57640C 12/12 (MBC)

User Manual


WLM2


WLTA


WLTD


WLTP


WLCT2

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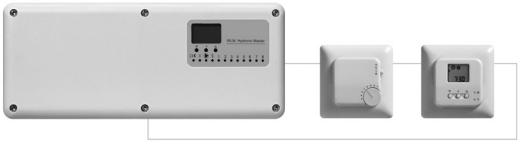
CONGRATULATIONS

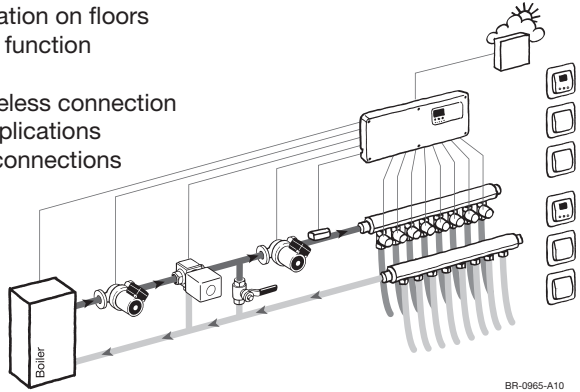


Congratulations with you new control system for underfloor heating and cooling.

The control system has been developed to provide a temperature control system for room heating and cooling, integrating the switching of primary heating and cooling sources with the control of water temperature and mixing devices.
This ensures the best possible comfort conditions and also reduces energy consumption.

Highlights of the system (depending on equipment):

:: Heating and cooling control for true comfort
:: Humidity sensor to prevent condensation on floors
:: Energy saving comfort with adaptive function
:: Area control for easy operation
:: Flexible installation for wired and wireless connection
:: Network communication for large applications
:: Easy installation with plug and lead connections
:: Optional weather compensation



CONTENT

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INSTRUCTIONS

QUICKGUIDES

QUICK GUIDE ANALOGUE ROOM SENSORS

TA TD TM

1 These room sensors have an adjustment knob, which enables you to increase or decrease the room temperature setting by up to 4 ˚C.

2 room sensors type WLTM-19 and WLTD-19 have a slide switch for selecting the mode of operation of the room sensor. 4 different modes can be selected: Auto, Day, Night and OFF

- Auto: Roomsensor will follow the temperature settings of the master, or if the room sensor belongs to an area controlled by a WLCT2 room controller, it will follow the automatic sequence of temperatures and timings set in the WLCT2.
- Day: It will control the room temperature according to the (DAY) setting defined in the master (typically 21 ˚C).
- Night: It will control the room temperature according to the (NIGHT) setting defined in the master (typically 18 ˚C).
- OFF: It will control the room temperature according to the (OFF) setting defined in the master (typically 5 ˚C). This setting is intended to be a ”frost protection” mode and is used if the room is to be left unoccupied for long periods.
  WLTM-19 & WLTD-19 are recommended for guest rooms and other infrequently used rooms, asthey allow simple override of the automatic timing sequence.

QUICK GUIDE WLCT2 PROGRAMMABLE ROOM CONTROLLERS

1 Setting time and day

If not already done by the installer, adjust the time and day on any WLCT2 room controller as follows: (picture with button positions)

a. Using a pen or pencil press the small pinhole button with the clock symbol.
b. Using the up and down buttons adjust the hours and press OK.
c. Using the up and down buttons adjust the minutes and press OK.
d. Using the up and down buttons adjust the day number (1 = Monday) and press OK.

2 Setting areas

If not already done by the installer, the WLCT2 room controller can be used to set the operating times and temperatures of room sensors (channels) in addition to controlling its own room.
To achieve this, do the following on the WLCT2 room controller:

a. Enter the “InFo” menu by pressing the up and down button simultaneously for 4 seconds.
b. Find the “ArEA” menu with the down button and press OK.
c. The display shows “CH 1” (channel 1).
- Press OK button.

- Select “On” if this channel (room sensor) should be controlled by the WLCT2 room controller, or “OFF” if not.
- Now press OK button to get to the next channel (CH 2) and repeat this step until all required channels have been selected “On”.

d. After all channels are set up, find the “ESC” menu entry and press OK.

NB: If different times and temperatures are required for other channels (room sensors) within the system, more than one WLCT2 room controller can be used. Care must be taken to ensure that the action of selecting a channel “On” is not made on more than one WLCT2 room controller.

3 Setting program times and temperatures

Adjusting the program times and temperatures.
On Monday to Friday (day 1-5), the CT room controller operates a 4-event program (wake, leave, return, sleep), and on Saturday and Sunday (day 6-7), 2-events (wake and sleep). Each event can have a separate temperature & time.
Each event is indicated on the display by the symbols (☼ ⌂▸ ⌂◂ ☾)
To adjust these settings:

- **a.** Press OK button for 5 seconds.
- **b.** The display shows the wake up time for Monday to Friday.
- **c.** To adjust the hours use the up and down buttons and press OK.
- **d.** Now adjust the minutes using the up and down button and press OK.
- **e.** Now adjust the desired wake up temperature using the up and down button and press OK.
- **f.** Now repeat b to e for the leaving time and temperature, the return time and temperature and the sleep time and temperature.
- **g.** Now repeat b to e for Saturday and Sunday wake and sleep times and temperatures.

NB: To set up different types of event programs, change to Fahrenheit scale, change to AM/PM clock or change of other advanced settings - please refer to the section Instructions WLCT2.

QUICK GUIDE FOR MASTER MODULES

WLM2-1BA + WLM2-3BA

WLM2-1FS + WLM2-3FS

BA masters are pre set and need no adjustment - see “Factory settings” page 13
On the FS Master you can adjust the operating temperatures for any rooms which are not controlled by a CT room sensor.

1 Setting day temperature

To adjust the day temperature (indicated by a sun in the display), press OK button.
Now use the up and down buttons to select the temperature required, and press OK button.

2 Setting remote night temperature

If a remote timer has been fitted by the installer, it is possible to automatically switch to a night temperature.
To adjust the night temperature, press the up button until the moon is displayed and press OK button.
Now use the up and down buttons to select the temperature required, and press OK button.

