HEATIT Z-RELAY

Multipurpose Relay

CONTENTS

1. PRODUCT DESCRIPTION

The Heatit Z-Relay is a Z-Wave module in a water-resistant housing equipped with 10 x membrane cable entries.

The Heatit Z-Relay is equipped with 1 relay output and 3 multi-purpose inputs, and a Z-Wave radio for interfacing to the wireless Z-Wave network. The module must be power supplied from a 230V AC mains connection.

The Heatit Z-Realy high-duty relay output are able to be freely controlled from the Z-Wave network, and can be used for several purposes, e.g. control of valve actuators, stoves etc.

Two of the Heatit Z-Relay inputs can be configured to function as either digital inputs or as analogue inputs for interfacing simple NTC temperature sensors. When the inputs are used as digital inputs, they can be connected to potential free contacts, open-collector outputs, and will be able to control other Z-Wave devices when the status of the inputs sent to other Z-Wave devices on the Z-Wave network. The last input can be used as either digital input or be used to be connected to a flood detector.

It is possible to configure the level- and the indication of the status indicator LED on the modules circuit board.

2. INSTALLATION GUIDELINES

ATTENTION: Only authorized technicians under consideration of the country-specific installation guidelines/norms may do works with 230 Volt mains power. Prior to the assembly of the product, the voltage network has to be switched off and ensured against re-switching.
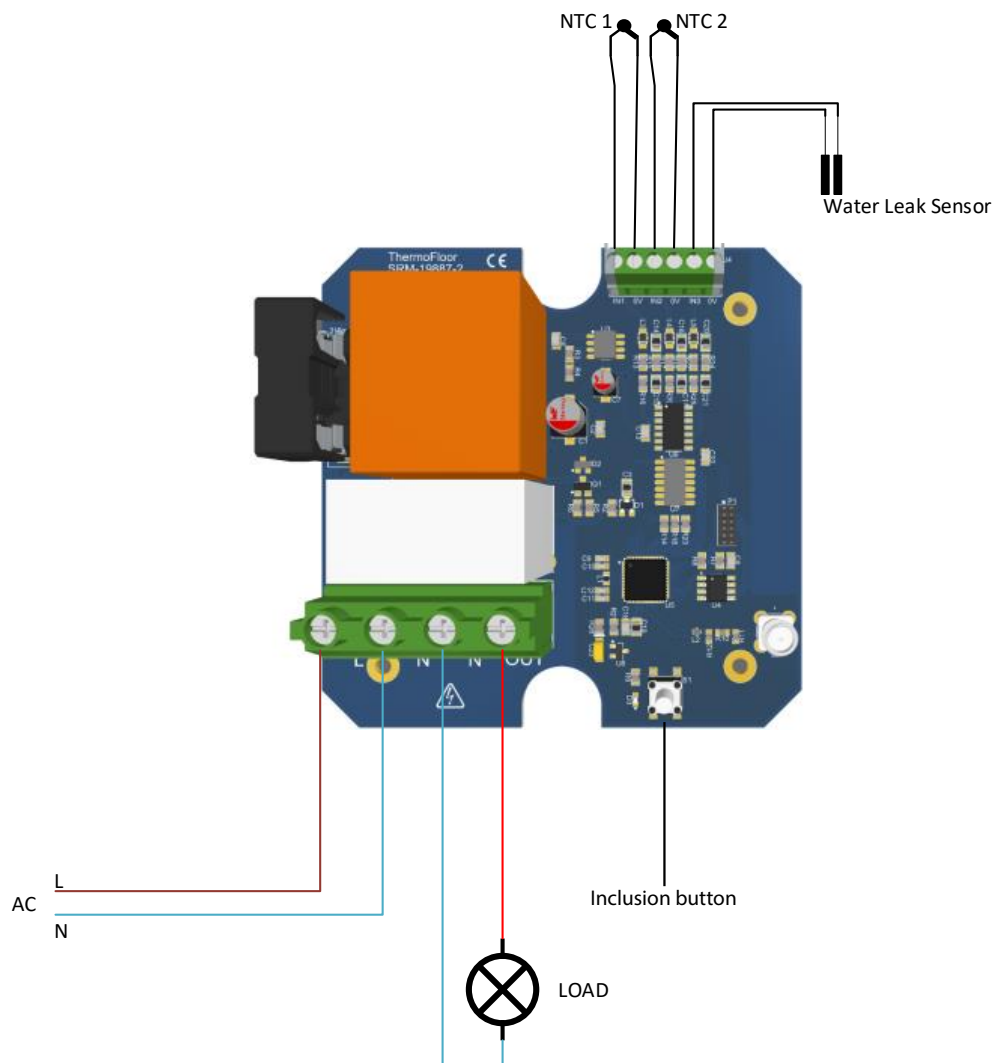
2.1. Inputs

2.1.1. Temperature inputs

Input 1 and 2 can be used as temperature inputs by connecting NTC sensors the inputs, the type of NTC sensor can be configured by means of configuration parameter 3 and 4.

