

RF16



16 Zone RF Controller
Installation and Operating Guide

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16 Zone RF Controller
Installation Instructions

Important Notes

It is extremely important to use good quality batteries in the eTRV and eTRV-HW to ensure correct operation of the product. EPH recommend using Li-FeS₂ (Lithium Iron) batteries. If poor quality batteries are used, they may cause the product to stop communicating wirelessly, fail to communicate information correctly and stop opening or closing.

Low power or discount store battery brands should not be used. When the battery is low, a battery low notification will appear on the eTRV, eTRV-HW and on the EMBER app. The batteries should be changed immediately. Normally the eTRV will stop operating soon after this notification. When the eTRV / eTRV-HW shows a fault E4 – the motor is not operating correctly, this is normally due to a battery issue – possibly one or both of the batteries are not providing adequate power.

Li-FeS₂ (Lithium Iron) batteries are available from www.ephcontrols.com

The eTRV and eTRV-HW detect temperature and communicate on cycles every 4 minutes to conserve battery power. When buttons are pressed on the eTRV and eTRV-HW it will save these changes but may not communicate immediately to the RF16. It will communicate these changes on the next communication cycle.

The eTRV is designed for use with EPH TRV Valve bodies.

Factory Default Settings

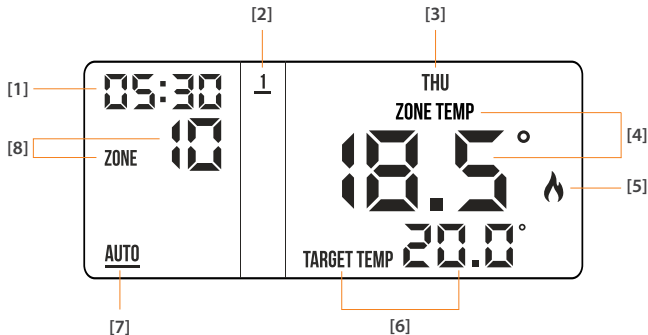
Contacts:	Volt Free Contacts	Operating Mode:	Auto
Program:	5/2D	Pin Lock:	Off
Backlight:	On	Service Interval:	Off
Keypad Lock:	Off		

Specifications

Power Supply:	230VAC	Backplate:	British System Standard
Ambient Temperature:	0...50°C	Pollution degree:	2 (Resistance to voltage surge 2000V; as per EN60730)
Dimensions:	142 x 95 x 27.8 mm	Software Class:	Class A
Contact Rating:	5(1)A	Frequency:	868.35 MHz
Backlight:	White		
IP Rating:	IP20		
Battery:	3VDC Lithium LIR2032		

LCD Display

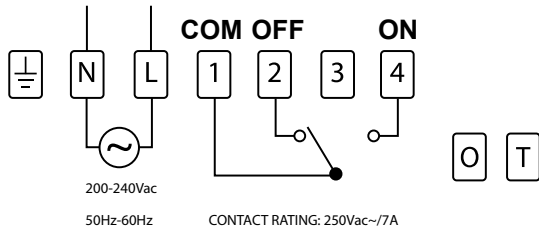
- [1] Displays current time.
- [2] Displays current program.
- [3] Displays current day.
- [4] Displays zone temperature.
- [5] Displays when a zone is calling for heat.
- [6] Displays current Target temperature.
- [7] Displays current mode.
- [8] Displays current zone.



Button Description



Wiring Diagram



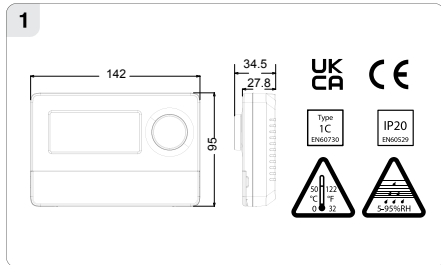
*If mains voltage output is required, terminal L & 1 must be electrically linked.
The cable link is provided with this controller.*

Mounting & Installation

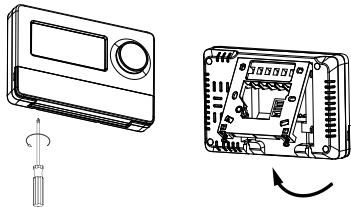
Caution!

