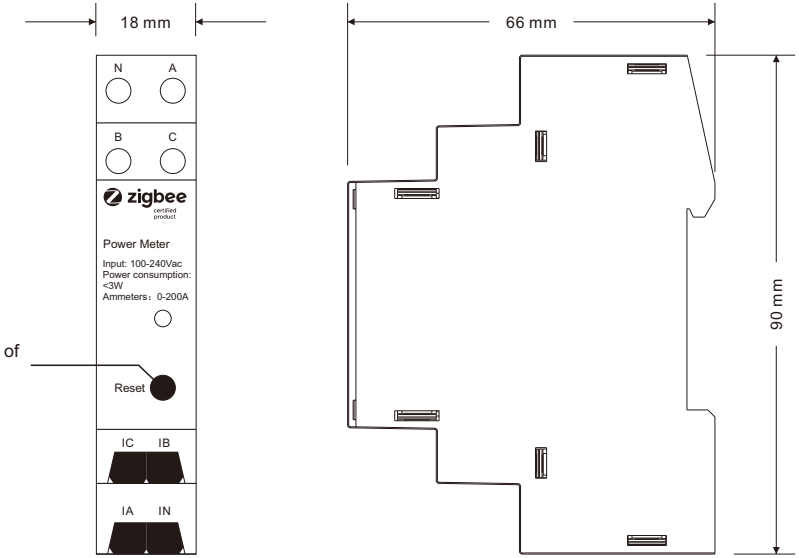
ZigBee Three-Phase Power Meter

Important: *Read All Instructions Prior to Installation*

Function introduction



Product Data

Input Voltage	Power Consumption	Ammeters	Voltmeters accuracy	Ammeters accuracy	Size(LxWxH)
100-240VAC	<3W	0-200A	±1 %	±1 % (2 - 200 A), ±2 % (1 - 2 A), ±5 % (0 - 1 A)	90x66x18mm

- Precise 3-phase energy metering based on latest ZigBee 3.0 protocol
- 4 Quadrant measurement
- Up to 200A per phase
- Solar and Wind power compatible
- Factory calibrated with over 99% accuracy
- Multiple connection types
- Current transformer connection
- DIN mountable
- Power and energy meters:
  1. Active and apparent power
  2. Active and apparent energy
  3. Power factor
  4. Fundamental active and fundamental reactive energy

Safety & Warnings

- DO NOT install with power applied to device.
- DO NOT expose the device to moisture.

Operation

1. Join Zigbee Network

Step 1: Operate your ZigBee Controller (Gateway) to add a device.
Step 2: Press the button on the device 5 times continuously.
If the device is not connected to a network, it will directly enter network paring mode, the LED will flash quickly;
If connected to a network, it will automatically exit the network, the LED will flash 3 times to indicate a successful network exit. After a few seconds, the device will automatically enter network pairing mode, the LED will flash quickly.
Step 3: Wait for this process to finish. If the connection is successful, the LED will flash 3 times, otherwise the LED will go off.

*Re-powering the device: if the LED flashes quickly, the device isn't connected to a network; Otherwise, it has been connected to a network.
*When the device is working properly, the LED flashes slowly with a frequency of 1s. When EEPROM reading is abnormal, the LED flashes once within 1.5s.

2. Exit ZigBee Network

Method 1: Operate your gateway to delete the device, the LED will flash 3 times to indicate a successful network exit.
Method 2: Press the button on the device 5 times continuously, the LED will flash 3 times to indicate a successful network exit.

3. Factory Reset

Long press the button for over 10s, the LED will flash slowly then stay on for 3s to indicate a successful reset.

Note: After the device exits the Zigbee network, the device's bind table will be cleared. Electrical consumption data will not be cleared unless the device is restored to factory settings or receives a "Reset to Factory Defaults Command" after being added to the network.

