

ZIF MODULE

INTERFACE FOR UTILITY METERS

Z-Wave DIN-rail Module Type ZIF5029



Installation and User Manual

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1. Product Description.

The ZIF5029 DIN-rail module is a device with a wireless Z-Wave communication protocol. It has 6 relay driven outputs and 6 pulse inputs (S0). The unit is a multi-purpose Z-Wave I/O module, which can be used for many applications. E.g. the module provides the possibility to control other systems via the Z-Wave network, by utilizing the 6 outputs as a kind of hand-over function to another automation system.

The relay outputs can be controlled from the Z-Wave network, and are suitable for switching up to 6 230Vac loads. When connecting to SELV (**S**afety **E**xtra **L**ow **V**oltage) and 230Vac power circuits for relay outputs, relays must be considered as two groups, where the first group includes output 1 to 3 and the second group includes the outputs 4 to 6. If one of the relays in the group is connected to a SELV circuit, the remaining outputs are not allowed to be connected to 230Vac or another circuit which is not a SELV circuit. This ensures complete separation between the SELV and 230Vac circuits.

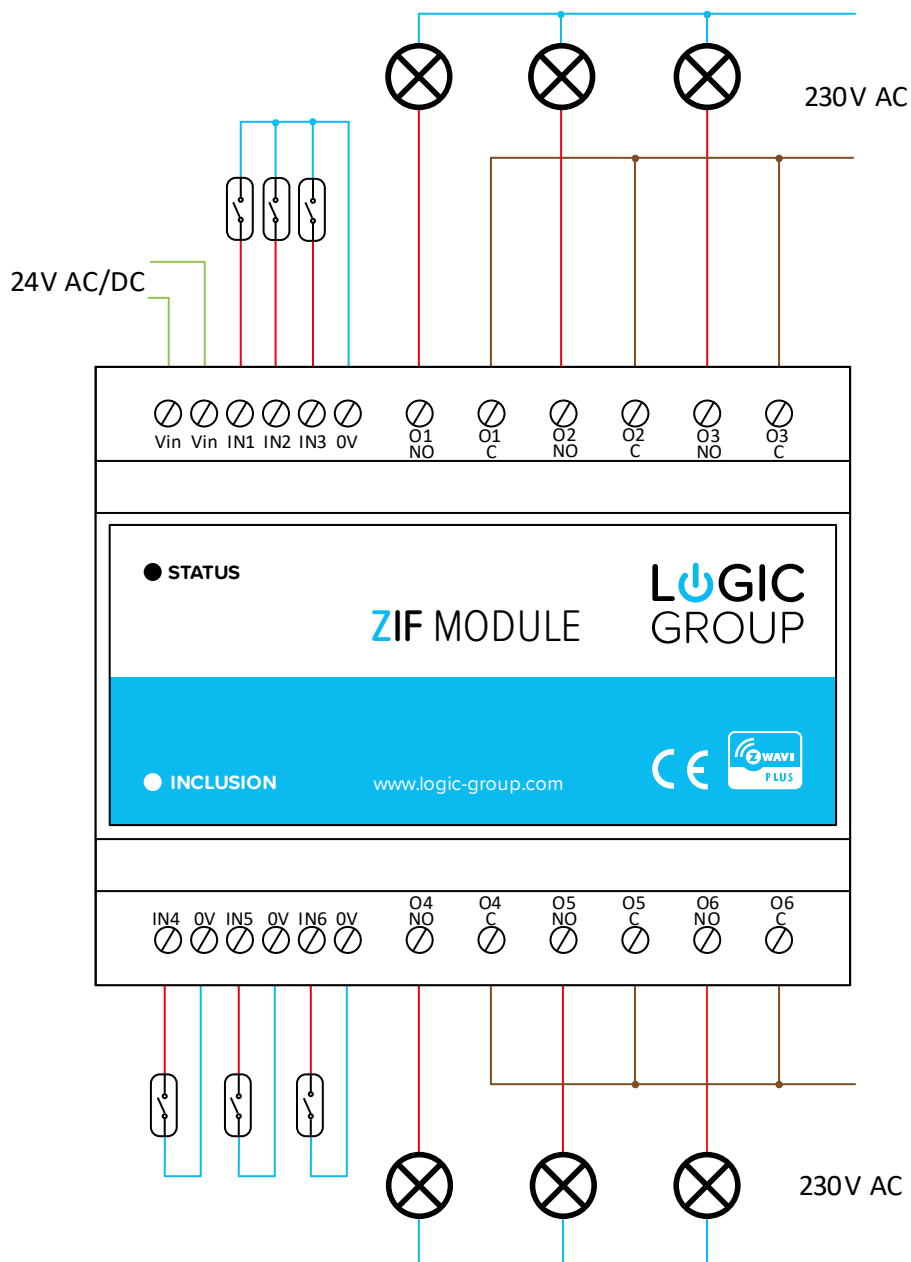
For example, the relay outputs can be used to control the 230Vac power supply outlet, making it possible to turn on and disconnect the electrical outlets directly through the Z-Wave network. For safety reasons, however, it is recommended not to use the ZIF5029 to plug electrical outlets that are normally used for hazardous tools and machinery.

