DAN_RS-Z
Z-Wave electrical thermostat and room sensor

Firmware Version : 1.0

Quick Start

S This device is a Z-Wave actuator. Ensure that the device is in the factory default state. If it is not please refer to the later section of this manual to learn how to reset the device. Put your controller in the Inclusion-Mode and press the LED button on the device 3 times. Observe the device and controller to see the status of the inclusion. While the device is including the symbol above the temperature will flash. Once it is included the symbol will stay solid.

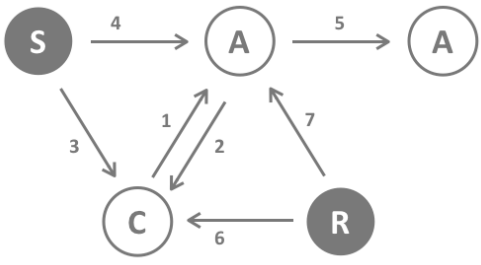
Please refer to the chapters below for detailed information about all aspects of the products usage.

What is Z-Wave?

This device is equipped with wireless communication complying to the Z-Wave standard. Z-Wave is the **international standard for wireless communication** in smart homes and buildings. It is using the **frequency of 868.42 MHz** to realize a very stable and secure communication. Each message is reconfirmed (**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.

Z-Wave differentiates between Controllers and Slaves. Slaves are either sensors **(S)** transmitting metered or measured data or actuators **(A)** capable to execute an action. Controllers are either static mains powered controllers **(C)** also referred to as gateways or mobile battery operated remote controls **(R)**. This results in a number of possible communication patterns within a Z-Wave network that are partly or completely supported by a specific device.

1. Controllers control actuators
2. Actuators report change of status back to controller
3. Sensors report change of status of measured values to controller
4. Sensors directly control actuators
5. Actuators control other actuators
6. Remote controls send signals to static controllers to trigger scenes or other actions
7. Remote controls control other actuators.



There are two different role a controller can have. There is always one single primary controller that is managing the network and including/excluding devices. The controller may have other functions - like control buttons - as well. All other controllers don't manage the network itself but can control other devices. They are called secondary controllers. The image also shows that its not possible to operate a sensor just from a remote control. Sensors only communicate with static controllers.

Product description

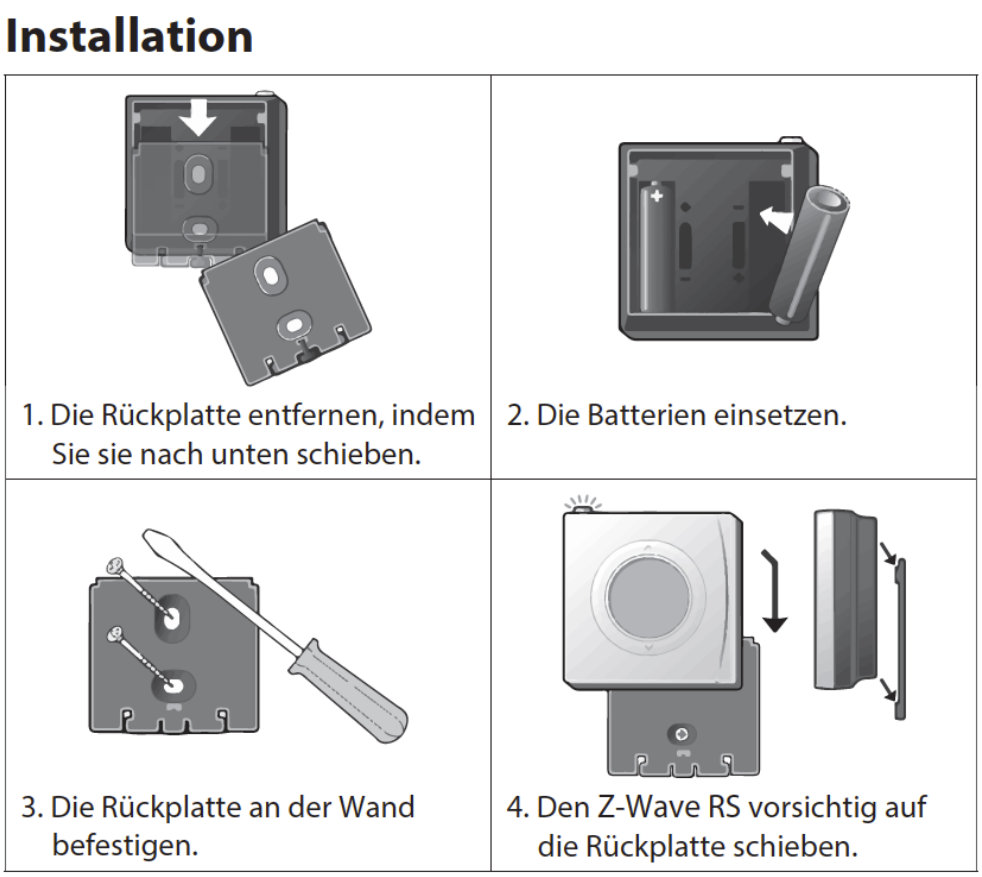
This Z-Wave device is used as a central temperature sensor for heating or cooling solutions with multiple actuators. The measured temperature is displayed. Two buttons allow to overwrite the setpoint temperature. It can be used as Z-Wave stand alone temperature sensor or to control heating, cooling of ventilation devices. The overwrite can be terminated for certain hours. After this time the setpoint temperature will go back to the redefined value. Beside the two front buttons the device has one more button on the top side. The use of this button can be defined by the central controller. Possible functions can include a temperature boost (heat up as soon as possible) or the activation of a energy saving mode.

