SE Devices Wheel Controller FWC Manual

Contents

SE Devices

Wheel Controller

SKU: FWC

Quickstart

This is a
secure
Wall Controller
for
CEPT (Europe).

To run this device please connect it to your mains power supply.

To add this device to your network execute the following action:
To add the device to a Z-Wave network, the Z-Wave Controller must first be set into Add mode. Once the Controller is listening for devices to add, Push and Hold the lower part of the Wheel Controller for 5 seconds.The device will indicate that it sends information to the Controller by showing a Radio Communication Icon in the display. The Controller should now discover the device and add it to the Z-Wave network. Once added, the device should respond commands over the Z-Wave network.

Please refer to the
Manufacturers Manual for more information.

Important safety information

Please read this manual carefully. Failure to follow the recommendations in this manual may be dangerous or may violate the law.
The manufacturer, importer, distributor and seller shall not be liable for any loss or damage resulting from failure to comply with the instructions in this manual or any other material.
Use this equipment only for its intended purpose. Follow the disposal instructions.

Do not dispose of electronic equipment or batteries in a fire or near open heat sources.

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.

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.

Product Description

The SE Devices Wheel Controller Z-Wave is a modular Wall-Box mountable control wheel, which is controllable over a Z-Wave Home Automation Network. The device can be added to and remote controlled via a Z-Wave Home Automation network. This product can be operated in any Z-Wave network with other Z-Wave certified devices from other manufacturers. All non-battery operated nodes within the network will act as repeaters regardless of vendor to increase reliability of the network.The Wheel Controller unit itself can be combined with a Back Unit hidden inside a wall-box to provide local control possibilities. It can also operate in a Stand-Alone mode, powered via a Cascade connector to another unit (Multifunction Switch or Wheel Controller).There are a variety of Back Units available for the Wheel, which can provide Local control functionality such as Relay Control and

Dimming.The Wheel is backed by 4 push buttons, located at the Upper, Lower, Left and Right sides of the wheel. By pushing on these points of the wheel, the various functions of the wheel can be accessed and controlled.The Wheel can be rotated in a clockwise and counter clockwise direction to control the Light Level, adjust temperature settings for the Thermostat and issue Central Scene commands. The current operation is shown in the display at all times. When used as a Thermostat, the display will show information on thermostat operation when the device is Idle.

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.

Reset to factory default

This device also allows to be reset without any involvement of a Z-Wave controller. This procedure should only be used when the primary controller is inoperable.

Follow this procedure to Factory Reset the Wheel Controller. This will restore all configuration parameters back to the default settings, and remove the device from the Z-Wave network.WARNING! Executing a Factory Reset on a device may make it stop working as wanted, and will disable remote control of the device. The device will have to be re-added to the Z-Wave network and reconfigured afterwards, to regain the previous operation of the device. Please DO NOT execute this procedure unless it is absolutely necessary.Step 1: Push and Hold the DOWN and LEFT wheel buttons at the same time, and keep holding them for approximately 15 seconds. It is recommended to use two fingers to insure that both buttons are pushed completely down.Step 2: Release the buttons when the text RESET appears in the display, after approximately 15 seconds.Step 3: Then Push and Hold UP (marked OK) for approximately 1 second to CONFIRM the Factory Reset. Pushing any other direction button will Cancel the Factory Reset, and restore normal operation. Also, if the RESET is not confirmed within 5 seconds, the device will resume normal operation.Step 4: When you confirm the Reset by pushing and holding UP, the RESET text will start blinking. Then the device will resume operation, but with all configuration Reset to their defaults. Also, if the device was added to a Z-Wave network, the device will no longer be available for Z-Wave control (only Local control will work).

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.

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

To add the device to a Z-Wave network, the Z-Wave Controller must first be set into Add mode. Once the Controller is listening for devices to add, Push and Hold the lower part of the Wheel Controller for 5 seconds.The

device will indicate that it sends information to the Controller by showing a Radio Communication Icon in the display. The Controller should now discover the device and add it to the Z-Wave network. Once added, the device should respond commands over the Z-Wave network.