The 6 pulse inputs can be used for counting pulses from utility meters such as water meters and electricity meters with an output that generates pulses when a specific consumption measure has been reached. E.g. a water meter can generate a pulse per liter passing through the meter or 1,000 pulses per m³ water. ZIF5029 can translate these pulses to a Command Class Metering Report which is sent over the Z-Wave network.

All 6 inputs can be used for different utility meters. For instance, input 1 can be connected to an electricity meter, input 2 to a water meter and so on. It is possible to individually configure the utility meter type connected to each input.

In addition, the ZIF5029 also acts as a repeater, thus extending the range of the Z-Wave network.

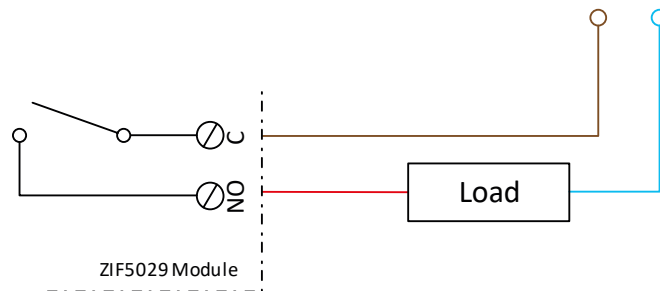
2. Connection.



Connect a 24V AC or DC power supply on the terminals marked "Vin" (polarity is no object). The power supply must be dimensioned to provide the module with enough power to enable all relays to be activated – see the Technical Specifications in section 8 about power consumption.

2.1. Outputs.

The 6 Outputs (**O1 NO/C** - **O6 NO/C**) consist of Single-Pole Single-Throw connectors.

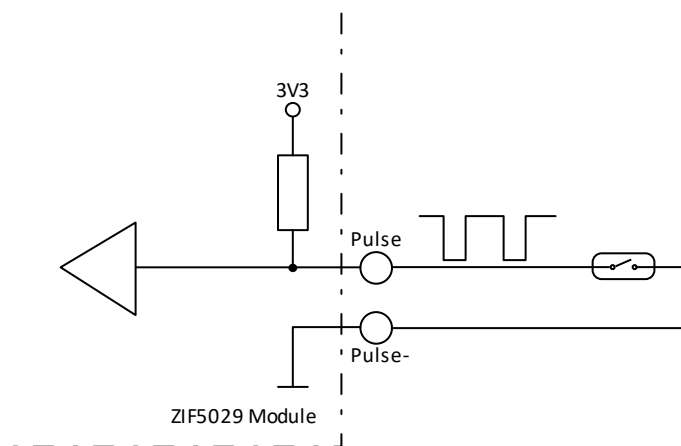


The outputs are directly controlled through the Z-Wave network. Activate and deactivate through the **Command Class Basic – Set** commandos, or **Command Class Binary Switch – Set** commandos.

2.2. Inputs.

The pulse inputs can be connected to different types of pulse generators: contacts, relays, open-collector outputs etc.

The 6 Inputs terminals (**IN1** - **IN6**) supply an output voltage of approximately 3V which is shorted to 0V by mounting a connector between the **INx** and **0V** terminals.



The turnover ratio between pulses and utility meter type, as well as the utility meter specification, are configured using configuration parameters for each input. See configuration parameters 9 - 38.

3. Factory Reset.

Please, only use this procedure in cases where the primary network controller is not operative.

When restoring factory settings, the device address and certain configuration parameters will be reset to the values at fabrication. The device must subsequently be included in the Z-Wave network again.

