EMD-1ZBS Electricity Power Reader

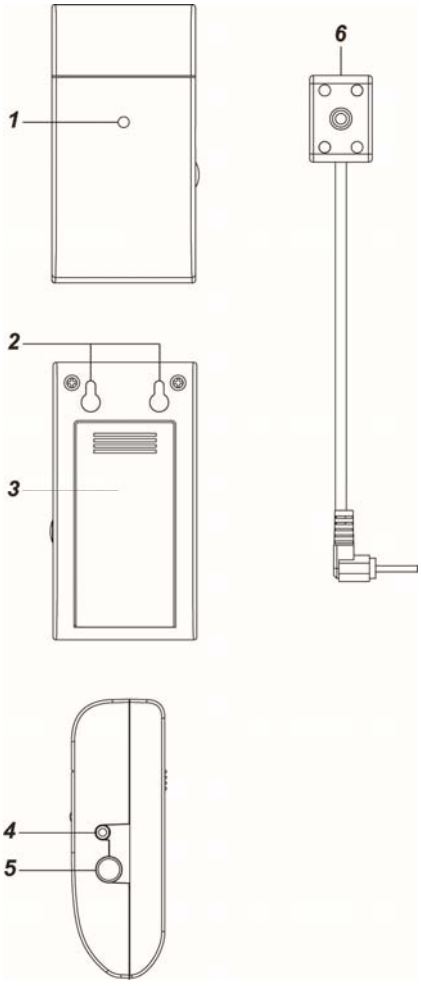
Introduction

The Energy Meter is a ZigBee Electricity Power reader designed to be used with a digital watt hour meter supporting LED pulse output port. The E-meter reads the LED pulse from the watt hour meter and transmits the data to ZigBee network coordinator.

The Energy Meter utilizes ZigBee technology for wireless signal transmission. ZigBee is a wireless communication protocol that is reliable, has low power consumption and has high transmission efficiency. Based on the IEEE802.15.4 standard, ZigBee allows a large amount of devices to be included in a network and coordinated for data exchange and signal transmission.

The Energy Meter serves as an end device in the ZigBee network. It can be included in the ZigBee network to transmit signal upon activation, but cannot permit any other ZigBee device to join the network through the Energy Meter.

Parts Identification



1. LED indicator

The LED indicator lights up in the following conditions:

- Flashes quickly:
  The Energy Meter received LED signal.
- Flashes once:
  The Energy Meter is reset.
- Flashes twice:
  The Energy Meter has successfully joined a ZigBee network.
- Flashes every 20 minutes
  The Energy Meter has lost connection to current ZigBee network

2. Mounting Holes

3. Battery compartment Cover

Remove the cover to insert 2 Alkaline AA 1.5V batteries to power up the Energy Meter.

4. LED Sensor Jack

Plug the Sensor into this jack to receive LED signal from the watt hour meter.

5. Function Button

- Press the button once to transmit supervision signal.
- Press and hold the button for 10 seconds then release to reset the Power Meter.

6. IR Sensor

Attach the IR sensor to the watt hour meter, and plug into the IR sensor Jack to read data from the watt hour meter.

Features

- ***Battery and Low Battery Detection***

  The Energy Meter uses 2 Alkaline 1.5V batteries as its power source, It feature Low Battery Detection function. When the battery voltage is low, the Energy Meter will transmit Low Battery signal to notify ZigBee network coordinator.

  When changing battery, after removing the old batteries, press the function button a couple times to fully discharge before inserting new batteries

- ***Supervision***

  The Energy Meter will transmit a supervision signal to report its condition regularly according to user setting. The factory default interval is 30 minutes. The user can also press the Function Button once to transmit a supervision signal manually.

ZigBee Network Setup

ZigBee Device Guideline

ZigBee is a wireless communication protocol that is reliable, has low power consumption and has high transmission efficiency. Based on the IEEE802.15.4 standard, ZigBee allows a large amount of devices to be included in a network and are coordinated for data exchange and signal transmission.

Joining the ZigBee Network

As a ZigBee device, the Power Switch needs to join a ZigBee network to receive commands and transmit energy consumption information. Follow the steps bellow to join the Power Switch into a ZigBee network.

The Energy Meter can only join ZigBee network within 3 minutes after power on.

1. Insert batteries to power on the E-meter.
2. Press and hold the function button for 10 seconds within 3 minutes after power on to reset E-meter and start searching for existing ZigBee network. Please make sure the permit-to-join feature on the router or coordinator of your ZigBee network is enabled.
3. If the E-meter successfully joins a ZigBee network, the LED Indicator will flash twice to confirm.
4. After joining the ZigBee network, the Power Switch will be registered in the network automatically. Please check the Zigbee network coordinator, system control panel or CIE (Control and Indicating Equipment) to confirm if joining and registration is successful.
5. If registration and joining to the network is unsuccessful, please check your ZigBee network coordinator, system control panel or CIE setting to ensure the permit-to-join function is available, and then use the Factory Reset function below to join the ZigBee network.

Removing Device from ZigBee Network (Factory Reset)

To remove the device from current ZigBee network, the Energy Meter must be put to Factory Reset to complete device removal. Factory Reset function will clear the device of its stored setting information and prompt Energy Meter to search for new ZigBee network.