- Installation and connection should only be carried out by a qualified person.
- Only qualified electricians or authorised service staff are permitted to open the controller.
- If the controller is used in a way not specified by the manufacturer, its safety may be impaired.
- Prior to setting the controller, it is necessary to complete all required settings described in this section.
- Before commencing installation, the controller must be first disconnected from the mains.

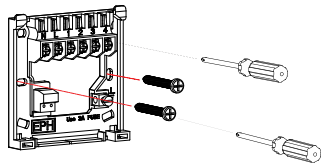
This RF16 can be surface mounted or mounted to a recessed conduit box.



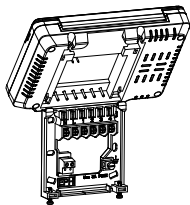
2



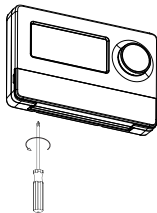
3



4



5



Mounting & Installation continued

- 1) Remove the controller from its packaging.
- 2) Choose a mounting location for the RF16:
 - Mount the controller in an accessible location.
 - Prevent direct exposure to sunlight or other heating / cooling sources. (Over ovens/ Kettles, etc.)
- 3) Use a philips screwdriver to loosen the screws of the backplate on the bottom of the controller.
The controller is lifted upwards from the bottom and removed from the backplate.
(See Diagram 2 on Page 9)
- 4) Screw the backplate onto a recessed conduit box or directly to the surface.
- 5) Wire the backplate as per the wiring diagram on page 7.
- 6) Sit the RF16 onto the backplate making sure the controller pins and the backplate contacts are making a sound connection, push the controller flush to the surface and tighten the screws of the backplate from the bottom. (See Diagram 5 on Page 9)



16 Zone RF Controller
Operating Instructions

Quick introduction to your RF16 Controller

The EPH RF16 is a central controller for the eTRV range. It will allow a wireless connection of up to 16 eTRV or eTRV-HW and allow the user to control and program these products.

Each eTRV can be programmed with up to 6 programs per day for each zone, for each day of the week.

This allows you to program all zones down to an individual zone to heat at any time.

You can manually control any zone, program any zone and also boost at any time.

With the addition of the GW04 gateway the system can also be controlled with the EMBER app which makes programming easier and gives you the ability to control the system from anywhere.

The RF16 will show each zone in rotation giving information as to it's current program, mode, current and target temperature so you can easily get information from every room in your home.

How your programmable eTRV and eTRV-HW works

AUTO mode: The eTRV & eTRV-HW will operate according to the times and temperatures that have been programmed.

When a program is scheduled to be ON it will remain ON until the next OFF program.

During this time the eTRV will remain on until the temperature setpoint is reached.

For Heating:

The user can select from 6 different programs per day - each with a time and temperature.

For Hot water:

The user can select from 6 different programs per day - each with a time and a status of ON or OFF.

There is only one temperature setpoint which is applied to all programs. The default temperature setpoint is 60°C. - See Page 30 for instructions on how to set the boost and hot water temperatures.

MANUAL mode: The eTRV & eTRV-HW will constantly work to the temperature that has been set.


OFF mode: The eTRV & eTRV-HW will be OFF, Frost protection will be active in this mode.

Setting the Date, Time and Programming Mode




5/2d DST ON


Press **TIME**, the year will begin to flash.

Rotate  to adjust the year.


Press .

Rotate  to adjust the month.


Press .

Rotate  to adjust the day.



Press .

Rotate  to adjust the hour.

Press .

Rotate  to adjust the minute.

Press .

Rotate  to adjust from 5/2d to 7d or 24h mode. Press .

Rotate  to turn DST (Day Light Saving time) ON or OFF.

Press **MENU** and the controller will return to normal operation.

Note:

Please see page 15 for descriptions of Programming Modes.

Programming Modes


This controller has the following programming modes, these are set in the TIME menu.

5/2 Day mode Programming Monday to Friday as one block and
Saturday and Sunday as a 2nd block of days.

