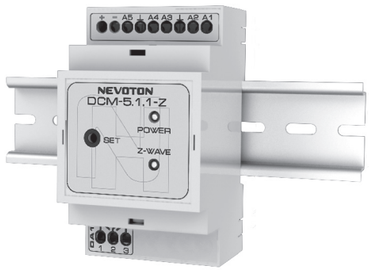


Nevoton DCM-5.1.1Z

Input-Output module 5th channel

Firmware Version : 1.0

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 adding/removing 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

NEVOTON DCM-5.1.1-Z - is a Z-Wave device which is intended for industrial and household sensors with electrical outputs of different types (e.g., 4-20 mA, 0-10V, dry contact, and thermocouples and thermistors). The data collecting module NEVOTON DCM-5.1.1-Z can manage with 5 sensors at the same time, as well as it is able to control one external device (has one switching relay). List of the types of respondents sensors corresponds to the modern equipment of industrial automation:

1. Platinum thermistor 50, 100, 500, 1000. Accuracy: 0,1°C, measurement error: above 0,1%
2. Copper thermistor 50, 100, 500, 1000. Accuracy: 0,1°C, measurement error: above 0,1%
3. Thermocouples: R,S,B,J,T,E,K,N,A,L,M types. Accuracy: 1°C, measurement error: above 0,1%
4. DC current signal 0..5 mA. Measurement error: above 0,1%
5. DC current signal 0..20 mA. Measurement error: above 0,1%
6. DC current signal 4..20 mA. Measurement error: above 0,1%
7. DC voltage signal 0..10 V. Measurement error: above 0,1%
8. DC voltage signal -50..+50 mV Measurement error: above 0,1%
9. DC voltage signal 0..1 V Measurement error: above 0,1%
10. Dry contact
11. Flap position sensor 0..900 Ohm
12. Flap position sensor 0..2000 Ohm

Since the DCM is added to the Z-Wave net sensors are not configured and not shown at the Z-Wave controller interface. Sensors are configured by the Configuration Command Class. The maximal number of used sensors is 5. The private channel generated by the MultiChannel CC should be used for each sensor. The number of channels depends on number of configured sensors. It can vary from 0 to 5. After setting sensors the DCM should be removed from the Z-Wave net and then added again. When the DCM is added to the Z-Wave net again it reports to the controller data about the number of used channels and types of connecter sensors. Sensors types are represented Command Classes below: Sensor Binary, Notification (Dry Contact) and Multilevel (temperature, voltage, current etc.).

Channels numbers are set in ascending order. I.e. if channels 2 and 5 are configured, then after removal and adding to the Z-Wave net user would see channels 1 and 2

The DCM contains one relay, which can be operated by the SwitchBinary or the Basic Command Classes. The Basic CC is associated with the SwitchBinary CC and is used to control the relay state and to change it.

When the DCM is configured the SensorBinary CC, the Notification CC and the SensorMultilevel CC appears at NIF if they were used at least at one channel. Each of these CCs out of the channel description would be projected to correspond CC for the minor channel.

The DCM channels settings don't change even after the DCM removal from the Z-Wave net.

Before Device is installed

Please read carefully the enclosed user manual before installation of the radio-actuator, in order to ensure an error-free functioning.

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

The product is permitted only for proper use as specified in the user manual. Any kind of guarantee claim has to be forfeited if changes, modifications or painting are undertaken. The product must be checked for damages immediately after unpacking. In the case of damages, the product must not be operated in any case. If a danger-free operation of the equipment cannot be assured, the voltage supply has to be interrupted immediately and the equipment has to be protected from unintended operation.

Installation Guidelines

The device is designed for mounting on a wall or other surface on DIN-rail. To switch the device on its power terminals must be energized by an external 12 V DC power supply. After the power indicator «POWER» lights.