A temperature offset can be configured for each of the inputs by means of configuration parameter 5 and 6.

2.1.2. Flood sensor input

Input 3 is a flood sensor input where it is possible to connect a simple flood sensor.

The flood sensor can be left lying on the floor (on an electrically insulating surface), or attached to the floor or to a wall. Designed for flood detection, senses water and other electrically conductive liquids. The sensitivity of the sensor can be configured by means of configuration parameter 14.

It is possible for the flood input directly to be able to control the Heatit Z-relay output, either to turn the relay output ON or OFF when flood is detected, or when no flood is detected, see configuration parameter 12 and 13.

2.2. Relay Output

The relay output is a high power "normally open" (NO) contact, that can be used for several purposes.

It is possible to control the relay from the Z-Wave network, or it can be controlled by the flood sensor input.

The Heatit Z-Relay monitors the current used by the load connected to the relay output. The energy that the load consumes is calculated by means of the measured current and the voltage entered in configuration parameter 15. Energy data is sent to the controller through the Z-Wave network. These data values that the controller is able to receive are; current (A), power (Watt) and the energy consumed over time (kWh).

3. BEHAVIOUR WITHIN THE Z-WAVE 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.

On delivery, 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. Devices can also be removed from a network. Both add and remove process are initiated by the primary controller of the Z-Wave network. This controller will be turned into a mode for adding or removing devices. Please refer to your primary controller's manual on how to turn your controller into add or remove mode. Only if the primary controller is in add or remove mode, this device can be added or removed from the network. When the device is removed from the network, it will set the device back to factory default.

If the device already belongs to a network, follow the remove process before adding it in your network. Otherwise, the adding of this device will fail. Place your primary controller in Adding Mode by following the manufacturer's instructions, then activate the add mode on the device by clicking the inclusion button in the module. The Adding Mode is indicated by status LED is blinking until a timeout occurs after 10 seconds or if the module has been added to the Z-Wave network.

The device is removed in the same manner, when the controller is put into Removing Mode.

4. FACTORY RESET

The Heatit Z-Relay can be factory reset by pressing the inclusion button in the module for at least 10 seconds.

NOTE: ONLY USE THIS PROCEDURE WHEN THE PRIMARY NETWORK CONTROLLER IS MISSING OR IS OTHERWISE INOPERABLE.

5.   ASSOCIATION GROUPS

From a Controller's point of view, the Heatit Z-Relay will consists of a root device and 4 endpoint devices - if the Controller is supporting Multichannel devices, otherwise only the root devices will be seen by the Controller (root device / endpoint 0)

The devices are:

- •   Root device; an intersection of all the devices (endpoint 0).
- •   1 switch device to control the relay output (endpoint 1).
- •   2 sensor devices representing the temperature inputs (endpoint 2 – 3).
- •   1 notification sensor device representing the flood sensor input (endpoint 4).

Below is an overview of all the devices and the association groups for each device.

The first number in the association group number indicates the group number for actual device, and the second number is the group number on the root device (endpoint 0).

DEVICE 1 (ENDPOINT 1)	RELAY OUTPUT
Group 1 / 1	Lifeline. Lifeline group for the entire module. Sends **Basic Report On / Off** when the relay is turned on or off. Sends **Meter Report** with energy data for the load connected to the relay output. Max. nodes in the group: 1
DEVICE 2 (ENDPOINT 2)	**TEMPERATURE INPUT 1**
Group 1 / -	Lifeline. Max. nodes in the group: 0
Group 2 / 2	Sends **Sensor Multilevel Report** for input 1. Nodes in this group will receive information of the current temperature measured by the NTC connected to input 1. Max. nodes in the group: 5
DEVICE 3 (ENDPOINT 3)	**TEMPERATURE INPUT 2**
Group 1 / -	Lifeline. Max. nodes in the group: 0
Group 2 / 3	Sends **Sensor Multilevel Report** for input 2. Nodes in this group will receive information of the current temperature measured by the NTC connected to input 2. Max. nodes in the group: 5
DEVICE 4 (ENDPOINT 4)	**FLOOD SENSOR INPUT**
Group 1 / -	Lifeline. Max. nodes in the group: 0
Group 2 / 4	Nodes in this group receives **Basic Report On / Off** when the flood sensor detects a flood. Normally used for visualization in the Controller. Max. nodes in the group: 5
Group 3 / 5	Nodes in this group receives **Basic Set On / Off** when the flood sensor detects a flood. Max. nodes in the group: 5
Group 4 / 6	Nodes in this group receives **Notification Report** when the flood sensor detects a flood. The notification events reported are: "Water leak detected "0x02 and "Idle" 0x00. Max. nodes in the group: 5

6.   SECURITY (S2)

The S2 security enhances Z-Wave Plus with an additional layer of AES 128-bit encryption of the wireless Z-Wave communication in order to prevent hacking and man-in-middle attacks of the home network. The Heatit Z-Relay supports S2 and has a QR-code label that can be used when the module is included into the Z-Wave home network. The including Controller will ask for a 5-digit code, which can be identified beneath the QR-code, and will then ask to confirm the rest of the code that is contained in the QR-code.

7.   CONFIGURATION PARAMETERS

Z-Wave products are supposed to work out of the box after they are added to the Z-Wave network, however certain configuration of a device can alter the functionality to better serve the needs of the user's or unlock further enhanced features.

Parameter 1, Parameter size 1 byte. Status LED.

Configuration of the status LED.

VALUE	DESCRIPTION
0	LED turned off.
1	LED turned on. (Default)
2	LED flashing at 1 second intervals (½ Hz).
3	LED flashing at ½ second interval (1 Hz).

Parameter 2, Parameter size 1 byte. Status LED brightness level.

Configure the percentage of light in the status LED, when the LED is turned on

VALUE	DESCRIPTION
0 - 100	Specifies the brightness level of the LED when it is on. Default is 50.

Parameter 3, Parameter size 1 byte. Thermistor type for input 1.

Configures the thermistor type connected to input 1.

VALUE	DESCRIPTION
0	Input disabled. (Default).
1	10K NTC (TEWA PART NUMBER: TT02-10KC3-93D-3000R-TPH)

Parameter 4, Parameter size 1 byte. Thermistor type for input 2.

Configures the thermistor type connected to input 2.

VALUE	DESCRIPTION
0	Input disabled. (Default).
1	10K NTC (TEWA PART NUMBER: TT02-10KC3-93D-3000R-TPH)

Parameter 5, Parameter size 1 byte. Temperature offset on input 1.

Configures a temperature offset that can be added to the measured temperature in order to get a more accurate measurement from the thermistor on input 1.

VALUE	DESCRIPTION
-40 – 40	-4,0 – 4,0°C. Value is added to the temperature measurement. (Default is 0).

Parameter 6, Parameter size 1 byte. Temperature offset on input 2.

Configures a temperature offset that can be added to the measured temperature in order to get a more accurate measurement from the thermistor on input 2.

VALUE	DESCRIPTION
-40 – 40	-4,0 – 4,0°C. Value is added to the temperature measurement. (Default is 0).

Parameter 7, Parameter size 2 bytes. Time interval for reports sent about input 1.

Configures the time interval between when sensor reports are transmitted for input 1.

VALUE	DESCRIPTION
0 – 8,640	0 – 86 400 seconds. Default value is 6 (60 seconds) which will cause a report to be sent every minute.

Parameter 8, Parameter size 2 bytes. Time interval for reports sent about input 2.

Configures the time interval between when sensor reports are transmitted for input 2.

VALUE	DESCRIPTION
0 – 8,640	0 – 86 400 seconds. Default value is 6 (60 seconds) which will cause a report to be sent every minute.

Parameter 9, Parameter size 2 bytes. Time interval between notification reports for input 3.

Configures the time interval between when notification reports for flood input 3.

VALUE	DESCRIPTION
0 – 8,640	0 – 86 400 seconds. Default value is 2 (20 seconds) which will cause reports to be sent every 20 seconds.

Parameter 10, Parameter size 2 bytes. Time interval between meter reports.

Configures the time interval between when meter reports for reporting the energy (kWh) consumed by the load connected to the relay output.

VALUE	DESCRIPTION
0 – 8,640	0 – 86 400 seconds. Default value is 90 (900 seconds) which will cause reports to be sent every 15 minute.

Parameter 11, Parameter size 1 byte. Flood steady timer.

Configures the time that the flood input (input 3) has to be steady before the state is accepted as a valid state.

VALUE	DESCRIPTION
0 – 60	0 – 60 seconds. Default value is 6 (6 seconds) before a state is accepted as valid.

Parameter 12, Parameter size 1 byte. Auto relay on.

Configures internal states that will cause the relay to be turned on.

VALUE	DESCRIPTION
0	Relay is not turned on automatically.
1	The relay is turned on when a flood is detected. (Default)
2	The relay is turned on when no flood is detected.