Before removing device, make sure Energy Meter is within current ZigBee network signal range

1. Delete Energy Meter from current control panel / CIE.
2. The Energy Meter can only be reset **within 3 minutes** after power up. If it has been powered up for more than 3 minutes, remove and reinsert the battery.
3. Press and hold the function button for 10 seconds, then release the button to reset Energy Meter.
4. Upon reset, the Energy Meter will clear current ZigBee network setting and transmit signal to ZigBee coordinator to remove itself from current ZigBee network. It will then actively search for available ZigBee network again and join the network automatically.

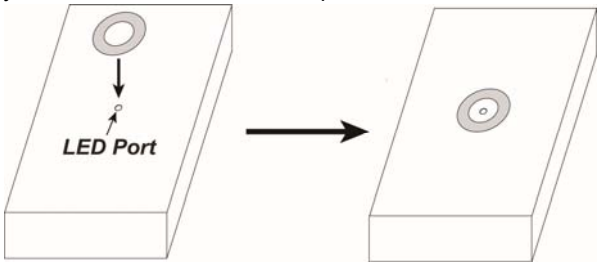
Operation

Installation

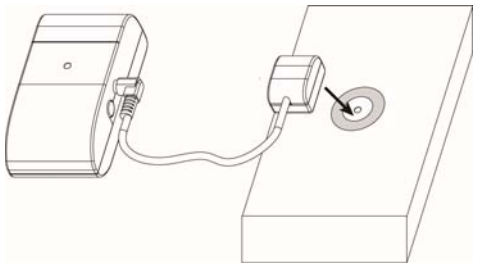
Wat Hour Meter connection.

A Washer with double-side adhesive tape is provided to connect the IR sensor to watt hour meter

1. Locate the LED pulse output port on the watt hour meter, remove the double-side adhesive tape cover on the washer and apply the washer around the LED port.



2. The sensor head has built-in magnet. Apply the sensor head to the washer to attach the sensor to LED port for reading LED pulse from watt hour meter



Wall Mounting

The Energy Meter has two mounting holes on the back for wall mounting.

1. Mark the mounting location on the wall according to mounting hole position
2. Install two screws at the mounting location.
3. Hook the Energy Meter onto the screws.

- ***Energy Consumption Monitor***
  - The Energy Meter reads LED pulse from the watt hour meter to monitor energy consumption.
  - The Energy Meter will transmit current wattage every 5 minutes to ZigBee network coordinator
  - The Energy Meter transmits a power data to coordinator whenever accumulated power usage increases by 0.1kW/hr.
  - To clear the Energy Meter of its accumulated power consumption data, follow steps below:
    1. Remove the batteries to power down.
    2. Press and hold the function button and reinsert batteries again when holding down the button.
    3. Keep holding the button and release after 3 seconds. The accumulated power consumption data will be cleared.

Appendix (For developers only)

- ***Power Switch Cluster ID***

Device ID: Meter Interface : 0x0053 **Endpoint:0x01**	
Server Side	**Client Side**
Mandatory	
Basic (0x0000)	Identify(0x0003)
Metering(0x0702)	
Meter Identification(0x0B01)	
Optional	
Power Configuration(0x0001)	*None*
Identify(0x0003)	

- ***Attribute of Basic Cluster Information***

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	*ZCLVersion*	Unsigned 8-bit integer	0x00 –0xff	Read only	0x01	M
0x0001	ApplicationVersion	Unsigned 8-bit integer	0x00 –0xff	Read only	0x00	O
0x0003	*HWVersion*	Unsigned 8-bit integer	0x00 –0xff	Read only	0	O
0x0004	*ManufacturerName*	Character String	0 – 32 bytes	Read only	Climax Technology	O
0x0005	*ModelIdentifier*	Character String	0 – 32 bytes	Read only	(Model Version)	O
0x0006	*DateCode*	Character String	0 – 16 bytes	Read only		O
0x0007	*PowerSource*	8-bit	0x00 –0xff	Read only		M
0x0010	*LocationDescription*	Character String	0 – 32 bytes	Read / Write		O
0x0011	*PhysicalEnvironment*	8-bit	0x00 –0xff	Read / Write	0x00	O
0x0012	*DeviceEnabled*	Boolean	0x00 –0x01	Read / Write	0x01	M

- ***Attribute of Power Configuration Cluster Information***

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0035	*BatteryAlarmMask*	8-bit bitmap	0000 000x	Read / Write	0000 0000	O

- ***Attribute of Identify Cluster Information***

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	*IdentifyTime*	Unsigned 16-bit integer	0x00 –0xffff	Read / Write	0x0000	M

- ***Attributes of the Metering cluster Information***

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	CurrentSummation Delivered	Unsigned 48-bit Integer	0x000000000000 to 0xFFFFFFFFFFFF	Read Only		M

- ***Attributes of the Metering Identification cluster Information***

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	CompanyName	Character String	0 – 16 Octets	Read Only	-	M
0x0001	MeterTypeID	Unsigned 16-bit Integer	0x0000 to 0xFFFF	Read Only	-	M
0x0004	DataQualityID	Unsigned 16-bit Integer	0x0000 to 0xFFFF	Read Only	-	M
0x000C	POD	Character String	0 – 16 Octets	Read Only	-	M
0x000D	AvailablePower	signed 24-bit Integer	0x000000 to 0xFFFFFF	Read Only	-	M
0x000E	PowerThreshold	signed 24-bit Integer	0x000000 to 0xFFFFFF	Read Only	-	M

Federal Communication Commission 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.

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

FCC Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The antennas used for this transmitter must be installed to provide a separation distance of at 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. 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.