7 Day mode Programming all 7 days individually.

24 Hour mode Programming all 7 days as one block.



Factory Program Settings 5/2d

5/2 Day						
	P1	P2	P3	P4	P5	P6
Mon-Fri	06:30	08:00	12:00	14:00	17:30	22:00
	21°C	10°C	10°C	10°C	21°C	10°C
Sat-Sun	07:30	10:00	12:00	14:00	17:30	23:00
	21°C	10°C	10°C	10°C	21°C	10°C
7 Day						
	P1	P2	P3	P4	P5	P6
Mon-Fri	06:30	08:00	12:00	14:00	17:30	22:00
	21°C	10°C	10°C	10°C	21°C	10°C
Sat-Sun	07:30	10:00	12:00	14:00	17:30	23:00
	21°C	10°C	10°C	10°C	21°C	10°C
24 Hour						
	P1	P2	P3	P4	P5	P6
Everyday	06:30	08:00	12:00	14:00	17:30	22:00
	21°C	10°C	10°C	10°C	21°C	10°C



Adjust the Program Setting in 5/2 Day Mode

For Heating:

Press **PROG**. 'All' will flash on the screen,

Press  to select all heating zones or rotate  to select a specific zone.



Programming for Monday to Friday is now selected.

Rotate  to adjust the P1 ON time. Press .

Rotate  to adjust the P1 temperature. Press .

Repeat this process to adjust P2 to P6 times and temperatures.

Programming for Saturday to Sunday is now selected.

Rotate  to adjust the P1 ON time. Press .

Rotate  to adjust the P1 temperature. Press .

Repeat this process to adjust P2 to P6 times and temperatures.

Press **MENU** to return to normal operation.


While in programming mode, pressing **TIME** will jump to the next day (block of days) without changing the program and pressing **PROG** will jump to the next program.

- Note:**
1. To change from 5/2d to 7D or 24H programming, refer to page 14, Setting the Date, Time and Programming mode.
 2. If you don't wish to use one or more of the daily programs then simply set the temperature to a low level as per default setting on P3 & P4 as shown on Page 16.

Adjust the Program Setting in 5/2 Day Mode continued


For Hot Water:

Press **PROG**. 'All' will flash on the screen,


Rotate  to select the hot water zone.

Press .

Programming for Monday to Friday is now selected.

Rotate  to adjust the P1 ON time.


Press .

Rotate  to select ON or OFF.


Press .

Repeat this process to adjust P2 to P6 times and temperatures.

Programming for Saturday to Sunday is now selected.

Rotate  to adjust the P1 ON time.

Press .

Rotate  to select ON or OFF.

Press .

Repeat this process to adjust P2 to P6 times.



Press **MENU** to return to normal operation.

Note:

1. Temperature for the hot water zone can only be set on the eTRV-HW.

Reviewing the Program Settings

Press **PROG**.

Rotate  to view zones and press  to select.

Press **PROG** to jump to the next program.

Press **TIME** to jump to the next day (block of days).

Press **MENU** to return to normal operation.


Copy Function

The RF16 can copy the programs from a zone to another zone and it can also copy from one day to another in the programming menu when set to 7d mode.


1. To Copy programs from a zone to another zone:

Press **PROG** to enter the programming mode.

Press **COPY**, 'COPY' will appear on the screen.

Rotate  and select the zone you want to copy from.

'00' & 'ALL' will flash on the screen.

Press  to copy to all heating zones and return to normal operation.

Alternatively rotate  to select a specific zone.


When the zone has been selected it will stop flashing, you can rotate  to select other zones.

Press **MENU** to return to normal operation.

Note: You can't copy from or to a hot water zone.

2. To Copy from one day to another while programming:

Copy function can only be used when the 7d mode is selected. (see page 14 to select 7d mode).


Press **PROG** to enter the programming mode. Rotate  and select the zone.

You should now program the day of the week that you want to copy.

Do not press  on the P6 temperature setting, Leave this setting flash.

Press **COPY**, 'COPY' will appear on the screen with the next day of the week flashing.

To add the desired schedule to this day, rotate  to the right. The day will appear solid on the screen.

To skip this day rotate  to the left. The day will disappear from the screen.

Press  and the selected days will be copied.

You will return to normal operation.

Zone Mode Selection AUTO

There are three modes available for selection.