NB. Parameters regarding the setup of each input (parameter 9-38) are NOT reset. These parameters are retained both during inclusion and exclusion of the ZIF5029 device on the Z-Wave network. This allows you to set the desired values for the utility meters, then perform a new exclusion and inclusion, making the controller display the correct usage symbols on the user interface.

Restore factory settings by pushing the inclusion button (marked with the text "INCLUSION") and activate it for at least 10 seconds or until the status LED flashes briefly.

4. Inclusion in a Z-Wave Network.

Upon delivery, the ZIF5029 module has not been enrolled into any Z-Wave network. To communicate with other devices in the Z-Wave network, ZIF5029 must be enrolled in the network. This process is called to **include** the device in the Z-Wave network. Devices can also be removed from the Z-Wave network if they are to be used in another installation. This is called to **exclude** the device from the Z-Wave network.

Both processes are initiated by setting the central network controls in either **inclusion** or **exclusion** mode. Please refer to the network controller's manual how to set the central controls in either inclusion or exclusion mode.

The inclusion / exclusion mode on the ZIF5029 device is activated by pressing the small button through the hole in the front of the module, marked "INCLUSION", after which the status LED will start flashing.

If the device already belongs to a network, the device must be excluded before it can be included in the current network, otherwise the inclusion process will fail.

Furthermore, see section 3 above about maintaining configuration parameters during exclusion / inclusion.

5. Association Groups.

From a Z-Wave network perspective, the ZIF5028 consists of a basic virtual device (*root device* or *endpoint 0*), and 12 individual sub devices (12 *endpoints*).

The basic device is used by the Controllers which does not support Multichannel communication, hence providing a very limited use of this module.

The 12 endpoints consist of 6 devices for controlling module outputs and 6 units for reporting pulse inputs.

Shown below is an overview of the various association groups for each individual unit.

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*)

Group 1 / 1

Relay Output 1

Lifeline. Lifeline group for the entire module.

Sends Basic Report On / Off when relay output 1 is activated.

This group is typically used for reporting the actual status of the output to the Controller to let the Controller visualize the output in its user interface.

Max. nodes in the group: 1

Device 2 (*Endpoint 2*)

Group 1 / -

Relay Output 2

Lifeline. Lifeline group for the entire module.

Sends Basic Report On / Off when relay output 2 is activated.

This group is typically used for reporting the actual status of the output to the Controller to let the Controller visualize the output in its user interface.

Max. nodes in the group: 1

Device 3 (*Endpoint 3*)

Group 1 / -

Relay Output 3

Lifeline. Lifeline group for the entire module.

Sends Basic Report On / Off when relay output 3 is activated.

This group is typically used for reporting the actual status of the output to the Controller to let the Controller visualize the output in its user interface.

Max. nodes in the group: 1

Device 4 (Endpoint 4)	Relay Output 4
Group 1 / -	<i>Lifeline.</i> Lifeline group for the entire module. Sends Basic Report On / Off when relay output 4 is activated. This group is typically used for reporting the actual status of the output to the Controller to let the Controller visualize the output in its user interface. Max. nodes in the group: 1
Device 5 (Endpoint 5)	Relay Output 5
Group 1 / -	<i>Lifeline.</i> Lifeline group for the entire module. Sends Basic Report On / Off when relay output 5 is activated. This group is typically used for reporting the actual status of the output to the Controller to let the Controller visualize the output in its user interface. Max. nodes in the group: 1
Device 6 (Endpoint 6)	Relay Output 6
Group 1 / -	<i>Lifeline.</i> Lifeline group for the entire module. Sends Basic Report On / Off when relay output 6 is activated. This group is typically used for reporting the actual status of the output to the Controller to let the Controller visualize the output in its user interface. Max. nodes in the group: 1
Device 7 (Endpoint 7)	Input 1
Group 1 / -	<i>Lifeline.</i> Sends Meter Report for pulse input 1. Max. nodes in the group: 1
Device 8 (Endpoint 8)	Input 2
Group 1 / -	<i>Lifeline.</i> Sends Meter Report for pulse input 2. Max. nodes in the group: 1
Device 9 (Endpoint 9)	Input 3
Group 1 / -	<i>Lifeline.</i> Sends Meter Report for pulse input 3. Max. nodes in the group: 1
Device 10 (Endpoint 10)	Input 4
Group 1 / -	<i>Lifeline.</i> Sends Meter Report for pulse input 4.

Max. nodes in the group: 1

Device 11 (Endpoint 11)

Group 1 / -

Input 5

Lifeline.

Sends **Meter Report** for pulse input 5.

Max. nodes in the group: 1

Device 12 (Endpoint 12)

Group 1 / -

Input 6

Lifeline.

Sends **Meter Report** for pulse input 6.

Max. nodes in the group: 1

6. Configuration Parameters.

Z-Wave devices should be able to work directly after they have been included in the Z-Wave network, but by using different configuration parameters, the device functionality can be changed to better match individual wishes or needs, as well as allow for additional features.

Parameter 1, Parameter size: 1 byte. Status of LED.

This parameter can be used to change the mode of the front-mounted status LED.

Value Description

- 0 The LED is Off.
- 1 The LED is steadily lit-up. (Standard)
- 2 The LED flashes in 1 second interval (1 Hz).
- 3 The LED flashes in ½ second interval (½ Hz).

Parameter 2, Parameter size: 1 byte. Brightness of status LED.

Determines the brightness of the status LED.

Value Description

- 0 Switch off LED.
- 1 - 99 Brightness level (%). (Standard 50%)

Parameter 3, Parameter size: 1 byte. Output Function, Output 1.

Choose parameter value from the scheme below.

Value Description

- 0 Output is controlled via Z-Wave messages. (Standard)
- 1 *(Not applicable)*

Parameter 4, Parameter size: 1 byte. Output Function, Output 2.

Choose parameter value from the scheme below.

Value Description

0 Output is controlled via Z-Wave messages. (Standard)

1 *(Not applicable)*

Parameter 5, Parameter size: 1 byte. Output Function, Output 3.

Choose parameter value from the scheme below.

Value Description

0 Output is controlled via Z-Wave messages. (Standard)

1 *(Not applicable)*

Parameter 6, Parameter size: 1 byte. Output Function, Output 4.

Choose parameter value from the scheme below.

Value Description

0 Output is controlled via Z-Wave messages. (Standard)

1 *(Not applicable)*

Parameter 7, Parameter size: 1 byte. Output Function, Output 5.

Choose parameter value from the scheme below.

Value Description

0 Output is controlled via Z-Wave messages. (Standard)

1 *(Not applicable)*

Parameter 8, Parameter size: 1 byte. Output Function, Output 6.

Choose parameter value from the scheme below.

Value Description

0 Output is controlled via Z-Wave messages. (Standard)

1 *(Not applicable)*

Parameter 9, Parameter size: 1 byte. Meter Type of input 1.

Specifies the type of meter connected to input 1.

This parameter is retained during exclusion / inclusion of the device.

Value	Description
0	Input not in use.
1	Electricity meter. (Standard)
2	Gas meter.
3	Water meter.
4	Heat meter.
5	Cooling meter.

Parameter 10, Parameter size: 1 byte. Scale Type of input 1.

Specifies unit type for the chosen meter type connected to input 1.

This parameter is retained during exclusion / inclusion of the device.

Chosen meter type:	Value	Description
<u>Electricity meter (1)</u>	0	kWh
	1	kVAh
	2	W
	3	Pulse counter (Standard)
	4	V
	5	A
	6	Power Factor
<u>Gas meter (2)</u>	0	Cubic meter
	1	Cubic foot
	2	Reserved
	3	Pulse counter
<u>Water meter (3)</u>	0	Cubic meter
	1	Cubic foot
	2	US gallons
	3	Pulse counter
<u>Heat meter (4)</u>	0	kWh
<u>Cooling meter (5)</u>	0	kWh

Parameter 11, Parameter size: 1 byte. Precision of input 1.

Specifies the number of decimals in the measurement format for entry 1. For example, if this field is set to 1, the value will be sent with 1 decimal (e.g. 102.5).

This parameter is retained during exclusion / inclusion of the device.

Value	Description
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0 – 7	Number of decimals. Standard is 0.
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Parameter 12, Parameter size: 2 bytes. Pulses per Unit of input 1.

Specifies the number of pulses to count before one unit is reached at input 1. For example, if this parameter is set to 1,000 and Scale Type is set to Cubic meters, 1,000 pulses is counted to equal 1m³.

This parameter is retained during exclusion / inclusion of the device.

Value	Description
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0 – 65,000	Number of pulses needed to equal one scale value. Standard is 1.
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Parameter 13, Parameter size: 1 byte. Rate Type of input 1.

