

# MICROMODULE ENERGY METER

QUICK INSTALLATION GUIDE  
v1.0

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## ELECTROMAGNETIC COMPATIBILITY

When operated according to manufacturer instructions, the product complies with all applicable CE harmonised standards from EMC Directive 2004/108/EC and Part 15 of the FCC Rules. The connections conducting HF signals must not be damaged or altered in any way by the user.

## TAKE CARE OF YOUR SAFETY

Display extreme caution when using ladders or steps, please follow manufacturer's instructions. Be careful when using hand and power tools and follow the manufacturer's guidelines when using them. Take care that the correct tools are used. Wear goggles or protective clothing where required.

## 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 Micromodule Single Switch Max.Load 11A 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.

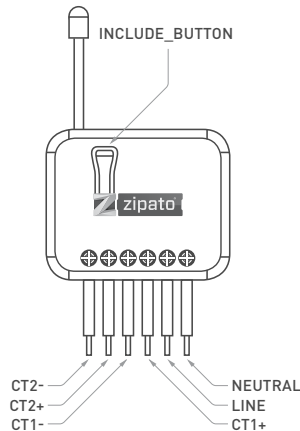
## CAUTION

The connected devices and the flush-mounted receiver can become damaged if devices are operated that do not correspond to the technical specifications (see technical data).

## INTRODUCTION

Zipato Energy Meter monitors total electricity consumption of connected appliances and reports it to Zipato or any other Z-Wave enabled controller in real time. Small and compact size allows easy installation in majority of electricity distribution boxes. It supports two loads upto 6000W each (@ 120V).

## OVERVIEW



## PACKAGE CONTENT

1PC	Micromodule
1PC	Amper Clamp
1PC	Quick Installation Guide

## FEATURES

- Slim, compact remote Z-Wave module measures power parameters of connected device
- Dual power meter function
- Instant power wattage and Accumulated power consumption kWh report
- Amper meter clamp included in the box
- Maximum current measure 60A
- Higher output power enhances communication range(+2.5dBm output power compared to -2.5dBm 300 series)
- New Z-Wave 500 series chip supports multichannel operation and higher data rates (9.6/40/100kbps)
- Very low power power consumption
- Over-the-air firmware update
- Easy installation

## SPECIFICATION

### TECHNICAL SPECIFICATION

PROTOCOL	Z-Wave Plus
OPERATING VOLTAGE:	100 ~ 240VAC

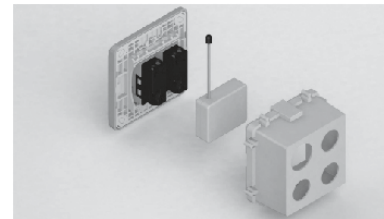
MAXIMUM LOAD	6000W x 2 @ 120V
OPERATING TEMPERATURE	0°C ~ 40°C
STORAGE TEMPERATURE RANGE	-20°C ~ 60°C
OPERATING HUMIDITY	10% to 85%RH
RANGE	Minimum 30m indoor / 100m outdoor
WEIGHT	-
DIMENSIONS	-
PACKAGE WEIGHT	137.3 g
PACKAGE DIMENSIONS	127 x 115 x 54 mm
REGULATIONS	EMC 2004/108/EC, R&TTE 1995/5/EC, LVD 2006/95/EC, FCC PART 15
WARRANTY	1 year

### MODELS AND FREQUENCIES

EUROPE - EU version	ph-pab01.eu / 868.42 MHz
UNITED STATES - US version	ph-pab01.us / 908.42MHz
RUSSIA - RU version	ph-pab01.ru / 869.02MHz
ISRAEL - IS version	ph-pab01.is / 916.02MHz
AUSTRALIA - AU version	ph-pab01.au / 921.42MHz
INDIA - IN version	ph-pab01.in / 865.20MHz

