VEMMIO

innovation in automation

double switch

MODEL: DS-100
V1.0

Z·WAVE PLUS

INTRODUCTION

Thank you for choosing Vemmio. We welcome you in our customer society.
Vemmio Double Switch is a dual relay in-wall module. The product works as a transceiver and is a Z-Wave Plus enabled device. Mini size design lets the module be easily hidden into the wall box to do not interfere with house decoration. One of many uses of the Double Switch is to turn on or off the connected fittings and monitor power consumption in real time. The new smart relay calibration technology can work perfectly with many kinds of lights like: incandescent, fluorescent and LED lights.

PACKAGE CONTENTS:
- user manual
- Double Switch.

KEY FEATURES
Remotely control your equipment and fittings (On/Off)
Two channels used separately (2x 1500 W)
Monitor power consumption in real time
If an overload (>1600-1700 W) is detected, the module automatically cuts off the powered circuit
Mini size design lets the module be easily hidden into the wall box

SPECIFICATION

Wireless standard	Z-Wave Plus
Frequency	868.40 MHz
Network range	40 m indoor/ 100 m line of sight
Operating temperature	0°C ~ 40°C
Maximum Load	6.5 A (230 VAC/120 VAC) (Resistive load)
Operating Voltage	100 to 240 VAC
Control circuits	Two channels 2 x 1500 W

INSTALLATION
DANGER
RISK OF ELECTROCUTION
All work on the device should only be carried out by trained and skilled electricians. Observe the country-specific regulations.
DANGER
RISK OF FATAL INJURY FROM ELECTRIC CURRENT.
The device has no basic insulation and must therefore be installed in a way that protects against accidental contact.

DANGER
RISK OF FATAL INJURY FROM ELECTRIC CURRENT.
When installing a wall plate, the distance between the cover's fixing brackets or screws and the connections of the flush-mounted Double Switch must be at least 4 mm once installed. If the distance is less than 4 mm, a deeper installation box must be used. The fixing brackets or screws of the cover must not press against the housing. Only insulated tools may be used for operation on the device, e.g. an insulated phase tester.

ADDING TO Z-WAVE NETWORK
The Z-Wave button, located in the front casing, can toggle Double Switch on and off, add, remove, reset or associate the sensor to Z-Wave network.

FIRST INCLUSION
Follow the instructions for your Z-Wave certified controller to enter the desired mode and then follow the instructions from the table below. When power is applied for the first time, LED flashes on and off at 0.5 second intervals. It implies that the Double Switch has not been assigned a node ID and starts auto inclusion. Auto inclusion will be executed.
Please note: first inclusion may vary depending on your gateway - please see gateway manual for details.
Please note: Auto inclusion timeout is 2 minute during which the node information of explorer frame will be emitted once every several seconds. Unlike "inclusion" function as shown in the table below, the execution of auto inclusion is free from pressing the Z-Wave button.

Function	Description	Annotation
No node ID	The Z-Wave Controller does not allocate a node ID to the Switch.	LED 2-second on, 2-second off
Inclusion*	1. Put your Z-Wave controller into inclusion mode by following the instructions provided by the controller manufacturer. 2. Pressing Z-Wave button three times within 2 seconds will enter inclusion mode.	One press one flash LED
Exclusion	1. Put your Z-Wave controller into exclusion mode by following the instructions provided by the controller manufacturer. 1. Pressing Z-Wave button three times within 2 seconds will enter exclusion mode.	One press one flash LED
	3. Node ID has been excluded.	LED 0.5s On, 0.5s Off (Enter auto inclusion)
Factory Reset	1. Pressing Z-Wave button three times within 2 seconds will enter inclusion mode.	Use this procedure only in the event that the primary controller is lost or otherwise inoperable.
	2. Within 1 second, press On/Off button again for 5 seconds.	
	3. IDs are excluded.	LED 0.5s On, 0.5s Off (Enter auto inclusion)
Association	1. The Double Switch is an always listening Z-Wave device, so associations can be added or removed by a controller at any time. Or If your controller requires to have the Double Switch send a 'node information frame' or NIF for associations, pressing the Z-Wave button three times in 2 seconds will cause the Double Switch to send	LED one press one flash
	2. There are 3 groups for the switch	

Including a node ID allocated by Z-Wave Controller means inclusion. Excluding a node ID allocated by Z-Wave Controller means exclusion.

If the first attempt of exclusion is unsuccessful, please repeat the process following all steps carefully.