Zigbee Interface

Zigbee application endpoints:

Endpoint	Profile	Application
0(0x00)	0x0000(ZDP)	ZigBee Device Object (ZDO) - standard management features
1(0x01)	0x0104(HA)	Simple sensor, DeviceID = 0x000C
242	0x0104(HA)	Green power, DeviceID = 0x0301

1. Application Endpoint #0-ZDO

Device standard management features.

2. Application endpoint #1-Thermostat

Cluster	Supported	Description
0x0000	Server	Basic Provides basic information about the device, such as the manufacturer ID, vendor and model name, stack profile, ZCL version, production date, hardware revision etc. Allows a factory reset of attributes, without the device leaving the network.
0x0003	Server	Identify Allows to put the endpoint into identify mode. Useful for identifying/locating devices and required for Finding & Binding.
0x0004	Server	Groups Allows adding this endpoint to one or more groups. Afterwards the endpoint can be addressed using the group address. This is also a prerequisite for scenes. You may also query group membership and delete group associations.
0x0005	Server	Scenes Allows storing one or more scenes per group, where each scene consists of a pre-set on/off state value. You may either store the current values as a scene, or provide scene settings when adding a scene, or delete scenes.
0x0B04	Server	Electrical Measurement
0x0702	Server	Simple Meter
0x0019	Client	OTA Upgrade Pull-oriented firmware upgrade. Searches the network for mating servers and allows the server to control all stages of the upgrade process, including which image to download, when to download, at what rate and when to install the downloaded image.

2.1 Basic - 0x0000(Server)

Attributes supported:

Attribute	Type	Description
0x0000	INT8U, read-only	ZCLVersion
0x0001	INT8U, read-only	ApplicationVersion
0x0002	INT8U, read-only	StackVersion
0x0003	INT8U, read-only	HWVersion
0x0004	string, read-only	ManufacturerName
0x0005	string, read-only	ModelIdentifier
0x0006	string, read-only	DateCode NULL
0x0007	ENUM8, read-only	PowerSource The type of power source for the device. Fixed value: 0x01 Mains (single phase)
0x0008	ENUM8, read-only	GenericDevice-Class 0XFF
0x0009	ENUM8, read-only	GenericDevice-Type 0XFF
0x000A	octstr, read-only	ProductCode 00
0x000B	string, read-only	ProductURL NULL
0x4000	string, read-only	Sw build id 6.10.3.0

Command supported:

Command	Description
0x00	Reset to Factory Defaults Command On receipt of this command, the device resets all the attributes of all its clusters to their factory defaults. Note that networking functionality, bindings, groups, or other persistent data are not affected by this command.

2.2 Identify - 0x0003(Server)

Attributes supported:

Attribute	Type	Description
0x0000	Int16U	Identify time

Receive command supported:

Command	Description
0x0000	Identify
0x0001	IdentifyQuery

Generate command supported:

Command	Description
0x0000	IdentifyQueryResponse

2.3 Simple Meter - 0x0702(Server)

Attributes supported:

Attribute	Type	Description
0x0000	unsigned48, read-only, reportable	CurrentSummationDelivered Indicates the current amount of electrical energy delivered to the load.
0x0006	Int8, read-only	PowerFactor
0x0200	bitmap8, read-only	Status Flags indicating current device status, always is 0x00
0x0300	enum8, read-only	UnitOfMeasure The unit of measurement data. This is always kWh(0x00)
0x0301	Int24U, read-only	Multiplier 1
0x0303	map8, read-only	SummationFormatting 0xF1
0x0306	bitmap8, read-only	MeteringDeviceType The type of measurement data. This is always Electric Metering (0x00)
0x0302	Int24U, read-only	Divisor

2.4. Electrical Measurement - 0x0b04(Server)

Attributes supported:

AC: Non - Phase Specific or common attributes supported		
Attribute	Type	Description
0x0000	bitmap32, read-only	MeasurementType Indicates the physical entities that this device is able to measure. Supports: bit0: Active measurement(AC) bit1: Reactive measurement(AC) bit2: Apparent measurement(AC) bit3~bit5: Phase A, B, C measurement
0x0300	int16U, read-only, reportable	ACFrequency Unit is Hz, 0xffff means invalid.
0x0303	int16U, read-only, reportable	NeutralCurrent Unsigned, unit is A.
0x0304	int32S, read-only, reportable	Total Active Power Signed, unit is kW.
0x0305	int32S, read-only, reportable	Total Reactive Power Signed, unit is kVAr.
0x0306	int32U, read-only, reportable	Total Apparent Power Unsigned, unit is kVA.
0x0400	int16U, read-only, reportable	ACFrequencyMultiplier 0x01
0x0401	int16U, read-only, reportable	ACFrequencyDivisor 0x64 (100) used together with the above attribute, the actual displayed frequency = ACFrequency* ACFrequencyMultiplier/ ACFrequencyDivisor
0x0402	uint32, read-only, reportable	PowerMultiplier 0x01
0x0403	uint32, read-only, reportable	PowerDivisor 1000 used together with the above attribute, the actual displayed power = [total XX Power]* PowerMultiplier/ PowerDivisor
0x0600	int16U, read-only, reportable	ACVoltageMultiplier 0x01
0x0601	int16U, read-only, reportable	ACVolatgeDivisor 0x0a used together with the above attribute, the actual displayed voltage = RMSVoltage* ACVoltageMultiplier/ ACVoltageDivisor
0x0602	int16U, read-only, reportable	ACCurrentMultiplier 0x01
0x0603	int16U, read-only, reportable	ACCurrentDivisor (100) used together with the above attribute, the actual displayed current = RMSCurrent* ACCurrentMultiplier/ ACCurrentDivisor
0x0604	int16U, read-only, reportable	ACPowerMultiplier 0x01
0x0605	int16U, read-only, reportable	ACPowerDivisor 1 used together with the above attribute, the actual displayed power = ActivePower* ACPowerMultiplier/ ACPowerDivisor
0x0800	map16	ACAlarmsMask, supports: bit0: Voltage Overload bit1: Current Overload bit3: Active Power Overload
0x0801	int16S, read-only, reportable	ACVoltageOverload
0x0802	int16S, read-only, reportable	ACCurrentOverload
0x0803	int16S, read-only, reportable	ACActivePowerOverload

AC: Single Phase or Phase A Attributes supported		
Attribute	Type	Description
0x0505	int16U, read-only, reportable	RMSVoltage Valid voltage of single phase or phase A, unit is V
0x0508	int16U, read-only, reportable	RMSCurrent Valid current of single phase or phase A, unit is A.
0x050B	int16S, read-only, reportable	Active Power Active power of single phase or phase A, unit is W.
0x050E	int16, read-only, reportable	Reactive Power Reactive power of single phase or phase A, unit is VAr.
0x050F	int16U, read-only, reportable	Apparent Power Apparent power of single phase or phase A, unit is VA.
0x0510	int8s, read-only, reportable	PowerFactor Power factor of single phase or phase A, unit is 1/100(0.01).

AC: Phase B Attributes supported		
Attribute	Type	Description
0x0905	int16U, read-only, reportable	RMSVoltagePhB Valid voltage of phase B, unit is V
0x0908	int16U, read-only, reportable	RMSCurrentPhB Valid current of phase B, unit is A.
0x090B	int16S, read-only, reportable	Active PowerPhB Active power of phase B, unit is W.
0x090E	int16, read-only, reportable	Reactive PowerPhB Reactive power of phase B, unit is VAr.
0x090F	int16U, read-only, reportable	Apparent PowerPhB Apparent power of phase B, unit is VA.
0x0910	int8s, read-only, reportable	PowerFactorPhB Power factor of phase B, unit is 1/100.