Other advanced settings can be changed-See section “Master with display type WLM2”.

TROUBLE SHOOTING

- If any LED is flashing on master - Please refer to section “Error indication”.

Room is too cold.

(After running for at least 48 hours)

1. The room sensor is placed in a position that does not represent the general temperature in the room. E.g. mounted on external wall or near an extraneous heat source
2. If the room is controlled by a WLCT2 room controller, check that the time and temperatures are set correctly.
3. If the room sensor has got an override switch (WLTM or WLTD), the switch may be set in the “off” or “night” position.
4. For rooms with floor sensors, the maximum floor limit setting could be preventing the room reaching the desired temperature.
5. Insufficient heating capacity of the system.
6. Bad insulation creating large heat loss.

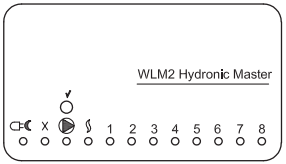
Room is too hot.

(After running for at least 48 hours)

1. This could be caused by draughts within the wall cavities.
2. The room sensor is placed in a position that does not represent the general temperature in the room.
3. If the room is controlled by a WLCT2 room sensor, check that the time and temperatures are set correctly.
4. If the room sensor has got an override switch (WLTM or WLTD), the switch may be set in the “day” position
5. For rooms with floor sensors, the minimum floor limit setting could be increasing the room temperature above the desired setting.
6. Solar gain or extraneous heat source.

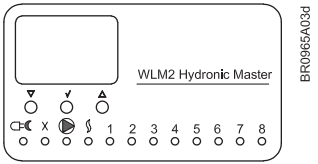
Master with Display Type WLM2

Introduction



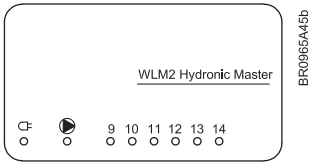
WLM2-1BA - 3BA

The masters type WLM2-1BA and -3BA are pre-set and need no adustment. See Master factory settings page 11.



WLM2-1FS -3FS

The masters type WLM2-1FS and WLM2-3FS are provided with graphic display to enable simple programming and operations of the unit to be achieved using simple and easy to understand icons and symbols.



WLM2-1AO and WLM2-3AO

The ADD ON type WLM2-1AO and WLM2-3AO is an extension module for additional 6 outputs. The module needs no adjustment

Using Clock thermostat (WLCT2-x9):

If a room controller is used as an area control for one room or a group of rooms, then all the room sensors within this zone will operate according to the temperatures and times defined in the room controller. However the local room sensors within the group are still capable of being adjusted by ± 4 ˚C so that some rooms can be set higher or lower than others. The decision as to which room sensors will form part of the room controllers group is made by programming the room controller (see instructions for WLCT2 unit). Any room sensors that are not part of the room controllers group will operate to the temperature as defined in the master control, but again with the option of local ±4 ˚C adjustment.

Using External Switch for Night Setback

The day temperature set point is defaulted to typically 21 ˚C and the night temperature to typically 18 ˚C. These default settings can be changed on the FS master.
The current operating set point of the master can be changed from the day temperature into night temperature, by connecting a separate timing device to the master. When the external switch or timer is used to switch to night setback, this will override any time settings in a WLCT2 room controller, including any room sensors that are part of a group allocated to that room controller.

Moving Around in the Menu

By using the (△) (UP), and the (▽) (DOWN) you move through the main menu into sub menus. The description of these submenus can be seen below. If a value needs to be changed, then press (√) (CONFIRM) button once, and alter the value with the (△) (UP) and (▽) (DOWN) buttons. Then press (√) (CONFIRM) to accept the new value.

If you wish to reset the master to factory settings, then push the (√) (CONFIRM) button for 15 sec. until the 8 outputs starts blinking. The master has now been reset to factory settings.

Control of Room Temperature

Within the memory of the master, there is a room temperature Setpoint which will apply for all rooms connected to the system. This setting is typically 21 ˚C when the unit leaves the factory, but it can be increased or decreased as required. Any change will apply to all rooms on the system unless a room controller is employed (see next para).

Day Temperature

21 ˚C

Temperature set point for all room sensors not part of a room controller group.
Push (√) accept and (△) (▽) to adjust the set point.

Night Temperature

18 ˚C

When activated via an external timer, this action is valid for all room sensors connected to the master. Night setback can also be activated on individual room sensors (WLTM & WLTD) by using the selector switch and setting to the “night” position. A room controller (WLCT2) will automatically switch to night setback at the times programmed into it, as will all the other room sensors which are included in its group.

Off Temperature

5 ˚C

All room sensors with an override switch (WLTM & WLTD) can be set to an OFF position. This is known as a frost protection position, and if the temperature in the room shoud fall as low as 5 ˚C, the heating will be enabled to prevent frost damage. The 5 ˚C level can be changed in the master module.

Max.

27 ˚C

Maximum Floor limit temperature for room sensors with limit sensor (floor sensor)

Min.

17 ˚C

Minimum Floor limit temperature for room sensors with limit sensor (floor sensor)

Supply Water Temperature Control

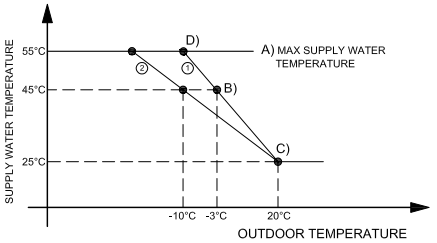
Using supply water sensor for limitation of supply water:

A limit sensor should be used with the WLM2 1FS & WLM2 3FS, but can be used without the weather compensation module (WLOC-19). In this case the master will control the supply water temperature flowing into the system via the 3 or 4 port mixing valve and actuator. The factory default setting is 45 ˚C, but can be changed via the master display.*

Using outdoor compensation module for weather compensation

When the outdoor compensation module (WLOC) is connected to the system, the master calculates the correct supply water temperature, taking into account the heat losses that will vary depending on the outdoor temperature, and the room temperature requirements of the system. For example, on a day when the outdoor temperature is 12 ˚C, it is possible to run the heating system with a supply water temperature of only 35 ˚C. this ensures economical running of the boilers, and comfortable room conditions throughout the year. The max allowed supply water temperatur prevents excessive water temperatures if the outdoor temperature becomes extremely cold, e.g. - 30 ˚C.