*Please note: Always exclude a Z-wave product before trying to add it to a Z-Wave network.
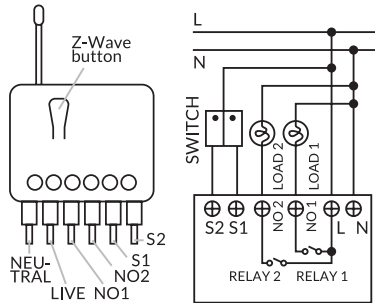
ASSOCIATION

Group ID	Maximum Nodes	Description
1	1	For group 1, the Switch will report (1) ON/OFF status of Relay1 and Relay2 (2) Instant Power Consumption (Watt) of Relay1 and Relay2 (3) Accumulated Power Consumption (KWh) of Relay1 and Relay2 to Group1 node.
2	1	For group 2, the Switch will report (1) ON/OFF status of Relay1 (2) Instant Power Consumption (Watt) of Relay1 (3) Accumulated Power Consumption (KWh) of Relay1 to Group2 node.
3	1	For group 3, the Switch will report (1) ON/OFF status of Relay2 (2) Instant Power Consumption (Watt) of Relay2 (3) Accumulated Power Consumption (KWh) of Relay2 to Group3 node.

PHYSICAL INSTALLATION
Choosing a Suitable Location
1. Do not locate the Double Switch facing direct sunlight, humid or dusty place.
2. The suitable ambient temperature for the Double Switch is 0°C~40°C.
3. Do not locate the Double Switch near combustible substances or any source of heat, e.g. fires, radiators, boiler etc.
4. After putting it into use, the body of Double Switch will become a little bit hot.

Assembly drawings

MOUNTING
1. Put the Double Switch into a wall box and connect the wires L, N to the Double Switch connector L, N.
2. Connect the wall switch to the Double Switch according to the above assembly drawings.
3. To manually turn on the Double Switch, press and release the Z-Wave button. The LED will flash for 1 second, and the load plugged into the Double Switch will become active.
4. To manually turn off the Double Switch, simply press and release the Z-Wave button. The LED will flash for 1 second and the load plugged into the Double Switch will become inactive.

FIRMWARE UPDATE OVER THE AIR (OTA)
Double Switch supports Firmware Update Command

Class, it can receive the updated firmware image sent by controller via the Z-wave RF media.

Supported Command Classes
COMMAND_CLASS_ZWAVEPLUS_INFO
COMMAND_CLASS_VERSION_V2
COMMAND_CLASS_MANUFACTURER_SPECIFIC_V2
COMMAND_CLASS_DEVICE_RESET_LOCALLY
COMMAND_CLASS_ASSOCIATION_V2
COMMAND_CLASS_ASSOCIATION_GRP_INFO
COMMAND_CLASS_POWERLEVEL
COMMAND_CLASS_SWITCH_BINARY
COMMAND_CLASS_BASIC
COMMAND_CLASS_SWITCH_ALL
COMMAND_CLASS_ALARM
COMMAND_CLASS_SCENE_ACTIVATION
COMMAND_CLASS_SCENE_ACTUATOR_CONF
COMMAND_CLASS_PROTECTION
COMMAND_CLASS_FIRMWARE_UPDATE_MD_V2
COMMAND_CLASS_MULTI_CHANNEL_V3
COMMAND_CLASS_METER_V3
COMMAND_CLASS_CONFIGURATION

PROGRAMMING
BASIC COMMAND CLASS / BINARY SWITCH COMMAND CLASS
The Switch will respond to BASIC and BINARY SWITCH commands that are part of the Z Wave system.

1-1 BASIC_GET / BINARY_SWITCH_GET
Since the switch has two relays, the Switch will report its On/Off state to the Controller by setting Configuration parameter 3.

Configuration parameter 3=1

Report ON when relay 1 ON
Report OFF when relay 1 OFF

Configuration parameter 3=2

Report ON when relay 2 ON
Report OFF when relay 2 OFF

Configuration parameter 3=3 (default)

Report ON when either relay 1 ON or relay 2 ON
Report OFF when both relay 1 and relay 2 OFF

Basic Get Command: **[Command Class Basic, Basic Get]**
Basic Report Command:
Report OFF: **[Command Class Basic, Basic Report, Value = 0(0x00)]**
Report ON: **[Command Class Basic, Basic Report, Value = 255(0xFF)]**

Binary Switch Get Command: **[Command Class Switch Binary, Switch Binary Get]**
Binary Switch Report Command:
Report OFF: **[Command Class Switch Binary, Switch Binary Report, Value =0(0x00)]**
Report ON: **[Command Class Switch Binary, Switch Binary Report, Value = 255(0xFF)]**

1-2 BASIC_SET / SWITCH_BINARY_SET
Since the switch has two relays, the load attached to the Double Switch will turn on or off upon receipt of the following commands from a Z-Wave Controller by setting Configuration parameter 3.

