of arrow keys choose the type of the step (it is set „ **Stpt**“, ramp function is defined by final set point temperature and time) and confirm with the key „**ENTER**“.
	Is shown the list of parameters of the edited step: • Type of the step, • Set point value, • Time of the step, • …
	With help of arrow keys go to the parameter **Setpoint1** (set point value 1), you can edit the parameter by pressing the key „**ENTER**“ and with arrow keys you will set the set point value (300). Writing a parameter is confirmed by pressing the key „**ENTER**“ again.
	Go to the parameter **Time** (time of step), and set the value **01:00** (1 hour, 0 minute).
	Go to the parameter **GuarSoak** and set **Off** (guaranteed soak deviation – GSD is switched OFF in Step 1).
	Go to the parameter **Event1** and set **Off** (event output is switched OFF in step 1).

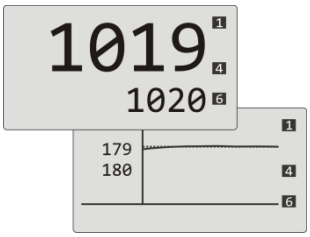
Go to another step of the program	
	With help of arrow keys go to setting of the step (parameter „**Step**“) and set the step number 2.
	Go to the parameter **Step type** and set **Soak**.
	Go to the parameter **Time** and set **01:30** (time of step duration 1 hour 30 minutes).
	Go to the parameter **GuarSoak** and set **Start**.
	Go to the parameter **Event1** and set **On** (the event output 1 is switched ON in the step 2).
In the same manner you can set other steps in program. To return from „Editing a program“ press the both keys (▼ ▲).	

4.3 Starting, interruption and ending up a program

Program can be started up by the following ways:
- With help of the keys,
- By real time o clock,
- By digital inputs,
- Through the communication line from PC.

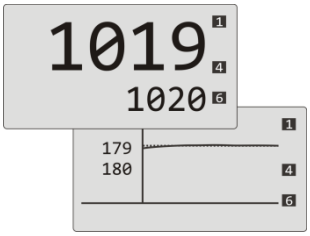
Starting a program with help of the keys

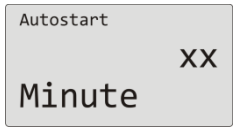
The most used way for starting a program in the controller is with help of the keys.

	The controller is in Basic mode (numerical and graphic screen). No program runs.
	By pressing the key „**START / STOP**“ you will enter menu for starting a program. • By the keys you can set the number of the program that is to be started up, • Confirm by the key „**START / STOP**“, • If it is not set the start by the program and step, the program starts from the first step.
	If it is set the start by the program and step (***configuration level***, menu **Program**, parameter **Start prog = PrSt**), it appears the request for setting of the step on the screen: • With the arrow keys you can edit the step for starting a program, • Confirm with the key „**START / STOP**“, • The program is started from the chosen step.

Starting a program by real time clock

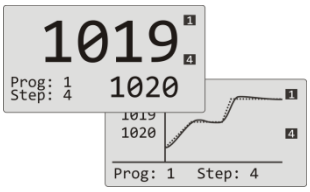
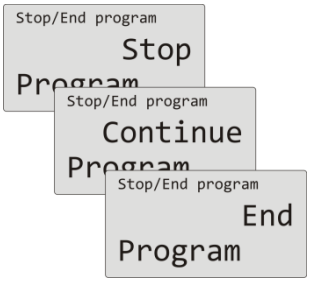
In controller you can choose the automatic starting a program by the real time clock in format:
- **month, day, hour, minute** … program is started in the set month, day, hour, minute,
- **hour, minute** … program is started every day in the chosen hour and minute (when is set **Month** = **Off**).

	The controller is Basic mode (numerical and graphic screen). To enter menu for setting automatic start of the program by real time clock by pressing the key „**START / STOP**“ for 3 seconds.
	Choose the number of the program that you want to run (**Off**, **1**, **2**, .. , **30**). Confirm by the key „**START / STOP**“. If you set **Off**, automatic starting of a program is switched OFF.