AC: Phase C Attributes supported		
Attribute	Type	Description
0x0A05	int16U, read-only, reportable	RMSVoltagePhC Valid voltage of phase C, unit is V
0x0A08	int16U, read-only, reportable	RMSCurrentPhC Valid current of phase C, unit is A.
0x0A0B	int16S, read-only, reportable	Active PowerPhC Active power of phase C, unit is W.
0x0A0E	int16, read-only, reportable	Reactive PowerPhC Reactive power of phase C, unit is VAr.
0x0A0F	int16U, read-only, reportable	Apparent PowerPhC Apparent power of phase C, unit is VA.
0x0A10	int8s, read-only, reportable	PowerFactorPhC Power factor of phase C, unit is 1/100.

2.5 OTA Upgrade - 0x0019 (Client)

OTA follows the standard Zigbee protocol.

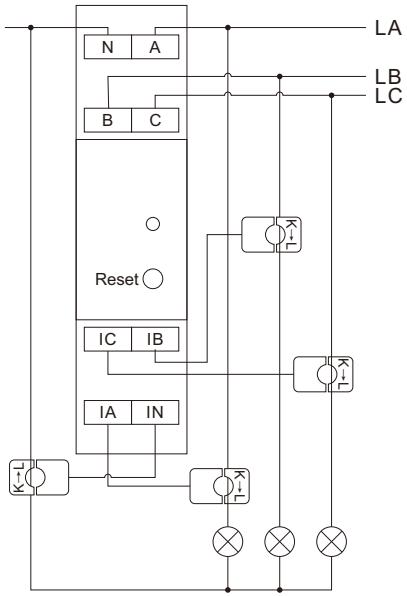
2.6 Other private attributes

Cluster	Attributes	Data Type	Data Description	Data Default
0x0b04	0x3e00	0x20	Metering calibration enable 0: Delete internal calibration value and do not calibrate 1: Enable automatic calibration	0
0x0b04	0x3e01	0x21	Measure voltage calibration value	0
0x0b04	0x3e02	0x21	Measure current calibration value	0
0x0b04	0x3e03	0x21	Measure power calibration value	0

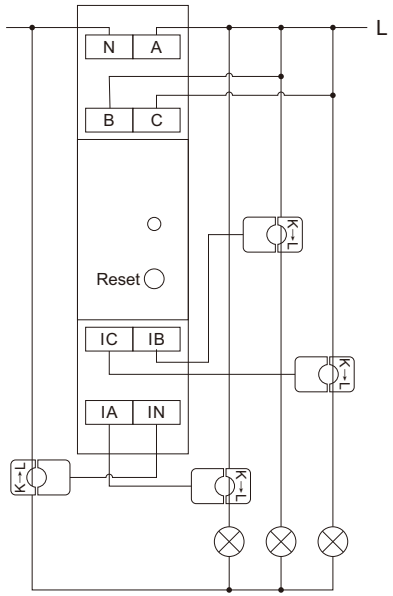
3. Application Endpoint #242 - GreenPower

Wiring

1) Three phase wiring way



2) Mono-phase wiring way



Terminals Introduction

A: Phase A and power supply input
B: Phase B input
C: Phase C input
N: Neutral terminal
IA: Phase A current transformer input
IB: Phase B current transformer input
IC: Phase C current transformer input
IN: Neutral current transformer input

LA: Phase A live (110-240 V) wire
LB: Phase B live (110-240 V) wire
LC: Phase C live (110-240 V) wire
N: Neutral terminal
L: Mono-phase live (110-240 V) wire
N: Neutral wire

Note: To obtain a value for the combined phase power, one of the phases A, B, or C must be connected.
The direction of the combined phase current transformer can be ignored, but the A, B, and C phase current transformers have a specific direction when clamped to the lines. If the direction is reversed, the active power and power factor will be negative. The current direction for wiring should pass through the current transformer in the S1->S2 direction, as shown in the following figure: