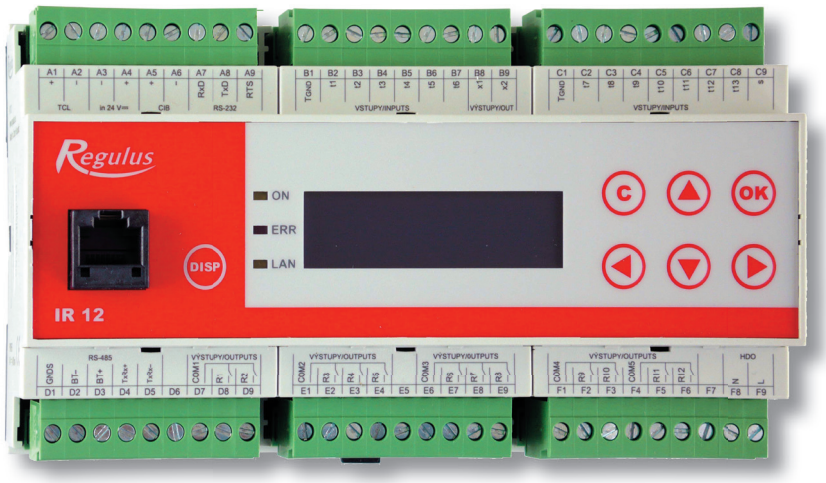
Users Guide

IR 12 Heating Controller

Ver.: IR12_KRB



CE

Regulus

EN
ver. 1.9
Valid for FW 4.01

Technical Description of IR 12 Heating Controller

IR 12 Heating Controller (ver. IR12_KRB) is a heating system controller. The controller can handle up to 2 heating zones (one with a mixing valve, one unmixed with a return mixing valve OR two mixed zones with no return mixing valve), DHW heating, DHW and space heating by a fireplace, and a solar thermal system with 1-3 solar storage tanks. The controller can be upgraded with an OpenTherm communication module and module for third solar storage tank, universal output and two universal inputs for temperature sensors.

IR 12 Heating Controller is controlled by 6 keys. Information is shown on a 4-line display. The Controller features 13 inputs for temperatures measured (by Pt 1000 temperature sensors) and one input for Ripple control signal. Further it features 10 relay outputs (250V 3A) and two triac outputs (250V 1A).

The Controller is fitted with an Ethernet interface enabling connection to a tablet, PC or from a mobile phone. Servicing, firmware upgrade or elementary visualization of the concerned heating system can be performed via this interface. The Controller also features an RS 232 communication interface. A gas boiler can be controlled from an OT (OpenTherm) module.

1. How to operate IR 12 Controller

The controller is operated using 6 keys ◄, ►, ▲, ▼, **C**, **OK** on its front panel.

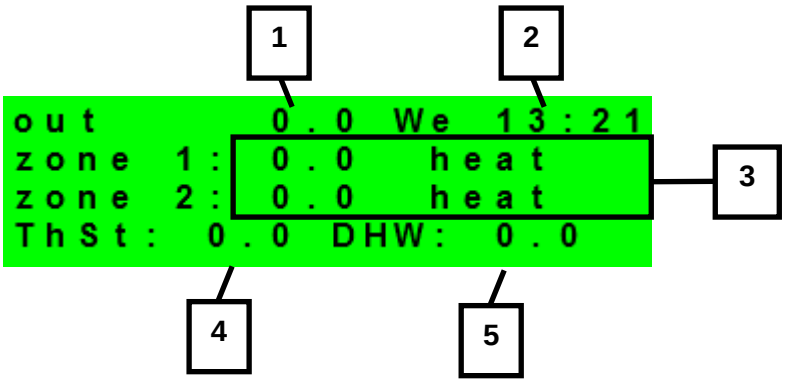
The **DISP** key switches between User and Service display.

Note: The Service display is intended to show info on the Controller itself and therefore it is not needed during common operation.

The keys ⮝, ⮟ are used to browse in the menu. In order to edit a parameter, press **OK** and a cursor appears on the parameter. The values of numeric parameters can be increased/decreased by pressing ⮝ / ⮟ keys. Selection parameters (e.g. ON/OFF) are chosen by pressing keys ⮜, ⮞. When finished, pressing **OK** will move the cursor to the next parameter in the same display. Parameter editing can be also exited without saving by pressing the key **C**.

1.1 Basic User Menu

Pressing **C** in the basic User menu will always bring back the first – basic display.



1 – outdoor temperature

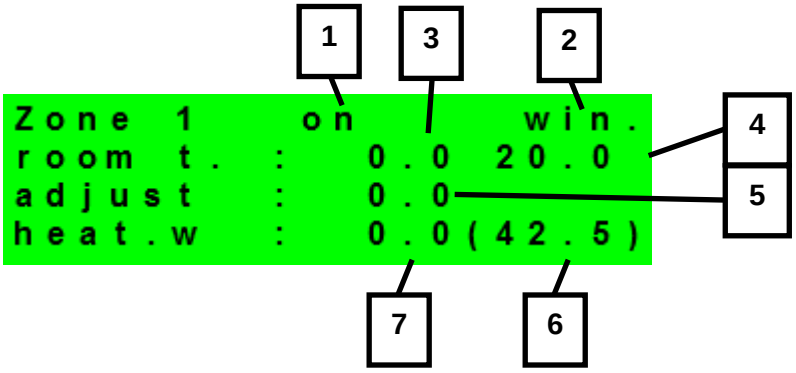
2 – weekday and time

3 – temperature in zone (if room temp. sensor is used) / heating water temp.

4 – temperature in Thermal Store

5 – temperature in DHW storage tank

Heating zone display (zone 1, zone 2):



1 – zone ON / OFF / NO (switched off in service menu)

2 – controller mode winter / summer (zone heating off)

3 – current room temperature. If no room sensor is used, the real temperature is shown as 0°C. Temperature for zone 1 only.

4 – desired room temperature.

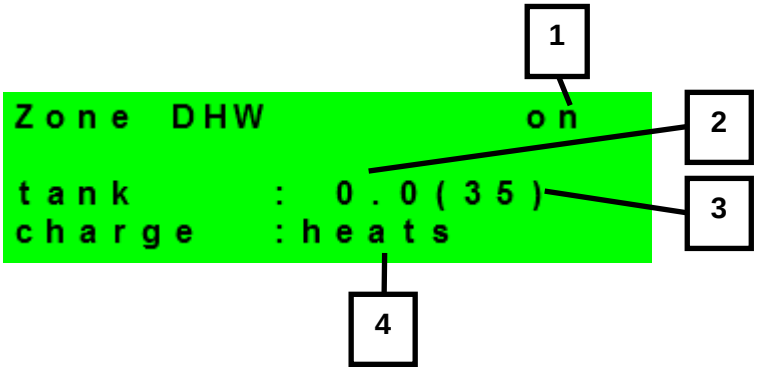
5 – adjustment to the desired room temperature. When RC21 IR room unit is used, "PJ" appears and the adjustment made by this unit is shown.

6 – desired heating water temperature for the zone

7 – current heating water temperature

The desired temperature can be changed by the user. If a room unit is used (for zone 1), the temperature can be modified through this unit. Otherwise the desired temperature can be adjusted via the parameter "adjust".

Hot water zone display (DHW):



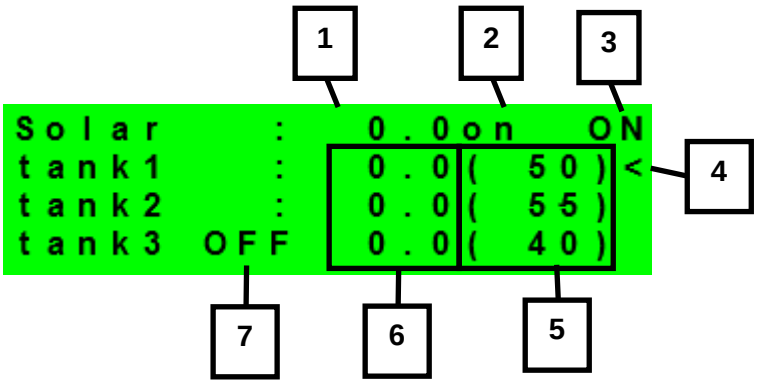
1 – hot water storage tank heating condition: ON / OFF / NO (switched off in service menu)

2 – current temperature in the hot water storage tank

3 – desired temperature in the hot water storage tank

4 – information if the tank is being charged by the boiler (heat / noheat)

Solar thermal system display:



1 – solar collector temperature

2 – system ON

3 – ON = solar pump running

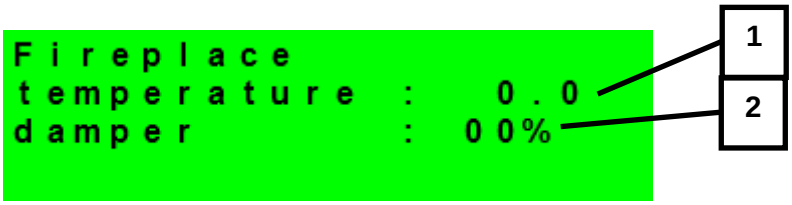
4 – currently charged tank mark

5 – desired temp. for tanks when charged from solar

6 – current temp. in tanks

7 – hot water storage tank OFF

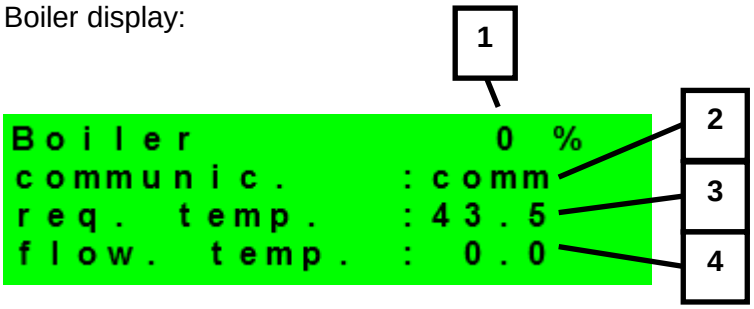
Fireplace display



1 – fireplace current flow temperature

2 – flue gas damper position (% open)

Boiler display:



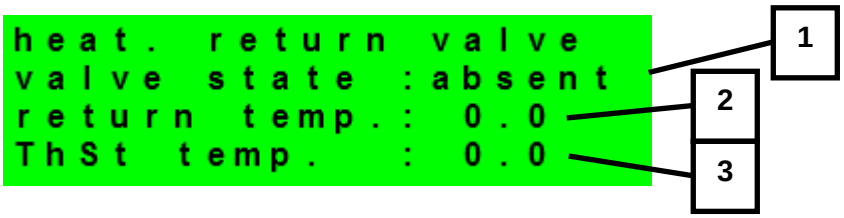
1 – relative boiler modulation

2 – state of controller communication with boiler: comm (OK) / error

3 – desired flow temperature

4 – current flow temperature

Return heating water valve display:

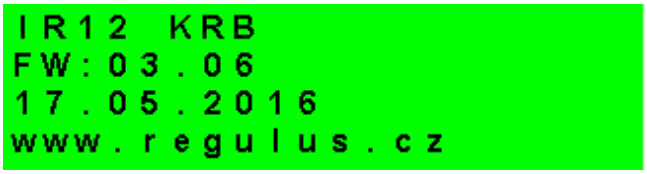


1 – state of return water valve (absent – return water valve is not present; mixing – return water to boiler is mixed from return heating water and preheated water in Thermal Store; toBoil – return heating water is diverted directly into boiler; toThSt – return heating water is diverted into Thermal Store for preheating)

2 – return heating water temperature

3 – Thermal Store water temperature

Firmware version and release date display:

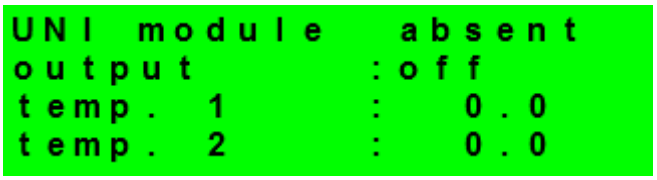


Menu:

While in MENU, use arrow keys ➤, ➤ to select user or service menu, or switch circulation on immediately.