Specifies if the meter at input 1 register consumption or production. This is only used in **Metering Reports** sent on the Z-Wave network.

This parameter is retained during exclusion / inclusion of the device.

Value	Description
-------	-------------

0	Unspecified
1	Import (consumption). (Standard).
2	Export (production).
3	Reserved.

Parameter 14, Parameter size: 1 byte. Meter Type of input 2.

Specifies the type of meter connected to input 2.

This parameter is retained during exclusion / inclusion of the device.

Value	Description
0	Input not in use.
1	Electricity meter. (Standard)
2	Gas meter.
3	Water meter.
4	Heat meter.
5	Cooling meter.

Parameter 15, Parameter size: 1 byte. Scale Type of input 2.

Specifies unit type for the chosen meter type connected to input 2.

This parameter is retained during exclusion / inclusion of the device.

Chosen meter type:	Value	Description
<u>Electricity meter (1)</u>	0	kWh
	1	kVAh
	2	W
	3	Pulse counter (Standard)
	4	V
	5	A
	6	Power Factor
<u>Gas meter (2)</u>	0	Cubic meter
	1	Cubic foot
	2	Reserved
	3	Pulse counter
<u>Water meter (3)</u>	0	Cubic meter
	1	Cubic foot
	2	US gallons
	3	Pulse counter
<u>Heat meter (4)</u>	0	kWh
<u>Cooling meter (5)</u>	0	kWh

Parameter 16, Parameter size: 1 byte. Precision of input 2.

Specifies the number of decimals in the measurement format for input 2. For example, if this field is set to 1, the value will be sent with 1 decimal (e.g. 102.5).

This parameter is retained during exclusion / inclusion of the device.

Value	Description
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0 – 7	Number of decimals. Standard is 0.
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Parameter 17, Parameter size: 2 bytes. Pulses per Unit of input 2.

Specifies the number of pulses to count before one unit is reached at input 2. For example, if this parameter is set to 1,000 and Scale Type is set to Cubic meters, 1,000 pulses is counted to equal 1m³.

This parameter is retained during exclusion / inclusion of the device.

Value	Description
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0 – 65,000	Number of pulses needed to equal one scale value. Standard is 1.
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Parameter 18, Parameter size: 1 byte. Rate Type of input 2.

Specifies if the meter at input 2 register consumption or production. This is only used in **Metering Reports** sent on the Z-Wave network.

This parameter is retained during exclusion / inclusion of the device.

Value	Description
-------	-------------

0	Unspecified
1	Import (consumption). (Standard).
2	Export (production).
3	Reserved.

Parameter 19, Parameter size: 1 byte. Meter Type of input 3.

Specifies the type of meter connected to input 3.

This parameter is retained during exclusion / inclusion of the device.

Value	Description
0	Input not in use.
1	Electricity meter. (Standard)
2	Gas meter.
3	Water meter.
4	Heat meter.
5	Cooling meter.

Parameter 20, Parameter size: 1 byte. Scale Type of input 3.

Specifies unit type for the chosen meter type connected to input 3.

This parameter is retained during exclusion / inclusion of the device.

Chosen meter type:	Value	Description
<u>Electricity meter (1)</u>	0	kWh
	1	kVAh
	2	W
	3	Pulse counter (Standard)
	4	V
	5	A
	6	Power Factor
<u>Gas meter (2)</u>	0	Cubic meter
	1	Cubic foot
	2	Reserved
	3	Pulse counter
<u>Water meter (3)</u>	0	Cubic meter
	1	Cubic foot
	2	US gallons
	3	Pulse counter
<u>Heat meter (4)</u>	0	kWh
<u>Cooling meter (5)</u>	0	kWh

Parameter 21, Parameter size: 1 byte. Precision of input 3.

Specifies the number of decimals in the measurement format for input 3. For example, if this field is set to 1, the value will be sent with 1 decimal (e.g. 102.5).

This parameter is retained during exclusion / inclusion of the device.

Value	Description
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0 – 7	Number of decimals. Standard is 0.
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Parameter 22, Parameter size: 2 bytes. Pulses per Unit of input 3.

Specifies the number of pulses to count before one unit is reached at input 3. For example, if this parameter is set to 1,000 and Scale Type is set to Cubic meters, 1,000 pulses is counted to equal 1m³.

This parameter is retained during exclusion / inclusion of the device.