ATTENTION: *do not use the power supply of the data collecting module to power the devices connected to the data collecting module. This can lead to incorrect operation of the last one.*

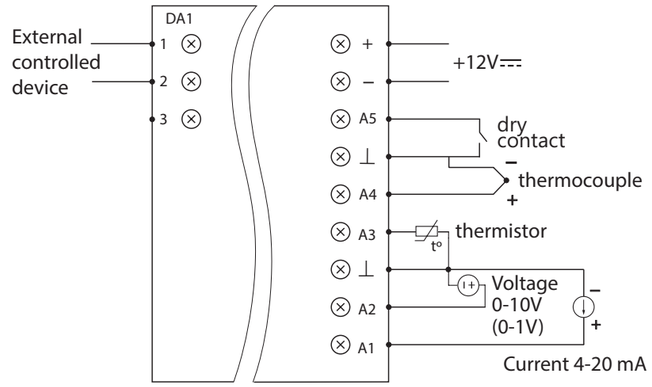
Behavior within the Z-Wave network

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 Adding. Devices can also leave a network. This process is called Removing. Both processes are initiated by the primary controller of the Z-Wave network. This controller will be turned into removing respective adding mode. Please refer to your primary controllers manual on how to turn your controller into adding or removing mode. Only if the primary controller is in adding or removing mode, this device can join or leave the network. Leaving the network - i.e. being removed - sets the device back to factory default.

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

For adding the device to the Z-Wave network the triple click of the Set button is needed. To remove the device from the Z-Wave network click the Set button trice again.

Operating the device



Data collecting module settings

The settings are described by the example of the 1st input channel of data collecting module. The relevant parameters for the other channels from 2nd to 5th set up by analogy with the difference that their number is different first digit (which corresponds to the channel number)

Parameter №10 This parameter is used to select the type of sensor. If you select «No sensor», the channel is not used and is not polled.

Parameter №14 This parameter determines the report sending time for the 1st channel. It is measured in seconds. The values range from 1 to 655535 seconds.

Parameter №15 This parameter is the sensor sensitivity parameter. It defines value of the changes necessary for sending the report, the channel 1.

Parameter №16 Parameter Limitation of the rate of departure of the report. Parameter is defined as the time from the time of dispatch of the previous report, after which it is possible to send another report. Time is given in milliseconds. Range from 1 to 65535 msec. Limitation can be turned off.

Basic CC are binding with SwitchBinary CC and uses to get relay status and control it.

Upgrade over the air

A firmware update can fix the existing bugs and add new functionality.

To confirm the firmware wireless update the double-click of the Set button is needed. The Z-Wave Indicator alternately flashes red and green. When the firmware update is complete, the Z-Wave indicator will light up in green continuously.

Factory reset

Hold the Set button pushed for 5 seconds, then push it three times shortly. The Z-Wave Indicator alternately flashes red and green. After that the triple-click is needed.

Please use this procedure only when the network primary controller is missing or otherwise inoperable.

The sensors configuration and used channels quantity can't be reset by remove the DCM from the Z-Wave net. Thus the factory reset is needed.

Associations

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 a common wireless command.

The only association group available for Nevoton DCM-5.1.1-Z is Lifeline - the controller recieves information from the sensors and relay (max. nodes in group: 5)

Configuration Parameters

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

Sensor type for Channel #1 (Parameter Number 10, Parameter Size 1) Sensor type, Sensor type for Channel #1. Interview need for new values