User Menu is intended to set zones, time schedules, OTC curve, date and time.

Add. Modules – this item will make available basic information on additional CIB modules (if present).



UNI module *universal module extending both inputs and outputs – absent/active (shows whether the module is connected to PLC controller)*

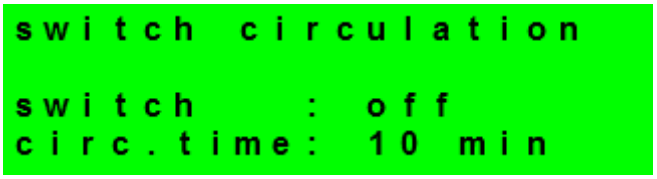
output *state of the module's universal output (a function adjustable on the service level)*

t1, t2 *temperatures at temperature sensors of the module*

Service Menu is intended for more detailed adjustments to zones, sources, solar thermal system and other parameters.

Access to the Service Menu is password protected and parameter adjustments are not intended for laymen!

Immediate circulation is designed to switch DHW circulation immediately, with selected parameters.



switch *DHW circulation switched on immediately*

circ.time *how long the circulation will be on*

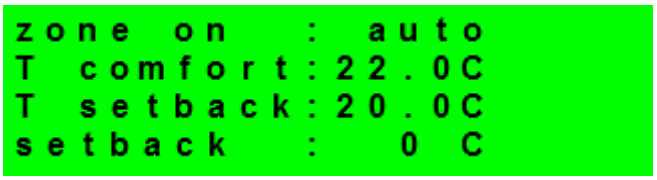
2. User menu

User menu is comprised of:

- zone 1
- zone 2
- DHW zone
- DHW recircul.
- time program (time programs)
- OTC Curves
- operation data (temperatures and outputs condition)
- time, date
- other (adjusting other parameters)
- SMS settings (automatic text messaging)
- heat measurement (heat measured between two sensors)

The keys ➤, ➤ enable browsing, and the selected item can be entered by pressing **OK.**

2.1 Heating zones



In this Menu, a user can adjust these parameters:

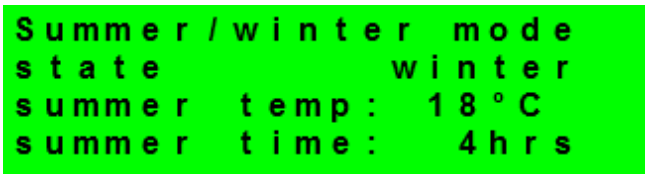
zone on *switching on the zone on the User level. When a zone gets switched off on this level, also the circulation pump and valve outlets switch off as well. The pump and valve outlets can be activated by frost protection function if it is on. In this controller version, switching off zone 1 will switch off zone 2 as well! Mode Auto will activate the summer/winter mode.*

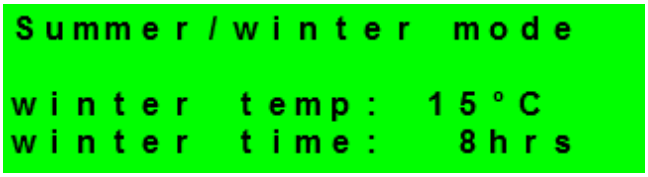
T comfort *setting comfort temperature in zone. This parameter makes sense only when a room sensor is used.*

T setback *setting setback temperature in zone. This parameter makes sense only when a room sensor is used.*

Note: During a day, the controller switches the desired zone temperatures between T day and T night by the preset time schedule.

setback *setting heating water temperature reduction calculated from the OTC curve when the mode changes from comfort to setback as preset by the time schedule.*





The Winter/Summer function is active if the zone is in Auto mode. The Controller will set the zone temperatures by the parameters set. If the outdoor temperature equals or exceeds the preset one for the specified number of hours, the zone will switch to Summer mode.

state *shows the current mode. If the Winter/Summer function is turned off, Winter is shown permanently here.*

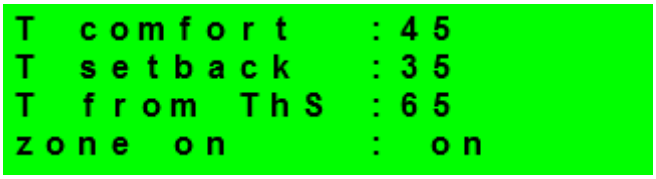
summer temp *temperature threshold to switch to Summer mode.*

summer time *waiting time before switching to Summer mode.*

winter temp *temperature threshold to switch to Winter mode.*

winter time *waiting time before switching to Winter mode.*

2.2 Setting temperatures for hot water storage tank



When there is demand for hot water storage tank to be heated up, the boiler is switched on to max. output temperature, however no more than 70°C, and the DHW diverter valve is shifted.

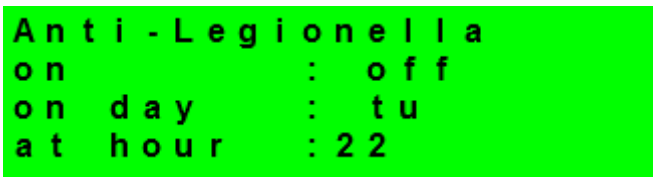
T comfort *comfort temperature. Hot water storage tank gets heated up to this temperature if the program is set to "Comfort" at the moment.*

T setback *setback temperature. Hot water storage tank gets heated up to this temperature if the program is set to "Setback" at the moment.*

T from ThS *hot water storage tank is heated to this temperature (at DHWL sensor) from this function disregarded of time schedules and comfort/setback temperatures selected.*

zone on *DHW zone heated by heat pump switched on by User.*

Anti Legionella:



Anti-Legionella function helps "disinfect" hot water storage tanks, namely it kills Legionella bacteria.

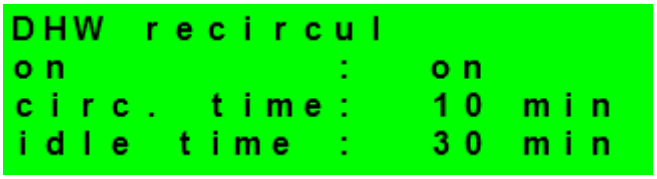
When this function is ON, the hot water storage tank heats up to 65°C once in a week, at a preset time on a preset day. Heating is switched off either when this temperature is reached, or after two hours of heating disregarded of the temperature.

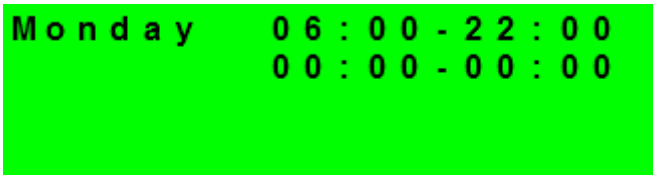
on *turns Anti Legionella function on.*

day (weekday: mo-su) *day when heating up starts.*

hour *hour when heating up starts.*

2.3 DHW recirculation



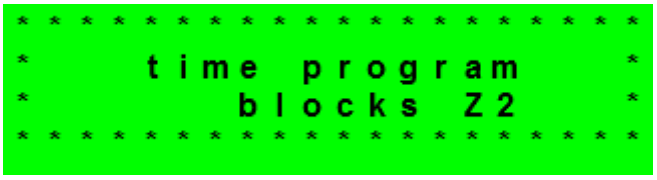


Here DHW recirculation is enabled and the time schedule of the pump set. When recirculation is on, it is performed following the time schedule set for each day. The time

schedule defines from-to operation times. For this period, circulation time and idle time can be set if continuous operation is not desired. E.g. Monday from 6.00 a.m. to 10.30 p.m. the recirculation pump will always run for 10 min. and then idle for 15 min.

on (off / on)	*recirculation switched on.*
circ. time (min)	*circulation time setting.*
idle time (min)	*idle time setting.*
circulation times	*time setting for separate days when recirculation is on (7 displays – Monday to Sunday).*

2.4 Time programs



Time programs can be set either for separate days, or in blocks Mo-Fr and Sa-Su.

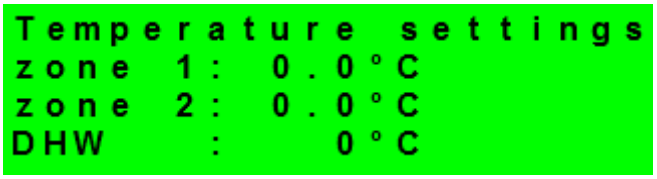
When the program is being set for separate days, there are 2 transitions from Comfort to Setback and 2 from Setback to Comfort for each day.

When the program is being set in blocks, there are similarly 2 transitions from Comfort to Setback and 2 from Setback to Comfort for the blocks Mo-Fr and Sa-Su. Answering YES to the question Copy program? will rewrite the respective time program blocks.

If program copying is not desired, let the question be with no and leave the menu by pressing **C.**

Holidays:

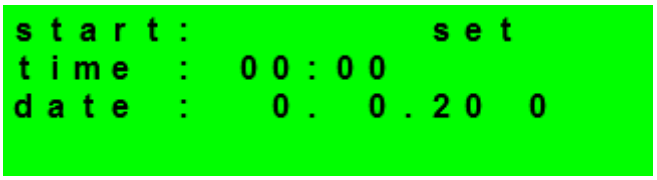
Temperature control of separate zones following a special time schedule. Temperatures in zones can be set, as well as the date and time for the beginning and end of the time program.



zone 1 *desired temperature in zone 1.*

zone 2 *desired temperature in zone 2.*

DHW *desired DHW temperature.*



start *date and time of Holidays time program beginning*

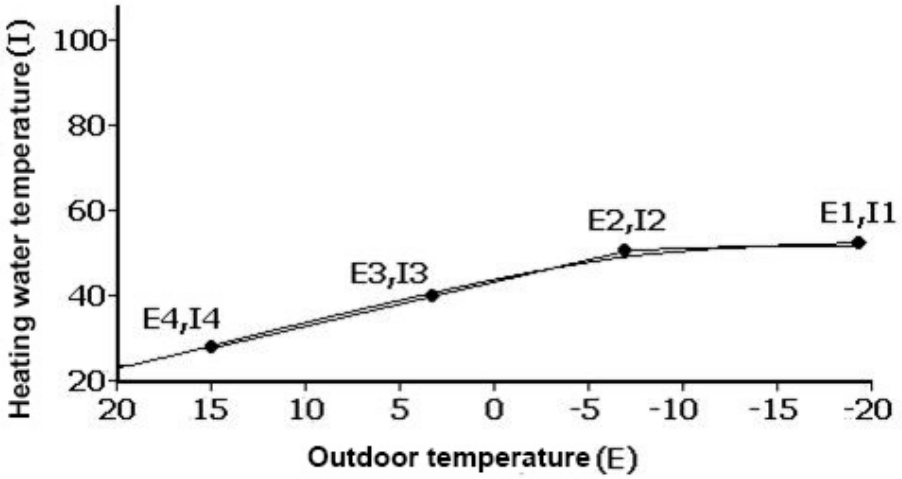
set / today *selecting today will save current date and time as the beginning of Holidays time program*

end *date and time of Holidays time program end*

off / on *turning on / off Holidays time program*

2.5 OTC curves

The controller works with a linear characteristics between separate points of the curve showing how heating water temperature depends on the outdoor temperature. The real OTC curve is entered into the controller using a 4-point polyline (see Fig.) with points E1; I1 to E4; I4 (cf. the display picture).



OTC points settings:

```
Zone 1   E1: -15   I1: 55
OTC      E2:  -5   I2: 45
curve    E3:   5   I3: 40
         E4:  20   I4: 20
```

Point I1 represents the highest temperature that can be calculated by the controller, while point I4 represents the lowest temperature that can be calculated.

2.6 Operation data

All temperature inputs and logical output values of the controller are displayed here. The logical value of 0 means a valve closed, pump not running; 1 means a valve open, pump running. Temperatures shown in brackets mean desired values.