Value	Description
-------	-------------

0 – 65,000	Number of pulses needed to equal one scale value. Standard is 1.
------------	--

Parameter 23, Parameter size: 1 byte. Rate Type of input 3.

Specifies if the meter at input 3 register consumption or production. This is only used in **Metering Reports** sent on the Z-Wave network.

This parameter is retained during exclusion / inclusion of the device.

Value	Description
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0	Unspecified
1	Import (consumption). (Standard).
2	Export (production).
3	Reserved.

Parameter 24, Parameter size: 1 byte. Meter Type of input 4.

Specifies the type of meter connected to input 4.

This parameter is retained during exclusion / inclusion of the device.

Value	Description
0	Input not in use.
1	Electricity meter. (Standard)
2	Gas meter.
3	Water meter.
4	Heat meter.
5	Cooling meter.

Parameter 25, Parameter size: 1 byte. Scale Type of input 4.

Specifies unit type for the chosen meter type connected to input 4.

This parameter is retained during exclusion / inclusion of the device.

Chosen meter type:	Value	Description
<u>Electricity meter (1)</u>	0	kWh
	1	kVAh
	2	W
	3	Pulse counter (Standard)
	4	V
	5	A
	6	Power Factor
<u>Gas meter (2)</u>	0	Cubic meter
	1	Cubic foot
	2	Reserved
	3	Pulse counter
<u>Water meter (3)</u>	0	Cubic meter
	1	Cubic foot
	2	US gallons
	3	Pulse counter
<u>Heat meter (4)</u>	0	kWh
<u>Cooling meter (5)</u>	0	kWh

Parameter 26, Parameter size: 1 byte. Precision of input 4.

Specifies the number of decimals in the measurement format for input 4. For example, if this field is set to 1, the value will be sent with 1 decimal (e.g. 102.5).

This parameter is retained during exclusion / inclusion of the device.

Value Description

0 – 7 Number of decimals. Standard is 0.

Parameter 27, Parameter size: 2 bytes. Pulses per Unit of input 4.

Specifies the number of pulses to count before one unit is reached at input 4. For example, if this parameter is set to 1,000 and Scale Type is set to Cubic meters, 1,000 pulses is counted to equal 1m³.

This parameter is retained during exclusion / inclusion of the device.

Value Description

0 – 65,000 Number of pulses needed to equal one scale value. Standard is 1.

Parameter 28, Parameter size: 1 byte. Rate Type of input 4.

Specifies if the meter at input 4 register consumption or production. This is only used in **Metering Reports** sent on the Z-Wave network.

This parameter is retained during exclusion / inclusion of the device.

Value Description

0 Unspecified

1 Import (consumption). (Standard).

2 Export (production).

3 Reserved.

Parameter 29, Parameter size: 1 byte. Meter Type of input 5.

Specifies the type of meter connected to input 5.

This parameter is retained during exclusion / inclusion of the device.

Value	Description
0	Input not in use.
1	Electricity meter. (Standard)
2	Gas meter.
3	Water meter.
4	Heat meter.
5	Cooling meter.

Parameter 30, Parameter size: 1 byte. Scale Type of input 5.

Specifies unit type for the chosen meter type connected to input 5.

This parameter is retained during exclusion / inclusion of the device.

Chosen meter type:	Value	Description
<u>Electricity meter (1)</u>	0	kWh
	1	kVAh
	2	W
	3	Pulse counter (Standard)
	4	V
	5	A
	6	Power Factor
<u>Gas meter (2)</u>	0	Cubic meter
	1	Cubic foot
	2	Reserved
	3	Pulse counter
<u>Water meter (3)</u>	0	Cubic meter
	1	Cubic foot
	2	US gallons
	3	Pulse counter
<u>Heat meter (4)</u>	0	kWh
<u>Cooling meter (5)</u>	0	kWh

Parameter 31, Parameter size: 1 byte. Precision of input 5.

Specifies the number of decimals in the measurement format for input 5. For example, if this field is set to 1, the value will be sent with 1 decimal (e.g. 102.5).

This parameter is retained during exclusion / inclusion of the device.

Value Description

0 – 7 Number of decimals. Standard is 0.

Parameter 32, Parameter size: 2 bytes. Pulses per Unit of input 5.

Specifies the number of pulses to count before one unit is reached at input 5. For example, if this parameter is set to 1,000 and Scale Type is set to Cubic meters, 1,000 pulses is counted to equal 1m³.