Batteries

The unit is operated by batteries. Use only batteries of correct type. Never mix old and new batteries in the same device. Used batteries contain hazardous substances and should not be disposed of with household waste!

Battery Type: 2 * AA

Installation Guidelines



Remove the back panel of the device by sliding it downwards. Put in the batteries and include the Device into the network. Mount the back panel to your desired place at the wall and gently slide the device back on the panel.

Behavior within the Z-Wave network

I On factory default the device does not belong to any Z-Wave network. The device needs to join an existing wireless network to communicate with the devices of this network. This process is called **Inclusion**. Devices can also leave a network. This process is called **Exclusion**. Both processes are initiated by the primary controller of the Z-Wave network. This controller will be turned into exclusion respective inclusion mode. Please refer to your primary controllers manual on how to turn your controller into inclusion or exclusion mode. Only if the primary controller is in inclusion or exclusion mode, this device can join or leave the network. Leaving the network - i.e. being excluded - sets the device back to factory default.

If the device already belongs to a network, follow the exclusion process before including it in your network. Otherwise inclusion of this device will fail. If the controller being included was a primary controller, it has to be reset first.

Ensure that the device is in the factory default state. If it is not you can reset it by removing one battery and pressing and holding the LED button while putting the battery back in. After about 5 seconds the LED should flash in a red light. This signals that the device is now in the factory default state. Put your controller in the Inclusion-Mode and press the LED button on the device 3 times. Observe the device and controller to see the status of the inclusion. While the device is including the symbol above the temperature will flash. Once it is included the symbol will stay solid. To exclude the device simply set your controller into exclusion mode and hold down all 3 buttons (LED, up and down) for at least 5 seconds. As with the inclusion please see the symbol and your controller for the status of the process.

Operating the device

The Danfoss RS-Z is a room sensor that can measure the room temperature as well as controlling other thermostats in the Z-Wave network. The buttons on the device itself let you regulate the temperature of a connected thermostat. Alternatively you can use the interface of your controller to use the room sensor remotely without loosing any functionality. The temperature reported to the controller can be used to trigger predefined scenes that can control other devices in the network depending on the room temperature. Since the LED button can be programmed freely you can create your very own functionality within your network.

Wakeup Intervals - how to communicate with the device?

W This device is battery operated and turned into deep sleep state most of the time to save battery life time. Communication with the device is limited. In order to communicate with the device, a static controller C is needed in the network. This controller will maintain a mailbox for the battery operated devices and store commands that can not be received during deep sleep state. Without such a controller, communication may become impossible and/or the battery life time is significantly decreased.