Configuration parameter 3=1

switch ON and OFF of relay 1

Configuration parameter 3=2

switch ON and OFF of relay 2

Configuration parameter 3=3(default)

switch ON and OFF both relay 1 and relay 2

[Command Class Basic, Basic Set, Value = 1~99, 255(0xFF)]: the load attached to the Switch turns on.
[Command Class Basic, Basic Set, Value = 0(0x00)]: the load attached to the Switch turns off.
[Command Class Switch Binary, Switch Binary Set, Value = 1~99, 255(0xFF)]: the load attached to the Switch turns on.
[Command Class Switch Binary, Switch Binary Set, Value = 0(0x00)]: the load attached to the Switch turns off.

2. Z-Wave's Groups (Association Command Class Version 2)
The Switch can be set to send reports to control associated Z-Wave devices. It supports 3 association groups which every group has one node support. Group1~Group3 support SWITCH_BINARY_REPORT,

METER_REPORT_COMMAND_V3

For group 1, the Double Switch will report (1) ON/OFF status of Relay1 and Relay2 (2) Instant Power Consumption (Watt) of Relay1 and Relay2 (3) Accumulated Power Consumption (KWh) of Relay1 and Relay2 to Z-Wave Controller.

For group 2, the Double Switch will report (1) ON/OFF status of Relay1 (2) Instant Power Consumption (Watt) of Relay1 (3) Accumulated Power Consumption (KWh) of Relay1 to Z-Wave Controller.

For group 3, the Double Switch will report (1) ON/OFF status of Relay2 (2) Instant Power Consumption (Watt) of Relay2 (3) Accumulated Power Consumption (KWh) of Relay2 to Z-Wave Controller.

2-1 Auto report to Grouping 1 ~3 (Maximum Node 1)

2-1-1 On/Off Event Report

When "on" or "off" state has been changed, it will send Binary Switch Report to the nodes of Group1~3.

Binary Switch Report

ON:**[Command Class Switch Binary, Switch Binary Report, Value =255 (0xFF)]**
OFF:**[Command Class Switch Binary, Switch Binary Report, Value =0 (0x00)]**

2-1-2 Instant Power Consumption vary over 5% report
When the power consumption of load vary over 5%, it will send Meter report to the nodes of Group
Meter Report Command:
[Command Class Meter, Meter Report, Rate Type = 0x01, Meter Type = 0x01,
Precision = 1, Scale = 0x02, Size = 4, Meter Value(W)]

2-1-3 overload alarm report command
When DOUBLE SWITCH detects the overload, it will send Alarm Report to the correspond Group.

The content of Alarm Report

Alarm report command: **[Command_Class_Alarm, Alarm_Report, Alarm Type = 0x08,**
Alarm Level = 0xFF]

2-2 Response to Meter Get Command
The Double Switch will report its (1) instant Power Consumption (Watt) or (2) accumulated power consumption(KWH) or (3) AC load Voltage (V) or (4) AC load current (I) (5) load power factor (PF) to Z-Wave Controller after receive the Meter Get Command from Z-Wave Controller.
2-2-1 Instant Power Consumption (Watt) of Switch
When receiving Meter Get Command, it will report Meter Report Command to the node asked.

Meter Get Command: **[Command Class Meter, Meter Get, Scale =0x02(W)]**

Meter Report Command:

[Command Class Meter, Meter Report, Rate Type = 0x01, Meter Type = 0x01,
Precision = 1, Scale = 0x02, Size = 4, Meter Value(W)]

2-2-2 Accumulated Power Consumption (KW/h)
When receiving Meter Get Command, it will report Meter Report Command to the node asked.

Meter Get Command:

[Command Class Meter, Meter Get, Scale = 0x00 KW/h]

Meter Report Command:
[Command Class Meter, Meter Report, Rate Type = 0x01, Meter Type =0x01, Precision = 2, Scale = 0x00, Size = 4, Meter Value (KWh)]

Accumulated power consumption (KW/h) = (Meter Value 2*65536) + (Meter Value 3*256) + (Meter Value 4) = 800.35 (KW/h)

2-2-3 Clearing accumulated power consumption
Whenever re-start counting the accumulated power consumption is needed, you can use Meter Reset Command to clear it.

Meter Reset Command: **[Command Class Meter, Meter Reset]**

2-2-4 AC load Voltage (V)
When receiving Meter Get Command, it will report Meter Report Command to the node asked.

Meter Get Command: **[Command Class Meter, Meter Get, Scale =0x04(V)]**
Meter Report Command:
[Command Class Meter, Meter Report, Rate Type = 0x01, Meter Type = 0x01, Precision = 1, Scale = 0x04, Size = 2, Meter Value(V)]

2-2-5 AC load current (I)
When receiving Meter Get Command, it will report Meter Report Command to the node asked.

Meter Get Command: **[Command Class Meter, Meter Get, Scale =0x05(I)]**
Meter Report Command:
[Command Class Meter, Meter Report, Rate Type = 0x01, Meter Type = 0x01,
Precision = 2, Scale = 0x05, Size = 2, Meter Value(I)]

2-2-6 load power factor (PF)
When receiving Meter Get Command, it will report Meter Report Command to the node asked.