This parameter is retained during exclusion / inclusion of the device.

Value Description

0 – 65,000 Number of pulses needed to equal one scale value. Standard is 1.

Parameter 33, Parameter size: 1 byte. Rate Type of input 5.

Specifies if the meter at input 5 register consumption or production. This is only used in **Metering Reports** sent on the Z-Wave network.

This parameter is retained during exclusion / inclusion of the device.

Value Description

0 Unspecified

1 Import (consumption). (Standard).

2 Export (production).

3 Reserved.

Parameter 34, Parameter size: 1 byte. Meter Type of input 6.

Specifies the type of meter connected to input 6.

This parameter is retained during exclusion / inclusion of the device.

Value	Description
0	Input not in use.
1	Electricity meter. (Standard)
2	Gas meter.
3	Water meter.
4	Heat meter.
5	Cooling meter.

Parameter 35, Parameter size: 1 byte. Scale Type of input 6.

Specifies unit type for the chosen meter type connected to input 6.

This parameter is retained during exclusion / inclusion of the device.

Chosen meter type:	Value	Description
<u>Electricity meter (1)</u>	0	kWh
	1	kVAh
	2	W
	3	Pulse counter (Standard)
	4	V
	5	A
	6	Power Factor
<u>Gas meter (2)</u>	0	Cubic meter
	1	Cubic foot
	2	Reserved
	3	Pulse counter
<u>Water meter (3)</u>	0	Cubic meter
	1	Cubic foot
	2	US gallons
	3	Pulse counter
<u>Heat meter (4)</u>	0	kWh
<u>Cooling meter (5)</u>	0	kWh

Parameter 36, Parameter size: 1 byte. Precision of input 6.

Specifies the number of decimals in the measurement format for input 6. For example, if this field is set to 1, the value will be sent with 1 decimal (e.g. 102.5).

This parameter is retained during exclusion / inclusion of the device.

Value	Description
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0 – 7	Number of decimals. Standard is 0.
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Parameter 37, Parameter size: 2 bytes. Pulses per Unit of input 6.

Specifies the number of pulses to count before one unit is reached at input 6. For example, if this parameter is set to 1,000 and Scale Type is set to Cubic meters, 1,000 pulses is counted to equal 1m³.

This parameter is retained during exclusion / inclusion of the device.

Value	Description
-------	-------------

0 – 65,000	Number of pulses needed to equal one scale value. Standard is 1.
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Parameter 38, Parameter size: 1 byte. Rate Type of input 6.

Specifies if the meter at input 6 register consumption or production. This is only used in **Metering Reports** sent on the Z-Wave network.

This parameter is retained during exclusion / inclusion of the device.

Value	Description
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0	Unspecified
1	Import (consumption). (Standard).
2	Export (production).
3	Reserved.

Parameter 39, Parameter size: 2 bytes. Time interval between meter reports.

Specifies the time interval between the automatic **Meter Reports** for each input.

Value	Description
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0 – 8.640	0 – 864 seconds. Standard value is 90 (equal to 900 seconds) which will send a report every 15 minute.
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7. Commando Classes.

Supported Commando 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)
- Basic (version 2)
- Binary Switch (version 1)
- Security (version 1)
- Security 2 (version 1)
- Supervision Command Class (version 1)
- Meter (version 3)

Controlled Commando Classes

- Meter (version 3)

8. Technical Specification.

Power supply	10 - 24V DC, 8 – 24V AC
Relay outputs	AC1: 16A 250V AC AC3: 750W (motor) AC15: 360VA Inrush: 80A/20ms (Max)
Inputs	Digital potential free, input impedance 22 kΩ.
Terminals	Screw terminals: 0,2 – 2,5 mm ² Outputs: 6 x 2 pole connection; 6 x 1-pole NO contacts. Inputs: 2 x 6 pole connection; 6 x inputs, 4 x 0V.
Power consumption	Standby: 0,6 W. All relays activated: 3,5 W.
Radio protocol	Z-Wave®: EU 868.4MHz – 500 Series.
Approvals	CE
Explorer Frame Support	Ja
SDK	6.71.00
Device type	Slave with router / repeater functionality.
Generic Device Class	Binary Switch.
Specific Device Class	Power Binary Switch.
Routing	Yes
FLiRS	No
Z-Wave Plus	Yes
Firmware Version	1.0
Security	Ja, S0, S2