This device will wakeup regularly and announce the wakeup state by sending out a so called Wakeup Notification. The controller can then empty the mailbox. Therefore, the device needs to be configured with the desired wakeup interval and the node ID of the controller. If the device was included by a static controller this controller will usually perform all necessary configurations. The wakeup interval is a tradeoff between maximal battery life time and the desired responses of the device.

Ein Klick auf eine beliebige Taste weckt den Sensor auf. Er bleibt danach 10 Sekunden wach.

It is possible to set the node ID to 255 to send wakeup notifications as broadcast. In this mode device takes more time to go to sleep and drains battery faster, but can notify all it's direct neighbors about a wakeup.

Node Information Frame

NI The Node Information Frame is the business card of a Z-Wave device. It contains information about the device type and the technical capabilities. The inclusion and exclusion of the device is confirmed by sending out a Node Information Frame. Beside this it may be needed for certain network operations to send out a Node Information Frame.

Ein Klick auf die LED-Taste sendet einen Node Information Frame aus.

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 to configure 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 two byte value the same logic applies: Values greater than 32768 may needed to be given as negative values too.

Temperature Report threshold (Parameter Number 1, Parameter Size 2)
0.1 to 10°C 1=0.1°C 100=10°C

Value	Description
1 — 100	temperature in celsius (Default 5)

Set-point display resolution (Parameter Number 2, Parameter Size 2)
0.1 to 10°C 1=0.1°C 100=10°C

Value	Description
1 — 100	temperature in celsius (Default 5)

Min Set-point and override limit (Parameter Number 3, Parameter Size 2)
from min 0°C to max setpoint override limit 0=0°C 40=40°C

Value	Description
0 — 40	temperature in celsius (Default 12)

Max Set-point and override limit (Parameter Number 4, Parameter Size 2)
from min setpoint override limit to max 40°C 0=0°C 40=40°C

Value	Description
0 — 40	temperature in celsius (Default 28)

LED Flash period (Parameter Number 5, Parameter Size 4)
0 to 65535 seconds

Value	Description
0 — 65535	seconds (Default 1)

Set-point control function (Parameter Number 6, Parameter Size 1)
0=Disabled 1=Enabled

Value	Description
0	disabled
1	enabled (Default)

Temporarily override scheduler (Parameter Number 7, Parameter Size 1)
0=Disabled 1=Enabled

Value	Description
0	disabled
1	enabled (Default)

Set-point type in Thermostat_Setpoint_Reports (Parameter Number 8, Parameter Size 1)
1=Heating 2=Cooling 10=Auto Changeover

Value	Description
1	Heating (Default)
2	Cooling
10	Auto Changeover

LED on time (Parameter Number 9, Parameter Size 2)
1=100ms 5=500ms

Value	Description
100 — 500	milliseconds (in 100ms steps)

Number of LED flashes (duration) (Parameter Number 10, Parameter Size 1)
0 to 255

Value	Description

LED color (Parameter Number 11, Parameter Size 1)
1=Green 2=Red

Value	Description
1	Green (Default)
2	Red

Command Classes
Supported Command Classes

- Basic (version 1)
- Manufacturer Specific (version 2)
- Version (version 2)
- Battery (version 1)
- Multi Command Encapsulated (version 1)
- Wake Up (version 2)
- Protection (version 2)
- Configuration (version 2)
- Multilevel Sensor (version 6)
- Central Scene (version 1)
- Thermostat Setpoint (version 3)
- (version 1)
- Indicator (version 1)

Controlled Command Classes

- Multi Command Encapsulated (version 1)

Technical Data

Battery Type	2 * AA
Explorer Frame Support	No
SDK	
Device Type	Slave with routing capabilities
Generic Device Class	Multilevel Sensor
Specific Device Class	Routing Multilevel Sensor
Routing	No
FLiRS	No
Firmware Version	1.0

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 bringing 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 annonces that is is able to communicate.
- **Node Information Frame** — is a special wireless message issued by a Z_Wave device to announce its capabilities and functions.

Disposal Guidelines

The product contains batteries. Please remove the batteries when the device is not used.

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.