AUTO The zone operates to the times and temperatures set in mode.

Temporary override - If the eTRV temperature is changed when in the Auto mode it will apply a temporary change to the current program and will then revert to the programmed settings at the next program time.

OFF The zone is permanently OFF.

MANUAL The zone operates to the temperature set on the eTRV / eTRV-HW only.

Press , 'ALL' will flash on the screen,

Press to select 'ALL' or rotate to the zone you wish to select. Press .

A line will appear under the mode, AUTO, OFF or MAN will show on the screen,

Rotate to select the required mode.

Press to select.

You will return to select another zone.

Press to exit at any point.



Boost Function

All zones can be boosted from the controller for 30 minutes, 1, 2 or 3 hours.

Press **BOOST**, 'ALL' will flash on the screen.

Note: *If you don't press any other button, all zones will be boosted for 1 hour after 10 seconds.*

Press  to select ALL zones or rotate the  to select the required zone and press .

The boost duration will flash, rotate  to select 30mins, 1hr, 2hr or 3hr and press  to select.


The target temperature will flash. Rotate  and press  to select the target temperature.

Note: The temperature selection will only apply to a eTRV heating zone.

Hot water will boost to the eTRV-HW temperature.


The selected zone will boost.

To deactivate a zone that is boosting

Rotate  to the zone and press **BOOST**.

To deactivate all zones that are boosting


Press **MODE** and select ALL zones by pressing .


Rotate  to change the mode to AUTO, OFF or MAN.

Press  to confirm.

Locking the Keypad


To lock the controller:


Press  for 10 seconds.

 will appear on the screen.

The buttons are now disabled.

To unlock the controller:

Press  for 10 seconds.

 will disappear from the screen.

The buttons are now enabled.

Master Reset

To master reset the controller to factory settings, locate the master reset button on the front of the controller. *(see page 6)*

Use a ballpoint pen to press the Master Reset button and release it.


The controller will reboot.

The controller will restart and revert to its factory defined settings.

Note: The paired eTRV/ eTRV-HW will stay connected.

Menu


This menu allows the user to adjust additional functions.

To access the menu, press .

P01 'rF Cn' Connecting an eTRV or eTRV-HW to the RF16 Controller

Note: The GW04 should be connected before pairing the eTRV / eTRV-HW see page 27.


On the RF16:


Press .

'P01 & rF Cn' will appear on the screen.

Press  to confirm.

'01' will appear on the screen.

Rotate  to the required zone.



Press  to select that zone.

'CONNECT' will appear flashing on the screen.

Note: When selecting a zone to pair, zones that are flashing are available while zones that are solid have already been paired.

P01 'rF Cn' Connecting an eTRV or eTRV-HW to the RF16 Controller

On the eTRV / eTRV-HW:

Press and hold  and  for 5 seconds.



'nOE' will appear on the screen followed by ' - - '


The eTRV will display 'r' followed by the **zone number**.

Press  to exit from screen.

On the RF16:

'CONNECTED' will appear solid on the screen when the eTRV is successfully paired.

Rotate  to pair the next available zone and repeat the process or press  to exit.


Press  to return to normal operation at anytime.

■ P02 'gAtE' Connecting the Gateway to the RF16 Controller

On the GW04:

Press and hold the RF Connect button on the GW04, the white light will start to flash.

On the RF16:

Press .

'P01 & rF Cn' will appear on the screen.

Rotate  until 'P02 & gAtE' appears on the screen.

Press  to select.


'CONNECT' will flash on the screen momentarily and the RF16 will return to normal operation.

The GW04 and RF16 will now pair.

The white light on the GW04 will stop flashing and will become solid.



P03 'HOL' Holiday Mode



This menu allows the user to switch off their heating system by defining a start and end date.

Press , 'P01 & rF Cn' will appear on the screen.



Rotate  until 'P03 & HOL' appears on the screen.

Press , 'FROM' the date and time will appear on the screen. The year will begin to flash.



Rotate  to adjust the year. Press .



Rotate  to adjust the month. Press .

Rotate  to adjust the day. Press .



Rotate  to adjust the hour. Press .

'TO' and the date and time will appear on the screen. The year will begin to flash.

Rotate  to adjust the year. Press .

Rotate  to adjust the month. Press .

Rotate  to adjust the day. Press .

Rotate  to adjust the hour. Press .

The controller will now be switched off during this selected period.

To cancel the HOLIDAY, press when holiday is active.

The controller will return to the normal operation when a holiday has finished or has been cancelled.

■ P04 'bL' Backlight Mode Selection ON

There are 3 backlight settings available for selection:

AUTO Backlight stays on for 10 seconds when any button is pressed.

ON Backlight is permanently ON.

OFF Backlight is permanently OFF.

Press , 'P01 & rF Cn' will appear on the screen.

Rotate until 'P04 & BL' appears on the screen.

Press .

Rotate to select between ON, OFF or Auto.

Press to confirm selection and return to normal operation.

P05 'bStL' Boost Levels Htg 21°C & HW 60°C

This menu allows the user to select the temperature that is used when boosting all zones.

Note: It is important that the hot water temperature level should be set here and should match the recommendation of the installer.

Press , 'P01 & rF Cn' will appear on the screen.

Rotate until 'P05 & bS tL' appears on the screen.

Press .

Rotate to select 'Htg' or 'HOT'.

Press .

Rotate to select the required default temperature for boost.

Press .

Press to return to normal operation.

■ P06 'rFdn' Disconnecting an eTRV from the RF16 Controller

To Disconnect all zones:

Press , 'P01 & rF Cn' will appear on the screen.

Rotate until 'P06 & rF dn' appears on the screen.

Press .

'ALL' will flash on the screen.

Press . 'nO' will appear on the screen.

Rotate until 'YES' appears on the screen.

Press to disconnect all connected eTRV and eTRV-HW's.

To Disconnect individual zones:

Press , 'P01 & rF Cn' will appear on the screen.

Rotate until 'P06 & rF dn' appears on the screen.

Press .

'ALL' will flash on the screen.

Rotate and you will see the numbers of the connected eTRV.

Press on the number of the eTRV that you wish to disconnect, 'nO' will show on the screen.

Rotate until 'YES' appears on the screen.

Press to disconnect the selected zone.

You will be returned to select other zones to disconnect.

Press to return to normal operation.


P07 PIN Lock



This menu allows the user to put a PIN lock on the controller. The PIN lock will completely lock the controller. **Note:** The EMBER app can still control a locked controller.

Set up the PIN


Press , 'P01 & rF Cn' will appear on the screen.



Rotate  until 'P07 & Pin' appears on the screen.

Press , 'OFF' will appear on the screen.

Rotate  to change from OFF to ON. Press . '0000' will flash on the screen.


Rotate  to set the value from 0 to 9 for the first digit. Press  to move to the next PIN digit.

When the last digit of the PIN is set, press . 'vEr1' is displayed with '0000'.

Rotate  to set the value from 0 to 9 for the first digit. Press  to move to the next PIN digit.


When the last digit of the PIN is set, press . The PIN is now verified, and the PIN lock is activated.


If the verification PIN is entered incorrectly the user is brought back to the first digit.


When the PIN lock is active the Lock symbol  will flash every second on the screen.


When the RF16 is PIN locked, pressing the menu will take the user to the PIN unlock screen.

To Unlock the PIN

Press , 'UnLO' will appear on the screen. '0000' will flash on the screen.

Rotate  to set the value from 0 to 9 for the first digit.


Press  to move to the next PIN digit.

When the last digit of the PIN is set. Press .

The PIN is now unlocked. If a PIN has been unlocked on the controller, it will automatically reactivate if there is no button pressed for 2 minutes.

To Deactivate the PIN


When the PIN is unlocked (see above instructions)

Press , 'P01 & rF Cn' will appear on the screen.


Rotate  until 'P06 & Pin' appears on the screen. Press .

'ON' will appear on the screen.

Rotate  to select 'OFF'. Press .

'0000' will flash on the screen. Enter the PIN. Press .

The PIN is now disabled.

Press  to return to normal operation.

P08 'SEIZ' Anti Seize Function OFF

The Anti-Seize function is used to activate each eTRV / eTRV-HW on the 1st of each month at 12:00. It will open and close the eTRV / eTRV-HW twice without calling the boiler.