	55 °C	Max allowed supply water temperature. (This is a safety maximum)	
		-3 °C	**Winter** Outdoor temperature
		45 °C	**Winter** Design supply water temperature at outdoor temperature –3 °C Design supply water temperature if used **without** outdoor compensation module.*)
			**Return**
		20 °C	**Summer** Outdoor temperature
		25 °C	**Summer** Supply water temperature at outdoor temperature 25 °C



Line 1: Factory settings
Line 2: Example on modified settings

Max supply temperature
The max allowed supply water temperature is set according to the design requirements of the installation (line A on the curve). This is the safely maximum.

Weather compensation

Winter
A design outdoor temperature and the corresponding design supply water temperature are set (point B). To increase the heat output, adjust the supply water temperature higher, until you feel comfortable (we recommend only a 2 degree adjustment of this temperature at a time, and time allowed for the system to respond).

Summer
An outdoor temperature and the corresponding supply water temperature are set (point C). Set the outdoor temperature at the level where heating will no longer be required (this is known as the summer shut down temperature) Default setting is 20 ˚C.

Then set the supply water temperature that you require when the outside temperature is at 20 ˚C. The default is 25 ˚C.

To start the summer shut down at a lower temperature level, reduce the outdoor temperature setting, and/or reduce the supply water temperature at this setting.

The master calculates the supply water temperature on the line C to 1 if an outdoor design temperature of -3 ˚C is selected, or on the line C to 2 if the outdoor is selected at -10 ˚C. The intersection point on the line of the actual outdoor temperature indicates the calculated supply water temperature.

Compensation for outdoor temperature can only be done if an outdoor compensation module (WLOC) is installed. Without outdoor compensation module the Master will adjust the supply temperature after the design supply water temperature winter setpoint (default 45 °C).

55 °C

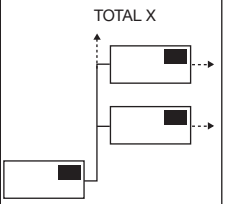
Service menu
Push accept to enter
The controller will automatically return to main menu after 30 minutes.

2.0 — Software version

OK no failures
E0 to E11 if a failure is present. See page 15 for explanation.
LS= Low signal on wireless room sensors/controllers
LB= Low battery on wireless room sensors/controllers *Submenu 2*

C00 - OU---	C08 - OU---
C01 - 1U-E1	C09 - OU---
C02 - 1U-OK	C10 - OU---
C03 - OU---	C11 - OU---
C04 - OU---	C12 - OU---
C05 - OU---	C13 - OU---
C06 - OU---	C14 - OU---
C07 - OU---	C15 - OU---

Push accept to enter and see which unit has the failure *Submenu 2a*



Network Status (normally hidden)
If a network master detects a network this menu entry is shown.
Here it is possible to check the status of the network.

"TOTAL X":	Shows how many masters the network master detects. (x is the amount of connected masters)
"NET OK"	No errors detected in the network
"ERROR ON IDxx"	Shows if any of the attached masters has local errors. (IDxx tells which master it concerns. The ID number is what the encoder on the master is set to)
"NET ERROR"	Tells that one or more masters on the network has stopped communicating. Please use the menu entry below to check which masters it concerns

Push accept to enter and see which master it is that has the error and what error it is.
Using the "up" and "down" button, select which masters status should be shown on the right side of the display.

>ID11 - ? ID12 - ? ID21 - ?	E:CHANNEL

Possible Errors:

"LOADING STATUS..." :	Receiving information from the network.
"STATUS OK":	No errors detected
"NET-COMM ERROR" :	Communication is missing to that master. Please check the connection or remove the master from memory with a hard reset.
"E1-E11":	The same errors as shown in section "Error Indication" under "Flashing Power LED"
"E:CHANNEL":	This is a channel error which has to be checked locally on that master.

	 -2.4 °C	**Read-out** Outdoor temperature
	 49.2 °C 39.2 °C	**Read-out** Actual supply water temperature Actual application sensor temperature
	 44.4 °C	**Read-out** Calculated setpoint by the controller for the supply water temperature
	 3.5 V	**Read-out** Control signal for the mixing valve. At 10 V the mixing valve is fully open (unless the output setting has been changed to 10-0, in which case at 10 V, the valve will be fully closed). Push accept for 3 sec. to change PI-action & 0-10 V out.
	 --- 24.0 °C 22.9 °C	**Read-out** Room temperature in the different rooms. Push accept (√), and the up and down keys to select another room. The actual room temperature is shown in the centre of the display. If a maximum limitation sensor is connected the measured temperature is shown above the room temperature, and if a minimum limitation sensor is connected, the temperature is shown below.
		**Return**

Using cooling functions

If the installation is capable of doing cooling, a WLAC-1 switching module is installed.

To enable cooling, switch the slider on the right hand side to the cooling position.
The system now switches into cooling with a set point than is 3˚C above the master day set point.
(In case the WLAC-1 module is connected to a BMS controlled signal, the BMS system will make the decision when to switch to cooling – please leave the slider on the WLAC-1 in position heat).

- By using a humidity sensor the system limits the formation of condensation on floor surfaces due to high humidity.
- If a dehumidifier is being used it will activate if high humidity limits the cooling function.
- When cooling is enabled the cooling set point will be pre-determined by the master and will override any settings in any clock thermostat to ensure optimum energy efficiency.