2.7 Setting system date and time

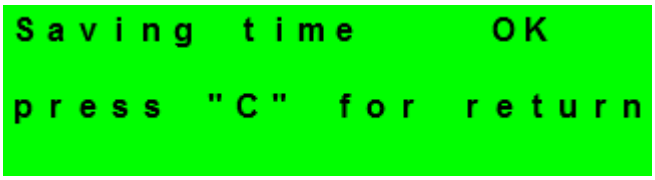
Time and Date shall be set to ensure proper operation of the controller's time program.

The clock features 24-hour format.

Setting date and time:

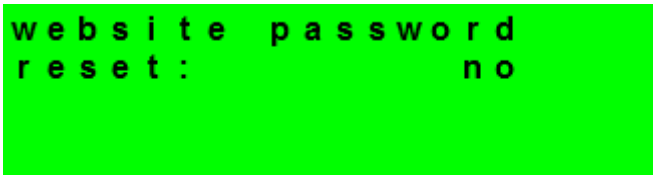
```
        set time
hours          :  13
minutes        :  29
```

Having set time and date, press ➧ and the following display appears:



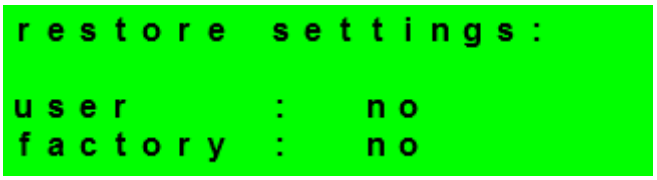
When this display is shown, time and date are being saved into the real-time circuit of the controller.

2.8 Setting other parameters



website password reset *Selecting yes will reset the website password and username to the default username: user and password: user.*

Restore settings:



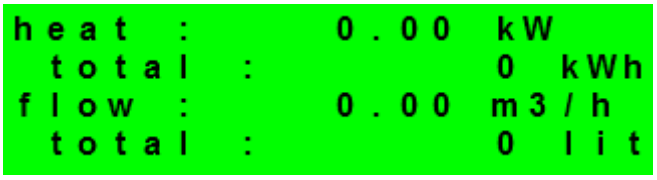
user *the last saved user settings (saved every 10 min.) will be restored*

factory *default settings will be restored*

2.9 Setting SMS

This function can be accessed only in combination with a GSM modem and its description can be found in its specific Manual.

2.10 Heat and energy measurement



This display offers information on the momentary heat output (in Kw), on the total heat supplied (in kWh) and information on the current flow rate (in m3/h) and on total volume flown through (in liters). Measurement points and other necessary data are set in the Service menu.

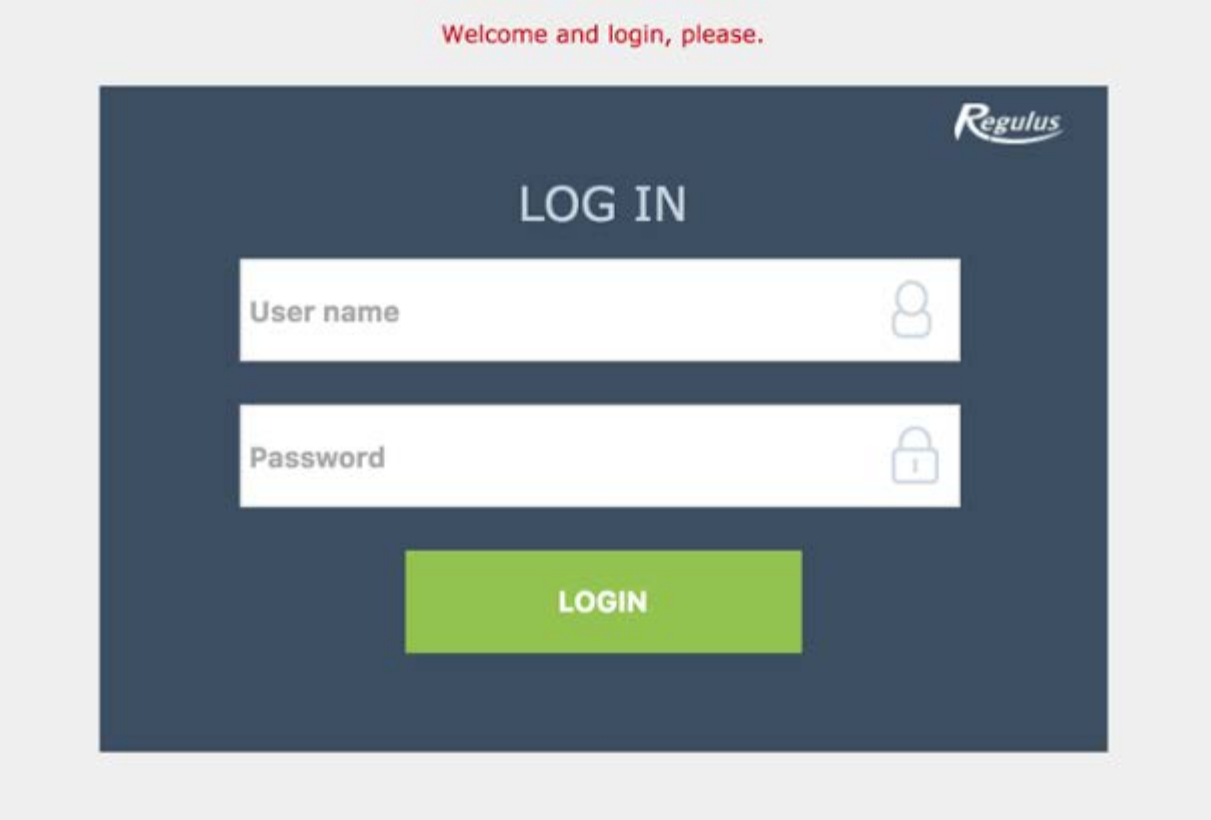
3. Web interface

3.1 Introduction

The controller contains integrated web pages displaying an overview of the heating system and user settings.

In order to get access to the web pages of the controller, it shall be connected either to a LAN or directly to a PC through a crossover network cable. IP address of the controller can be displayed by pressing the **DISP** key and ➘ key. This displays information on the controller network settings. For return to User Menu, press **DISP** again.

Having connected the controller to a LAN, enter its IP address into the address bar of your browser and the initial log-in window will be displayed:



Username for User level is: **user** (default setting)

Password for User level is: **user** (default setting)

After login, the initial menu of the User level appears that enables access to settings pages.

3.2 Functions Adjustable from a Web Browser

All parameters accessible in the menu on the controller's display can be adjusted via the web browser. The web environment further enables adjustment of parameters that are accessible from the browser only. These involve password change, synchronization settings, adjusting and displaying weather forecast, e-mail notifications, displaying charts and some selected statistics.

Service Manual for IR 12 Controller

IR12_KRB

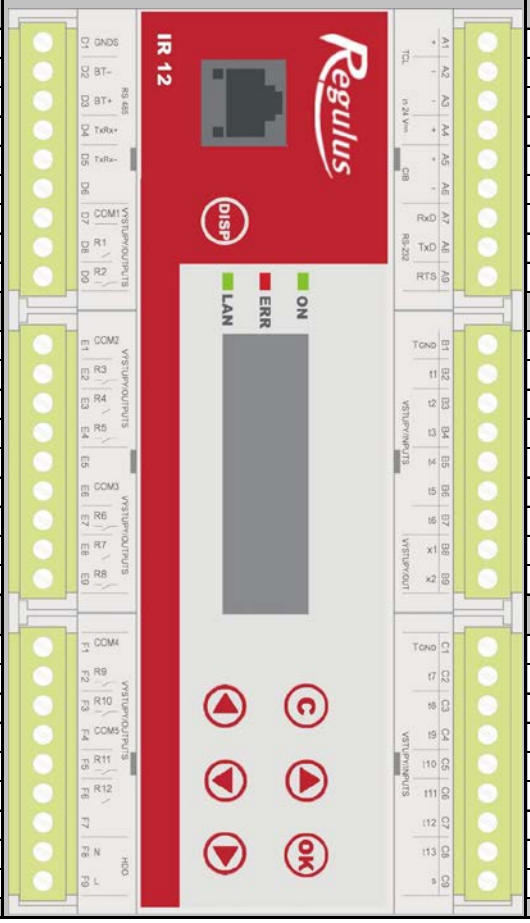
FW 4.01

S 1 – Controller wiring

Warning: Controller wiring may be performed by authorized staff only. Improper setting of the Controller may cause damage to system components.

Key to terminal wiring

Scheme No. 9,10,20,21,31,32	Other schemes		Other schemes	Scheme No. 9,10,20,21,31,32
			OT modul comm. +	
			OT modul comm. -	
			power -24V	
			power +24V	
			CIB modules (e.g. UNI module)	
			CIB modules (e.g. UNI module)	
power L			GSM modem RxD	
solar pump			GSM modem TxD	
diverter valve sol. tank 2			GSM modem RTS	
power L			sensor common ground	
zone 2 valve opens			solar	
zone 2 valve closes			DHW lower	
UNI2 - (zone 2 pump)			DHW upper	
			ThSt lower	
power L			ThSt upper	
DHW (diverter valve or source)			fire outlet	
DHW from ThSt pump			UNI output 0-10V 1 - (DHW recirc. pump)	
fire pump			UNI output 0-10V 2 - (fire damper)	
power L			sensor common ground	
ON/OFF source			sensor 2 (RC)	
UNI1 - (zone 1 pump)			zone 2	boiler return
power L			heating water - zone 1	heating return
return valve opens	zone 1 valve opens		heating water - zone 2	
return valve closes	zone 1 valve closes		sensor 1 (RC)	
			zone 1	
Ripple Control N			outside	
Ripple Control L			flow meter	



S 1.1 – Technical parameters of IR 12 controller

Power supply

Power supply voltage	24 V DC ± 5%
Power input	9.6 W max.
Installation	fuse board, on DIN rail
IP rating	IP 10B
Operating temperatures	0-50 °C
Relative humidity	10-95%, non condensing

R1,R2 Outputs

COM terminal max. current	2 A
Relay current	1 A (230 V AC)
Relay type	semi-conductor

R3-R12 Outputs

COM terminal max. current	10 A
Relay current	3 A (12-230 V AC)
Relay type	electromechanical

0-10V Output

Output voltage	0-10V DC
Common wire	T_{GND}
Max. current	10 mA

Inputs:

Temperature inputs	resistance type sensors Pt 1000 (-90 °C to 250 °C)
Common terminal	T_{GND}

S 1.2 - Technical parameters for OpenTherm™ module IR 1x OT

Power supply:

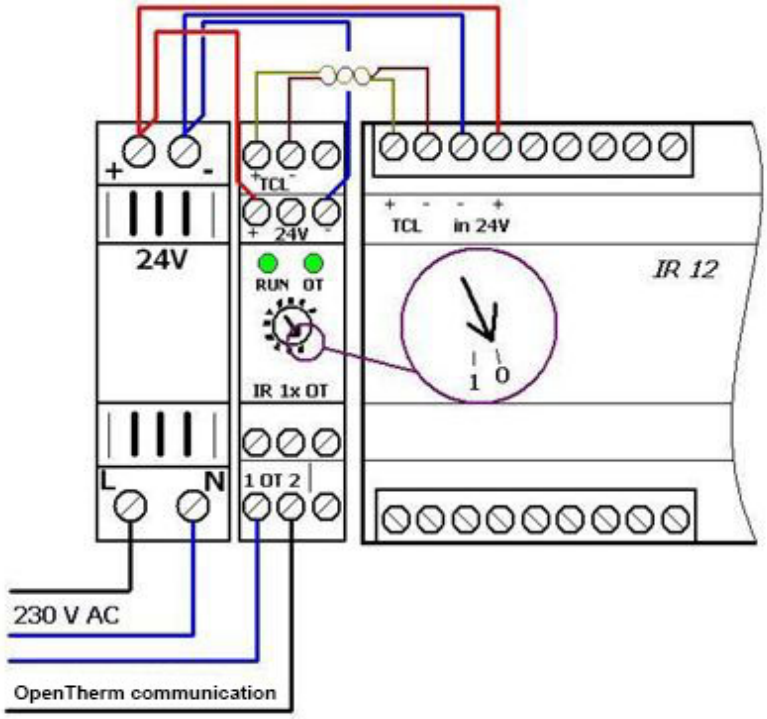
Power supply voltage	24 V DC ± 5%
Power input	0.24 W max.
Installation	fuse board, on DIN rail
IP rating	IP 10B
Operating temperatures	0-50 °C
Relative humidity	10-95%, non condensing

S 1.3 – Controller installation

The Controller is designed for installation on a DIN rail in a fuse board.