Value	Description
0	No sensor (Default)
1	Thermocouple L type
2	Thermocouple J type
3	Thermocouple N type
4	Thermocouple K type
5	Thermocouple S type
6	Thermocouple R type
7	Thermocouple B type
8	Thermocouple A1 type
9	Thermocouple A2 type
10	Thermocouple A3 type
11	Thermocouple T type
12	Thermocouple E type
13	Thermocouple E type
13	Thermistor Pt50 L=3.85
14	Thermistor Pt50 L=3.91
15	Thermistor Pt100 L=3.85
16	Thermistor Pt100 L=3.91
17	Thermistor Pt500 L=3.85
18	Thermistor Pt500 L=3.91
19	Thermistor Pt1000 L=3.85
20	Thermistor Pt1000 L=3.91
21	Thermistor Cu50 L=4.26
22	Thermistor Cu50 L=4.28
23	Thermistor Cu100 L=4.26
24	Thermistor Cu100 L=4.28
25	Thermistor Cu500 L=4.26
26	Thermistor Cu500 L=4.28
27	Thermistor Cu1000 L=4.26
28	Thermistor Cu1000 L=4.28
29	Thermistor Ni100 L=6.17
30	Thermistor Ni500 L=6.17
31	Thermistor Ni1000 L=6.17
32	Thermistor 23
33	Voltage 0-1 V range
34	Voltage 0-10 V range
35	Current 4-20 mA range
36	Dry Contact

Report sending time, channel #1 (Parameter Number 14, Parameter Size 2) Time interval in seconds for sensor data sending, channel #1

Value	Description
0	Off
30 — 65535	Seconds (Default 30)

Send report at change of value to the set size, channel #1 (Parameter Number 15, Parameter Size 2) Defines value of the changes necessary for sending the report, the channel #1. For example, the established value 1, will lead to sending the report at change of the value established sensor on 0.01

Value	Description
0	Off (Default)
1 — 65535	Value/100

Send the report not more often, than, channel #1 (Parameter Number 16, Parameter Size 2)

Value	Description
30 — 65535	Seconds (Default 30)

Sensor type for Channel #2 (Parameter Number 20, Parameter Size 1) Sensor type, Sensor type for Channel #2. Interview need for new values

Value	Description
0	No sensor (Default)
1	Thermocouple L type

2	Thermocouple J type
3	Thermocouple N type
4	Thermocouple K type
5	Thermocouple S type
6	Thermocouple R type
7	Thermocouple B type
8	Thermocouple A1 type
9	Thermocouple A2 type
10	Thermocouple A3 type
11	Thermocouple T type
12	Thermocouple E type
13	Thermocouple E type
13	Thermistor Pt50 L=3.85
14	Thermistor Pt50 L=3.91
15	Thermistor Pt100 L=3.85
16	Thermistor Pt100 L=3.91
17	Thermistor Pt500 L=3.85
18	Thermistor Pt500 L=3.91
19	Thermistor Pt1000 L=3.85
20	Thermistor Pt1000 L=3.91
21	Thermistor Cu50 L=4.26
22	Thermistor Cu50 L=4.28
23	Thermistor Cu100 L=4.26
24	Thermistor Cu100 L=4.28
25	Thermistor Cu500 L=4.26
26	Thermistor Cu500 L=4.28
27	Thermistor Cu1000 L=4.26
28	Thermistor Cu1000 L=4.28
29	Thermistor Ni100 L=6.17
30	Thermistor Ni500 L=6.17
31	Thermistor Ni1000 L=6.17
32	Thermistor 23
33	Voltage 0-1 V range
34	Voltage 0-10 V range
35	Current 4-20 mA range
36	Dry Contact

Report sending time, channel #2 (Parameter Number 24, Parameter Size 2) Time interval in seconds for sensor data sending, channel #2

Value	Description
0	Off
30 — 65535	Seconds (Default 30)

Send report at change of value to the set size, channel #2 (Parameter Number 25, Parameter Size 2) Defines value of the changes necessary for sending the report, the channel #2. For example, the established value 1, will lead to sending the report at change of the value established sensor on 0.01

Value	Description
0	Off (Default)
1 — 65535	Value/100

Send the report not more often, than, channel #2 (Parameter Number 26, Parameter Size 2)

Value	Description
30 — 65535	Seconds (Default 30)

Sensor type for Channel #3 (Parameter Number 30, Parameter Size 1) Sensor type, Sensor type for Channel #3. Interview need for new values