Parameter 13, Parameter size 1 byte. Auto relay off.

Configures internal states that will cause the relay to be turned off.

VALUE	DESCRIPTION
0	Relay is not turned off automatically.
1	The relay is turned off when a flood is detected.
2	The relay is turned off when no flood is detected. (Default)

Parameter 14, Parameter size 2 bytes. Flood detection threshold.

Configures the threshold for input 3 that will cause a flood to be detected.

VALUE	DESCRIPTION
0 - 4095	Low value means a low detection threshold, high value will cause the input to be more sensitive. Default value is 2048.

Parameter 15, Parameter size 1 byte. Voltage.

Configures the value used for power calculation, as only the current for the load on the relay output is measured.

VALUE	DESCRIPTION
0 – 250	0 – 250 Volt. Default value is 220.

Parameter 16, Parameter size 1 byte. Ampere.

NOT USED

VALUE	DESCRIPTION
0 - 255	Default value is 0.

Parameter 17, Parameter size 1 byte. Digital value per ampere.

Configures the digital value on the A/D converter that corresponds to a current of one ampere.
DO NOT CHANGE THIS VALUE, UNLESS INSTRUCTED TO.

VALUE	DESCRIPTION
0 - 255	0 – 255. Default value is 81 which is corresponds to the current sensor ACS722LLCTR-20AB.

Parameter 18, Parameter size 2 bytes. Size of load connected on the relay output.

Configures a constant value that will be used in power metering when this value is different from 0.
This value specifies the actual load in **Watt** used for power metering.

VALUE	DESCRIPTION
0 – 6000	0 – 6000 Watt. Default value is 0.

8. COMMAND CLASSES

SUPPORTED COMMAND CLASSES

- Association (version 2)
- Association Group Information (version 1)
- Multi Channel Association (version 3)
- Version (version 2)
- Configuration (version 3)
- Manufacturer Specific (version 2)
- Z-Wave Plus Information (version 2)
- Device Reset Locally (version 1)
- Powerlevel (version 1)
- Firmware Update (version 4)
- Security (version 1)
- Security 2 (version 1)
- Supervision (version 1)
- Multi Channel (version 4)
- Basic (version 2)
- Switch Binary (version 1)
- Meter (version 3)

CONTROLLED COMMAND CLASSES

- Basic (version 2)
- Meter (version 3)
- Multilevel Sensor (version 5)
- Notification Sensor (version 8)

heatit

PRODUCT INFO Heatit Z-Relay

FEATURES

- Multipurpose product for many different applications
- Relay 16A or 25A
- 3 inputs. Combinations of analog/digital inputs of your choice
- External antenna option
- Can be used in connection with different NTC-sensors
- Calibration
- Associations
- Firmware updates (OTA)
- Power metering
- Multilevel sensor command class
- Supports encryption mode: S0, S2 Authenticated Class, S2 Unauthenticated Class

This product is a security enabled Z-Wave Plus product with encryption. The product must be used with a security enabled Z-Wave Controller in order to fully utilize the product.

TECHNICAL DATA

Protocol	Z-Wave
SDK	6.71.00
Rated voltage	230V 50/60Hz
Max load	3600W/5750W (resistive load)
	750W self-limiting heating cable
Max current	16A or 25A
Power consumption	0,8W standby
Min/max installation temp	-20℃ - 40℃
Min/max operating temp	-20℃ - 40℃
Hysteresis	0,3℃ - 3,0℃ (default 0,5℃)
Compatible with NTC sensors with values	10, 12, 15, 22, 33 and 47 kΩ @ 25℃
Range	Up to 50 meters
	(depending on surroundings)
IP Class	IP 55
Size (LxWxD)	100 x 100 x 46 mm
Fuse	315mA 250V AC SLOW
Relay outputs	Rated carry current: 26A
	Max. switching voltage: 277V AC
	Max switching current:
	26A cosφ=1, 75℃
Inputs	Input impedance 22K Ohm
	Loop output voltage 3.3V DC
Connection terminals	Solid wire: 30-10 AWG / 5.26-0.05 mm²
	Stranded wire:
	30-10 AWG / 5.26-0.05 mm²
	Wire stripe length: 8 mm
	Screw: M3
Explorer Frame Support	Yes
Device Type	Slave with routing capabilities
Generic Device Class	Binary Switch
Specific Device Class	Valve Open Close
Approvals	Z-Wave Plus (pending)
	EN 50491-3: 2009, EN 60669-2: 2004
	CE
	EMC 2014/30/EU, RoHS 2011/65/EU
	LVD 2014/35/EU