Meter Get Command: **[Command Class Meter, Meter Get, Scale =0x06(PF)]**
Meter Report Command:
[Command Class Meter, Meter Report, Rate Type = 0x01, Meter Type = 0x01, Precision = 2, Scale = 0x06, Size = 1 Bytes, Meter Value(PF)]

2-3 Multi Channel Command Class Version 3
DOUBLE SWITCH also supports Multi Channel command class (version 3), which include
BINARY_SWITCH_GET, BINARY_SWITCH_SET, BASIC_GET, BASIC_SET,
METER_SUPPORTED_GET, METER_RESET, METER_GET
You may control or get report from 3 endpoints of DOUBLE SWITCH.
2-3-1 BINARY_SWITCH_GET,
You may get the ON/OFF state from every endpoint, when endpoint set to 1, DOUBLE SWITCH will reply state of Relay1. If endpoint set to 2, DOUBLE SWITCH will reply state of Relay2. If endpoint set to 3, DOUBLE SWITCH will reply ON (0xFF) when either Relay 1 or Relay2 is ON, report OFF (0x00) when both Relay 1 and Relay2 are OFF. Below is an example showing a source endpoint 5 sending a Get command to DOUBLE SWITCH endpoint 3.
Please note: the below tables present information for the following:

COMMAND_CLASS_MULTI_CHANNEL
MULTI_CHANNEL_CMD_ENCAP

Source End Point = 0x05	(this is the endpoint of command inquirer here we assume endpoint is 5, if the inquirer doesn't suport multi Channel this value will be 0)
(Bit Address+Destination End Point = 0x03)	(Bit Address =0; Destination End Point range from 1~3)
Command Class = 0x25	(Command_Class_Switch_Binary = 0x25)
Command =0x02	(Switch_Binary_Get = 0x02)

Below is the example show DOUBLE SWITCH report to last command

Source End Point = 0x03	Since the endpoint is 3 so DOUBLE SWITCH will reply ON(0xFF) when either Relay 1 or Relay2 is ON, report OFF (0x00) when both Relay 1 and Relay2 are OFF
(Bit Address+Destination End Point = 0x05)	(Bit Address = 0; Destination End Point
Command Class = 0x25	(Command_Class_Switch_Binary=0x25)
Parameter 1 = 0xFF	(ON=0xFF, OFF=0x00)

2-3-2 BINARY_SWITCH_SET
By using BINARY_SWITCH_SET Command of Multi Channel Command Class Encapsulation Command, you can switch Relay1 ON/OFF by setting endpoint to 1, or switch Relay2 ON/OFF by setting endpoint to 2, or switch both Relay1 and Relay2 ON/OFF by setting endpoint to 3
The example of the command shows that switch off relay1 of DOUBLE SWITCH

Source End Point = 0x01	(this is the endpoint of command inquirer here we assume ednpoint is 1, if the inquirer doesn't suport multi channel, this value will be 0)
(Bit Address+Destination End Point=0x01)	(Bit Address = 0; Destination End Point range 1-3
Command Class = 0x25	(Command_Class_Switch_Binary=0x25)
Command =0x01	(Switch_Binary_Set = 0x01)
Parameter 1 = 0x00	(ON=0xFF , OFF=0x00)

2-3-3 METER_SUPPORTED_GET
This command is to ask the endpoint of DOUBLE SWITCH what kind of meter data can be reported.
The example shows how to get the meter report type

Source End Point = 0x01	(this is the endpoint of command inquirer here we assume endpoint is 1, if the inquirer doesn't support Multi Channel this value will be 0)
(Bit Address+Destination End Point = 0x03)	(Bit Address =0; Destination End Point range1~3)
Command Class = 0x32	(Command_Class_Meter_V3 = 0x32)
Command =0x03	(Meter_Supported_Get = 0x03)

Below is the example show DOUBLE SWITCH report to last command

Source End Point = 0x03	
(Bit Address+Destination End Point = 0x01)	
Command Class = 0x32	(Command_Class_Meter_V3 = 0x32)
Command Class = 0x32	
Command =0x04	(Meter_Supported_Report = 0x04)
Parameter 1 = 0x81	(Meter Reset =1, Meter Type=0x01)

Parameter 2 = 0x75	(Scale Supported = KWh+W+V+A+Power Factor = 0x75)

2-3-4 METER_RESET
This command is to reset the Accumulated Power Consumption (KWh) to 0
The example shows how to reset the KWh

Source End Point = 0x03	(this is the endpoint of command inquirer, here we assume endpoint is 3, if the inquirer doesn't support multi Channel this value will be 0)
(Bit Address+Destination End Point = 0x01)	(Bit Address = 0; Destination End Point = range 1-3
Command Class = 0x32	(Command_Class_Meter_V3 = 0x32)
Command =0x05	(Meter Reset = 0x05)