Value	Description
0	No sensor (Default)
1	Thermocouple L type
2	Thermocouple J type
3	Thermocouple N type
4	Thermocouple K type
5	Thermocouple S type
6	Thermocouple R type
7	Thermocouple B type
8	Thermocouple A1 type
9	Thermocouple A2 type
10	Thermocouple A3 type
11	Thermocouple T type
12	Thermocouple E type
13	Thermocouple E type
13	Thermistor Pt50 L=3.85
14	Thermistor Pt50 L=3.91
15	Thermistor Pt100 L=3.85
16	Thermistor Pt100 L=3.91
17	Thermistor Pt500 L=3.85
18	Thermistor Pt500 L=3.91
19	Thermistor Pt1000 L=3.85
20	Thermistor Pt1000 L=3.91
21	Thermistor Cu50 L=4.26
22	Thermistor Cu50 L=4.28
23	Thermistor Cu100 L=4.26
24	Thermistor Cu100 L=4.28
25	Thermistor Cu500 L=4.26
26	Thermistor Cu500 L=4.28
27	Thermistor Cu1000 L=4.26
28	Thermistor Cu1000 L=4.28
29	Thermistor Ni100 L=6.17
30	Thermistor Ni500 L=6.17
31	Thermistor Ni1000 L=6.17
32	Thermistor 23
33	Voltage 0-1 V range
34	Voltage 0-10 V range
35	Current 4-20 mA range
36	Dry Contact

Report sending time, channel #3 (Parameter Number 34, Parameter Size 2) Time interval in seconds for sensor data sending, channel #3

Value	Description
0	Off
30 — 65535	Seconds (Default 30)

Send report at change of value to the set size, channel #3 (Parameter Number 35, Parameter Size 2) Defines value of the changes necessary for sending the report, the channel #3. For example, the established value 1, will lead to sending the report at change of the value established sensor on 0.01

Value	Description
0	Off (Default)
1 — 65535	Value/100

Send the report not more often, than, channel #3 (Parameter Number 36, Parameter Size 2)

Value	Description
30 — 65535	Seconds (Default 30)

Sensor type for Channel #4 (Parameter Number 40, Parameter Size 1) Sensor type, Sensor type for Channel #4. Interview need for new values

Value	Description
0	No sensor (Default)
1	Thermocouple L type
2	Thermocouple J type
3	Thermocouple N type
4	Thermocouple K type
5	Thermocouple S type
6	Thermocouple R type
7	Thermocouple B type
8	Thermocouple A1 type
9	Thermocouple A2 type
10	Thermocouple A3 type
11	Thermocouple T type
12	Thermocouple E type
13	Thermocouple E type
13	Thermistor Pt50 L=3.85
14	Thermistor Pt50 L=3.91
15	Thermistor Pt100 L=3.85
16	Thermistor Pt100 L=3.91
17	Thermistor Pt500 L=3.85
18	Thermistor Pt500 L=3.91
19	Thermistor Pt1000 L=3.85
20	Thermistor Pt1000 L=3.91
21	Thermistor Cu50 L=4.26
22	Thermistor Cu50 L=4.28
23	Thermistor Cu100 L=4.26
24	Thermistor Cu100 L=4.28
25	Thermistor Cu500 L=4.26
26	Thermistor Cu500 L=4.28
27	Thermistor Cu1000 L=4.26
28	Thermistor Cu1000 L=4.28
29	Thermistor Ni100 L=6.17
30	Thermistor Ni500 L=6.17
31	Thermistor Ni1000 L=6.17
32	Thermistor 23
33	Voltage 0-1 V range
34	Voltage 0-10 V range
35	Current 4-20 mA range
36	Dry Contact

Report sending time, channel #4 (Parameter Number 44, Parameter Size 2) Time interval in seconds for sensor data sending, channel #4

Value	Description
0	Off
30 — 65535	Seconds (Default 30)

Send report at change of value to the set size, channel #4 (Parameter Number 45, Parameter Size 2) Defines value of the changes necessary for sending the report, the channel #4. For example, the established value 1, will lead to sending the report at change of the value established sensor on 0.01

Value	Description
0	Off (Default)
1 — 65535	Value/100

Send the report not more often, than, channel #4 (Parameter Number 46, Parameter Size 2)

Value	Description
30 — 65535	Seconds (Default 30)

Sensor type for Channel #5 (Parameter Number 50, Parameter Size 1) Sensor type, Sensor type for Channel #5. Interview need for new values

Value	Description
0	No sensor (Default)
1	Thermocouple L type
2	Thermocouple J type
3	Thermocouple N type
4	Thermocouple K type
5	Thermocouple S type
6	Thermocouple R type
7	Thermocouple B type
8	Thermocouple A1 type
9	Thermocouple A2 type
10	Thermocouple A3 type
11	Thermocouple T type
12	Thermocouple E type
13	Thermocouple E type
13	Thermistor Pt50 L=3.85
14	Thermistor Pt50 L=3.91
15	Thermistor Pt100 L=3.85
16	Thermistor Pt100 L=3.91
17	Thermistor Pt500 L=3.85
18	Thermistor Pt500 L=3.91
19	Thermistor Pt1000 L=3.85
20	Thermistor Pt1000 L=3.91
21	Thermistor Cu50 L=4.26
22	Thermistor Cu50 L=4.28
23	Thermistor Cu100 L=4.26
24	Thermistor Cu100 L=4.28
25	Thermistor Cu500 L=4.26
26	Thermistor Cu500 L=4.28
27	Thermistor Cu1000 L=4.26
28	Thermistor Cu1000 L=4.28
29	Thermistor Ni100 L=6.17
30	Thermistor Ni500 L=6.17
31	Thermistor Ni1000 L=6.17
32	Thermistor 23
33	Voltage 0-1 V range
34	Voltage 0-10 V range
35	Current 4-20 mA range
36	Dry Contact

Report sending time, channel #5 (Parameter Number 54, Parameter Size 2) Time interval in seconds for sensor data sending, channel #5

Value	Description
0	Off
30 — 65535	Seconds (Default 30)

Send report at change of value to the set size, channel #5 (Parameter Number 55, Parameter Size 2) Defines value of the changes necessary for sending the report, the channel #5. For example, the established value 1, will lead to sending the report at change of the value established sensor on 0.01

Value	Description
0	Off (Default)
1 — 65535	Value/100

Send the report not more often, than, channel #5 (Parameter Number 56, Parameter Size 2)

Value	Description
30 — 65535	Seconds (Default 30)

ATTENTION: *As the DCM settings don't change after the removal from the Z-Wave net, the manual reset is needed.*

After the sensor type is changed the device should be removed and then added necessarily.

Command Classes

Supported Command Classes

- Basic (version 1)
- Binary Switch (version 1)
- Binary Sensor (version 2)
- Multilevel Sensor (version 5)
- Association Group Information (version 1)
- Device Reset Locally (version 1)
- Z-Wave Plus Information (version 2)
- Multi Channel (version 4)
- Configuration (version 1)
- Alarm (version 5)
- Manufacturer Specific (version 2)
- Powerlevel (version 1)
- Firmware Update Meta Data (version 3)
- Association (version 2)
- Version (version 2)
- Multi Channel Association (version 3)
- Multi Command Encapsulated (version 1)

Technical Data

IP Rating ..... IP 20
Frequency ..... 869 MHz
Wireless Range ..... up to 50 m outside, on average up to 15 m inside buildings
Routing ..... Yes
Explorer Frame Support ..... Yes
SDK 6.51.06
Device Type ..... Slave with routing capabilities
Generic Device Class ..... Binary Switch
Specific Device Class ..... Binary Power Switch
Routing ..... Yes
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.

Add — is the process of bringing new Z-Wave devices into a network.

Remove — 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 does not contain hazardous chemicals.

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.