	Set the month of starting a program (**Off**, **1**, **2**, .. ,**12**). Confirm with the key „**START / STOP**“. If you set **Off**, it does not appear the parameter **Date** and the program will start everyday.
	Set the date of starting a program (**1**, **2**, .. ,**31**). Confirm with the key „**START / STOP**“. Parameter will not appear, if it is set **Month** = **Off**.
	Set the hour of starting a program (**0**, **1**, .. ,**23**). Confirm with the key „**START / STOP**“.
	Set the minute of starting a program (**0**, **1**, .. ,**59**). Confirm with the key „**START / STOP**“.

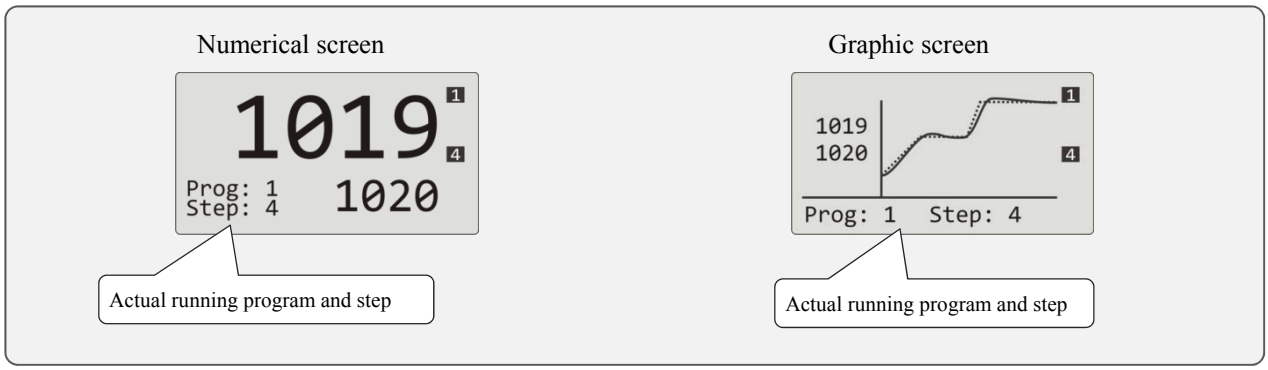
Interruption, ending up a program

Running a program can be interrupted or prematurely ended up.

	The controller is in Basic mode, the program runs. Press the key „**START / STOP**“ shortly.
	Choose one of the opportunities: • **Stop** … program will be interrupted, • **Continue** … program will continue, • **End** … program will be ended up, And confirm with the key „**START / STOP**“. Interruption must be allowed in ***configuration level***, menu **Program >**, parameter **Stop prog** = **Yes**. When program is ended up, the event outputs are set according to the setting in ***configuration level*** of the device, menu **Output4 >**, **Output5 >**, …, parameter **IEvent1**, **IEvent2**, … .

4.4 The course of the program

The course of the program is indicated on display by showing the actual program and the step.



More information about the course of the program can be found in menu **Program view >** .
Change in the parameters of the actual running step can be done in menu **Program edit >** .

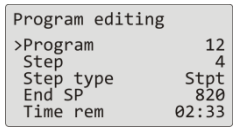
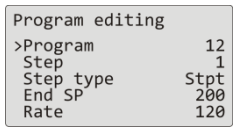
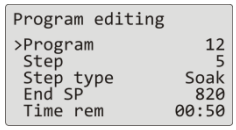
Reading the status of the running program

Reading the status of the running program can be done in menu **Program view >** , that can be made accessible in ***user level***.

Level USER >Program view > Datalogger > Event1 Off Event2 Off	In ***User level*** you will choose the item **Program view >** and confirm. Procedure how to make menu accessible **Program view >** in user level can be found on page ***12***.
Program view >Program 2 Step 4 Step type Stpt End SP 820 Time rem 02:33	Status of program is decribed by 5 parameters: • **Program** … number of the running program, • **Step** … number of the actual step of the program, • **Step type** … type of the actual step, • **End SP** … final set point value of the actual step, • **Time rem** … remaining time till the end of the step.

Editing a running program

Editing a running program can be set in menu **Program edit >** , that can be made accessible in ***user level***.

	In ***User level*** you will choose the item **Program edit >** and confirm it. How to make menu accessible **Program edit >** can be found.in user level.
	**Editing a step Stpt** • **Program** … number of the running program, • **Step** … number of the actual step of the program, • **Step type** … type of the actual step, • **End SP** … final set point value of the actual step, **it is possible to EDIT**, • **Time rem** … remaining time till the end of the step, **it is possible to EDIT**.
	**Editing a step Rate** • **Program** … number of the running program, • **Step** … number of the actaul step of the program, • **Step type** … type of the actual step, • **End SP** … final set point value of the actual step, **it is possible to EDIT**, • **Rate** … rate of ramp up of the actual step, **it is possible to EDIT**, • **Time rem** … remaining time till the end of the step.
	**Editing a step Soak** • **Program** … number of the running program, • **Step** … number of the actual step of the program, • **Step type** … type of the actual step, • **End SP** … final set point value of the actual step, **it is possible to EDIT**, • **Time rem** … remaining time till the end of the step, **it is possible to EDIT**.

Important:

- Changed parameters will be effective only in the actual running step.
- Writing of a program will remain unchanged.

4.5 Guaranteed Soak Deviation - GSD

The function of GSD helps to maintain the requested course of the program and checks the deviation of the process value from set point value. If the process value leaves the defined Soak Band, counting down is paused.
Typical example is a furnace where a fast ramp and soak is requested. The function GSD ensures that the counting down of soak time starts after the stp value in the furnace is reached.

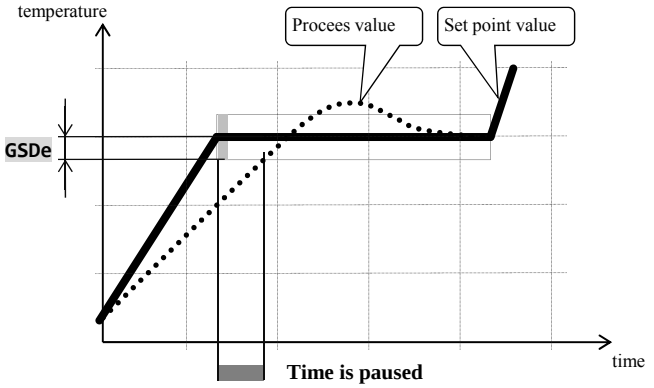
The function GSD is defined for each step separately and can be set up in the following way:

- `GuarSoak` = `Start` … GSD is turned ON only at the beginning of the step.
- `GuarSoak` = `On` … GSD is turned ON for the whole step.
- `GuarSoak` = `Off` … GSD is turned OFF at that step (counting down is not paused in that step).

Width of soak band **GSD** can be set in ***configuration level***, menu `Program`, parameter `GSDe`.

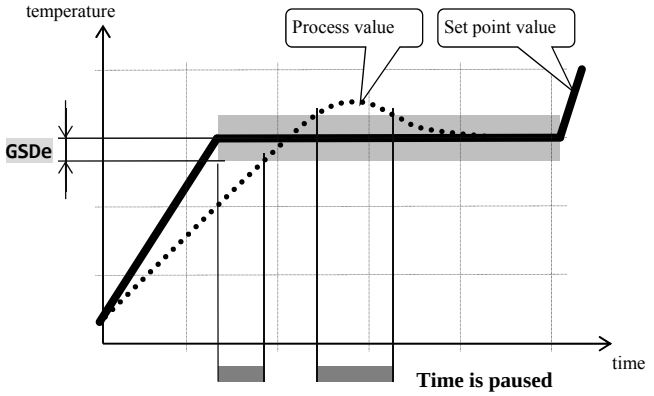
`GuarSoak` = `Start`

- In example there is GSD of type `Start` set up for the soak (2. step).
- Counting down of the soak starts at the moment when process value is within the chosen band `GSDe.`
- From this moment the whole step will be performed without interruption.



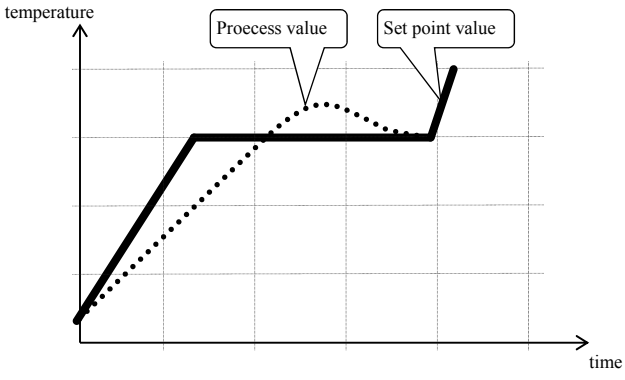
`GuarSoak` = `On`

- In example there is a GSD of the type `On` set up for the soak (2. step).
- During the whole course of the step the deviation of process value from set point value is checked.
- If the process value is outside the band `GSDe`, it is paused the time of the course of the program.



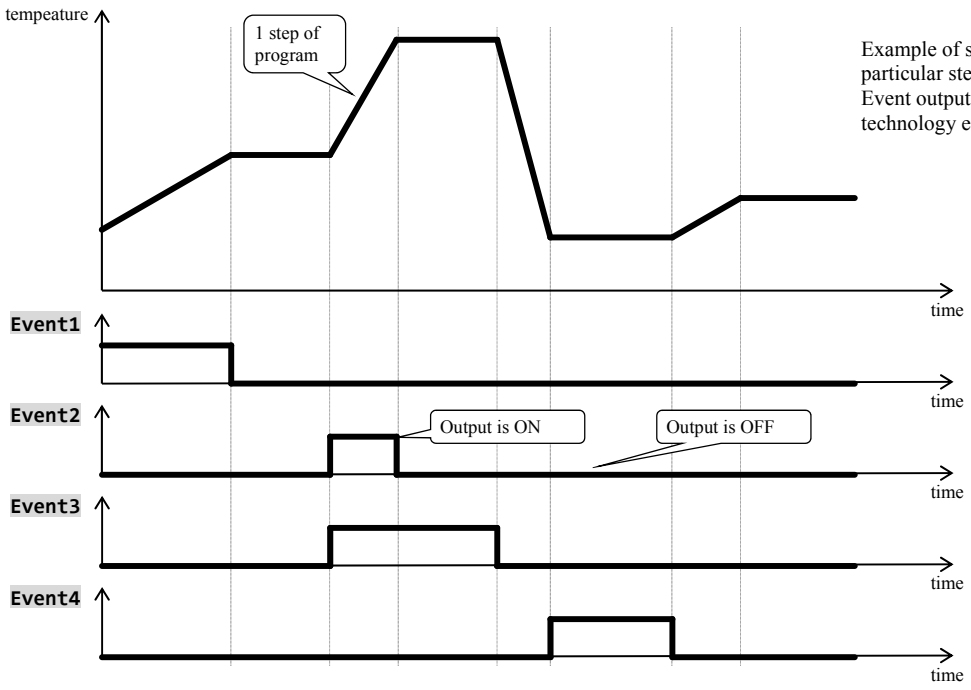
`GuarSoak` = `Off`

- In this example there is GSD switched OFF for the 2. step.
- Counting down of soak time of program is not paused in the whole step.



4.6 Event outputs

Event outputs are intended for controlling of external actions/events (cooling flap of the furnace, fan, …) by the program. In particular steps of the program the event output can be switched ON (**Event_** = **On**) or switched OFF (**Event_** = **Off**).



Example of setting for event outputs at particular steps of the program. Event outputs can control external technology equipment.

Options for the configurations of event output

Output 4 to 7 can be configured as the event one (**Event1** to **Event4**). You can carry out this setting in ***Configuration level***, menu:

- **Output4 >**, parameter **Output4** = **Event1**,
- **Output5 >**, parameter **Output5** = **Event2**,
- …

State of event output at the interruption of the program

If you end up the program before (interruption of firing), you want the event outputs to be set in the defined status by you (e.g. opening of cooling flap). The response of the event outputs to the interruption of program can be configured in ***configuration level***, menu **Output4 >** to **Output7 >**, parameter **IEvent1** to **IEvent4** as follows:

- **IEvent_** = **Hold**, state of the event output remains unchanged.
- **IEvent_** = **Off**, the event output is switched OFF at the interruption of the program.
- **IEvent_** = **On**, the event output is switched ON at the interruption of the program.

Controlling of event output outside the course of program

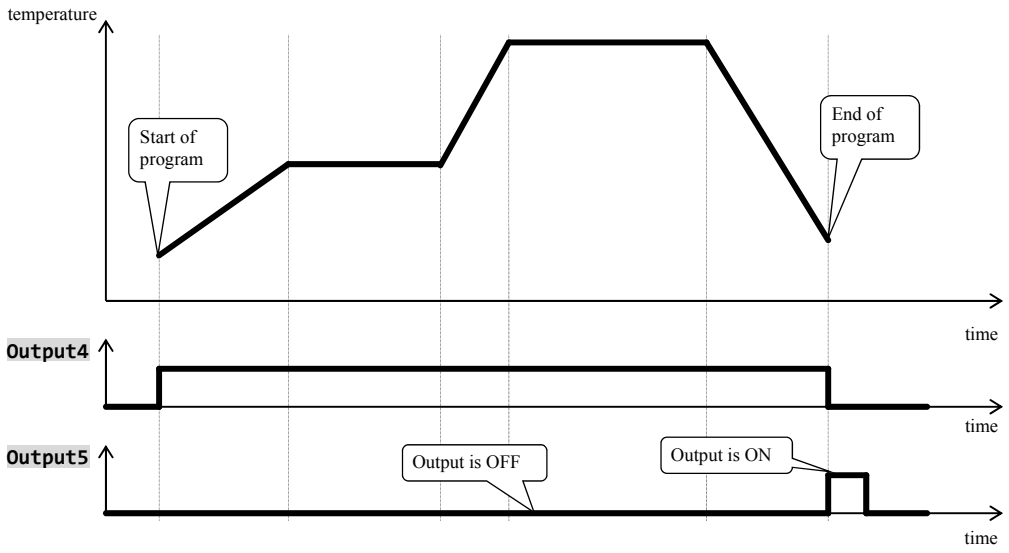
In ***operation level*** with help of parameter **Event_** (this parameter can be placed as well as in ***user level***) you can control the status of the event. output. **When in program you can only view the state of the event output.**

4.7 Signalling of the run of a program and the end of a program

The auxiliary outputs (**Output4** to **Output7**) can indicate the run of a program as well as the end of a program.

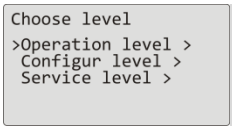
Example … output 4 will indicate the run of a program, output 5 will indicate the end of a program (the duration for the switching ON of relay will be adjusted to 15 seconds).
You will set in ***configuration level***:

- **Output4** = **Prog**.
- **Output5** = **PrEnd**, parameter **SgTime5** = **15**.
-



5 Operation level

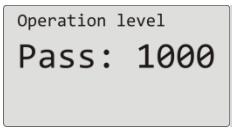
To enter operation level press both keys for 3 seconds



After 3 seconds you will see screen for choosing a level:

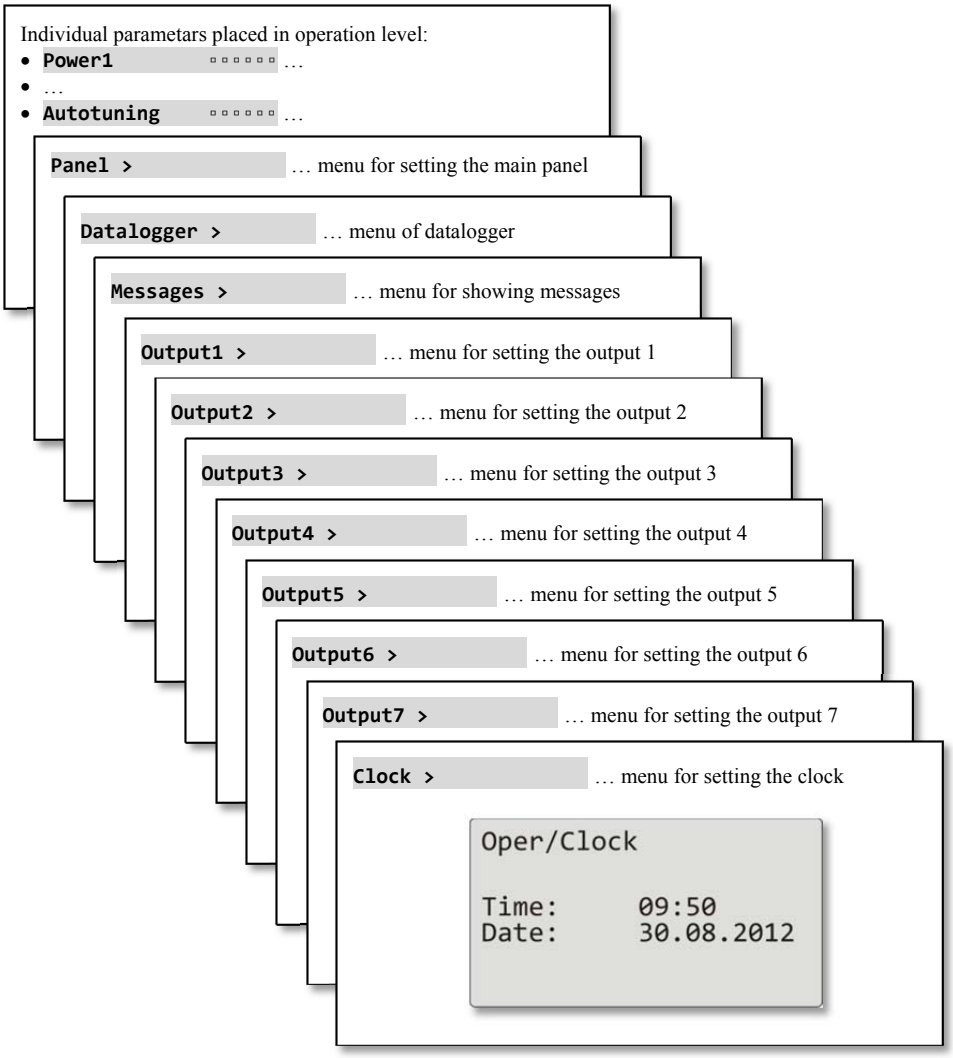
- set **Operation level >** and confirm.

If the password is set to secure entering *operation level*, it will appear the following screen:



- with help of arrow keys you will set the correct password and confirm.

Operation level – overview of menu



Individual parameters placed in operation level

Power1 ▫▫▫▫▫▫	**Shows the actual power of the output 1 in %.**
Power2 ▫▫▫▫▫▫	**Shows the actual power of the output 2 in %.**
Power prog ▫▫▫▫▫▫	**Energy consumption for the last firing in kWh**. Value is read from external energy meter (EM24).
Power total ▫▫▫▫▫▫	**Total consumption in kWh**. Value is read from external energy meter (EM24).
Alarm Off ▫▫▫▫▫▫	**Switching OFF of permanent alarm** by setting **Yes** and confirming.
Event1 ▫▫▫▫▫▫	**It shows the state of the event output 1**. If the program does not run, you can set up the output.
Event2 ▫▫▫▫▫▫	**It shows the state of the event output 2**. If the program does not run, you can set up the output.
Event3 ▫▫▫▫▫▫	**It shows the state of the event output 3**. If the program does not run, you can set up the output.
Event4 ▫▫▫▫▫▫	**It shows the state of the event output 4**. If the program does not run, you can set up the output.
Autotuning ▫▫▫▫▫▫	**Starting / turning OFF of autotuning of PID parameters:** • **Off** … turning OFF of autotuning of PID parameters, • **Ht** … starting of autotuning of PID parameters, heating, • **Cl** … starting of autotuning of PID parameters, cooling.

Panel … setting of parameters for basic screen

Panel ▫▫▫▫▫▫	**Setting of basic screen of the controller**: • **Num** … numerical screen, • **Graph** … graphic screen.
Graph-Per ▫▫▫▫▫▫	**Period of writing into the graph**. Range: 1 to 300 seconds Total number of lines of the graph is 80. Length of the graph depends on the period of writing: • period = 1 second … length of the graph is 80 seconds, • period = 45 seconds … length of the graph is 1 hour, • period = 90 seconds … length of the graph is 2 hours, • period = 225 seconds … length of the graph is 5 hours.
Graph-Min ▫▫▫▫▫▫	**Range of the graph, low limit**. Range: -999 to **Graph-Max**.
Graph-Max ▫▫▫▫▫▫	**Range of the graph, high limit**. Range: **Graph-Min** to 2999.

Datalogger … how to operate datalogger of data

View data >	Menu for showing process and set point value on display of the the device.
Datalogger 30.08.2012 Time Sp C 10:53:18 Vyp 849 10:52:18 Vyp 850 10:51:18 850 851 10:50:18 850 850	**Datalogger stores:** • set point value of the controller, • process value of the controller, • process values read through the communication line Comm1 or Comm2 out of max. 7 Slave controllers in control systm „enhnaced Master – Slave“, • value of total energy consumption read through communication line Comm1 from energy meter EM24. **On screen you can view:** • date of measurement … next to heading „Datalogger“, • 1. column … time of measurement, • 2. column … set point value of Ht205, • 3. column … process value of Ht205. You can browse data in datalogger with arrow keys.
Set datalogger >	Menu for setting of the period of logging and conditions for logging.
Dlog period ▫▫▫▫▫▫	Period of logging. Range: 10 to 600 seconds.
Dlog record ▫▫▫▫▫▫	Condition for logging: • **Off** …datalogger is turned OFF, • **Prog** … logging runs only when the program goes, • **Alarm** … logging only at alarm, • **Perm** … logging runs permanently.

Messages ... how to handle with messages

	On display it is shown date, time and message. Detailed information about the shown messages you can find on page ***16***.

Output1 ... menu for output 1

Prop1-A ▫▫▫▫▫▫	**Proportional band,** the first set of PID parameters for heating**.** **Range: 1 to 2499 °C.**
Int1-A ▫▫▫▫▫▫	**Integral value,** the first set of PID parameters for heating**.** Range: **Off**, 0,1 to 99,9 minutes.
Der1-A ▫▫▫▫▫▫	**Derivative value,** the first set of PID parameters for heating. Range: **Off**, 0,01 to 9,99 minutes.
Prop1-B ▫▫▫▫▫▫	**Proportional band,** the second set of PID parameters for heating. **Range: 1 to 2499 °C**
Int1-B ▫▫▫▫▫▫	**Integral value,** the second set of PID parameters for heating. Range: **Off**, 0,1 to 99,9 minutes.
Der1-B ▫▫▫▫▫▫	**Derivative value,** the second set of PID parameters for heating. Range: **Off**, 0,01 to 9,99 minutes.
Hys1 ▫▫▫▫▫▫	**Hysteresis,** this single parameter is set only for ON/OFF control. Range: 1 to 249 ºC.

Output2 ... menu for output 2

Prop2-A ▫▫▫▫▫▫	**Proportional band,** the PID parameters for cooling. **Range: 1 to 2499 °C.**
Int2-A ▫▫▫▫▫▫	**Integral value,** the PID parameters for cooling**.** Range: **Off**, 0,1 to 99,9 minutes.
Der2-A ▫▫▫▫▫▫	**Derivative value,** the PID parameters for cooling. Range: **Off**, 0,01 to 9,99 minutes.
Hys2 ▫▫▫▫▫▫	**Hysteresis,** this single parameter is set only for ON/OFF control. Range: 1 to 249 ºC.

Output3 ... menu for output 3

Alarm-Pr-Lo ▫▫▫▫▫▫	**Low limit of alarm, absolute value**. Range: -999 to **Alarm-Pr-Hi** ºC.
Alarm-Pr-Hi ▫▫▫▫▫▫	**High limit of alarm, absolute value**. Range: **Alarm-Pr-Lo** to 2999 ºC.
Alarm-De-Lo ▫▫▫▫▫▫	**Low limit of alarm, deviation from set point value**. Range: -999 to 0 ºC.
Alarm-De-Hi ▫▫▫▫▫▫	**High limit of alarm, deviation from set point value.** Range: 0 to 999 ºC.

Output4 ... menu for output 4

Sg4-Pr-Lo ▫▫▫▫▫▫	**Low limit of signalling, absolute value**. Range: -999 to **Sg4-Pr-Hi** ºC.
Sg4-Pr-Hi ▫▫▫▫▫▫	**High limit of signalling, absolute value**. Range: **Sg4-Pr-Lo** to 2999 ºC.
Sg4-De-Lo ▫▫▫▫▫▫	**Low limit of signalling, deviation from set point value**. Range: -999 to 0 ºC.
Sg4-De-Hi ▫▫▫▫▫▫	**High limit of signalling, deviation from set point value**. Range: 0 to 999 ºC.

Output5 ... menu for output 5

Sg5-Pr-Lo ▫▫▫▫▫▫	**Low limit of signalling, absolute value**. Range: -999 to **Sg5-Pr-Hi** ºC.
Sg5-Pr-Hi ▫▫▫▫▫▫	**High limit of signalling, absolute value**. Range: **Sg5-Pr-Lo** to 2999 ºC.
Sg5-De-Lo ▫▫▫▫▫▫	**Low limit of signalling, deviation from set point value**. Range: -999 to 0 ºC.
Sg5-De-Hi ▫▫▫▫▫▫	**High limit of signalling, deviation from set point value**. Range: 0 to 999 ºC.

Output6 ... menu for output 6

Sg6-Pr-Lo ▫▫▫▫▫▫	**Low limit of signalling, absolute value**. Range: -999 to **Sg6-Pr-Hi** ºC.
Sg6-Pr-Hi ▫▫▫▫▫▫	**High limit of signalling, absolute value**. Range: **Sg6-Pr-Lo** to 2999 ºC.
Sg6-De-Lo ▫▫▫▫▫▫	**Low limit of signalling, deviation from set point value**. Range: -999 to 0 ºC.
Sg6-De-Hi ▫▫▫▫▫▫	**High limit of signalling, deviation from set point value**. Range: 0 to 999 ºC.

Output7 ... menu for output 7

Sg7-Pr-Lo ▫▫▫▫▫▫	**Low limit of signalling, absolute value**. Range: -999 to **Sg7-Pr-Hi** ºC.
Sg7-Pr-Hi ▫▫▫▫▫▫	**High limit of signalling, absolute value**. Range: **Sg7-Pr-Lo** to 2999 ºC.
Sg7-De-Lo ▫▫▫▫▫▫	**Low limit of signalling, deviation from set point value**. Range: -999 to 0 ºC.
Sg7-De-Hi ▫▫▫▫▫▫	**High limit of signalling, deviation from set point value**. Range: 0 to 999 ºC.

Clock ... setting of the real time clock

Clock >	Setting of the real time clock
Oper/Clock Time: 09:50 Date: 30.08.2012	With help of the key „**ENTER**“ you go through the particular time data. With help of the arrow keys you set the correct time data.

Notes

6 Index