



MCO Home

## MCO Home - Electrical Heating Thermostat with humidity sensor Version 2

SKU: MCOEMH7H-EH2



### Quickstart

This is a **Z-Wave Device** for **Europe**. To run this device please connect it to your mains power supply. To add this device to your network execute the following action:

In normal working interface, press & hold S4 to enter interface for inclusion of Z-Wave network. Before device included into network, “- - -” will display on the screen. Then press S4 once, device will enter learning mode to get a node ID. If inclusion is success, a node ID will display on the screen in a few seconds.

### What is Z-Wave?

Z-Wave is the international wireless protocol for communication in the Smart Home. This device is suited for use in the region mentioned in the Quickstart section. (For more information about frequency regulations please refer to [the frequency coverage overview at Sigma Designs Website](#) ).

Z-Wave ensures a reliable communication by reconfirming every message (**two-way communication**) and every mains powered node can act as a repeater for other nodes (**meshed network**) in case the receiver is not in direct wireless range of the transmitter.

This device and every other certified Z-Wave device can be **used together with any other certified Z-Wave device regardless of brand and origin** as long as both are suited for the same frequency range.

If a device supports **secure communication** it will communicate with other devices secure as long as this device provides the same or a higher level of security. Otherwise it will automatically turn into a lower level of security to maintain backward compatibility.

For more information about Z-Wave technology, devices, white papers etc. please refer to [www.z-wave.info](http://www.z-wave.info).



## Product Description

MCOHome Electrical Heating Thermostat is a Z-Wave enabled device for indoor temperature control. MH7H-WH is mainly applied to control wall mounted boiler, water valve/pump etc. The device is of high reliability and practicability, which can be included and operated in any Z-Wave network with other Z-Wave certified devices from any other manufacturers.

## Prepare for Installation / Reset

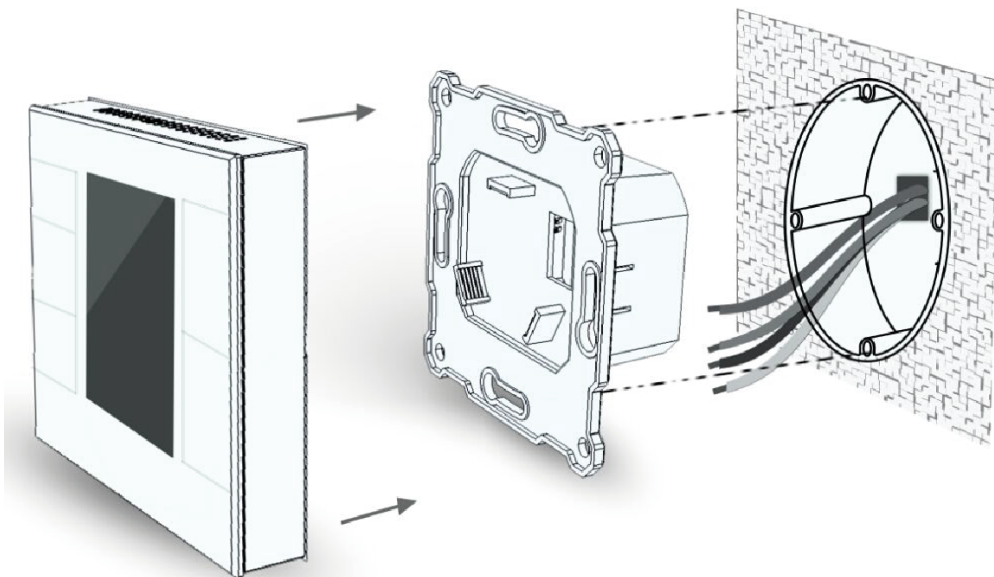
Please read the user manual before installing the product.

In order to include (add) a Z-Wave device to a network it **must be in factory default state**. Please make sure to reset the device into factory default. You can do this by performing an Exclusion operation as described below in the manual. Every Z-Wave controller is able to perform this operation however it is recommended to use the primary controller of the previous network to make sure the very device is excluded properly from this network.

### Safety Warning for Mains Powered Devices

**ATTENTION:** only authorized technicians under consideration of the country-specific installation guidelines/norms may do works with mains power. Prior to the assembly of the product, the voltage network has to be switched off and ensured against re-switching.

## Installation

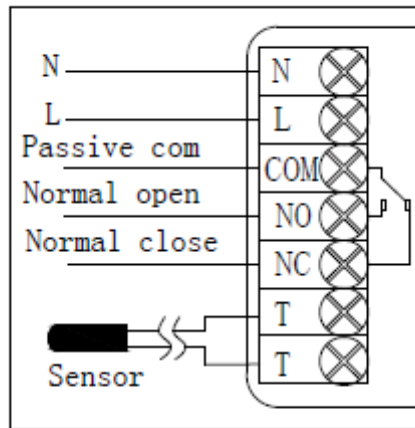


Step 1: Separate the device into two parts: the display panel and the bottom.

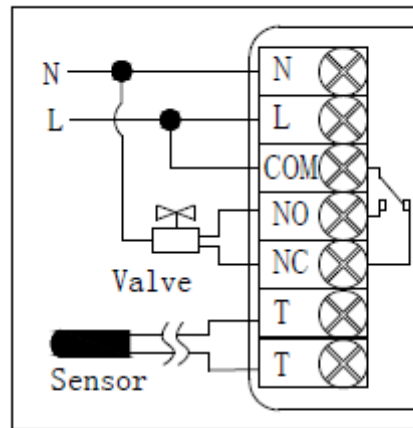
Step 2: Insert all wires into the right terminals and tighten screws. Wiring diagrams are shown below.

Step 3: Push the bottom into the junction box and secure it with two screws, and then mount the touch panel back.

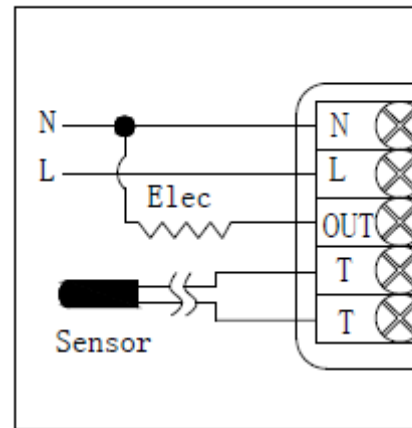
Step 4: Confirm the device is well mounted, power on and it is ready to operate.



(1) **Passive Wall-boiler**



(2) **Active normal close valve**



(3) **Electrical Heating**

Model	Terminals	Control devices	Wiring instructions	Contact capacity
MH7H-WH	N, L, COM, NO, NC	Thermostatic valve/electric ball valve/pump	For passive control, follow wiring diagram (1); For active control, follow wiring diagram (2)	10A
MH7H-EH	N, L, OUT, T, T	Heating film, electric radiator, heating cable ect	TT terminal is to be connected with an external sensor with high temperature protection function	16A

## Inclusion/Exclusion

On factory default the device does not belong to any Z-Wave network. The device needs to be **added to an existing wireless network** to communicate with the devices of this network. This process is called **Inclusion**.

Devices can also be removed from a network. This process is called **Exclusion**. Both processes are initiated by the primary controller of the Z-Wave network. This controller is turned into exclusion respective inclusion mode. Inclusion and Exclusion is then performed doing a special manual action right on the device.

### Inclusion

In normal working interface, press & hold S4 to enter interface for inclusion of Z-Wave network. Before device included into network, “- -” will display on the screen. Then press S4 once, device will enter learning mode to get a node ID. If inclusion is success, a node ID will display on the screen in a few seconds.

### Exclusion

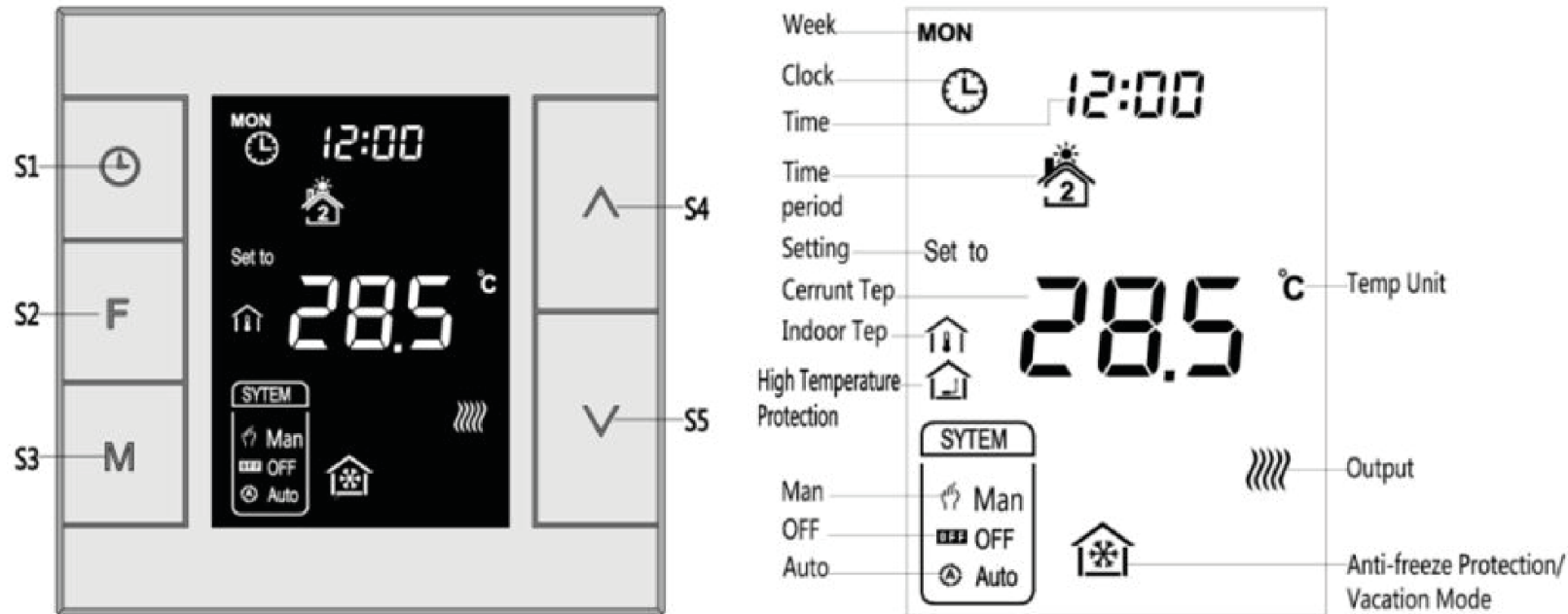
In normal working interface, press & hold S4 to enter interface for exclusion of Z-Wave network. Before device excluded into network, a node id will display on the screen. Then

press S4 once, device will enter learning mode to get a node ID. If inclusion is success, "- - -" will display on the screen in a few seconds.

### Auto-Inclusion

Beside the standard inclusion this devices supports the so called **auto inclusion**. Right after powering up the device remains in inclusion state and can be included by (any) gateway without further actions on the device itself. The auto inclusion mode will time out after some time.

## Product Usage



### On/Off operation

When power on, thermostat displays "OFF", all outputs are forced off. Touch S3 button to switch (manual/off/auto) mode, then press S2 to confirm and proceed power on/off setting. After power on, device displays current week, local time, working mode, current temperature, output status etc.

*Note:* After the backlit goes out, please press the button to light up the backlit first, then press the button again for corresponding operation.

### Temperature setting

In normal working status, press S4 or S5 button will enter into temperature setting interface.

The setting range is 5-37 °C (41-99°F) . Then press S4 or S5 can adjust the value. Press S3 or wait 25 seconds without any key operation will save the setting and return back to the normal operation interface.

**Auto Mode:** The changed value only valid in the current time period for this time, and the device will not effect the preset time period value .

**Manual Mode:** The changed value will be valid until next setting.

**Vacation Mode:** The changed value will be valid until next setting.

### Key lock function

In normal operating interface, long press S1+S4 button, icon appear that indicates the button is locked, at this time all buttons are disabled; When long press S1+S4 button again, icon disappear that indicates the button is unlocked, all buttons back to normal work.

### Control specifications

- Detection temperature < setting temperature - 1.5°C, output turns on, and output icon displays.
- Detection temperature ≥ setting temperature , output turns off, and output icon disappears.

### Manual / Auto mode setting

In normal display interface, touch S3 button can switch between Manual and Auto mode.

Choose the mode you may need and press S2 button to save the setting.

**Auto Mode:** Device will follow the preset time periods and temperature to control heating system automatically.

**Manual Mode:** Device will follow the manual setting temperature to control the heating system.

### Vacation mode setting

- In normal working interface, if vocation mode is not activated, long press S2 button to enter vacation mode temperature setting. The default temperature is 10 °C, and setting range is 5-37 °C (41-98°F) . Press S4 or S5 to adjust the value, then press S3 or wait 25 seconds to save the setting and return to the normal working interface. In this time vacation mode icon displays, and device will follow the setting.

- Long press S2 again will end vacation mode and resume to normal work, vacation mode icon will be disappeared.

### Local Time Setting

- In normal working interface, long press S1 to enter into local time setting interface.

- In local time setting interface, press S4 or S5 button to set the “week, hour & minute” parameter, and press S1 button can switch among the “week, hour & minute”.

- After finish the local time setting, press S1 or wait 25 seconds without any key operation will save the setting and return to normal display.

### Auto Mode Time Periods Parameter Setting

- In normal working interface, short press S1 to enter into time periods setting. Four time periods can be set for each day of the whole week.
- Press S2 can switch among “Hours, Minutes, Temperature value”. Press S4 or S5 can change the value.
- After finished the setting of 4 time periods on Monday, press S1 and follow the same way to set periods of next days.
- After all periods set, press S1 /S2 or wait 25 seconds without any key operation will save the setting and return to normal display. Device will operate in accordance with the new setting.

The default setting is as follow:

Week\Periods	Period 1	Period 2	Period 3	Period 4
Mon~Fri	5:00 18°C	7:00 16°C	16:00 22°C	21:00 16°C
Sat~Sun	6:00 18°C	8:00 16°C	16:00 22°C	21:00 16°C

### High temperature protection

When external temperature sensor detect the temperature value $\geq 55^{\circ}\text{C}$ , device will open high temperature protection, electric heating will be forced off, and high temperature protection icon displays.

When external temperature sensor detect the temperature value $< 50^{\circ}\text{C}$ , device will return to normal work, high temperature protection icon disappears.

### Anti-freeze protection function: (Optional)

In shutdown interface:

- When the built-in temperature sensor detect the temperature value $\leq 5^{\circ}\text{C}$ , device will open anti-freeze protection, electric heating will be forced open, and anti-freeze protection icon displays.
- When the built-in temperature sensor detect the temperature value $> 8^{\circ}\text{C}$ , device will turn off anti-freeze protection and return to normal work, anti-freeze icon disappears.

*Note:* If MH7 thermostat do not connect with an external temperature sensor, it will only display the indoor temperature icon; If MH7 thermostat connect with an external temperature sensor, it will display the indoor temperature and high temperature protection icon; When it is under high temperature protection, high temperature protection icon flickers.

### Humidity display operation

In normal working interface, long press S1+S5 buttons and enter into humidity display interface, when press S1+S5 buttons again, it will back to the normal interface.

### Secret Menu:



In shutdown state, long press S3+S5 synchronically can enter into secret menu. Press S4 or S5 to enter code 1234. Touch S3 to enter setting interface. Following are parameters which can be set.

Item	Explain	Default	Range	Remark
P01	Temp. Setting upper limit	37.0°C ( 99°F )	00-99.5°C ( 32-211°F )	Always confirm the upper limit > bottom limit
P02	Temp. Setting bottom limit	5°C ( 41°F )	00-99.5°C ( 32-211°F )	
P03	Slave Address	1	1~64	Reserved
		96	12~576	
P04	Hourly	24	12/24	
P05	EH back by Temp. differential	1.5°C ( 3°F )	0.0-10.0°C ( 0-18°F )	
	WH back by Temp. differential	0.5°C ( 1°F )	0.0-10.0°C ( 0-18°F )	
P06	EH Temp differential	0.0°C (00°F)	0.0-10.0°C ( 0-18°F )	
	WH Temp differential	0.5°C ( 1°F )	0.0-10.0°C ( 0-18°F )	
P07	Anti-freeze temperature setting	5°C ( 41°F )	0-30°C ( 32-86°F )	

P08	Protection temperature	55°C ( 131°F )	45-95°C ( 113-203°F ) OFF	Indoor temperature control
		OFF		High temperature control
P09	Power on state	OFF	OFF/OPN/PRU	= OFF electricity power off , = OPN electricity power on , = PRU power failure memory
P10	The time of temperature change	2	0-99	
P11	Temperature calibration	0.0°C(00°F)	-9.5-9.5°C ( -16-16°F )	
P12	Sound level	3	OF/0-9	
P13	Backlit level	2	1-8/NO/OFF	
P14	External temperature	0.0°C(00°F)	-9.5-9.5°C ( -16-16°F )	
P15	External temperature control switching	OFF	ON/OFF	Indoor temperature control
		ON	ON/OFF	External sensor temperature control
P16	External temperature display	OFF	ON/OFF	Indoor temperature display

	switching	ON	ON/OFF	External temperature display
P17	Temp. format	OC	OC/OF	=OC , Celsius ; =OF , Fahrenheit ( After modify settings, to restore the factory settings. )
P18	Restore factory setting	Display: 53 Password: 55	00-99	Change 53 to 55, and press S3 to confirm

\* After power failure:

0 indicates device will be in shutdown state (“OFF”) when power on again;

1 indicates device will be in working interface when power on again;

2 (default) indicates device will stay the status before power failure when power on again.

## Quick trouble shooting

Here are a few hints for network installation if things dont work as expected.

1. Make sure a device is in factory reset state before including. In doubt exclude before include.
2. If inclusion still fails, check if both devices use the same frequency.
3. Remove all dead devices from associations. Otherwise you will see severe delays.
4. Never use sleeping battery devices without a central controller.
5. Dont poll FLIRS devices.
6. Make sure to have enough mains powered device to benefit from the meshing

## Association - one device controls an other device

Z-Wave devices control other Z-Wave devices. The relationship between one device controlling another device is called association. In order to control a different device, the controlling device needs to maintain a list of devices that will receive controlling commands. These lists are called association groups and they are always related to certain events (e.g. button pressed, sensor triggers, ...). In case the event happens all devices stored in the respective association group will receive the same wireless command wireless command, typically a 'Basic Set' Command.

### Association Groups:

Group Number	Maximum Nodes	Description
1	1	Lifeline
2	5	Relay Switch
3	5	Relay Switch

### Configuration Parameters

Z-Wave products are supposed to work out of the box after inclusion, however certain configuration can adapt the function better to user needs or unlock further enhanced features.

**IMPORTANT:** Controllers may only allow configuring signed values. In order to set values in the range 128 ... 255 the value sent in the application shall be the desired value minus 256. For example: To set a parameter to 200 it may be needed to set a value of 200 minus 256 = minus 56. In case of a two byte value the same logic applies: Values greater than 32768 may needed to be given as negative values too.

#### Parameter 1: Upload temperature format automatically

Size: 1 Byte, Default Value: 2

Setting	Description
0	Celsius
1	Fahrenheit
2	Follow the main display

#### Parameter 2: Upload temperature and humidity automatically

Size: 1 Byte, Default Value: 3

Setting	Description
0	OFF
1	Upload the difference value only

2	Timing upload mode only
3	Upload the difference+timing upload mode

### Parameter 3: Upload temperature difference

Size: 2 Byte, Default Value: 5

Setting	Description
3 - 1000	5*0.1°C=0.5°C, steps 0,1

### Parameter 4: Upload time interval regularly

Size: 2 Byte, Default Value: 30

Setting	Description
10 - 65535	in seconds

### Parameter 5: Upload humidity difference

*When the detection humidity value differ with the last percentage value, uploading activated 2-255*

Size: 2 Byte, Default Value: 3

Setting	Description
2 - 255	in %

### Parameter 255: Factory setting

Size: 1 Byte, Default Value: 0

Setting	Description
85	Reset

## Technical Data

<b>Dimensions</b>	85x85x45 mm
<b>Weight</b>	192 gr
<b>Hardware Platform</b>	ZM5101
<b>EAN</b>	6928954201806
<b>IP Class</b>	IP 20
<b>Voltage</b>	230 V
<b>Load</b>	16A
<b>Firmware Version</b>	02.06
<b>Z-Wave Version</b>	04.21
<b>Z-Wave Product Id</b>	0x015f.0x0702.0x5102

## Supported Command Classes

- Basic
- Sensor Multilevel
- Thermostat Mode
- Thermostat Operating State
- Thermostat Setpoint
- Association Grp Info
- Device Reset Locally
- Zwaveplus Info
- Configuration

- Manufacturer Specific
- Powerlevel
- Firmware Update Md
- Association
- Version
- Time
- Time Parameters

## Explanation of Z-Wave specific terms

- **Controller** — is a Z-Wave device with capabilities to manage the network. Controllers are typically Gateways, Remote Controls or battery operated wall controllers.
- **Slave** — is a Z-Wave device without capabilities to manage the network. Slaves can be sensors, actuators and even remote controls.
- **Primary Controller** — is the central organizer of the network. It must be a controller. There can be only one primary controller in a Z-Wave network.
- **Inclusion** — is the process of adding new Z-Wave devices into a network.
- **Exclusion** — is the process of removing Z-Wave devices from the network.
- **Association** — is a control relationship between a controlling device and a controlled device.
- **Wakeup Notification** — is a special wireless message issued by a Z-Wave device to announces that is able to communicate.
- **Node Information Frame** — is a special wireless message issued by a Z-Wave device to announce its capabilities and functions.

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