2-3-5 METER_GET:
Using meter get command to get the KWH, W, V, I, PF from endpoint of DOUBLE SWITCH 2-3-5-1 Get KWH from endpoint Meter_GET example:

Source End Point = 0x05	(this is the endpoint of command inquirer, here we assume endpoint is 5, if the inquirer doesn't support multi Channel this value will be 0)
(Bit Address+Destination End Point = 0x03)	(Bit Address =0 ; Destination End Point range1~3)
Command Class = 0x32	(Command_Class_Meter_V3 = 0x32)
Command =0x01	(Meter_Get = 0x01)
Parameter 1 = 0x00	(Scale = KWH = 0X00)

Accumulated power consumption (KWH) Report example:

Source End Point = 0x03	(Meter report = Endpoint3)
(Bit Address+Destination End Point = 0x05)	(Bit Address =0; Destination End Point = command inquirer's Endpoint value)
Command Class = 0x32	(Command_Class_Meter_V3 = 0x32)
Command =0x02	(Meter_Report = 0x02)
Parameter 1 = 0x21	(Scale Bit2 = 0, Rate Type = 0x01, Meter Type=0x01)
Parameter 2 = 0x44	(Precision = 2, Scale Bit1Bit0 = 0, Size = 4)
Parameter 3 = 0x00	
Parameter 4 = 0x00	
Parameter 5 = 0x05	Accumulated Power Consumption =0x000005FD = 15.33 KWh
Parameter 6 = 0xFD	

2-3-5-2 Get Instant Power Consumption (Watt) from endpoint
METER_GET example:

Source End Point = 0x05	(this is the endpoint of command inquirer, here we assume endpoint is 5, if the inquirer doesn't support multi Channel this value will be 0)
(Bit Address+Destination End Point =0x03)	(Bit Address =0:Destination End Point range 1~3)
Command Class = 0x32	(Command_Class_Meter_V3 = 0x32)
Command = 0x01	(Meter_Get = 0x01)
Parameter 1 = 0x10	(Scale = W = 0x02)

DOUBLE SWITCH Instant Power Consumption (W) Report example:

Source End Point = 0x03	(Meter report = Endpoint 3)
(Bit Address+Destination End Point = 0x05)	(Bit Address =0 ; Destination End Point = command inquirer's Endpoint value)

Command Class = 0x32	(Command_Class_Meter_V3 = 0x32)
Command = 0x02	(Meter_Report = 0x02)
Parameter 1 = 0x21	(Scale Bit2 = 0, Rate Type = 0x01,Meter Type=0x01)
Parameter 2 = 0x34	(Precision = 1, Scale Bit1Bit0 = 0x02, Size = 4)
Parameter 3 = 0x00	Instant Power Consumption = 0x000003EA = 100.2W
Parameter 4 = 0x00	
Parameter 5 = 0x03	
Parameter 6 = 0xEA	

2-3-5-3 Get load voltage V from endpoint:
Meter_GET example:

Source End Point = 0x05	(this is the endpoint of command inquirer, here we assume endpoint is 5, if the inquirer doesn't support multi Channel this value will be 0)
(Bit Address+Destination End Point = 0x03)	(Bit Address =0; Destination End Point range1~3)
Command Class = 0x32	(Command_Class_Meter_V3 = 0x32)
Command =0x01	(Meter_Get = 0x01)
Parameter 1 = 0x20	(Scale = V = 0x04)

DOUBLE SWITCH AC load Voltage report example:

Source End Point = 0x03	(Meter report = Endpoint3)
(Bit Address+Destination End Point = 0x05)	(Bit Address =0 ; Destination End Point = command inquirer's Endpoint value)
Command Class = 0x32	(Command_Class_Meter_V3 = 0x32)
Command =0x02	(Meter_Report = 0x02)
Parameter 1 = 0xA1	(Scale Bit2 = 1, Rate Type = 0x01, Meter Type=0x01)
Parameter 2 = 0x22	(Precision = 1, Scale Bit1Bit0 = 0x00, Size = 2)
Parameter 3 = 0x09	Voltage = 0x0910 = 232.0V
Parameter 4 = 0x10	

2-3-5-4 Get load current I from endpoint:
Meter_GET example:

Source End Point = 0x05	(this is the endpoint of command inquirer, here we assume endpoint is 5, if the inquirer doesn't support multi Channel this value will be 0)
(Bit Address + Destination End Point = 0x03)	(Bit Address =0;Destination End Point range1~3)
Command Class = 0x32	(Command_Class_Meter_V3 = 0x32)
Command =0x01	(Meter_Get = 0x01)
Parameter 1 = 0x28	(Scale = A = 0x05)

DOUBLE SWITCH AC load current (I) example:

Source End Point = 0x03	(Meter report = Endpoint3)
(Bit Address+Destination End Point = 0x05)	(Bit Address =0;Destination End Point = command inquirer's Endpoint value)
Command Class = 0x32	(Command_Class_Meter_V3 = 0x32)
Command =0x02	(Meter_Report = 0x02)
Parameter 1 = 0xA1	(Scale Bit2 = 1, Rate Type = 0x01, Meter Type=0x01)
Parameter 2 = 0x4A	(Precision = 2, Scale Bit1Bit0 = 0x01, Size = 2)
Parameter 3 = 0x00	Current = 0x002B = 0.043A
Parameter 4 = 0x2B	Current = 0x002B = 0.043A

2-3-5-5 Get power factor PF from endpoint
Meter_GET example:

Source End Point = 0x05	(this is the endpoint of command inquirer, here we assume endpoint is 5, if the inquirer doesn't support multi Channel thiS value will be 0)
(Bit Address+Destination End Point = 0x03)	(Bit Address =0;Destination End Point range 1-3)
Command Class = 0x32	(Command_Class_Meter_V3 = 0x32)
Command =0x01	(Meter_Get = 0x01)
Parameter 1 = 0x30	(Scale = PF = 0x06)

DOUBLE SWITCH power factor report example:

Source End Point = 0x03	(Meter report = Endpoint 3)
(Bit Address+Destination End Point = 0x05)	(Bit Address =0;Destination End Point = command inquirer's Endpoint value)
Command Class = 0x32	(Command_Class_Meter_V3 = 0x32)
Command =0x02	(Meter_Report = 0x02)
Parameter 1 = 0xA1	(Scale Bit2 = 1, Rate Type = 0x01,Meter Type=0x01)
Parameter 2 = 0x51	(Precision = 2, Scale Bit1Bit0 = 0x10, Size =1)
Parameter 3 = 0x63	Power Factor = 0x63 = 0.99

3. Z – Wave's Configuration

Configuration Parameter		Size (Byte)	Unit	Default	
	Function		Value		Description
1	Watt Meter Report Period	2	0x01-0x7FFF	5s	720	720*5s=3600s=1 hour
2	KWH Meter Report Period	2	0x01-0x7FFF	10min	6	6*10min= 1 hour
3	Selected Relay	1	1-3		3	1:Relay 1 2:Relay 2 3:Relay 1 & Relay 2
4	Edge or Pulse mode or Edge-Toggle mode	1	1-3		1	1:Edge mode 2:Pulse mode 3:Edge-Toggle mode
5	Threshold of current for Load Caution	2	10-750	0.01A	750	750*0.01A = 7.5A
6	Threshold of KWH for Load Caution	2	1-10000	1KWh	10000	
7	Restore switch state mode	1	0-2		1	0 Swith off 1 Last switch state 2 Switch on
8	Auto off timer	2	0-0x7FFF	1s	0	0 Disable auto off function 1 0x7FFF 1s-32767s
9	RF off command mode	1	0-3		0	0 Switch off 1 Ignore 2 Switch toggle 3 Switch on
10	Existance of Endpoint 3	1	1-2		1	1 Endpoint 3 exist 2 No Enpoint 3

3-1 Watt Meter Report Period:
If the setting is configured for 1hour (set value =720), the DOUBLE SWITCH will report its instant power consumption every 1 hour to the node of correspond Group. The maximum interval to report its instant power consumption is 45 hours (5s*32767/3600=45hr).

3-2 KWH Meter Report Period:
If the setting is configured for 1hour (set value =6), the DOUBLE SWITCH will report its Accumulated Power Consumption (KW/h) every 1 hour to the node of correspond Group. The maximum interval to report its Accumulated Power Consumption (KW/h) is 227.55 days (10min*32767/1440=227.55 days).

3-3 Selected Relay
If Controller not using Multi_Channel command class to access the relay of DOUBLE SWITCH, you may configure the select value to react the Basic Command Class Binary Switch Command Class or Meter Command Class V3

3-3-1 Selected Relay1:
Only relay1 can be controlled and report.

3-3-2 Selected Relay 2:
Only relay2 can be controlled and report.

3-3-3 Selected Relay1 and Relay2: Default select is 3
Both relay1 and relay2 can be controlled and report.

Get Command	parameter	Raport to command sender
Meter Get	KWh	Relay1 KWh1+Relay2 KWh2
Meter Get	Watt	Relay1 W1+Relay2 W2
Meter Get	Voltage	Relay1 and Relay2 are the same voltage
Meter Get	Current	Relay1 I1+Relay2 I2
Meter Get	Power factor PF	Relay1

3-4 Edge and Pulse mode
Manual switch S1 and S2 can set to Edge mode or Pulse mode or Edge-Toggle mode, default value is Edge mode.