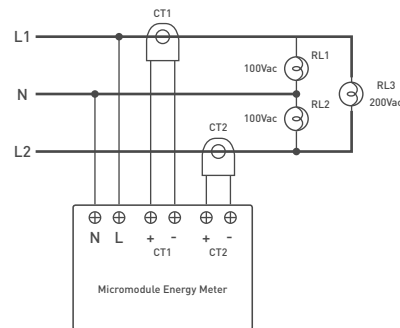
## INSTALLATION AND OPERATION

- Put the in wall switch into a wall box and connect the AC power wire L,N to Micromodule's L and N.
- The black wire of current sensor, CT1 or CT2, should connected to the negative terminal of Micromodule,CT1- or CT2-. Another wire should connected to the plus terminal of Micromodule,CT1+ or CT1+.
- There is a clasp on the side of the current sensor, it can lock or unlock the clamp. It is convenient to circle the already connected cable.



### APPLICATION

- Single phase three wire



### CHOOSING A SUTABLE LOCATION

- Do not locate the Micromodule facing direct sunlight, humid or

dusty place.

- The suitable ambient temperature is 0°C-40°C.
- Do not locate the Micromodule where exists combustible substances or any source of heat, e.g. fires, radiators, boiler etc.
- After putting it into use, the Micromodule's casing can become little hot which is normal phenomenon during operation.

### LED INDICATION

To know what mode the Micromodule is in, please see from the LED indication.

State Type	LED Indication
No node ID	Under normal operation, when the Micromodule has not been allocated to a node ID, the LED flashes on and off alternately at 2-second intervals.
Learning	When Micromodule is in learning mode, LED flashes on and off alternately and repeatedly at 0.5 second intervals.

## ADDING TO Z-WAVE NETWORK

In the front casing, there is an On/Off button with LED indicator which is used to carry out inclusion, exclusion, reset or association. After being excluded, its LED flashes on and off alternately and repeatedly at 2-second intervals. It implies that it has not been assigned a node ID and cannot work with Z-Wave enabled devices.

### AUTO INCLUSION

The function of auto inclusion will be executed as long as the Micromodule does not have Node ID and is plugged into a wall outlet. When first power is applied, its LED flashes on and off alternately and repeatedly at 0.5 second intervals. It implies that it is in learning mode now.

**Note:** Auto inclusion timeout lasts 2 minutes during which the node information of explorer frame will be emitted once per every 5 seconds. Unlike "inclusion" function as shown in the table below, auto inclusion doesn't require pressing on/off buttons on the switch. The table below lists an operation summary of basic Z-Wave functions. Please refer to the instructions for your Z-Wave Primary Controller to access the Setup function and to include/exclude/associate devices.

Function	Description	LED Indication
No node ID	The Z-Wave Controller does not allocate a node ID to the Micromodule.	2-second on, 2-second off
Inclusion	Put your Z-Wave controller into inclusion mode by following the instructions provided by the controller manufacturer. Pressing On/Off (Include) button three times within 2 seconds will enter inclusion mode.	
Exclusion	Put your Z-Wave controller into exclusion mode by following the instructions provided by the controller manufacturer. Pressing On/Off (Include) button three times within 2 seconds will enter exclusion mode. Node ID has been excluded.	One press one flash 2s On, 2s Off
Reset	Pressing On/Off (Include) button three times within 2 seconds will enter inclusion mode. Within 1 second, press and hold On/Off (Include) button again for 5 seconds until LED is off. IDs are excluded.	One press one flash

Association	Have Z-Wave Controller entered association mode. OR Pressing Include button three times within 2 seconds will enter association mode	One press one flash
	There are three groups for the Micromodule	

Note: Including a node ID allocated by Z-Wave Controller means inclusion. Excluding a node ID allocated by Z-Wave Controller means exclusion. Failed or success in including/excluding the node ID can be viewed from the Z-Wave Controller.

## PROGRAMMING

### 1 | Z-WAVE'S GROUPS (ASSOCIATION COMMAND CLASS VERSION 2)

The Micromodule can be set to send reports to associated Z-Wave devices. It supports 3 association groups which every group has one node support. Group1-Group3 support METER\_REPORT\_COMMAND\_V3.

For group 1, the Micromodule will report (1) The sum of instant Power Consumption [Watt] read from CT1 and CT2 (2) The sum of accumulated Power Consumption [KWh] read from CT1 and CT2.