Master Factory Settings

Master	Settings		Factory setting	Own settings
BA/FS	House temperature		21 ˚C	
	Night temperature		18 ˚C	
	Off temperature		5 ˚C	
	Floor Limit temp high		27 ˚C	
	Floor Limit temp low		17 ˚C	
FS	Max water temperature		55 ˚C	
	Weather compensation	Outdoor temperature	-3 ˚C	
	Cold (winter)	Water temperature	45 ˚C	
	Weather compensation	Outdoor temperature	20 ˚C	
	Warm (summer)	Water temperature	25 ˚C	

Additional information

Master	Settings		Factory settings
BA/FS	Cooling mode	Day cooling temperature	Day heat temperature + 3 °C
		Night cooling temperature	Day cooling temperature +3 °C
		DEW point safety zone	DEW point + 3 °C
	Room temperature control	PI - control	P = 4 °C I = 90-180 sec K-factor = 0.1
	Floor Limit temperature control	P - control	P = 4 °C
	Adaptive PWM control	Max allowed Room temperature fluctuation	+/- 0.5 °C
		Self adjusting (adaptive) PWM time interval limits	15 – 45 minutes
	Max number of connected sensors	Wired and wireless	24
	Sensor timeouts	Wired	300 sec. (5 min)
		Wireless	10000 sec. (2 h 45 min)
FS		Minimum cooling supply water temperature	16 °C
	Supply water temperature control	PI - control	P = 20 °C I = 300 sec. K-factor = 0.05

Error Indication

During normal operation the power LED will be ON when the master control is energised. The red output Channel LED's (1 to 8 on the master, and 9 to 14 on the add-on module) will indicate if the channel output relay is ON/OFF.

An error / fault message is shown by flashing the power LED or one of the red output Channel LED's. From the number of flashes on any one LED, the problem can be diagnosed, and identified from the following:

The error number will be indicated by the number of flashes, with a pause of less than a 1/2 second between the flashes. The indication will be followed by a pause of 2 seconds, following which the sequence will be repeated. The failure code can also be seen in the service menu on WLM2-FS MASTERS (submenu 2).

Flashing Power LED (Red and green)
Communication to the network has errors. On the network master it tells that one or more masters are not communicating. On a network slave it tells that communication to the network master is missing.

Flashing Power LED (Red)

E1, 1 flash	One or more room sensors, room controllers, WLH, WLAC that are set to channel 0 or channel 15 are no longer sending data to the master control. The fault is corrected by replacing the room sensor. The master will need to be HARD RESET (see next page "HARD RESET") *(NOTE: If the room sensor is of the WIRELESS type, the error/fault message could be an indication that the power has failed, and that the internal battery of the room sensor needs to be replaced)*
E2, 2 flashes	One or more room sensors have been set to a channel number which does not exist in the system. For example, the message will occur if the units are set to channels 9-14 and the required add on (AO) module are not found in the system. The error is corrected by setting the channel number of the room sensor to a channel that does exist within the installed master/add on module system.
E3, 3 flashes	Application sensor defect. The fault is corrected by changing the temperature sensor. If the sensor has been removed deliberately to change the operation of the system, follow the HARD RESET instruction below.
E4, 4 flashes	The outdoor compensation module (WLOC) is defective. The fault is corrected by changing the outdoor compensation module. If the module has been removed deliberately to change the operation of the system, follow the HARD RESET instruction below.
E5, 5 flashes	The external Supply limit sensor (type ETF-1899A) is defective. The fault is corrected by changing the temperature sensor. If the sensor has been removed deliberately to change the operation of the system, follow the HARD RESET instruction below.
E6, 6 flashes	Internal overheating. The master has its own internal safety temperature protection system. The problem is corrected by improving the ventilation around the master module.
E7, 7 flashes	Defective internal overheat sensor. The Master will control as normal, however the protection against internal over heating is no longer active. The fault can only be corrected by replacing the master module.
E8, 8 flashes	The communication to the AO module has been lost. The fault is corrected by re-establishing the connection to the AO module or by changing the AO module if it is defective - or if it has been deliberately removed, with a HARD RESET.
E9, 9 flashes	Indicates total number of input units exceeded. Please refer to factory or your local service engineer.
E10, 10 flashes	No connection to wireless receiver, type WLRC2-19.
E11, 11 flashes	Step 2 on 2-step controller (WLCT2-X9/2) is used by another room sensor/controller.

Only one error/fault condition can be shown at a time. If more than one error occurs, they will be prioritised in the shown sequence (E1, 2, 3…).

Flashing output LED (red):

The appropriate output channel LED can flash, indicating that the room sensor or room contoller on that channel has a fault/error. The failure code can also be seen in the service menu (submenu 2a).

E1, 1 flash	The master has lost communication to the room sensor. The fault is corrected by re-establishing the connection to the Room Sensor and the fault condition will be automatically reset once correct communication is resumed. If the room sensor is defective and has to be changed, or if it has been deliberately removed, it is necessary to make a HARD RESET. (NOTE: If the room sensor is of the WIRELESS type, the error/fault message could be an indication that the power has failed, and that the internal battery of the room sensor needs to be replaced)
E2, 2 flashes	The internal sensor in the room sensor/controller is defective. The fault can only be corrected by replacing the room sensor/ Controller. Remember to make a HARD RESET after installing the new room sensor/controller.
E3, 3 flashes	The limit sensor on the room sensor/controller is defective. Replace the faulty sensor. Reset is NOT required.
E4, 4 flashes	Defective WLCT2 room controller. If a room controller operating a group of room sensors becomes defective, the remaining room sensors will continue control within the maximum and minimum limits programmed into the Room controller.
E5, 5 flashes	Two or more room controllers are trying to control this output. Check “AREA” setting on the room controllers.
E6, 6 flashes	Channel output number one is configured as a dehumidifier output, error caused by a room sensor/controller also being set to control this output.

RESET
There are 2 different reset actions that can be used.

HARD RESET
If the ‘√’ button is pressed for 5 seconds, a HARD RESET will be initiated. (Indicated by all the red output LED’s (1-8) lighting in sequence). This reset will remove from the system any room sensor unit with a defective input sensor, or a defective AO module. The fault message will be reset but the defective items will no longer participate in the system. To add or replace a new unit, please refer to “Replacing equipment - Replacing a faulty sensor/ controller”. To erase the identity of the defective component from the master memory a HARD RESET must be performed Hard resets do not alter the temperature settings already programmed into the master control.

FACTORY RESET
If the (√) button is pressed for more than 15 seconds, a total factory reset will be initiated. This is indicated through flashes of channel LEDs 1,3, 5 and 7 alternating with channel LEDs 2, 4, 6 and 8 (while the “√” button is pressed).
A factory reset will put all programmed temperature settings back to the factory defaults. It will also remove all room sensors/Controllers from the master memory, and reset the system to accept only those room sensors/Controllers that are functioning correctly.
To reconnect room sensors/controllers, please refer to “Replacing equipment - Replacing a faulty sensor/controller”.

Type WLCT2 (and WLCT2/R/HW/2)

Introduction

The room controller type WLCT2-x9 is a 4 event programmable controller used to control underfloor heating areas or special features on the WLM2 installation. The standard WLCT2-x9 can be used to programme up to 4 time and temperature events over a 24 hour period, based upon a 7 day setting. Once a WLCT2-x9 has been fitted the times and temperatures for the area(s) it controls will no longer come from the defaults set in the main WLM2 master.

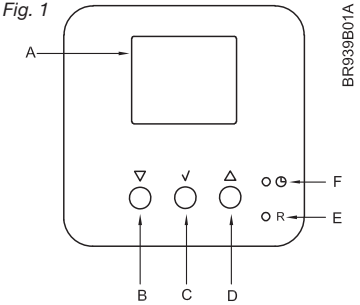
In addition to the immediate area of control set, within the WLCT2-x9, and selected via the 'AREA' setting contained within its internal menu, the WLCT2-x9 can control the time and temperature characteristics of other sensor (up to 14) fitted to the WLM2 master, this has been designed to maximise comfort and efficiency and promote energy saving and associated cost savings.

Where the WLCT2-x9 is controlling other areas the +/- 4 °C setting of those areas will now operate from the WLCT2-x9 settings, e.g. A WLCT2-x9 is set to 22 °C and has been given control over 'Area 1', the WLTA-x9 fitted in 'Area 1' now has a control range of 18 °C (-4 °C) to 24 °C (+4 °C).
In addition to the standard WLCT2-x9 room controller, you may have fitted to your system one of the following;

WLCT2-x9/2: This control allows the operation of a secondary heat source, for a specific area, as a boost function operating in conjunction with the underfloor heating.
WLCT2-x9/R: This control is used for the control of radiators in a domestic central heating circuit.
WLCT2-x9/HW: This control is used for the production of hot water control within a system.
Upon installation your installer should have set up the WLCT2-x9 control to suit your needs, should you need to change any of the setting please follow the instruction detailed in following pages.
The WLCT2-x9: can be reset by pressing the button marked 'R' (see fig 1), this will allow you to return to the factory settings at any time. The default factory settings are detailed after the WLCT2-x9 programming section of this manual.

Getting Started

Fig. 1

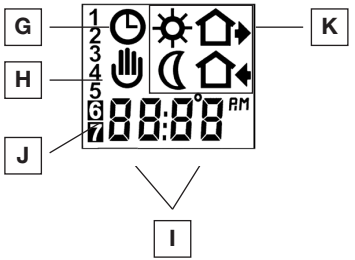


Buttons

A:	B: ▽	C: √
Display	Adjustment down	OK - accept

D: △	E: R	F:
Adjustment up	Reset to factory setting	Pin button adjust of clock

Display



G:	H:	I:
Automatic mode	Manual mode	Time and temperature

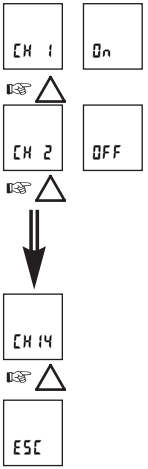
J:	K:
Day number	4-event symbol Wake Out Night Home

Setting the room controller into operation

First time power is connected the clock and day will be flashing and must be set. If you need to adjust the time of the thermostat at a later date, insert a pin into the hole marked (see fig. 1) for setting of time and day. Adjustment should be made for change in summer and winter time.

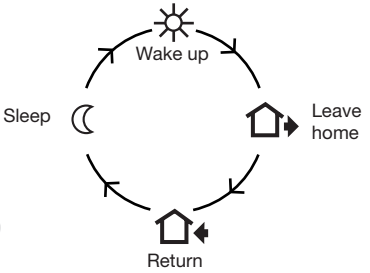
	☞ △ ▽ √	Press the UP (△) or DOWN (▽) buttons to select the correct **hours** and press OK button (√).
	☞ △ ▽ √	Press the UP (△) or DOWN (▽) buttons to select the correct **minutes** and press OK button (√).
	☞ △ ▽ √	Then press the UP (△) or DOWN (▽) button to select the correct **day** and press OK (√) button. 1-7

AREA SETUP - see next page.

ArEA	**ArEA - (Group of rooms)** The rooms that are to be set as part of the WLCT2 area will follow the temperature settings of the room controller example, an area could be the living room, kitchen, and children's rooms, having a high room temperature requirement during afternoon and early evening, and a lower temperature during the early part of the day and at night. Each room sensor will have a channel number, designated CH1, CH2 etc. The appropriate channel number of any room sensor is determined by the numbered output on the master control which is actually switching the valve/actuator for that area. For example, a system may have the kitchen room sensor operating master output # 4, and the childrens room sensor operating master output #5. If the WLCT2 room controller is then situated in the living room, and operating output #1, then the WLCT2 need be programmed to control outputs 1, 4, & 5. (Each room sensor will have been set to operate its appropriate output ch see separate instructions). To do this, enter the ArEA sub menu., and press OK (√) button. CH 1 will be displayed; use the OK (√) button and then the UP (△) button to change the setting to ON. Press OK (√) and CH 2 is displayed. Use the UP (△) button until CH4 is displayed, press OK (√), and change to ON. Repeat this for CH 5. All three room sensors will now operate under the control of the WLCT2 room controller. In total up to 14 Channels can be programmed in this way, and it is possible to have more than a single room controller, each own sub room sensors operating to its schedule and temperatures.	
		Set the Channels / Rooms (Ch) to ON if they should follow the settings of this clock thermostat. In total 14 channels / rooms can be controlled.

Daily Use of the room sensor

4-Event Clock Mode



The day has been split into 4 events describing a typical day. When the room sensor is in this 4-event mode it will change the temperature to the required level automatically at the programmed times. As standard the room controller has days 1 to 5 (Monday to Friday) with 4 events and days 6 and 7 (Saturday and Sunday) with 2 events. Each events allows you to increase or decrease the set temperature. For programming see page 17.
Please, see page 18 - PRO - 4-event sequence to alter the daily event sequence.

4-event clock mode/ automatic mode:		In automatic mode, the clock function symbol (◷) and one of the 4-event symbols (☼ ⌂▸ ⌂◂ ☾) will be indicated. Programming page 17.
Comfort mode: ☞ △ ▽ ⌛ 5 secs.		**Temporary override** To temporarily override any temperature in the 4-event schedule program, press the UP (△) button once, to show the temperature in the display, and press UP (△) or DOWN (▽) again to increase or decrease the temperature. The display will flash for 5 seconds, and will then revert to the time. The override will operate until the next programmed event when the thermostat will resume the automatic programme.
☞ √ √		**Cancel comfort mode (temporary override)** To cancel the temporary override, press the OK (√) button twice.
Manual mode: ☞ √ △ ▽ ⌛		**Permanent override:** During holidays, the scheduled 4-event program can be overridden. Press the OK (√) button, and then the UP (△) or DOWN (▽) button until the override temperature is set. The set temperature will remain in the display and the unit will now operate to this temperature permanently.
☞ √		**Cancel manual mode** To cancel the permanent override state press the OK (√) button once, and the unit will resume automatic function.

Programming 4-Event Clock Time and Temperature

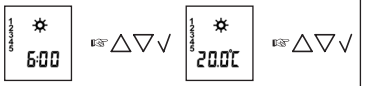
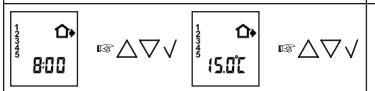
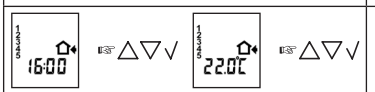
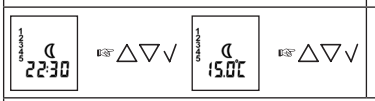
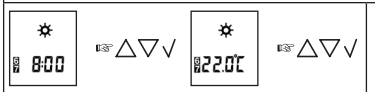
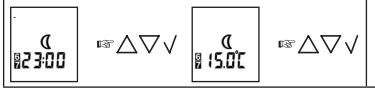
For each event, the start time and required temperature needs to be set.

For example, in the morning you wish the heating to start at 07:00 and the temperature to rise to 25 ˚C. Press OK (√) button for 3 seconds and the start time is displayed. Change this to 07:00 with the UP (△) or DOWN (▽) button. Press OK (√) to confirm.
The temperature is now displayed. Change this to 25 ˚C with the UP (△) or DOWN (▽) button. Press OK (√) button to confirm. This action can now be repeated for the second, third and fourth event.

These settings will be valid for days 1-5 showing on the display. To program the days 6 and 7, repeat the above. Days 6 and 7 are usually Saturday and Sunday, and only have two events (generally morning ON and evening OFF).

The temperature can be set within the range of +5 to +35 ˚C. It is also possible to select the heating OFF at that event by reducing the setting to 5 ˚C, and then pressing the (▽) once more.

Note that when programming the "Sleep" time (event 4), please ensure that this time is before midnight (00:00).

Press OK (√) button for 3 secs. to begin programming	
Day 1 - 5	
	☼ : Time and temperature
	⌂▸ : Time and temperature
	⌂◂ : Time and temperature
	☾ : Time and temperature
Day 6 - 7	
	☼ : Time and temperature
	☾ : Time and temperature

Advanced Settings and Read-out

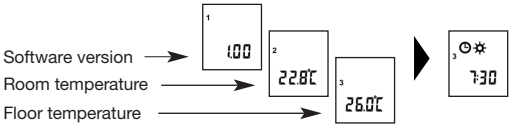
☞ △ + ▽

Press both UP (△) and DOWN (▽) buttons together for 3 seconds. INFO is displayed.
Continue pressing the UP(△) button until you reach one of the desired sub menus, PRO, Hi Li, Scal, and ArEA (For explanations, see below. Select the sub menu with the OK (√) button.

InFo ☞ √

INFO - Information
The values of the actual measured room temperature and the floor temperature can be seen.
The floor temperature is only shown if a floor sensor is installed.

☞ △

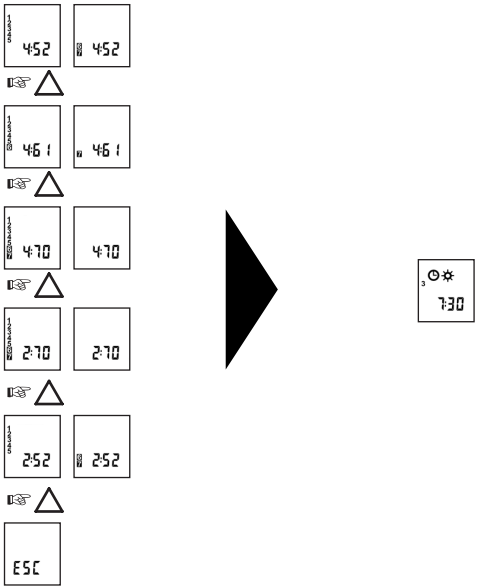


Press UP (△) or DOWN (▽) button to show the different readouts.

No changes can be made here. Use the OK (√) button to end.

Pro ☞ √

PRO - 4-event sequence
It is possible to change the factory event sequence of Days 1-5 - 4 event, and days 6 & 7 – 2 event. Days 1 to 5 are usually Monday to Friday, whilst days 6 & 7 are usually Saturday & Sunday. An EVENT is either an ON or an OFF operation. You can select from the following sequences which are displayed in the form of a code.



4 events 5 days, 2 events 2 days indicated by Code 4:52

4 events 6 days, 2 events 1 days indicated by Code 4:61

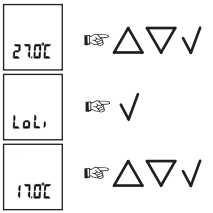
4 events 7 days indicated by Code 4:70

2 events 7 days indicated by Code 2:70

2 events 5 days, 2 event 2 days indicated by Code 2:52

Select the required sequence with the OK (√) button.

Hi Li - Floor sensor. Max and min allowed temperature of the floor surface
A limit sensor can be connected to the room controller.
Max limitation is used for safety to prevent high floor temperatures. For example wooden floor constructions which should not be allowed to exceed a maximum of 27 ˚C. The value can be set from 5 ˚C up to 55 ˚C. The value can also be set to OFF (adjust the temperature to 55 ˚C and push button up once more).
Low limitation is used where the temperature of the floor is required never to fall below the minimum set temperature. Example in kitchens or bathrooms with tiles. The value can be set from 5˚ C up to 55 ˚C. The value can also be set to OFF (adjust the temperature to 5 ˚C and push button down once more). Remember the max limit temperature must be set higher than the min limit temperature.
The limit temperatures defined in the room controller will be valid for all the room sensors with limit sensor (type WLTD-19) which are part of the area allocated to the WLCT2 unit.

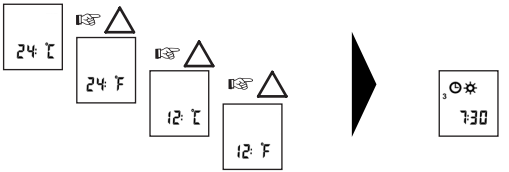


The maximum allowable floor temperature setting is shown. Use the UP (△) or DOWN (▽) button to increase or reduce, and OK (√) button to accept.

The display will now show LoLi. Press OK (√) button to continue.

The minimum allowable floor temperature setting. Use the UP (△) or DOWN (▽) button to increase or reduce and OK (√) button to accept.

SCAL - Time and temperature scale selection



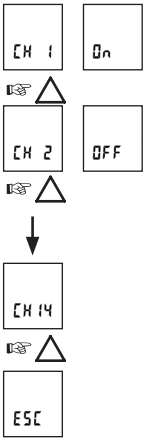
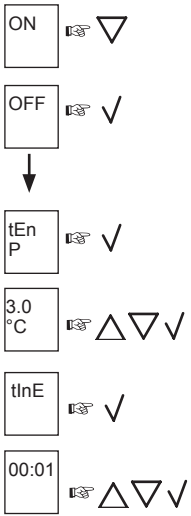
You can select either ˚C or ˚F scale, and 12 or 24 hour clock as follows:

Press UP (△) or DOWN (▽) button to change settings. Confirm the required scale with the OK button (√) button.

ArEA - (Group of rooms)
The rooms that are to be set as part of the WLCT2 area will follow the temperature settings of the room controller example, an area could be the living room, kitchen, and children's rooms, having a high room temperature requirement during afternoon and early evening, and a lower temperature during the early part of the day and at night. Each room sensor will have a channel number, designated CH1, CH2 etc. The appropriate channel number of any room sensor is determined by the numbered output on the master control which is actually switching the valve/actuator for that area.

For example, a system may have the kitchen room sensor operating master output # 4, and the childrens room sensor operating master output #5. If the WLCT2 room controller is then situated in the living room, and operating output #1, then the WLCT2 need be programmed to control outputs 1, 4, & 5. (Each room sensor will have been set to operate its appropriate output ch see separate instructions).
To do this, enter the ArEA sub menu., and press OK (√) button. CH 1 will be displayed; use the OK (√) button and then the UP (△) button to change the setting to ON. Press OK (√) and CH 2 is displayed. Use the UP (△) button until CH4 is displayed, press OK (√), and change to ON. Repeat this for CH 5. All three room sensors will now operate under the control of the WLCT2 room controller.

In total up to 14 Channels can be programmed in this way, and it is possible to have more than a single room controller, each own sub room sensors operating to its schedule and temperatures.

		Set the Channels / Rooms (Ch) to ON if they should follow the settings of this clock thermostat. In total 14 channels / rooms can be controlled.
2 st	**This menu is only visible on 2 step controllers (WLCT2-x9/2)** 2 step – Change of values in 2 step function. 	Press the DOWN (▽) button to activate or de-activate the 2 step function. Press OK (√) to confirm. The display will now show TEMP. Press OK (√) to continue. Use the UP (△) or DOWN (▽) button to change the temperature setpoint in the 2-step function. (If the actual room temperature is higher than the setpoint minus this setting, the second output will not be activated) The display will now show TEMP. Press OK (√) to continue. Use the UP (△) or DOWN (▽) button to change the time (in minutes) before step 2 is activated. (This parameter decides how long the actual temperature is allowed to remain below the setpoint minus the TEMP setting before the second output is activated)

	**Adaptive function** This function enables the thermostat to calculate when it needs to switch ON so that the required temperature is reached at the set time. With a start time of 07:00 therefore, the thermostat may switch ON as early as 06:00 so that the desired temperature of 25°C is achieved by 07:00. Without this function set, the thermostat will start to heat at the time you set.	
		Press the DOWN (▽) button to switch between on and off. Press OK (√) button to confirm.
		**ESC - Escape** Press OK (√) button to end programming and to return to scheduled programme.

Reset to fatctory Settings - room controllers

NOTE: If more than one WLCT2 is present on the system, please copy this page.

↘ • R	Press the pin button R for 3 secs. and the thermostat returns to factory settings. Remember to set time, day and area.