Press , 'P01 & rF Cn' will appear on the screen.

Rotate until 'P08 & SEIZ' appears on the screen.

Press to select.

Rotate to select ON or OFF.


Press to confirm selection and return to normal operation.

■ P09 'FrSt' Frost Protection ON

Frost protection is built into the RF16, it is prefixed at 5°C and is not adjustable.

Frost protection will be set ON as default.

When an eTRV or eTRV-HW is set to the OFF mode and the temperature of the eTRV or eTRV-HW drops below 5°C then the zone will activate until the temperature reaches 5°C.

 will be displayed on the RF16, it will only show on the specific zone which has dropped below 5°C.

Press , 'P01 & rF Cn' will appear on the screen.

Rotate until 'P09 & FrSt' appears on the screen.

Press to select.

Rotate to select OFF or ON.

Press to confirm selection and return to normal operation.

■ P10 'Ot' OpenTherm® Menu

If OpenTherm® is connected, the OpenTherm® menu will display automatically.


dHW	Setting DHW temperature
dHOP	DHOP
Info	OpenTherm® Information
PL	Set OpenTherm® Parameters
EXIT	Exit


■ DHOP

This menu allows the installer to activate or deactivate DHW target temperature control from the controller.

■ Setting DHW Temperature

This menu allows the installer to change the DHW temperature of the boiler.

The temperature can be set in 0.5°C increments by rotating .

Press  to select the desired temperature.

This menu is only available when the controller is connected to OpenTherm® and dHOP is ON.

P09 Installer menu OpenTherm® Instructions


OpenTherm® Information

This menu allows the installer to view information received from the OpenTherm® boiler. It may take a few seconds to load information relating to each parameter. The information that can be shown from the boiler is outlined in the table below.

Displayed on screen	Description	Remark
tSEt	Target water temp	
tFLO	Outlet water temp	
trEt	Return water temp	
tdH	DHW temperature	This is only visible if DHOP is On (P09 OT Installer menu)
tFLU	Flue gas temperature	Dependent on boiler
tESt	Outdoor temperature	Dependent on boiler
nOdU	Modulation percentage	
FLOr	Water flow	This is only visible if DHOP is On (P09 OT Installer menu)
HOUr	Burner on time	
PrES	Water pressure	Dependent on boiler

PL Set OpenTherm® Parameters

This menu allows the installer to configure the OpenTherm® parameters.

To access the menu please enter the password "08" by rotating .

Press  to confirm.

The parameters that can be set are outlined in the table below.

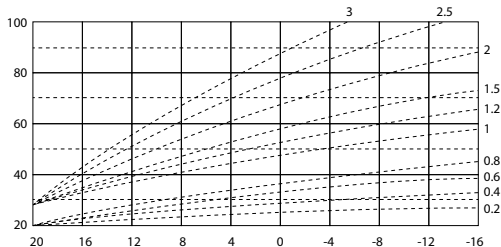
Param	Description	Range	Default
HHCH t-1	Maximum set point heating	45 - 85°C	85°C
LLCH t-2	Minimum set point heating	10 - HHCH°C	45°C
CLI t-3	This allows user to select different climatic curves for weather compensation. This only applies to Boilers with an outside sensor connected.	0.2 - 3.0	1.2
InFL t-4	Influence of room sensor on modulation of the boiler. Recommended value is 10.	0 - 20	10
HHbO t-5	This is the target setpoint for your CH flow temperature. Note: this value must be within the range of HHCH and LLCH.	HHCH Max >=ID57 >=LLCH Min	85°C
Exit	Press OK button to turn back to main interface.		

Menu continued


P09 Installer menu OpenTherm® Instructions


PL Set OpenTherm® Parameters

Climatic Curve




EXIT Exit

Press  to exit menu.


Press  at anytime to return to normal operation.

P11 'rSt' Resetting the RF16 Controller

Press .


'P01 & rF Cn' will appear on the screen.

Rotate  until 'P11 & rSt' appears on the screen.

Press .

'nO' will flash on the screen.

Rotate  until 'YES' flashes on screen.

Press .

The RF16 will reset to factory default.

Note: The paired eTRV / eTRV-HW will stay connected.

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