For group 2, the Micromodule will report (1) Instant Power Consumption [Watt] read from CT1 (2) Accumulated Power Consumption [KWh] read from CT1.

For group 3, the Micromodule will report (1) Instant Power Consumption [Watt] read from CT2 (2) Accumulated Power Consumption [KWh] read from CT2.

### 2.1 | AUTO REPORT TO GROUPING 1 (MAXIMUM NODE 1)

#### 2.1.1 | INSTANT POWER CONSUMPTION VARY OVER 5% REPORT

When the power consumption of load from CT1 or CT2 vary over 5%, it will send Meter report to the nodes of Group.

Meter Report Command:  
[Command Class Meter, Meter Report, scale(bit 2) +Rate Type +Meter Type, Precision + Scale(bit 1,0)+ Size, Meter Value 1, Meter Value 2, Meter Value 3, Meter Value 4]

### 2.2 | RESPONSE TO METER GET COMMAND

The Micromodule 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 receiving the Meter Get Command from Z-Wave Controller.

#### 2.2.1 | INSTANT POWER CONSUMPTION (WATT)

When receiving Meter Get Command, it will report Meter Report Command to the node.

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

Meter Report Command:  
[Command Class Meter, Meter Report, scale(bit 2) +Rate Type +Meter Type, Precision + Scale(bit 1,0)+ Size, Meter Value 1, Meter Value 2, Meter Value 3, Meter Value 4]

Rate Type = 0x01  
Meter Type = 0x01  
Precision = 1  
Scale = 0x02[W]  
Size = 4 Bytes (Meter Value)  
Meter Value 1 = [W] MSB  
Meter Value 2 = [W]  
Meter Value 3 = [W]  
Meter Value 4 = [W]LSB

Example:  
Meter Value 1 = 0x00 [W]  
Meter Value 2 = 0x00 [W]  
Meter Value 3 = 0x03 [W]  
Meter Value 4 = 0xEA [W]  
Meter [W] = Meter Value 3 \*256 + Meter Value 4 = 100.2W

#### 2.2.2 | ACCUMULATED POWER CONSUMPTION (KW/H)

When receiving Meter Get Command, it will report Meter Report Command to the node.

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

Meter Report Command:  
[Command Class Meter, Meter Report, scale(bit 2) +Rate Type +Meter Type, Precision + Scale(bit 1,0)+ Size, Meter Value 1, Meter Value 2, Meter Value 3, Meter Value 4]

Rate Type = 0x01  
Meter Type = 0x01  
Precision = 2  
Scale = 0x00 [KWh]  
Size = 4 bytes (Meter Value)  
Meter Value 1 = [KWh] MSB  
Meter Value 2 = [KWh]  
Meter Value 3 = [KWh]  
Meter Value 4 = [KWh] LSB

Example:  
Scale = 0x00 [KWh]  
Precision = 2  
Size = 4 Bytes [KW/h]  
Meter Value 1 = 0x00[KWh]  
Meter Value 2 = 0x01[KWh]  
Meter Value 3 = 0x38[KWh]  
Meter Value 4 = 0xA3[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

If you want to reset accumulated power consumption, you can use Meter Reset Command to clear it.

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

#### 2.2.4 | AC INPUT VOLTAGE (V)

When receiving Meter Get Command, it will report Meter Report Command to the node.

Meter Get Command: [Command Class Meter, Meter Get, Scale =0x04[V]]

Meter Report Command:  
[Command Class Meter, Meter Report, scale(bit 2) +Rate Type +Meter Type, Precision + Scale(bit 1,0)+ Size, Meter Value 1, Meter Value 2]

Rate Type = 0x01  
Meter Type = 0x01  
Precision = 1  
Scale = 0x04[V]  
Size = 2 Bytes (Meter Value)  
Meter Value 1 = High Byte [V]  
Meter Value 2 = Low Byte [V]

Example:  
Scale = 0x04 [V]  
Precision = 1  
Size = 2 [2 Bytes of V]  
Meter Value 1 = 0x09[V]  
Meter Value 2 = 0x01[V]  
AC load Voltage = (Meter Value 1\*256) +(Meter Value 2)= 230.5 [V]

#### 2.2.5 | AC LOAD CURRENT ( I )

When receiving Meter Get Command, it will report Meter Report Command to the node.

Meter Get Command: [Command Class Meter, Meter Get, Scale =0x05[I]]

Meter Report Command: [Command Class Meter, Meter Report, scale(bit 2) +Rate Type +Meter Type, Precision + Scale(bit 1,0)+ Size, Meter Value 1, Meter Value 2]

Rate Type = 0x01  
Meter Type = 0x01  
Precision = 2  
Scale = 0x05[I]  
Size = 2 Bytes (Meter Value)  
Meter Value 1 = High Byte [I]  
Meter Value 2 = Low Byte [I]

Example:  
Scale = 0x05 [I]  
Precision = 2  
Size = 2 [2 Bytes of I]  
Meter Value 1 = 0x01[I]  
Meter Value 2 = 0x21[I]  
AC load current = (Meter Value 1\*256) +(Meter Value 2)= 2.89 [A]

#### 2.2.6 | LOAD POWER FACTOR (PF)

When receiving Meter Get Command, it will report Meter Report Command to the node.

If the value of configuration parameter 3 is 1, it will report the power factor of CT1, but not the sum of PF of CT1 and CT2.

Meter Get Command: [Command Class Meter, Meter Get, Scale =0x06[PF]]

Meter Report Command: [Command Class Meter, Meter Report, scale(bit 2) +Rate Type +Meter Type, Precision + Scale(bit 1,0)+ Size, Meter Value 1]

Rate Type = 0x01  
Meter Type = 0x01  
Precision = 2  
Scale = 0x06[PF]  
Size = 1 Bytes  
Meter Value 1

Example:  
Scale = 0x06 [PF]  
Precision = 2  
Size = 1 [1 Byte of PF]  
Meter Value 1 = 0x63[PF]  
Load power factor [PF] = Meter Value 1 =0.99

#### 2.3 | MULTI CHANNEL COMMAND CLASS VERSION 3

Micromodule also support multi channel command class (version 3), which include METER\_SUPPORTED\_GET, METER\_RESET, METER\_GET. You may get report from 3 endpoint of Micromodule.

##### 2.3.1 | METER\_SUPPORTED\_GET

This command is to ask the endpoint of Micromodule what kind of meter data can be reported.

The example show how to get the meter report type:

COMMAND_CLASS_MULTI_CHANNEL	
MULTI_CHANNEL_CMD_ENCAP	
Source End Point = 0x01	(this is the endpoint of command owner here we assume endpoint is 1, if the owner 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 Micromodule report to last command:

COMMAND_CLASS_MULTI_CHANNEL	
MULTI_CHANNEL_CMD_ENCAP	
Source End Point = 0x03	
[Bit Address+Destination End Point = 0x01]	
Command Class = 0x32	[Command_Class_Meter_V3 = 0x32]
Command =0x04	[Meter_Supported_Report = 0x04]
Parameter 1 = 0x81	[Meter_Reset =1, Meter Type=0x01]
Parameter 2 = 0x75	[Scale Supported = KWh + W + V+V+Power Factor=0x75]

##### 2.3.2 | METER\_RESET

This command is to reset the Accumulated Power Consumption [KWh] to 0. The example below shows how to reset the KWh.

COMMAND_CLASS_MULTI_CHANNEL	
MULTI_CHANNEL_CMD_ENCAP	
Source End Point = 0x03	(this is the endpoint of command owner, here we assume endpoint is 3, if the owner doesn't support multi Channel this value will be 0)
[Bit Address+Destination End Point = 0x01]	[Bit Address =0; Destination End Point range1-3]
Command Class = 0x32	[ Command_Class_Meter_V3 = 0x32]
Command =0x05	[ Meter_Reset = 0x05]

##### 2.3.3.1 | METER\_GET

Using meter get command to get the KWH,W,V,I,PF from endpoint of Micromodule 2-3-5-1 Get KWH from endpoint.

Meter\_GET example:

COMMAND_CLASS_MULTI_CHANNEL	
MULTI_CHANNEL_CMD_ENCAP	
Source End Point = 0x05	(this is the endpoint of command owner, here we assume endpoint is 5, if the owner 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:

COMMAND_CLASS_MULTI_CHANNEL	
MULTI_CHANNEL_CMD_ENCAP	

Source End Point = 0x03	[Meter report = Endpoint3]
[Bit Address+Destination End Point = 0x05]	[Bit Address =0; Destination End Point = command owner Endpoint value]
Command Class = 0x32	[Command_Class_Meter_V3 = 0x32]
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	Accumulated Power Consumption = 0x000005FD = 15.33 kWh
Parameter 4 = 0x00	
Parameter 5 = 0x05	
Parameter 6 = 0xFD	

### 2.3.3.2 | GET INSTANT POWER CONSUMPTION (WATT) FROM ENDPOINT

METER\_GET example:

COMMAND_CLASS_MULTI_CHANNEL	
MULTI_CHANNEL_CMD_ENCAP	
Source End Point = 0x05	[this is the endpoint of command owner, here we assume endpoint is 5, if the owner 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]

Instant Power Consumption (W) Report example:

COMMAND_CLASS_MULTI_CHANNEL	
MULTI_CHANNEL_CMD_ENCAP	
Source End Point = 0x03	[Meter report = Endpoint3]
[Bit Address+Destination End Point = 0x05]	[Bit Address =0; Destination End Point = command owner 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	

### 2.3.3.3 | GET LOAD VOLTAGE V FROM ENDPOINT

Meter\_GET example:

COMMAND_CLASS_MULTI_CHANNEL	
MULTI_CHANNEL_CMD_ENCAP	
Source End Point = 0x05	[this is the endpoint of command owner, here we assume endpoint is 5, if the owner 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]

AC input Voltage report example:

COMMAND_CLASS_MULTI_CHANNEL	
MULTI_CHANNEL_CMD_ENCAP	
Source End Point = 0x03	[Meter report = Endpoint3]
[Bit Address+Destination End Point = 0x05]	[Bit Address =0; Destination End Point = command owner 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	

### 2.3.3.4 | GET LOAD CURRENT I FROM ENDPOINT

Meter\_GET example:

COMMAND_CLASS_MULTI_CHANNEL	
MULTI_CHANNEL_CMD_ENCAP	
Source End Point = 0x05	[this is the endpoint of command owner, here we assume endpoint is 5, if the owner 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]

AC input current (I) example:

COMMAND_CLASS_MULTI_CHANNEL	
MULTI_CHANNEL_CMD_ENCAP	
Source End Point = 0x03	[Meter report = Endpoint3]
[Bit Address+Destination End Point = 0x05]	[Bit Address =0; Destination End Point = command owner 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 = 0.43A
Parameter 4 = 0x2B	

### 2.3.3.5 | GET POWER FACTOR PF FROM ENDPOINT

Meter\_GET example:

COMMAND_CLASS_MULTI_CHANNEL	
MULTI_CHANNEL_CMD_ENCAP	
Source End Point = 0x05	[this is the endpoint of command owner, here we assume endpoint is 5, if the owner 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 = 0x30	[Scale = PF = 0x06]

Power factor report example:

COMMAND_CLASS_MULTI_CHANNEL	
MULTI_CHANNEL_CMD_ENCAP	
Source End Point = 0x03	[Meter report = Endpoint3]
[Bit Address+Destination End Point = 0x05]	[Bit Address =0, Destination End Point = command owner 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

Note: If the Destination End Point is 1, it will report the power factor of CT1, but not the sum of PF of CT1 and CT2.

## Z-WAVE CONFIGURATION

Configuration Parameter 1		
Function	Size (byte)	Value
Watt Meter Report Period	2	0x01-0x7FFF
Unit	Default	Description
5s	720	5*720s=3600s=1hour

Configuration Parameter 2		
Function	Size (byte)	Value
KWH Meter Report Period	2	0x01-0x7FFF
Unit	Default	Description
5s	720	5*720s=3600s=1hour

Configuration Parameter 3		
Function	Size (byte)	Value
Selected End Point	1	1-3
Unit	Default	Description
	1	1: CT1 and CT2 2: CT1 3: CT2

Configuration Parameter 4		
Function	Size (byte)	Value
Threshold of Current for Load Caution	2	10-750
Unit	Default	Description
0.01A	750	750*0.01A=7.5A

Configuration Parameter 5		
Function	Size (byte)	Value
Threshold of KWH for Load Caution	2	1-10000
Unit	Default	Description
1KWh	10000	

### 3.1 | WATT METER REPORT PERIOD:

If the setting is configured for 1hour (set value =720), Micromodule 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 =720), the PAB01 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 45 hours [5s\*32767/3600=45hr].

### 3.3 | SELECTED ENDPOINT

If Controller not using Multi\_Channel command class to access the endpoint of Micromodule, you may configure the endpoint value to react the Basic Command Class, Binary Switch Command Class or Meter Command Class V3.

### 3.3.1 | SELECTED ENDPOINT 1: DEFAULT SELECTED ENDPOINT IS 1

Get command	Parameter	Report to command sender
Meter_Get	KWh	CT1 KWh1+CT2 KWh2

Meter_Get	Watt	CT11 W1+CT2 W2
Meter_Get	Voltage	CT1 and CT2 are the same voltage
Meter_Get	Current	CT1 I1+CT2 I2
Meter_Get	Power factor PF	CT1

### 3.3.2 | SELECTED ENDPOINT 2

Similar like Selected Endpoint 1 but only relate to CT1 and ignore CT2.

### 3.3.2 | SELECTED ENDPOINT 3

Similar like Selected Endpoint 1 but only relate to CT2 and ignore CT1.

### 3.9.4 | SWITCH ON:

It switches to ON state.

### 3.4 | 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 wattage of CT1 or CT2 over 7.5A, Micromodule will send current Meter Report command to the node of correspond Group.

### 3.5 | 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 CT1 or CT2 over this value, Micromodule will send KWh Meter Report command to the node of correspond Group, minum value is 1KWh and default value is 10000 kWh.

## Z-WAVE COMMAND CLASSES

COMMAND\_CLASS\_ZWAVEPLUS\_INFO  
 COMMAND\_CLASS\_VERSION  
 COMMAND\_CLASS\_MANUFACTURER\_SPECIFIC\_V2  
 COMMAND\_CLASS\_DEVICE\_RESET\_LOCALLY  
 COMMAND\_CLASS\_ASSOCIATION\_V2  
 COMMAND\_CLASS\_ASSOCIATION\_GRP\_INFO  
 COMMAND\_CLASS\_POWERLEVEL  
 COMMAND\_CLASS\_MULTI\_CHANNEL\_V3  
 COMMAND\_CLASS\_METER\_V3  
 COMMAND\_CLASS\_CONFIGURATION

## TROUBLESHOOTING

Symptom	Cause of Failure	Recommendation
The meter is not working and LED off	1. The meter is not connect to the Main power	1. Check power connections
	2. The meter break down	1. Don't open up the meter and send it for repair.
The meter cannot report to the group	1. Not carry out association	1. Carry out association
	2. Same frequency interference	2. Wait for a while to re-try

#### Having trouble installing your new product?

Zipato's website contains the latest user documentation and software updates for Zipato products and services:

[www.zipato.com](http://www.zipato.com)

You can also find answers in the Zipato Community at:

[community.zipato.com](http://community.zipato.com)

Zipato Support: [support@zipato.com](mailto:support@zipato.com)

## LIMITED PRODUCT WARRANTY

### Ⓞ GENERAL TERMS

Nothing in this Limited Product Warranty affects your statutory rights as a consumer.

The Limited Product Warranty set forth below is given by Tri plus grupa d.o.o. (Europel [herein referred to as "ZIPATO"]). This Limited Product Warranty is only effective upon presentation of the proof of purchase. Upon further request by ZIPATO, this warranty card has to be presented, too.

EXCEPT AS EXPRESSLY SET FORTH IN THIS LIMITED WARRANTY, ZIPATO MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. ZIPATO EXPRESSLY DISCLAIMS ALL WARRANTIES NOT STATED IN THIS LIMITED WARRANTY. ANY IMPLIED WARRANTIES THAT MAY BE IMPOSED BY LAW ARE LIMITED IN DURATION TO THE LIMITED WARRANTY PERIOD. TO THE EXTENT ALLOWED BY LOCAL LAW, THE REMEDIES IN THIS WARRANTY STATEMENT ARE CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES AGAINST ZIPATO. THEY DO NOT, HOWEVER, AFFECT OR RESTRICT THE RIGHTS YOU HAVE AGAINST THE BUSINESS YOU BOUGHT A ZIPATO PRODUCT FROM. IN NO EVENT WILL ZIPATO BE LIABLE FOR LOSS OF DATA OR FOR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFIT OR DATA), OR OTHER DAMAGE, WHETHER BASED IN CONTRACT, TORT, OR OTHERWISE. HOWEVER, NOTHING IN THIS AGREEMENT LIMITS ZIPATO'S LIABILITY TO YOU (I) IN THE EVENT OF DEATH OR PERSONAL INJURY TO THE EXTENT RESULTING FROM ZIPATO'S NEGLIGENCE, OR (II) TO THE EXTENT RESULTING FROM ANY FRAUDULENT MISREPRESENTATION ON THE PART OF ZIPATO, OR (III) TO THE EXTENT ARISING UNDER PART 1 OF THE CONSUMER PROTECTION ACT 1987 OF THE UNITED KINGDOM. SOME STATES OR COUNTRIES DO NOT ALLOW: (1) A DISCLAIMER OF IMPLIED WARRANTIES; (2) A LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS OR THE EXCLUSION; OR (3) LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR CONSUMER PRODUCTS. IN SUCH STATES OR COUNTRIES, SOME EXCLUSIONS OR LIMITATIONS OF THIS LIMITED WARRANTY MAY NOT APPLY TO YOU. THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY ALSO HAVE OTHER RIGHTS THAT MAY VARY FROM STATE TO STATE OR FROM COUNTRY TO COUNTRY. YOU ARE ADVISED TO CONSULT APPLICABLE STATE OR COUNTRY LAWS FOR A FULL DETERMINATION OF YOUR RIGHTS.

This Limited Product Warranty applies to ZIPATO branded hardware products (collectively referred to as "ZIPATO Hardware Products") sold by ZIPATO (Europe), its European subsidiaries, affiliates, authorized resellers, or country distributors (collectively referred to as "ZIPATO Resellers") with this Limited Product Warranty. The term "ZIPATO Hardware Product" is limited to the hardware components and all its internal components including firmware. The term "ZIPATO Hardware Product" DOES NOT include any software applications or programs.

### Ⓞ GEOGRAPHICAL SCOPE OF THE LIMITED PRODUCT WARRANTY

This Limited Product Warranty is applicable to Hardware Products sold by Zipato Resellers in all countries listed at the beginning of this document under the heading "Countries in which this ZIPATO Limited Product Warranty applies". The Limited Product Warranty will be honored in any country where ZIPATO or its authorized service providers offer warranty service subject to the terms and conditions set forth in this Limited Product Warranty. However, warranty service availability and response times may vary from country to country and may also be subject to registration requirements.

### Ⓞ LIMITATION OF PRODUCT WARRANTY

ZIPATO warrants that the products described below under normal use are free from material defects in materials and workmanship during the Limited Product Warranty Period set forth below ("Limited Product Warranty Period"), if the product is used and serviced in accordance with the user manual and other documentation provided to the purchaser at the time of purchase (or as amended from time to time).