4-event time and temperature						**Own settings**	
		Standard WLCT2-x9	Special WLCT2-x9/R	Special WLCT2-x9/2	Special WLCT2-9/HW		
	Time	**Temperature**	**Temperature**	**Temperature**	**Temperature**	**Time**	**Temperature**
Day 1-5							
☼	06:00	21 ˚C	21 ˚C	21 ˚C	50 ˚C		
⌂↑	08:00	19 ˚C	19 ˚C	19 ˚C	30 ˚C		
⌂↓	16:00	22 ˚C	22 ˚C	22 ˚C	50 ˚C		
☾	22:30	17 ˚C	17 ˚C	17 ˚C	30 ˚C		
Day 6-7							
☼	08:00	22 ˚C	22 ˚C	22 ˚C	50 ˚C		
☾	23:00	17 ˚C	17 ˚C	17 ˚C	30 ˚C		
Other settings							
4-event sequence	-	4:52	4:52	4:52	4:52		
High floor limit temperature	-	27 ˚C	-	27 ˚C	-		
Low floor limit temperature	17 ˚C	17 ˚C	-	17 ˚C	-		
Special settings							
2-step time	-	-	-	60 min	-		
2-step temperature difference	-	-	-	2 ˚C	-		

Group		**Room**	
Ch 1	**Off**		
Ch 2	**Off**		
Ch 3	**Off**		
Ch 4	**Off**		
Ch 5	**Off**		
Ch 6	**Off**		
Ch 7	**Off**		
Ch 8	**Off**		
Ch 9	**Off**		
Ch 10	**Off**		
Ch 11	**Off**		
Ch 12	**Off**		
Ch 13	**Off**		
Ch 14	**Off**		
Example			
Ch 1		**Kitchen**	**On**
Ch 2		**Living room**	**On**

Insert the room name in the box against each Ch number, and add ON if it is controlled by a clock thermostat.

Domestic hot water control

WLCT2/HW

It is possible to control the domestic hot water temperature with a special version of the WLCT2, called WLCT2-X9/HW) to ensure optimum energy saving.
A hot water sensor is connected to the controller and measures the temperature in the storage cylinder.

- To change the temperature of the domestic hot water, just change the set point in the WLCT2-X9/HW by using the up or down button.
- The 4-event system in the WLCT2-X9/HW can be used to save energy when hot water is not needed..

Radiator control

WLCT2/R

It is possible to control a radiator circuit room temperature with a special version of the WLCT2 called a WLCT2-X9/R) to ensure optimum energy saving.
The controller measures the temperature in the room, and a zone valve is then controlled via the WLM2 master, which in turn activates the boiler on demand.

- To change the temperature of the radiator circuit , just change the set point in the WLCT2-X9/R by using the up or down button.
- The 4-event system in the WLCT2-X9/R can be used to save energy when heat is not needed.

2 step heating

WLCT2/2

A special version of the WLCT2 called WLCT2-X9/2 is capable of controlling an additional heat source in a room. In addition to the primary under floor heating output, the room controller is now able to control a second output as a boost function, which will be activated only if the temperature cannot be achieved by the primary under floor heating output within a preset time period.

The Room Controller is used as a standard WLCT2.
If required the settings for when the second heating output is needed can be changed in the service menu in the WLCT2-X9/2.

An additional Menu entry “2 st” can be found.
In this menu two parameters can be changed:

Temp: If the actual room temperature is higher than the setpoint minus this setting, the second output will not be activated.
Time: This parameter decides how long the actual temperature is allowed to remain below the setpoint minus the TEMP setting before the second output is activated.

Waterline Room sensors

Setting of Room Temperature

If the WLTM-x9 or WLTD-x9 Room sensor has been allocated to a WLCT2 controlled area, then when AUTOMATIC mode has been chosen with the built-in slide switch, the temperature settings will be as programmed in the WLCT2 Room controller and not in the master, but the same local ±4 °C adjustment is available.

On the Master WLM2-1FS and WLM2-3FS, if the temperature setting is changed, then the default temperature for all the rooms is changed, but each WLTA, WLTM or WLTD Room sensor is locally adjustable with its own adjustment knob. With this knob the temperature setting from the Master can be increased or decreased by 4 °C for that specific room.

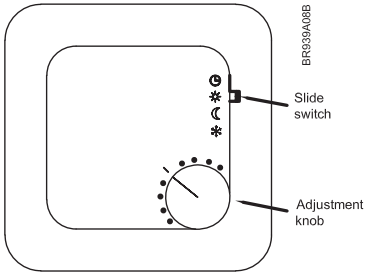
The master is supplied with default temperature settings which are used by all non Room sensors that are connected to the system. In Master WLM2-1BA & WLM2-3BA, the DAY temperature setting is fixed at 21 °C and the NIGHT temperature is fixed at 18 °C.

In Master WLM2-1FS & WLM2-3FS, the DAY, NIGHT and OFF default temperatures are adjustable through the display.

Automatic switching between DAY and NIGHT temperatures is done by either connecting a separate timing device to the master, or using a WLCT2 Room controller and allocating other Room sensors as part of its group. It is possible to have two or more Room controllers in the system, with each one having its own group of non Room controllers.

Setting of Room sensor Operating Mode

Fig. 3



Room sensors type WLTM-x9 and WLTD-x9 have a slide switch (see fig. 3) for selecting the mode of operation of the controller. Four different modes can be selected: Auto, Day, Night and OFF.

- Auto: The controller will follow the temperature settings of the master, or if the Room sensors belongs to a zone group using a WLCT2 Room controller, it will follow the automatic sequence of temperatures and timings set in the WLCT2.
- Day: It will control the room temperature according to the (DAY) setting defined in the master (typically 21 °C).
- Night: It will control the room temperature according to the (NIGHT) setting defined in the master (typically 18 °C).
- OFF: It will control the room temperature according to the (OFF) setting defined in the master (typically 5 °C). This setting is intended to be a ”frost protection” mode and is used if the room is to be left unoccupied for long periods.

WLTM-x9 & WLTD-x9 are recommended for guest rooms and other infrequently used rooms, as they allow simple override of the automatic timing sequence.

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Zone Chart

Example				
Thermostat	**Thermo heads / Output**	**Zone**		
CH 1	1	Kitchen	3 loops marked 1, 2 and 3	W adjustment and MIN limit sensor

NB

The following chart enables you to write down the zone name, the number of loops serving it, and the control thermostat type. PLEASE LEAVE THIS INSTRUCTION WITH THE CLIENT.

Thermostats	**Thermo heads / Output**	**Zone**	**Water loops**	**Thermostats**
CH 1	1			
CH 2	2			
CH 3	3			
CH 4	4			
CH 5	5			
CH 6	6			
CH 7	7			
CH 8	8			
CH 9	9			
CH A	10			
CH B	11			
CH C	12			
CH D	13			
CH E	14			
CH F	Special function		None	

5 7 6 4 0 C