It may be installed by authorized staff only!

The controller, power supply unit and optional OpenTherm communication module shall be installed close to each other (cf. the interconnection fig.). Prior to turning the Controller on, the ADR rotation knob shall be pointed to “0”. Pay attention to the right polarity of power supply and interconnection between the Controller and IR 1x OT module! The recommended min. cross section for power supply wires is 0.75 mm^2. The recommended cable for connection between the Controller and IR 1x OT module is JYTY 0.5



S 2 – Service menu

Warning: This Service Menu may be edited by qualified staff only. Improper parameter setting in the Service menu may cause damage to system components in both heating and solar circuits.

In order to enter Service Menu, select “service“ in the User Menu and press **OK**.

Password to enter Service menu:

Pressing **OK** will move from one password digit to the next. Digits that are not being edited are not visible and shown as *. After all digits are entered, pressing the key ➘ (down arrow) will bring you to Service Menu.

It is recommended to change the default password to your own!

Service Menu consists of these items:

zone 1	*setting service parameters for zone 1*
zone 2	*setting service parameters for zone 2*
solar	*setting service parameters for solar system*
DHW	*setting service parameters for DHW heating*
source OT	*setting service parameters for OpenTherm source control communication*
source on/off	*setting service parameters for an on/off source*
fireplace	*setting service parameters for fireplace control*
other	*setting other service parameters (password, temperature difference controller, frost protection, anti-seize functions)*
sensors	*temperature sensor management (offset, sensor state)*

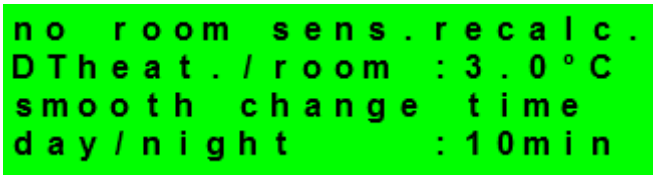
uni. output	*universal output 1 (controller universal terminal)*
uni. output 2	*universal output 2 (controller second universal terminal)*
sms	*switching on SMS function (adjustable from user interface)*
heat	*settings for heat and flowrate measurements*
statistics	*statistics for some parameters*
control type	*control type choice (mixed zone 1/heating return valve)*
test	*controller outputs test*
module UNI	*universal CIB module configuration*
CIB address	*HW addresses for additional CIB modules*
IP address	*set IP address, subnet mask, default gateway and DNS server*
RegulusRoute	*settings to TecoRoute service*

S 2.1 – Heating zones setting (1,2)

Settings are identical for both heating zones.

zone (on/off)	*Turning zone on/off from service level. In a zone turned off this way the frost protection is disabled.*
max.t to zone (°C)	*Setting max. heating water temperature to zone. Temperature calculated by the controller shall not be higher than this value. Max. temperature to zone 2 cannot be higher than max. temperature to zone 1; when attempted to set higher, it will be adjusted to the max. temperature of zone 1!!*
min.t to zone (°C)	*Setting min. heating water temperature to zone. Temperature calculated by the controller shall not be lower than this value.*
room sensor	*Choose whether a Pt1000 room sensor (**Pt**) used in the zone, or RC21 room unit (**RC21**) or no room sensor (**none**). Or you can choose thermostat (**therm**) for switching between comfort and setback temperature. For zone 2 there is*

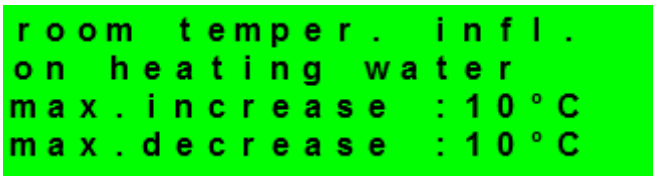
*an extra option (**fromZ1**) and in such a case the data from RC21 unit wired to zone 1 are valid for zone 2.*



no room sens.recalc. DTheat./room (°C) *Temperature drop setting between heating water and room temperature. E.g. the value 3 means that a desired change in room temperature by 1°C needs a heating water temperature change by some 3°C. This parameter is applied for operation without any room sensors.*

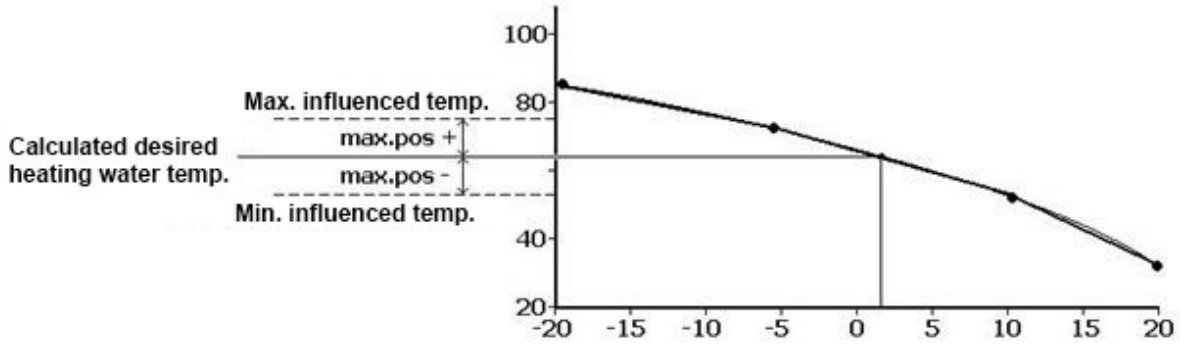
smooth change time day/night (min) *Time adjustment of how many minutes the controller will need to change from comfort to setback temperature during daily scheduled transition between day and night modes and vice versa.*

The influence of room temperature on heating water:



max. increase (°C) *Setting the max. permitted positive influence on the OTC curve calculated by the Controller based on the difference between the real and desired temperatures in zone (see fig. below).*

max. decrease (°C) *Setting the max. permitted negative influence on the OTC curve calculated by the Controller based on the difference between the real and desired temperatures in zone (see fig. below).*



Mixing valve:

```
Mixing valve
shift time      :120sec
manual gain    :  no
gain           :1.00
```

shift time (sec) *Setting the shift time between end positions of the mixing valve.*

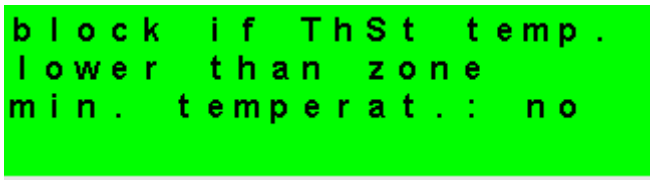
manual gain *If the preset value is not acceptable and the control shall be slowed down/speeded up, the switch shall be turned to yes. Then the following item,* ***gain****, can be changed.*

gain *determines the speed of control. The lower the parameter, the slower is the control. It is not recommended to use values above 1.5. Such values can cause valve cycling.*

```
turn pump OFF:  off
OTC setback   :  0°C
```

turn pump OFF (on/off) *If this function is on, the zone circulation pump will switch off when the temperature in zone reaches the desired value (with ± 0.3 °C difference).*

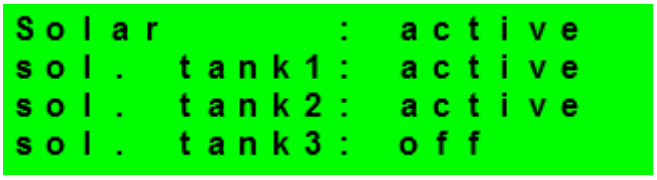
OTC setback (°C) *Setting the heating water temperature drop for transition from Day to Setback mode.*



block if ThSt temp. lower than zone min. temperat. (yes/no) *Blocks the zone when ThSt temperature (ThSt upper sensor) is lower than min. heating water temperature. Prevents extensive cooling of the thermal store.*

S 2.2 – Solar Zone Service Parameters Setting

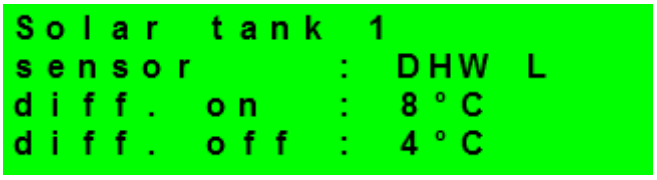
Solar system may work with one, two or three hot water storage tanks. Their heating is controlled by so call oscillating heating, i.e. the Controller tries to heat up Tank No. 1 first. If this is not possible due to a low temperature difference between a solar collector and the tank, and at the same time the difference for heating Tank 2 is sufficient, the Controller starts heating Tank 2 for the preset time. After that time, the Controller interrupts heating Tank 2 and tests if a collector temperature grows. If not, heating Tank 2 continues. If the collector temperature grows, the Controller waits until the temperature difference is fulfilled for Tank 1 and then its heating is started. Heating to Tank 3 is controlled in a similar way.



Solar (active/off) *Switching on solar zone.*

tank 1,2,3 (active/off) *Switching on separate solar tanks.*

The following two displays are the same for all the three tanks:

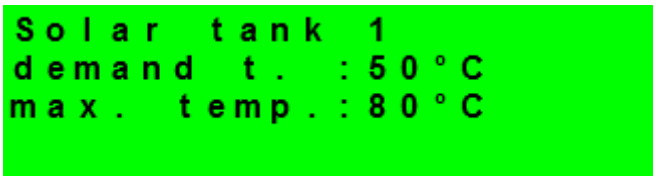


sensor (sensor list) *Choice of temperature sensor in a solar tank.*

For control type 2 the heating return sensor is replaced by the flow sensor in zone 1!!!

dif. on (°C) *Difference to switch on solar circuit. Difference between solar collector and temperature sensor set in parameter sensor.*

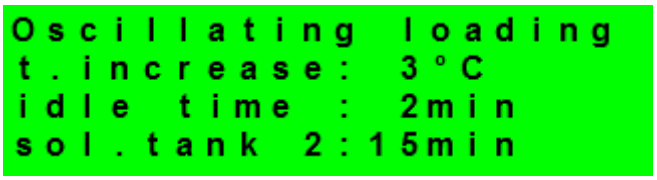
dif. off (°C) *Difference to switch off solar circuit.*

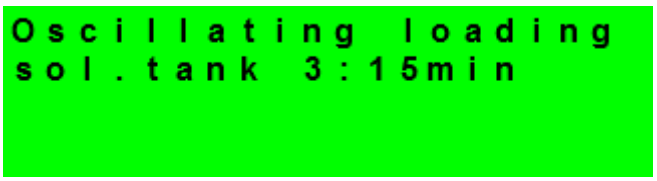


demand t. (°C) *The desired temperature. Under the normal solar circuit mode, the tank is heated up to this temperature. As soon as all switched-on tanks are heated up to the demand temperature, the Controller continues heating up to max. temperature.*

max. temp. (°C) *Max. temperature. Maximum temperature the solar tank is heated to under normal mode (the function of solar collectors cooling is turned off).*

Oscillating loading:





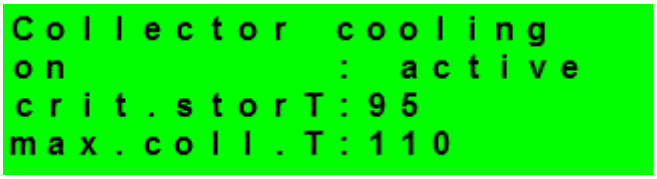
t.increase (°C) *Temperature increase during oscillating loading. If a solar tank of a higher priority cannot be loaded, the Controller waits for the time set in parameter idle time. If the temperature rises after this time by the value set in parameter t. increase, the Controller keeps idling. This repeats until the tank switch-on difference is reached. If this condition is not reached, the tank of lower priority is loaded, supposed the*

condition of switching difference is met – cf. more details in the description of Oscillating loading function.

idle time (min) *Time period the Controller idles, waiting if the solar collector temperature rises. The description see parameter t. increase.*

sol.tank 2(3) (min) *If a tank of higher priority cannot be loaded, a tank of lower priority is loaded for the time period set in this parameter.*

Collector cooling function:



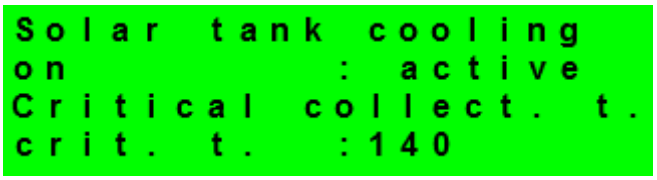
When this function is on, solar collector is cooled. As soon as the max. temperature is reached (in all tanks), tanks loading is stopped. When the solar collector temperature exceeds the preset max. collector temperature, the circulation pump starts and the collector is cooled by heating tank X. If the temperature in tank X exceeds the preset critical temperature, collector cooling is stopped. Tank number (X) is set in parameter **nmbr. of solar tank for collect. cooling and tank cooling** (see Solar tank cooling function).