ZIPATO does not warrant that the products will operate uninterrupted or error-free or that all deficiencies, errors, defects or non-conformities will be corrected. This warranty shall not apply to problems resulting from: (a) unauthorized alterations or attachments; (b) negligence, abuse or misuse, including failure to operate the product in accordance with specifications or interface requirements; (c) improper handling; (d) failure of goods or services not obtained from ZIPATO or not subject to a then-effective ZIPATO warranty or maintenance agreement; (e) improper use or storage; or (f) fire, water, acts of God or other catastrophic events. This warranty shall also not apply to any particular product if any ZIPATO serial number has been removed or defaced in any way. ZIPATO IS NOT RESPONSIBLE FOR DAMAGE THAT OCCURS AS A RESULT OF YOUR FAILURE TO FOLLOW THE INSTRUCTIONS FOR THE ZIPATO HARDWARE PRODUCT.

### Ⓞ LIMITED PRODUCT WARRANTY PERIOD

The Limited Product Warranty Period starts on the date of purchase from ZIPATO. Your dated sales or delivery receipt, showing the date of purchase of the product, is your proof of the purchase date. You may be required to provide proof of purchase as a condition of receiving warranty service. You are entitled to warranty service according to the terms and conditions of this document if a repair to your ZIPATO branded hardware is required within the Limited Product Warranty Period.

[Other than in respect of products for domestic use (in particular those listed in the first and last boxes in the table below), this Limited Product Warranty extends only to the original end user purchaser of this ZIPATO Hardware Product and is not transferable to anyone who obtains ownership of the ZIPATO Hardware Product from the original end-user purchaser.

### Ⓞ PRODUCT WARRANTY PERIOD TABLE

PRODUCT TYPE	Micromodule Energy Meter
PRODUCT WARRANTY PERIOD	One (1) year

#### IMPORTANT

The content of "Product Type" listed above is subject to change; please refer to the [www.zipato.com](http://www.zipato.com) for latest update.

### Ⓞ PERFORMANCE OF THE LIMITED PRODUCT WARRANTY

If a product defect occurs, ZIPATO's sole obligation shall be to repair or replace any defective Zipato Hardware Product free of charge provided it is returned to an Authorized ZIPATO Service Centre during the Limited Warranty Period. Such repair or replacement will be rendered by ZIPATO at an Authorized ZIPATO Service Centre. All component parts or hardware products that are replaced under this Limited Product Warranty become the property of ZIPATO. The replacement part or product takes on the remaining Limited Warranty Period of the replaced part or product. The replacement product need not be new or of an identical make, model or part; ZIPATO may in its discretion replace the defective product (or any part thereof) with any reconditioned equivalent (or superior) product in all material respects to the defective product.

#### WARRANTOR

Tri plus grupa d.o.o.

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10 000 Zagreb, CROATIA

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FAX +385 (0)1 4004 405

## DECLARATION OF CONFORMITY



The manufacturer Tri plus grupa d.o.o declares under our sole responsibility that the product:

**Marketing model:** Micromodule Energy Meter

**Regulatory model:** ph-pab01

**Trade/Brand name:** Zipato

is in conformity with the Low Voltage Directive 2006/95/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 301 489-1: V1.9.2

EN 301 489-3: V1.6.1

**LVD (2006/95/EC)**

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013

Changes or modifications not expressly approved by Tri plus grupa d.o.o. for compliance could void the user's authority to operate the equipment.



#### 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.

**NOTE: Changes or modifications not expressly approved by Zipato for compliance could void the user's authority to operate the equipment.** 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 or more 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.

### Ⓞ DISPOSING AND RECYCLING YOUR PRODUCT

When it reaches end of life, dispose of the product according to your local environmental laws, guidelines and regulations.



This symbol on the product or packaging means that according to local laws and regulations needs to be disposed of separately from household waste. Once this product has reached the end of its life, please take it to a collection point (recycle facilities) designated by your local authorities, some will accept your product for free or simply drop it off at your Zipato re-seller store. By recycling the product and its packaging in this manner you help to conserve the environment and protect human health. At Zipato, we understand and are committed to reducing any impact our operations and products may have on the environment. To minimize this impact Zipato designs and builds its products to be as environmentally friendly as possible, by using recyclable, low toxic materials in both products and packaging.

### Ⓞ COPYRIGHT

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