3-4-1 Edge mode: this mode is suitable for the bi stable wall switch that has indicator point on the switch, and the same position correspond to same state of relay1 and relay2. if the DOUBLE SWITCH relay change the state because of receiving Z-Wave RF command, it may need two times of change (switch on to off or switch off to on) to let relay back to the correspond state.

3-4-2 Pulse mode: this mode is suitable for the toggle type wall switch to swap the state of Relay1 or Relay2.

3-4-3 Edge-Toggle mode: this mode is suitable for the normal bi-stable switch, every time when change the state of the wall switch will also swap the state of Relay1 or Relay2.

3-5 Threshold of current for Load Caution
This is a warning when the current of load over the preset threshold value, if the setting value is 750, when the load current of Relay1 or Relay2 over this value, DOUBLE SWITCH will send current meter report to the node of correspond Group, the Range of the setting value is from 10 to 750, and the default value is 750.

3-6 Threshold of KWh for Load Caution
This is a warning when the KWh of load over the preset threshold value, If the setting value is 10000, when the Accumulated Power Consumption of Relay1 or Relay2 over this value, DOUBLE SWITCH will send KWh Meter Report command to the node of correspond Group, minimum value is 1KWh and default value is 10000 kWh.

3-7 Restore switch state mode
Whenever the AC power return from lost, DOUBLE SWITCH will restore the switch state which could be SWITCH OFF, LAST SWITCH STATE, SWITCH ON. The default setting is LAST SWITCH STATE.

3-8 Auto off timer:
Whenever DOUBLE SWITCH switches to on, the auto off timer begin to count down. After the timer decrease to zero, it will switch off automatically. However if Auto off timer is set as 0, the auto off function will be disabled. The default setting is 0.

3-9 RF off command mode

Whenever a switch off command, BASIC_SET BINARY_SWITCH_SET SWITCH_ALL_OFF, is received, it could be interpreted as 4 kinds of commands.

3-9-1 Switch Off: It switches to OFF state. The default setting is Switch Off.
3-9-2 Ignore: The switch off command will be ignored.
3-9-3 Switch Toggle: It switches to the inverse of current state.
3-9-4 Switch On: It switches to ON state.

3-10 Existence of Endpoint3:
Multi-Channel Command is a good way to control relay1 and relay2 of DOUBLE SWITCH individually. The endpoint3 of DOUBLE SWITCH is related to both relay1 and relay2. In some condition it becomes redundant in Multi-Channel Command Class. When the Existence of Endpoint3 is set as 2, the endpoint3 will be disabled. The default value is 1.

Endpoint1 and Endpoint2 are fixed, only Endpoint3 is dynamic.

4.Protection Command Classes
DOUBLE SWITCH supports Protection Command Class version 2, it can protect the switch against unintentionally control by e.g. a child. And it can also protect the switch from being turned off by setting it in "No RF Control" state.

After being set to "Protection by sequence" state, any intentional pressing of On/Off button or S2/S2 should be hold longer than 1 second, or the switch state will not change. However, the operation of learn function does not change, because learning will not be protected.
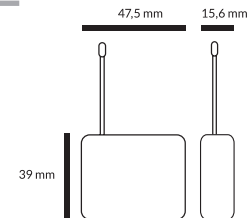
5. Firmware update over the air (OTA)
DOUBLE SWITCH is based on 500 series SoC and supports Firmware Update Command Class, it can receives the updated firmware image sent by controller via the Z-wave RF media. It is a helpful and convenient way to improve some functions if needed.

Troubleshooting

Symptom	Cause of failure	Recommendation
The Double Switch is not working and LED is off	1. The Switch is not connected to the Main Power. 2. The Double Switch has broken down	1. Check power connections 2. Don't open up the Double Switch and send it for repair.
The Double Switch LED is flashing, but can not control the ON/OFF Switch of the load attached	Check if the load connected into the Switch has its own ON/OFF switch	Set the ON/OFF switch of the load attached to ON Reffering to assembly drawing, check if all conections are correct.
The Switch LED is flashing, but the Detector cannot control the Switch	1. Association not carried out. 2. Same frequency interference.	1. Carry out association 2. Wait for a while to re-try
LED is flashing, but cannot control the Switch	Overload occurs	Remove the load attached or check max. load cannot exceed 6.5A

DIMENSIONS

47,5 mm   15,6 mm

39 mm

WARRANTY

This Limited Warranty applies to physical goods, and only for physical goods, purchased from Vemmio (the „Physical Goods"). This Limited Warranty of Vemmio, applies to products manufactured and distributed by Vemmio.

PRODUCTS COVERED AND DURATION OF WARRANTY

Warranty Period: 12 months for business customer and 24 months for individual customer from the date of purchase.
The product purchased shall be free from defects in material and workmanship from the date of purchase.
This Limited Warranty covers any defects in material or workmanship under normal use during the Warranty Period.