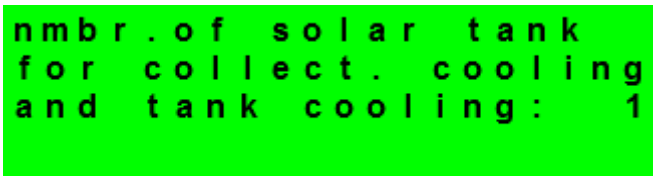
on (active/off) *Switching on the function of collector cooling.*

crit.storT (°C) *Setting the critical tank temperature. Collector cooling by heating tank 1 may run only until the tank temperature set by this parameter is reached. When this temperature is exceeded in tank 1, the collector stops cooling.*

max.coll.T (°C) *Max. collector temperature. When this value is exceeded, collector cooling by heating tank 1 is started, supposed this function is on.*

Tank cooling function + Critical collector temp.:





If the temperature in tank X is higher than that set in parameter Max. temp. tank X (e.g. due to collector cooling), tank X will get cooled via the collector. Cooling shall start if the collector is cooler by at least 6°C than tank X. Tank number (X) is set in parameter **nmbr. of solar tank for collect. cooling and tank cooling.**

If the temperature set in parameter crit.t. is exceeded in the collector, the solar pump is blocked. This function protects other solar components from damage by too hot solar fluid.

on (active/off) *Switching on tank cooling function.*

crit. t. (°C) *Critical temperature of solar collector.*

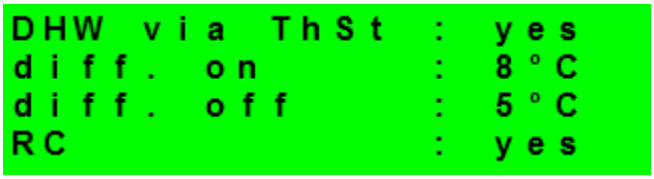
nmbr. of solar tank for collect. cooling and tank cooling *Number of the solar tank that will perform safety functions of collector cooling and tank cooling.*

S 2.3 – DHW Zone Service Parameters Setting

on (on/off) *Switching on DHW from the Service. level.*

switch on OT boiler during DHW (yes/no) *OT boiler will be switched on when DHW demand appears.*

DHW tank heated from Thermal Store:

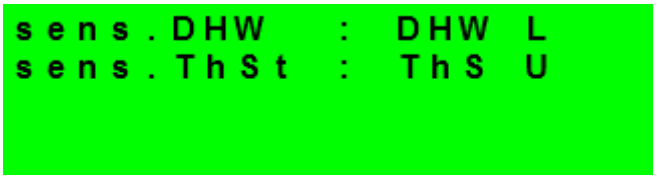


DHW via ThSt (yes/no) *Switching on DHW tank to be heated from Thermal Store.*

diff. on (°C) *Setting the difference between Thermal Store and DHW tank that controls starting the DHW pump.*

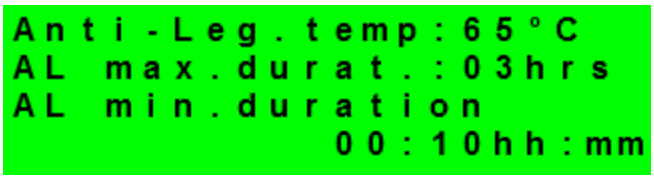
diff. off (°C) *Setting the difference between Thermal Store and DHW tank that controls stopping the DHW pump.*

RC (yes/no) *Option if DHW tank loading is blocked from RC signal.*



sens.DHW (sensor list) *Choice of sensor in DHW tank for the function of **DHW via Thermal Store**.*

sens.ThSt (sensor list) *Choice of sensor in Thermal Store for the function of **DHW via Thermal Store**.*

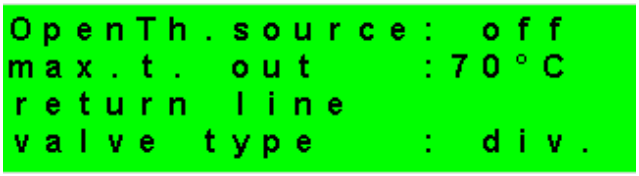


Anti-Leg.temp (°C) *Desired temperature for Anti-Legionella function*

AL max.durat. (hrs) *Max. duration of Anti-Legionella function. After this time expires, DHW will be heated by standard temperature values set in the DHW menu.*

AL min.duration (hh:mm) *Minimum duration of Anti-Legionella temperature in order to finish the Anti-Legionella function successfully.*

S 2.4 –OpenTherm source Service Parameters Setting



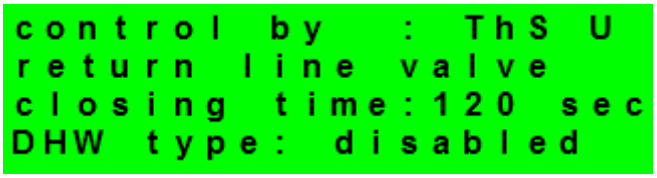
OpenTh. source (on/off) *Switching OpenTherm source on in service level. When off is selected, the Controller adjusts the boiler state to stop heating.*

However the source might run and keep circulation pump running for some time which is caused by safety algorithms of the source that cannot be overridden by the Controller.

max. t. out. (°C) *Setting the max. flow temperature from an OpenTherm source. This value will be sent to the source to limit its max. flow temperature.*

return line valve type (div./mix.) *Setting the valve type in the heating return line. A diverter diverts the return line either directly to the boiler, or to the Thermal Store for preheating, depending on the return line and Thermal Store temperatures. A mixing valve mixes the return line temperature to the desired value.*

For control type 2 no heating return valve is used.

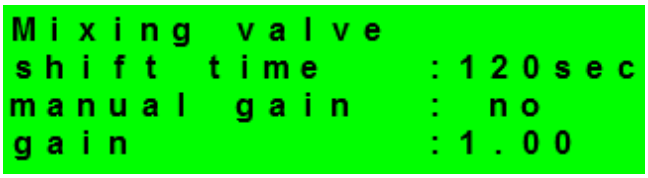


control by (ThS U, ThS L) *Selecting a sensor to be decisive for a return line diverter switching.*

return line valve closing time *Closing time for the return line valve after the demand to heat hot water is finished. The valve closes for the set time and then the function is released and the valve is again controlled by its own logic (diverter/mixer).*

DHW type (disabled, therm., own logic) *Configuration manner for heating of DHW zone in a source controlled by OpenTherm protocol. The option "**disabled**" indicates the independent DHW heating in the source is switched off. With the option "**therm.**" set, DHW is heated up depending on the sensor in the hot water storage; and when the option "**own logic**". is set, DHW heating is controlled by a dedicated DHW sensor.*

For control type 2 no heating return valve is used.

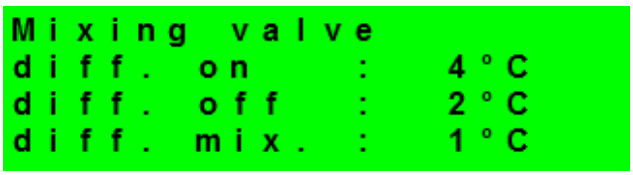


shift time (sec) *Setting of mixing valve shift time from one end position to the other one.*

manual gain *If the preset value is not acceptable and the control shall be slowed down/speeded up, the switch shall be turned to yes. Then the following item,* ***gain****, can be changed.*

gain *Determines the speed of control. The lower the parameter, the slower is the control. It is not recommended to use values above 1.5. Such values can cause valve cycling.*

For control type 2 no heating return valve is used.



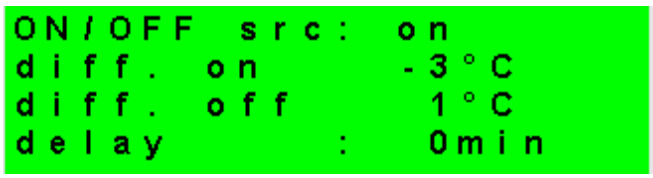
diff. on *The difference between Thermal Store (higher) and return line (lower) that makes the heating return valve divert to Thermal Store.*

diff. off *The switch-off difference for the preceding function, to divert the valve to the boiler.*

diff. mix. *If the temperature in Thermal Store is higher than the desired one + this difference, the return line valve will switch to the mixing mode.*

For control type 2 no heating return valve is used.

S 2.5 – ON/OFF source Service Parameters Setting



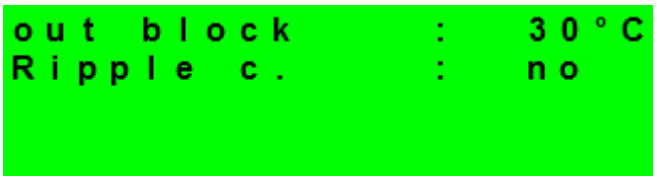
Decisive sensors can be switched on the third screen of ON/OFF source parameters setting.

ON/OFF src. (on/off) *Source 2 turned on in service level.*

diff. on (°C) *Setting the difference between boiler return temperature and that demanded by a heating system, for source 2 to be switched on.*

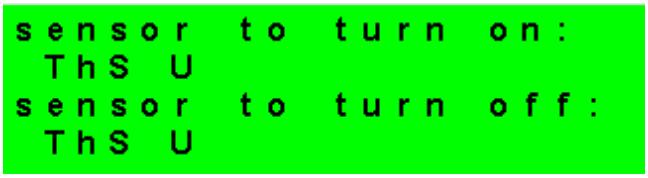
diff. off (°C) *Setting the difference between boiler return temperature and that demanded by a heating system, for source 2 to be switched off.*

delay (min) *Setting the delay in boiler start after the demand based on temperature difference appeared.*



out block (°C) *Setting the outdoor temperature limit above which the Source 2 will be blocked.*

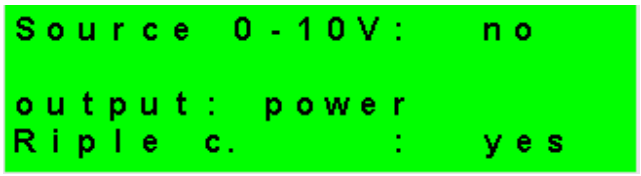
Ripple c. (yes/no) *Setting Source 2 control via Ripple control.*



sensor to turn on (sensor list) *Decisive sensor to turn the source on.*

sensor to turn off (sensor list) *Decisive sensor to turn the source off.*

S 2.6 – Setting service parameters of a modulated (0-10V) heat source



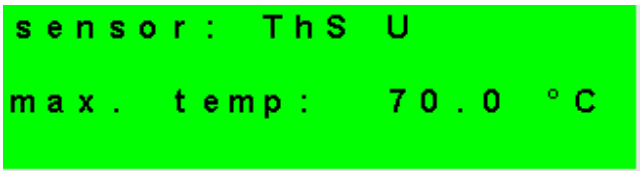
Control sensor for the source can be selected on the second settings screen.

source 0-10V (yes/no) *Switching on a 0-10V signal controlled heat souce on service level.*

output (power/temp.) *Setting the type of output signal. With **power** selected, the 0-10V signal is in direct relationship to the desired source output (in the range adjustable on the respective adjustment page). With **temp.***

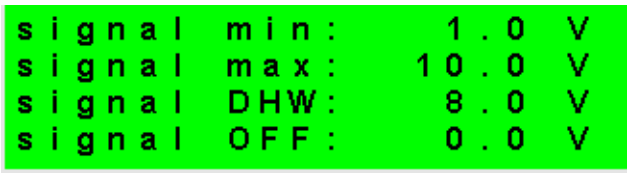
selected, the 0-10V output signal is in direct relationship to the desired temperature.

Ripple c. (yes/no) *Settings for 0-10V source control by Ripple control signal.*



sensor (sensor list) *Control sensor for a 0-10V source.*

max. temp. (°C) *Setting of max. flow temperature from a heat source. This temperature will be used as the upper limit value for a desired boiler temperature.*

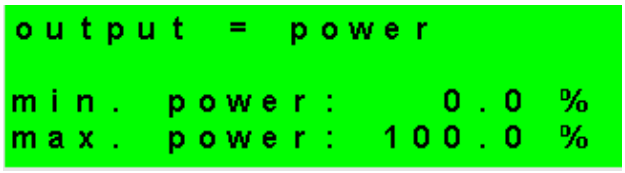


signal min (V) *Minimum signal level (corresponds to the min. temperature/output – see further screens).*

signal max (V) *Maximum signal level (corresponds to the max. temperature/output – see further screens).*

signal DHW (V) *Output value set for a DHW demand (independent of the desired temperature).*

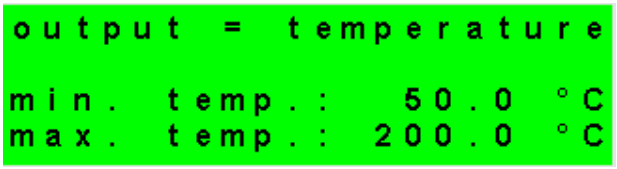
signal OFF (V) *Output value set for the source being off.*



Parameter settings for the output signal of **power** type (see the first adjustment screen).

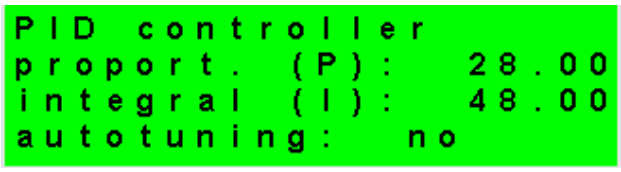
min. power (%) *Min. power, corresponding to **signal min**. parameter.*

max. power (%) *Max. power, corresponding to **signal max**. parameter.*



Parameter settings for the output signal of **temp.** type (see the first adjustment screen).

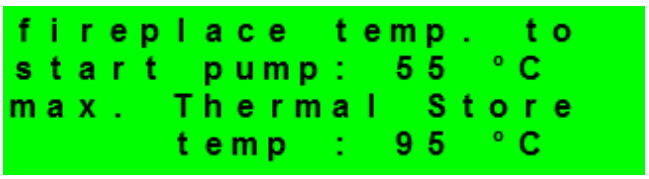
min. temp. (°C)	*Min. temperature, corresponding to **signal min**. parameter.*
max. temp. (°C)	*Max. temperature, corresponding to **signal max**. parameter. This is just to set the output signal level which does not need to correspond to the max. source temperature.*



Adjusting controller's PID parameters for the output signal of **power** type (see the first adjustment screen).

proport. (P)	*PID controller proportional gain.*
integral. (I)	*Integral time constant of the power.*
autotuning (yes/no)	*Automatic finding coefficients of the PID controller. It is advisable to run controller Autotuning after the boiler is connected to a heating system, before current operation starts. The source will not react to any requirements during the autotuning procedure! Autotuning will switch off automatically when finished.*

S 2.7 – Fireplace Service Parameters Setting



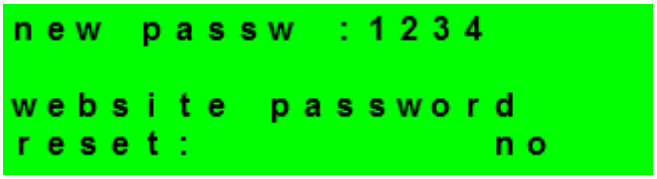
fireplace temp. to start pump (°C) *Setting the temperature of water outgoing from fireplace above which the fireplace circulation pump starts.*

max. Thermal Store temp (°C) *The max. Thermal Store temperature for the fireplace function. When this temperature is exceeded, the fire pump is turned off.*

temp.diff.to ON (°C) *Switch-on difference to start the fire pump, i.e. fireplace temp. above the Thermal Store Lower value.*

temp.diff.to OFF (°C) *Switch-off difference for the fire pump.*

S 2.8 – Other service parameters



new passw *Setting a numeric code for access to Service level of menu.*

website password reset (yes/no) *Selecting yes will reset the password and username for controller website access to the default values.*

Frost protection:

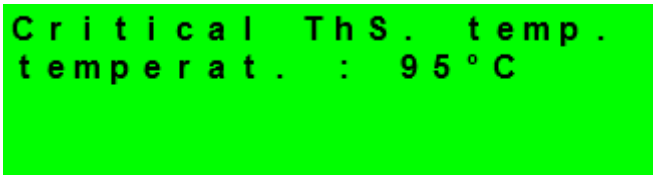
When Frost protection is on, the temperature is monitored for a switched off zone. Should the outdoor temperature drop below the value set in parameter **out. temp.**, then the heating water temperature is kept at value set by parameter **water temp.**.

state (active/off) *Turning frost protection on/off.*

out. temp. (°C) *Setting outdoor temperature limit below which Frost protection is activated.*

water temp. (°C) *Heating water temperature kept in a zone when Frost protection is active.*

Critical temperature in Thermal Store:



If the temperature in Thermal Store exceeds the set critical temperature, cooling will start with heating into all zones switched on in Service level, i.e. incl. those switched off in User level. During cooling, the zone pump is on and the max. temperature is set for the zone (**Max.t to zone**). Cooling will be finished when the Thermal Store temperature sinks by 5°C.

temperat. (°C) *Setting the critical temperature for Thermal Store.*

Anti-block function:

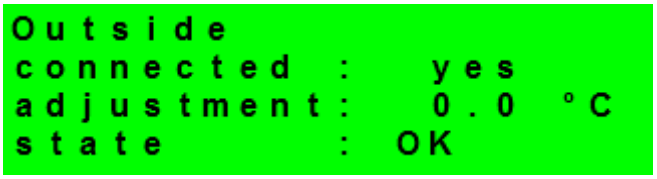
When this function is active, selected heating elements (pumps, valves) are spun for a while once a week (at a preset day and time). If any of these components was in operation the previous week due to the Controller intervention, this anti-block function will not apply.

state (active/off) *Switching on (off) the function of component spin.*

day (Mo - Su) *Selection of day when the spin shall occur.*

hour (0 - 23) *Hour when the spin starts.*

S 2.9 – Temperature Sensor Management



The temperature measured by the Controller may differ from a real temperature due to defects. The measured value may be affected e.g. by the preciseness of the temperature sensor, the length and cross section of the cable used for sensors, by the quality of contact between the temperature sensor and the medium measured. The temperature data can be adjusted by offset in the range from -9.0 to +9.0 °C.

connected *"No" option shall be selected in case no temperature sensor is connected (to avoid the program reporting an error when the sensor is disconnected). The default option is "Yes".*

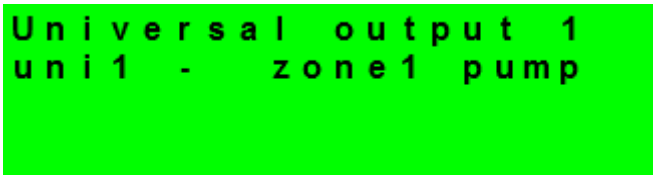
adjustment *Temperature sensor offset.*

state *The sensor state – if the sensor is in an error state (either a too high or a too low temperature is sensed), the text fault is displayed.*

S 2.10 – Universal Outputs

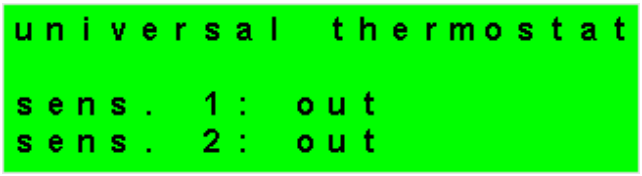
The universal output 1 (uni1) – the F3 terminal can be used to control a diverter valve for solar tank No. 3 (option div.v.sol3), control a DHW recirculation pump (option circulat.), control a heating zone 1 circulator (option zone 1 pump), or it may be used as a universal thermostat (option thermostat).

Eventually the universal output can be switched off completely. The universal output 2 (uni2) – the E4 terminal can be used to control heating zone 2 circulator (option zone 2 pump) or it can be used as a universal thermostat (option thermostat). Eventually the universal output can be switched off completely.



uni1 *Selection of the universal output type (cf. above).*

The following displays enable adjusting the function of universal thermostat (**uni1** thermostat or **uni2** thermostat).



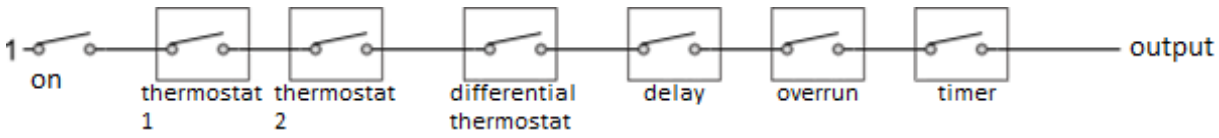
sens 1,2 *Temperature sensor selection for universal thermostat functions.*

For control type 2 the heating return sensor is replaced by the flow sensor in zone 1!!!

The universal thermostat features the following functions:

- thermostat 1
- thermostat 2
- differential thermostat
- delay
- overrun
- timer

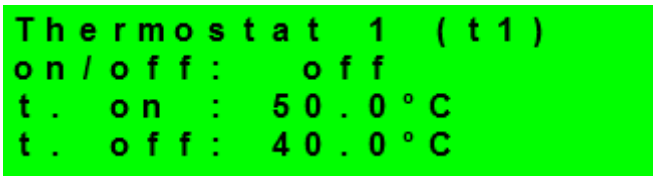
The function logic is designed in such a way that the output is closed when the universal thermostat is switched on and all the permitted functions are fulfilled, see fig. below. A function not permitted is equivalent to a closed switch.



It is obvious from the picture that the Delay function can delay signal from thermostat and diff. thermostat functions, the Overrun function can hold disconnection (switching off) from thermostat, diff. thermostat and delay functions. The Timer function is superior over the preceding functions.