Exclusion

Removal is done by setting the Controller in Remove Mode (instead of Add mode), and then follow the exact same procedure on the device itself as when adding the device.

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 NumberMaximum NodesDescription

1	5	Z-Wave Plus Lifeline – Supports MultichannelOnly local Light Zone changes are reported if Multichannel association is not used.Commands issued:- Basic Report: Reports Light Zone state and level changes- Central Scene Notification: Notifies activated Scenes- Thermostat Set-point report: When the Thermosta t set-point is changed locally- Thermostat Mode Report: When the Thermostat mode is changed locally- Sensor Multilevel Report: Power Consumption and Air Temperature (if a sensor is connected)- Meter: Re ports energy consumption- Device Reset Locally – Reports device Factory Reset
2	5	Controls devices in Light Zone 1. Supports Multichannel Association.Commands Issued:- Basic Set: Controlled by Light Zone 1. Dimmer or Switch mapped Basic command values is configurable
3	5	Controls devices in Light Zone 2. Supports Multichannel Association.Commands Issued:- Basic Set: Controlled by Light Zone 2. Dimmer or Switch mapped Basic command values is configurable
4	5	Controls devices in Light Zone 3. Supports Multichannel Association.Commands Issued:- Basic Set: Controlled by Light Zone 3. Dimmer or Switch mapped Basic command values is configurable
5	5	Controls devices in Light Zone 4. Supports Multichannel AssociationCommands Issued:- Basic Set: Controlled by Light Zone 4. Dimmer or Switch mapped Basic command values is configurable
6	5	Enables control of external Heating Thermostats in the same heating zone.Commands Issued:- Thermostat Setpoint Set: Sent on local Thermostat Set-Point changes- Thermostat Mode Set: Sent on lo cal Thermostat Mode changes
7	5	Enables the Thermostat to control Remote Heating Relays.Commands issued:- Basic Set: Value ON (25 5) or OFF (0), according to Thermostat Heating State changes.

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 200â€ˆit 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: Hardware Combination Identifier

READONLYByte which uniquely describes the combination of Front and Back Unit in the current installation. The first nibble (4 bits) Identifies the Controlling Unit (Front unit), which is always 0x3 for the Wheel Controller. The combined Byte then yields the following: – 0x30 – 2-Pole 8A Relay – 0x31 – 1-10V Dimmer – 0x32 – 230V MOSFET Dimmer – 0x33 – 1-Pole 16A Relay – 0x3F – No Back Unit connected
Size: 1 Byte, Default Value: 63

SettingDescription

48 – 63	Depending on the Hardware combination

Parameter 10: Dimming Speed

Defines the u0022fadeu0022 time when setting a dim level from a controller. Fade time is defined as the time it takes to dim from MIN level to MAX level. This means an increase of 10% in light level takes 1/10th of the configured time. The value defines the dim time in 1/100'th of a second, which means a value of 200 means the Dimming Speed is 2.0 seconds from MIN to MAX. Max time is 327.67 seconds (around 5.5 minutes). Values below 300 (0.3 seconds) are ignored and values below 1000 (1 second) are discouraged.
Size: 1 Byte, Default Value: 200

SettingDescription

30 – 32767	Dimmer Speed in 1/100th of a Second

Parameter 11: Dimmer Mode

Defines if Dimmer should operate in Leading or Tailing Edge mode. Most Lights work quite OK in the default Leading Edge mode, but this mode also usually cause some noise from the dimmer unit. During installation it is therefore recommended to try TE mode, and use this if the Light operates properly. Tailing Edge mode is known to cause instability in some type of Lights! This configuration does not have an effect on 1-10V Dimmer Back Units!0 = Leading Edge Mode (LE)1 = Tailing Edge Mode (TE)
Size: 1 Byte, Default Value: 0

SettingDescription

0 – 1	Dimmer Operation Mode

Parameter 12: Maximum Level

The Maximum Light level of the dimmer. Typically there is no visible difference when the dimming level reaches a point in the range 75 – 90, and the installer should set this value to the lowest value where no change is visible. The default value of 90 is usually OK. Range 1-99.
Size: 1 Byte, Default Value: 90

SettingDescription

1 – 99	Maximum Dimmer Level

Parameter 13: Minimum Level

The Minimum Light Level of the dimmer. This should be adjusted so the controlled Light is still ON and stable. Remember that LED type lights may work if dimmed down to a low value, but may not start if the light is turned OFF and ON again. Range 1-99.
Size: 1 Byte, Default Value: 12

SettingDescription

1 – 99	Minimum Dimmer Level

Parameter 14: UI Modes Enable

Defines which modes should be available in the Display User Interface. The following values can be used: 0 – Automatic based on Back Unit (default) The following values can be added to enable the specified function: 1 – Thermostat mode 2 – Light mode 4 – Central Scene Mode In addition, the number of Light Zones to be controllable via the display can be chosen by adding ONE of these value to the configuration above: 16 – 2 Light Zones enabled 32 – 3 Light Zones enabled 48 – 4 Light Zones enabled NOTE! If Light mode is not enabled, the Zones selection has no effect! Example: To enable 3 Light Zones in addition to Thermostat mode, set the value to (32 + 2 + 1) = 35
Size: 1 Byte, Default Value: 0

SettingDescription

0 – 67	UI Modes Enabled Flags

Parameter 15: Light Zone Control Mode

Controls if the Light Zones should operate in Switch or Dimmer Mode (only used in Button Modes 0, 1 and 2):0All Light Zones in Dimmer Mode (default)1All Light Zones in Switch Mode (default with Relay back unit)To control Light Zones mode individually, add any of the following values to enable switch mode individually (dimmer is default):2Light Zone 1 Switch Mode4Light Zone 2 Switch Mode8Light Zone 3 Switch Mode16Light Zone 4 Switch ModeExample: A value of 10 (8 + 2) enables switch mode in Light Zone 1 and 3.
Size: 1 Byte, Default Value: 0

SettingDescription

0 – 1	Common Mode for all Light Zones
2 – 30	Switch Mode for individual Light Zones

Parameter 16: Back Unit type

READONLYProvides an Identifier for the connected Back Unit. This configuration is fixed across the SE Devices range, and provides a consistent way to determine local device functionality across the entire range of devices. – 0xFF – No Backunit Connected – 0x00 – 2-Pole 8A Relay – 0x02 – 230V MOSFET Dimmer – 0x04 – 1-10V Dimmer – 0x06 – 1-Pole 16A Relay
Size: 1 Byte, Default Value: -1

SettingDescription

-1	No Backunit connected
0 – 6	Depending on Back Unit connected

Parameter 17: Back Unit Role

Configures the Role of the Back Unit, which dictates what Local functionality controls it.Valid configuration values are:0 – The Thermostat will control the Back Unit (if the back unit is a dimmer, then this value has no effect as Thermostats requires a relay to function)1 – The Light Control feature (buttons) will control the Back Unit.2 – Disconnected mode means the Back Unit is not controlled by any local UI or features, and can only be controlled via Z-Wave End-Point 5 (or non-channel encapsulated commands).
Size: 1 Byte, Default Value: 1

SettingDescription

0 – 2	Selected Back Unit Role

Parameter 18: Back Unit Light Zone

Selects which Light Zone the Back Unit should be assigned to. Possible values are:1Light Zone 1 (Button and Z-Wave) (default)2Light Zone 2 (Button and Z-Wave)3Light Zone 3 (Button and Z-Wave)4Light Zone 4 (Button and Z-Wave)This can be used to assign the back unit control to any of the Multiswitch buttons (Light Zone 1 – 4). This does not have any effect however when the BU role is set to Thermostat or Disconnected!
Size: 1 Byte, Default Value: 1

SettingDescription

1 – 4	Back Unit Light Zone

Parameter 240: Floor Sensor Temperature Offset

Defines an offset to the Floor Temperature, given as a signed integer at 1/10 of a degree celcius. This provides an offset range of 12.8 to +12.7 degrees celcius (-128 to 127).
Size: 1 Byte, Default Value: 0

SettingDescription

-128 – 127	Temperature Offset in 1/10th of a degree Celcius

Parameter 241: Room Sensor Temperature Offset

Defines an offset to the Room Temperature, given as a signed integer at 1/10 of a degree celcius. This provides an offset range of 12.8 to +12.7 degrees celcius (-128 to 127).
Size: 1 Byte, Default Value: 0

SettingDescription

1 – 4	Selected Back Unit Light Zone
-128 – 127	Temperature Offset in 1/10th of a degree Celcius

Parameter 32: Thermostat Set Point Max

Maximum Heat Set Point the Thermostat is allowed to be set to. If the Thermostat is used for Floor Heating, please make sure that this value is configured to the same value as (or lower than) the Max Floor Temperature. Given in 1/10 of a degree Celcius, which means a value of 300 means 30 degrees C. Range: 0500 (0-50 degrees).
Size: 2 Byte, Default Value: 270

SettingDescription

0 – 32767	Safety ON Period in seconds
0 – 500	Set Point Max in 1/10th of a degree Celcius

Parameter 34: Thermostat Set Point Min

Minimum Heat Set Point the Thermostat is allowed to be set to. Given in 1/10 of a degree Celcius, which means a value of 50 means 5 degrees C. Range: 0500 (0-50 degrees).
Size: 2 Byte, Default Value: 50

SettingDescription

0 – 500	Set Point Min in 1/10th of a degree Celcius

Parameter 36: Thermostat Control Resend Interval

Defines the interval between each time the Thermostat will repeat its last control command. This is used in combination with the Relay Safety configuration when controlling external Relays. If the Thermostat should fail, it would then stop sending control commands which in turn means the Relay will turn itself OFF after the safety mode delay has expired. This insures that heating will not be left ON indefinitely in failure situations. Range: 6032767 seconds
Size: 2 Byte, Default Value: 3600

SettingDescription

0 – 32767	Resend Interval in seconds

Parameter 37: Thermostat Minimum On/Off Interval

This configuration defines the minimum interval the controlled Thermostat Relays will be ON and OFF. This is a feature intended to avoid turning control relays ON and OFF too frequently, which should insure a better lifetime of

controlled relays. The default value is 5 minutes, which is OK for most electrical heating control. If used to control Water based heating, the value MUST be adjusted in accordance with the manufacturers specifications. Range: 6032767 seconds
Size: 2 Byte, Default Value: 300

SettingDescription

60 – 32767	Minimum On/Off interval in seconds

Parameter 38: Thermostat Floor Temp Max

Max floor temperature if a local floor sensor is connected. If the Floor Sensor reads a temperature Higher than the configured value, it will immediately turn the relay (or any associated relays) OFF. The relay will stay off until the temperature sinks below this value, and the Thermostat issues it's next control command. Disabled if zero (0) value, or if no floor sensor is connected. The value is given as 1/10th of a degree Celcius. Range: 0500 (0-50 degrees). NOTE! MAX 27 degrees is recommended for Wooden Floors! NOTE! This function is always active as long as a Floor Sensor is connected, regardless of the sensor configuration described below.
Size: 2 Byte, Default Value: 270

SettingDescription

0 – 500	Floor Temp Max in 1/10th of a degree Celcius

Parameter 4: Safety Activate Delay

Safety Mode is activated after the configured number of seconds has elapsed. It will start by turning OFF the Back Unit when activated. A 0 value Disables Safety Mode. The MAX limit is 32767 seconds (9 hours, 6 minutes and 7 seconds). The minimum Actication delay is 60 seconds, and values from 1 to 59 will automatically be translated to a 60 second delay.
Size: 2 Byte, Default Value: 0

SettingDescription

0 – 32767	Safety Activate Delay in seconds

Parameter 40: Temperature Sensor Select

Defines which temperature Sensor should be used for Heating Control. The default value is Both (3), which should work well in most scenarios (even when only a Floor or Room sensor is present). If both a Room and Floor sensor is used, the Thermostat will always control heating based on the lowest temperature reading of the two, to insure a comfortable floor temperature even if the room is already warm enough. If this is not wanted, the Thermostat should be configured to use the Room sensor Only. NOTE! The Floor Max Temperature feature will ALWAYS be active as long as a floor sensor is available, even if the Thermostat is configured to only use the Room Sensor. 1 – Local Room – Use temperature from Locally connected Room sensor ONLY. Max Floor Temp protection is still active as long as a floor sensor is available. 2 – Local Floor – Use temperature from Locally connected Floor sensor ONLY 3 – Both (auto) – Use temperature from Locally connected Floor AND Room sensor if available (Default).
Size: 1 Byte, Default Value: 3

SettingDescription

1 – 3	Temperature Sensor Select

Parameter 44: Cold Start Minimum Level

Sets the minimum level the Dimmer should go to when the light is switched ON. This is typically used for LED lamps which does not switch ON correctly when the dimming level is at the Minimum. See detailed description

below.
Size: 1 Byte, Default Value: 12

SettingDescription

1 – 99	Cold Start Minimum Level

Parameter 5: Safety OFF Period

The number of seconds to stay in OFF mode when Safety is activated. The Back unit turns ON when the timer have elapsed. If value is 0, the Back Unit will not turn back ON. The MAX limit is 32767 seconds (9 hours, 6 minutes and 7 seconds). A 60 second minimum period applies.
Size: 2 Byte, Default Value: 600

SettingDescription

0 – 32767	Safety OFF Period in seconds

Parameter 64: Temperature Report Inteval

Defines the Periodic Report interval for temperature readings. This can be configured to a minimum of 60 seconds and maximum of (32767 seconds. A 0 value disables the Interval based Periodic reporting, and any value below 60 results in a 60 second interval.
Size: 2 Byte, Default Value: 600

SettingDescription

0 – 32767	Report Interval in seconds

Parameter 66: Temperature Report Threshold

Defines a temperature change threshold where a temperature report is sent regardless of the Report Interval. This also works if the report interval is disabled. The value is given in 1/10 of a degree celsius, and can be in the range 1-127. A zero value disables the Threshold.
Size: 1 Byte, Default Value: 10

SettingDescription

0 – 127	Report Threshold in 1/10th of a degree Celcius

Parameter 67: Thermostat OnOff Interval Override Threshold

Defines a temperature threshold at which the configured On/Off interval is overridden and the Heating relay state will change regardless. The value is given in 1/10th of a degree, supporting a max threshold of 12.7 degrees celcius. A Zero (0) value disables this feature (the default)
Size: 1 Byte, Default Value: 0

SettingDescription

0 – 127	Temperature Threshold in 1/10th of a degree Celcius

Technical Data

Hardware Platform	ZM5202
Device Type	Wall Controller
Network Operation	Always On Slave
Firmware Version	HW: 30 FW: 3.00:03.00
Z-Wave Version	6.71.01
Certification ID	ZC10-18046079
Z-Wave Product Id	0x024F.0x0003.0x1003
Switch Type	Rotary Knob
Thermostat HVAC Systems Supported	Heat Only
Thermostat Modes	Auxiliary/Emergency HeatHeat
Thermostat Power Source	Mains powered (120V/240V)
Z-Wave Scene Type	Central Scene
Supported Meter Type	Electric Energy
Color	White
Sensors	Air TemperatureCurrentPowerVoltage
Neutral Wire Required	ok
Firmware Updatable	Updatable by Professional/Technician
Electric Load Type	Dimmable LEDELV (Electronic)IncandescentLED
Security V2	S2_UNAUTHENTICATED
Frequency	XXfrequency
Maximum transmission power	XXantenna

Supported Command Classes

- Association Grp Info
- Association V2
- Basic
- Central Scene V3
- Configuration
- Device Reset Locally
- Firmware Update Md V4
- Manufacturer Specific V2
- Meter V2
- Multi Channel Association V3
- Multi Channel V4
- Powerlevel
- Security
- Security 2

- Sensor Multilevel V5
- Supervision
- Switch Binary
- Switch Multilevel
- Thermostat Mode
- Thermostat Setpoint
- Transport Service V2
- Version V3
- Zwaveplus Info V2

Controlled Command Classes

- Basic
- Thermostat Mode
- Thermostat Setpoint

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.