PRODUCTION STATUS

Each product is manufactured from new parts.

TERMS OF THE WARRANTY

Vemmio warrants that the product you have purchased from Vemmio or a Vemmio's authorized reseller is free from defects in materials and workmanship under normal use during the warranty period. The warranty period begins on the day of purchase. The warranty extends only to the original purchaser. It is not transferable to anyone who subsequently purchases the product from the original purchaser.
During the Warranty Period, Vemmio will repair or replace (at the sole discretion of Vemmio), at no charge, products or parts of a product that proves defective. Once the defected product, during the guarantee period, is returned, it will be repaired or replaced no later than within 30 days. The warranty period is extended by the amount of days it has taken to repair or replace the product. All used elements changed under the guarantee become the property of Vemmio. The warranty period for replaced elements expires on the same date as the original warranty period for the product. There is a possibility that it will not be feasible to repair or replace the product (for example when the product is no longer a part of Vemmio's offer). Should this happen, Vemmio will repair/replace the product with parts/ product of similar technical characteristics. Such procedure will result in fulfilling Vemmio's warranty obligation against the customer. It is not possible to have money returned by Vemmio for the purchased product.
Warranty claim rated by Vemmio as unwarranted will be charged for handling and servicing costs.

Vemmio may reject a warranty claim if:
- the product has not been operated according to its intended purpose and the user manual,
- the returned product is incomplete,
- the cause of insufficient operation is other than a material or production defect,
- warranty date has expired or if the customer can not provide proof of purchase.

The Limited Warranty extends only to products purchased from Vemmio or a Vemmio's authorized reseller. The Limited Warranty does not extend to any product that has been damaged or rendered defective (a) as a result of accident, misuse or abuse; (b) as a result of an act of God; (c) by operation outside the usage parameters stated in the user manual; (d) by the use of parts not manufactured or sold by Vemmio (e) by modification of the product; (f) as a result of war or terrorist attack; or (g) as a result of service by anyone other than Vemmio or a Vemmio's authorized service center.

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LIMITED WARRANTY STATEMENT

VEMMIO is not liable for any damages caused by the product or by the failure of the product to perform, including any lost profits, lost savings, incidental damages, or consequential damages. VEMMIO is not liable for any claim made by a third party or made by you for a third party.

This limitation applies whether damages are sought, or a claim made, under this warranty or as a tort claim (including negligence and strict product liability), a contract claim, or any other claim. This limitation can not be waived or amended by any person. This limitation of liability will be effective even if VEMMIO or an authorized VEMMIO'S representative has been advised by you of the possibility of any such damages.

HOW TO OBTAIN WARRANTY SERVICE?

Please contact us first through support@vemmio.com for advice because we are very often able to resolve issues/problems without the need for warranty claim.
For a defect during the warranty period, you will need a proof of purchase. Contact your place of purchase or a Vemmio's authorized service center. Return the defective item, freight and insurance prepaid, in the original packaging to your place of purchase. Vemmio is not responsible for any loss or damages incurred in shipping. A Vemmio Failure Analysis/Test Engineer or a Vemmio's authorized reseller must validate all warranty claims.

WHAT IS NOT COVERED BY THIS WARRANTY?

Product purchased from anyone other than Vemmio or a Vemmio's authorized reseller.
Routine cleaning or normal cosmetic and mechanical wear.
Damage from misuse, abuse or neglect including ingress of water, dust or damage from dropping.
Damage from use outside the product's usage or storage parameters.
Damage from use of parts not manufactured or sold by Vemmio.
Damage from modification or incorporation into other products.
Damage from repair or replacement of warranted parts by a service provider other than a Vemmio's authorized service provider.
Damage from failure to perform preventative maintenance as imposed by the application environment (such as recurrent cleaning in dusty surroundings).

DECLARATION OF CONFORMITY

The manufacturer Vemmio Sp. z o.o. declares under sole responsibility that the product:
Marketing model: Double Switch
Regulatory model: DS-100
Brand name: Vemmio
is in conformity with the Low Voltage Directive 2009/95/EC, EMC Directive 2004/108/EC, R&TTE Directive 1995/5/EC and carries the CE marking accordingly.

The following harmonized standards were applied:
R&TTE (1995/5/EC)
EN 300 220-1: V2.4.1
EN 300 220-2: V2.4.1
EMC (2004/108/EC)
EN 301 481-1: V1.9.2
EN 301 489-3: V1.6.1
LVD (2006/95/EC)
EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011

Changes of modification not expressly approved by Vemmio Sp. z o.o. for compliance could void the user's authority to operate the equipment.

FCC INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.
FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IN ACCORDANCE WITH ROHS 2011/65/EU

RoHS

WARNING

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.
When replacing old appliances with new once, the retailer is legally obligated to take back your old appliance for disposal at least for free of charge.

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