Description of separate functions and parameters of the universal thermostat 1 (2)

Thermostat 1 (2): *thermostat function related to temperature input 1 (sensor 1) or 2 (sensor 2)*

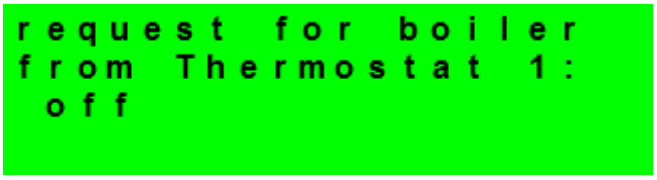


on/off (on/off) *Switching thermostat 1 function on/off.*

t. on (°C) *Switch-on temperature for thermostat 1.*

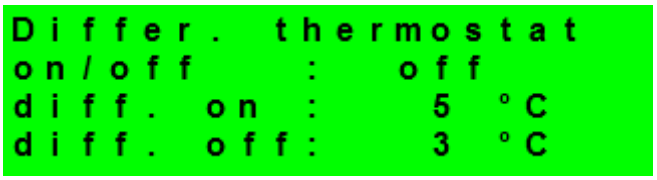
t. off (°C) *Switch-off temperature for thermostat 1.*

If the switch-on temperature is higher than the switch-off temperature, thermostat 1 works in a “cooling” mode, if vice versa, it works in a “heating” mode.



request for boiler from Thermostat 1/2 (on/off) *Switch-off temperature for Thermostat 1/2 will be taken over as the desired temperature for heat sources. Valid only if Thermostat 1/2 is set in Heating mode. When Timer function is also On, the request will be taken over during active time period only.*

Differential thermostat: *differential thermostat function between sensors 1 and 2*

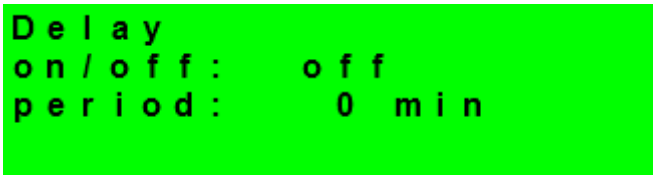


on/off (on/off) *Switching differential thermostat function on/off.*

diff. on (°C) *Switch-on difference between temperatures t1 and t2.*

diff. off (°C) *Switch-off difference between temperatures t1 and t2.*

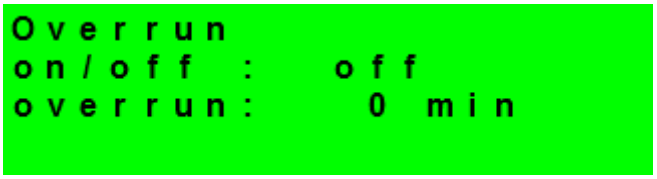
Delay: *output delay function*



on/off (on/off) *Switching the delay function on/off.*

period (minutes) *Delay time in case when all the preceding functions are fulfilled.*

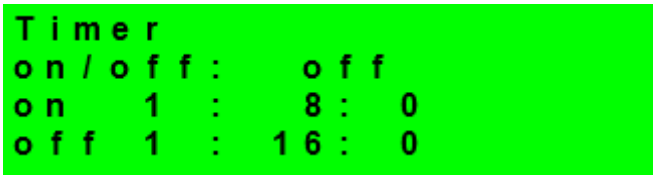
Overrun: *overrun function (output delayed switch-off)*



on/off (on/off) *Switching the overrun function on/off.*

overrun (minutes) *Overrun time after the preceding functions are switched off.*

Timer: *timer functions with two time periods*



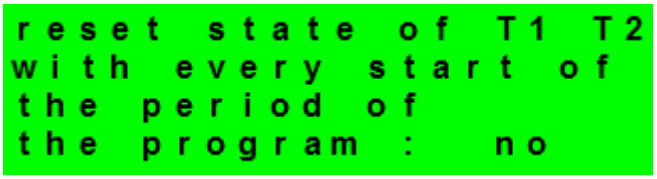
on/off (on/off) *Switching the timer function on/off.*

on 1 (hh:mm) *The first period switch-on time.*

off 1 (hh:mm) *The first period switch-off time.*

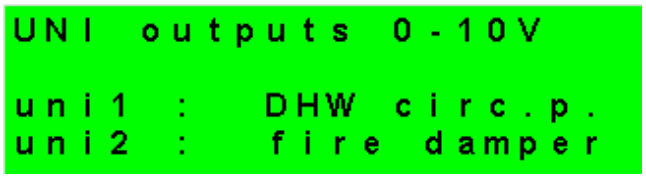
on 2 (hh:mm) *The second period switch-on time.*

off 2 (hh:mm) *The second period switch-off time.*



reset state of T1 T2 with every start of the period of the program *When this function is On, at every start of time period in time program the state of both thermostats will be reset according to the current temperature.*

S 2.11 – Universal outputs 0-10V



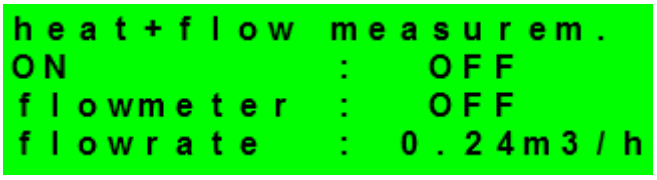
uni1, uni2 *Assign universal analogue outputs, options are:*

off	*output is not used*
fire damper	*damper on the fireplace combustion air inlet is assigned*
DHW circ.p.	*DHW recirculation pump (switched) is assigned to this output*
src. 0-10V	*0-10V source signal is assigned to this output*

S 2.12 – SMS Setting

ON (ON/OFF) *Turning on (off) the text message functions (text functions will be available for setting in the User Menu on the web and on the display as well).*

S 2.13 – Heat and Flow Rate Measurement Settings



ON (ON/OFF) *Turning on (off) the heat and flowrate measurement function.*

flowmeter (ON/OFF) *Option ON shall be selected when the flowrate is measured by a pulse flowmeter wired to the logical input terminal, marked **C9** on the Controller.*

flowrate (m3/h) *If no pulse flowmeter is present, the flowrate value shall be entered manually.*

inlet *Inlet temperature sensor for the purpose of heat measurements (select).*

For control type 2 the heating return sensor is replaced by the flow sensor in zone 1!!!

outlet *Outlet temperature sensor for the purpose of heat measurements (select).*

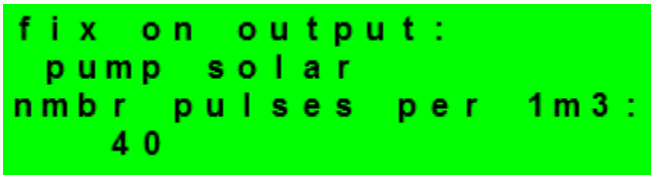
For control type 2 the heating return sensor is replaced by the flow sensor in zone 1!!!

fluid *Fluid circulating between selected sensors (options: water, ethylene glycol, propylene glycol).*

glyc.concent *Glycol concentration in the mixture (if the fluid selected is either ethylene glycol or propylene glycol).*

Selected inlet and outlet sensors swap automatically depending on actual temperatures (the temperature at an inlet sensor must be always higher than that at an outlet sensor).

Measurement fixed to input:



Measurement fixed to output (pump) means that heat and flow rate will be measured only when the input is active (pump is running). This fixation can be cancelled, then heat and flow rate will be measured continuously, independent of the pumps.

nmbr pulses per 1m3: *Number of pulses per 1 m^3 (resolution of flowmeter).*

reset heat (Yes/No) *Measured heat values are reset (all statistics, from hourly to total values).*

reset flow (Yes/No) *Measured values of flow rate and fluid volume passed through are reset (all statistics, from hourly to total values).*

S 2.14 – Total statistics

Statistics of sources and all pumps operation and of solar tanks heating, in HH:MM format.

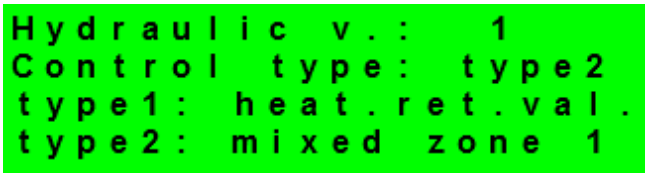
S 2.15 – Control type

Warning: **Changing the number of hydraulic variant will cause most settings to be overwritten. Always change the hydraulic variant first, before starting to adjust other values.**

Here the setting of the hydraulic variant is done, following the document: IR12 Intelligent Controller - typical designs of hydraulic variants that is enclosed. The document can be also downloaded from the service level of the controller website.

After you select the Hydraulic variant number (press OK in the display shown, set the desired number using up/down arrows in the range 1 to 34 and confirm by pressing OK), the control type will be set automatically as well as all the other variables concerning the selected variant.

For the control type 1, the heating return valve and temperature sensor are connected and Zone 1 is unmixed. For the control type 2, Zone 1 is mixed (i.e. a zone mixing valve is installed instead of a heating return valve) and a Zone 1 heating water temperature sensor is connected instead of a heating return temperature sensor. In that case the system features no heating return valve.



Hydraulic v. (1 to 33) *Choosing control manner.*

S 2.16 – Output test

```
      Output test
termin:  D8
operat:  solar pump
test   :  0
```

When Output test in Service Menu is entered, all outputs from the Controller are switched off. Then separate outputs can be tested. The output turns on when a display with the name of the output in question is shown and the option test = 1 selected. On leaving a display with the option test = 1, the respective output switches off.

termin *Terminal number for the respective Controller output.*

operat *Name of the output function.*

test (0,1) *Output setting for test, 1 means output on.*

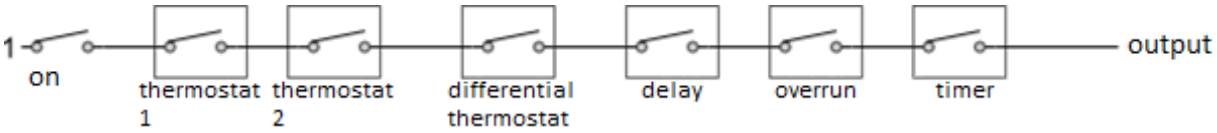
S 2.17 – Universal CIB module

This is a universal add-on module for IR12 controllers.

The module features the following functions:

- turning the module on
- thermostat 1
- thermostat 2
- differential thermostat
- delay
- overrun
- timer

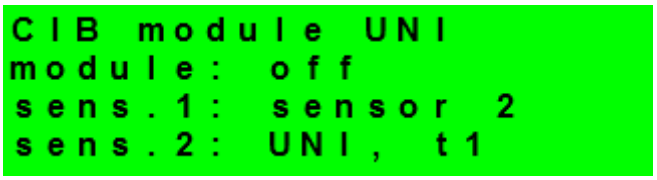
The function logic is designed in such a way that the output is closed when the add-on module is switched on and all the permitted functions are fulfilled, see fig. below. A function not permitted is equivalent to a closed switch.



It is obvious from the picture that the Delay function can delay signal from thermostat and diff. thermostat functions, the Overrun function can hold disconnection (switching off) from

thermostat, diff. thermostat and delay functions. The Timer function is superior over the preceding functions.

Description of separate functions and parameters of the add-on module

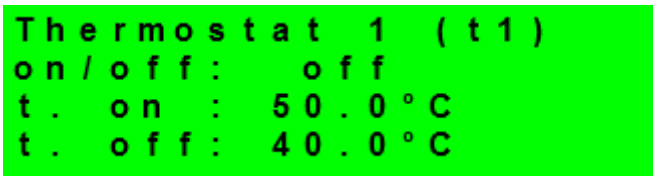


module (on/off) *Add-on module switching on (entering the right HW address is a precondition for its proper operation – see 2.16).*

sens 1, 2 *Temperature sensors for thermostat functions (thermostat 1, 2 and differential thermostat)*

For control type 2 the heating return sensor is replaced by the flow sensor in zone 1!!!

Thermostat 1 (2): *thermostat function related to temperature input 1 (sensor 1) or 2 (sensor 2)*

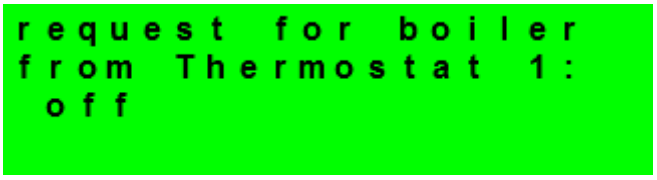


on/off (on/off) *Switching thermostat 1 function on/off.*

t. on (°C) *Switch-on temperature for thermostat 1.*

t. off (°C) *Switch-off temperature for thermostat 1.*

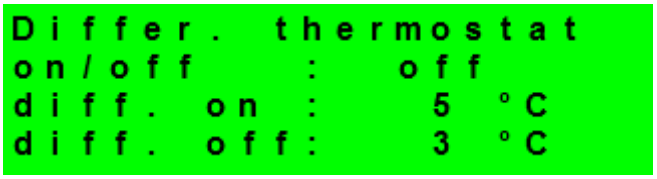
If the switch-on temperature is higher than the switch-off temperature, thermostat 1 works in a “cooling” mode, if vice versa, it works in a “heating” mode.



request for boiler from Thermostat 1/2 (on/off) *Switch-off temperature for Thermostat 1/2 will be taken over as the desired temperature for heat sources. Valid only if*

Thermostat 1/2 is set in Heating mode. When Timer function is also On, the request will be taken over during active time period only.

Differential thermostat: *differential thermostat function between sensors 1 and 2*

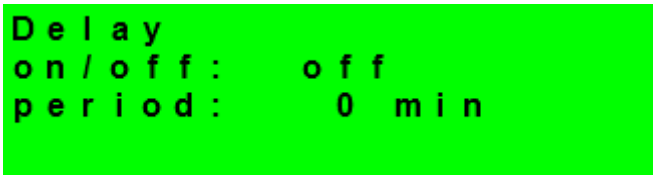


on/off (on/off) *Switching differential thermostat function on/off.*

diff. on (°C) *Switch-on difference between temperatures t1 and t2.*

diff. off (°C) *Switch-off difference between temperatures t1 and t2.*

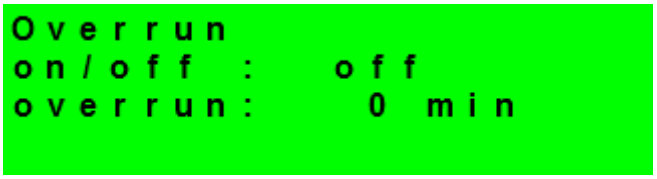
Delay: *output delay function*



on/off (on/off) *Switching the delay function on/off.*

period (minutes) *Delay time in case when all the preceding functions are fulfilled.*

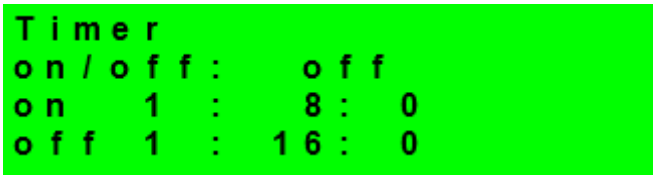
Overrun: *overrun function (output delayed switch-off)*



on/off (on/off) *Switching the overrun function on/off.*

overrun (minutes) *Overrun time after the preceding functions are switched off.*

Timer: *timer functions with two time periods*



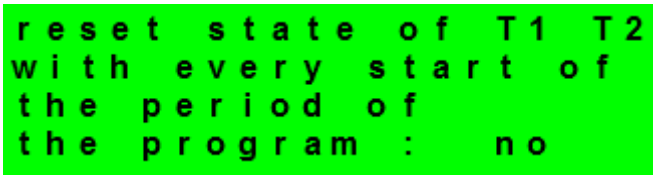
on/off (on/off) *Switching the timer function on/off.*

on 1 (hh:mm) *The first period switch-on time.*

off 1 (hh:mm) *The first period switch-off time.*

on 2 (hh:mm) *The second period switch-on time.*

off 2 (hh:mm) *The second period switch-off time.*

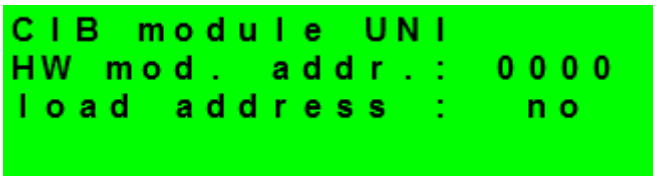


reset state of T1 T2 with every start of the period of the program *When this function is On, at every start of time period in time program the state of both thermostats will be reset according to the current temperature.*

S 2.18 – HW Address Setting for CIB Modules

An add-on module can be connected to the Controller on CIB bus. The module is also power-supplied from this bus. After the module is connected, its HW address shall be set using either the web interface or the Controller display; otherwise the module will not work together with the Controller.

Check the module HW address (it is printed on its side) and fill it in the HW module address line and press Load address. After that, the module should start working with the IR12 Controller.

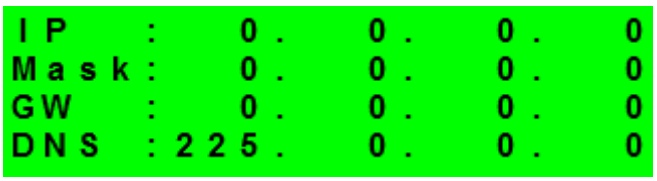


HM mod. addr. *HW address of the module, entered in hexadecimal format.*

load address *A key to confirm the address. If the address is entered right, the lower line will read **OK**.*

S 2.19 – IP Addresses

Setting the IP address, network mask, gateway, DNS server address, possibly also DHCP.



IP (192.168.100.014) *Controller IP address.*

Mask (255.255.252.000) *Network mask the controller is connected to.*

GW (000.000.000.000) *IP address of the default gateway the controller is connected to.*

DNS (008.008.008.008) *IP address of DNS server.*

Set new IP (yes/no) *Confirmation of the new IP addresses set. The Controller will not work with the new IP addresses without this confirmation.*

Set DHCP (yes/no) *When Yes is selected, the Controller will receive the address from the DHCP server. If the IP address cannot be received within 4 seconds (e.g. DHCP server is not present in the LAN), the IP address set above will be used as a replacement configuration.*

MAC (00.00.00.00.00.00) *MAC address of the Controller.*

S 2.20 – RegulusRoute

RegulusRoute service enables remote access to the Controller avoiding the need to use a public IP address. If you wish to have this service configured, kindly contact Regulus.

RegulusRoute (yes/no) *Enabling RegulusRoute service.*

status *Service state.*

S 3 – Web Server – service level

IR12 Controller is equipped with integrated web server that enables displaying either User or Service screen

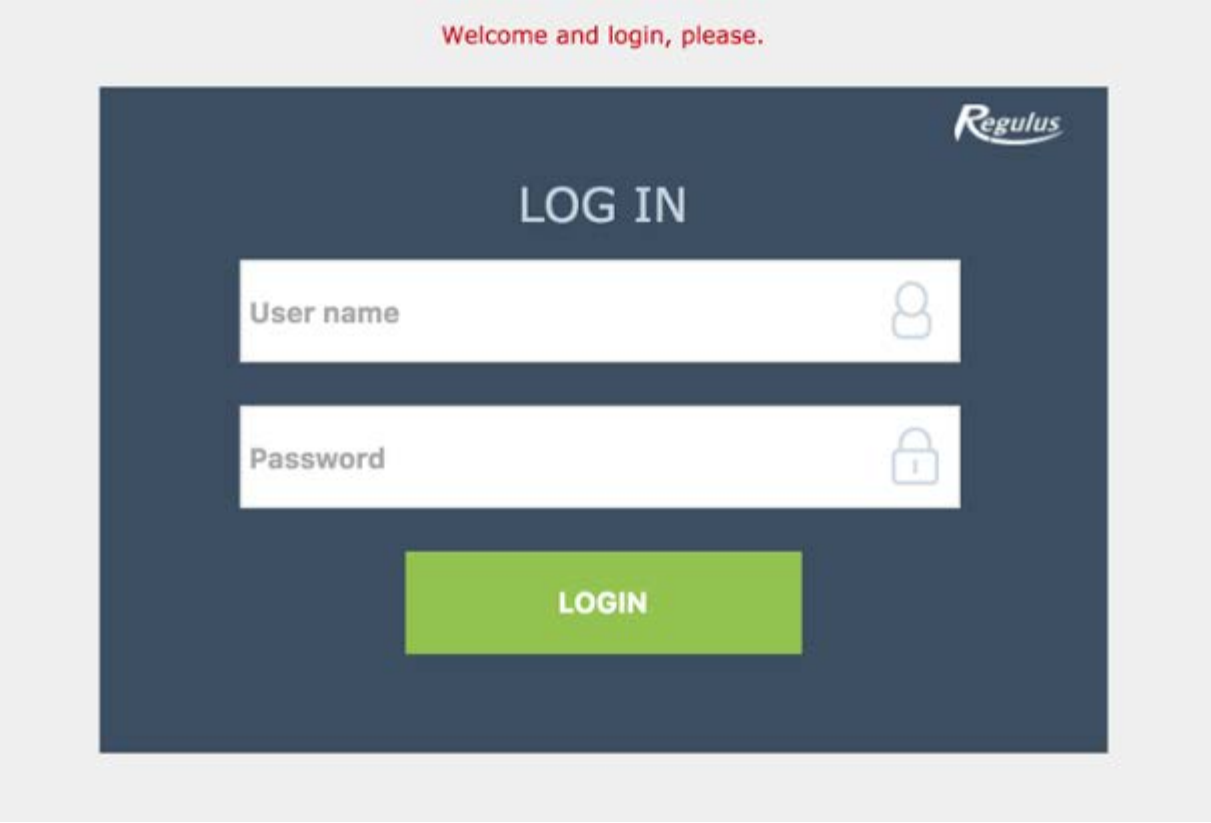
S 3.1 - Access to Service web interface, checking the IP address of the Controller

In order to access the Controller's interface via web browser, you need to know its IP address.

The IP address set in the Controller can be revealed by hitting DISP key. Then pressing arrow down key will display the IP address of the device, its mask and gateway.

Entering the IP address into the address bar of your browser will open a log-in window that enables visiting either User or Service level.

level	*username*	*password*
user	user	user



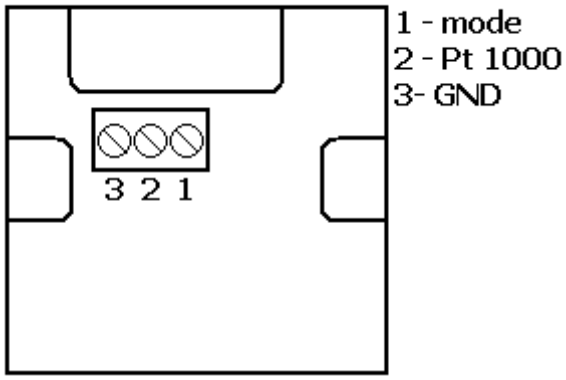
After successful login the welcome screen appears with the Service Menu.

S 4 - RC21 IR Room Unit, wiring

RC21 IR Room unit can be connected to the Controller. It involves a temperature sensor, keys for temperature correction and for a permanent temperature level, either Comfort or Setback.

The room unit shall be wired to the Controller with a shielded twisted cable 4x0.5 or 3x0.5, or 4x0.78 or 3x0.75 (e.g. JYTY).

Terminal board description:



Room unit connection to the Controller:

Room unit in Zone 1:

Unit terminal 1 → IR12 terminal C6 (t11) (sensor 1)

Unit terminal 2 → IR 12 terminal C7 (t12) (Zone 1)

Unit terminal 3 → IR 12 terminals B1,C1 (T_{GND})

The RC21 sensor type needs to be enabled on the Service level.

WARRANTY CERTIFICATE

IR 12 Heating Controller

Seller: ..... Date of Purchase: .....

WARRANTY CONDITIONS

1. The warranty period is 24 months from the date of purchase.
2. The product shall be installed and commissioned by a competent company or a person trained by the manufacturer.
3. When claiming warranty, this Warranty Certifi cate must be submitted together with the purchase receipt.
4. The warranty is valid only when the technical conditions set by the Manufacturer, installation manual and instructions in the documentation and on the product itself are maintained.
5. The warranty does not cover defects caused by external conditions or improper operation conditions, defects caused by usual wear and tear, further when the product is not used in compliance with its purpose and when the defect was caused by mechanical damage, improper handling, tampering by a third person, improper installation, improper stocking, natural disaster etc.

COMMISSIONING

Company: .....

Date: .....

Rubber stamp print and signature of the installing person:

Importer:

02/2017

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