Wireless Plug-and-Play Power Outlet with Consumption Monitoring and Power Outage Detection

R809A01
User Manual

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1. Introduction

R809A01 is a Wireless Plug-and-Play Power Outlet with Consumption Monitoring and Power Outage Detection for Netvox Class C type devices based on the LoRaWAN open protocol and is compatible with the LoRaWAN protocol.

R809A01 can be remote and manual to control (turn on/off) the external connect the electrical equipment, it will report current, voltage, power and energy of the load.

R809A01 also supports over current alarm and local power off alarms.

Note:
The specifications of the plug and socket supported by R809A01 are B, G, and I.

R809A01B: US type

R809A01G: UK type

R809A01I: AU type

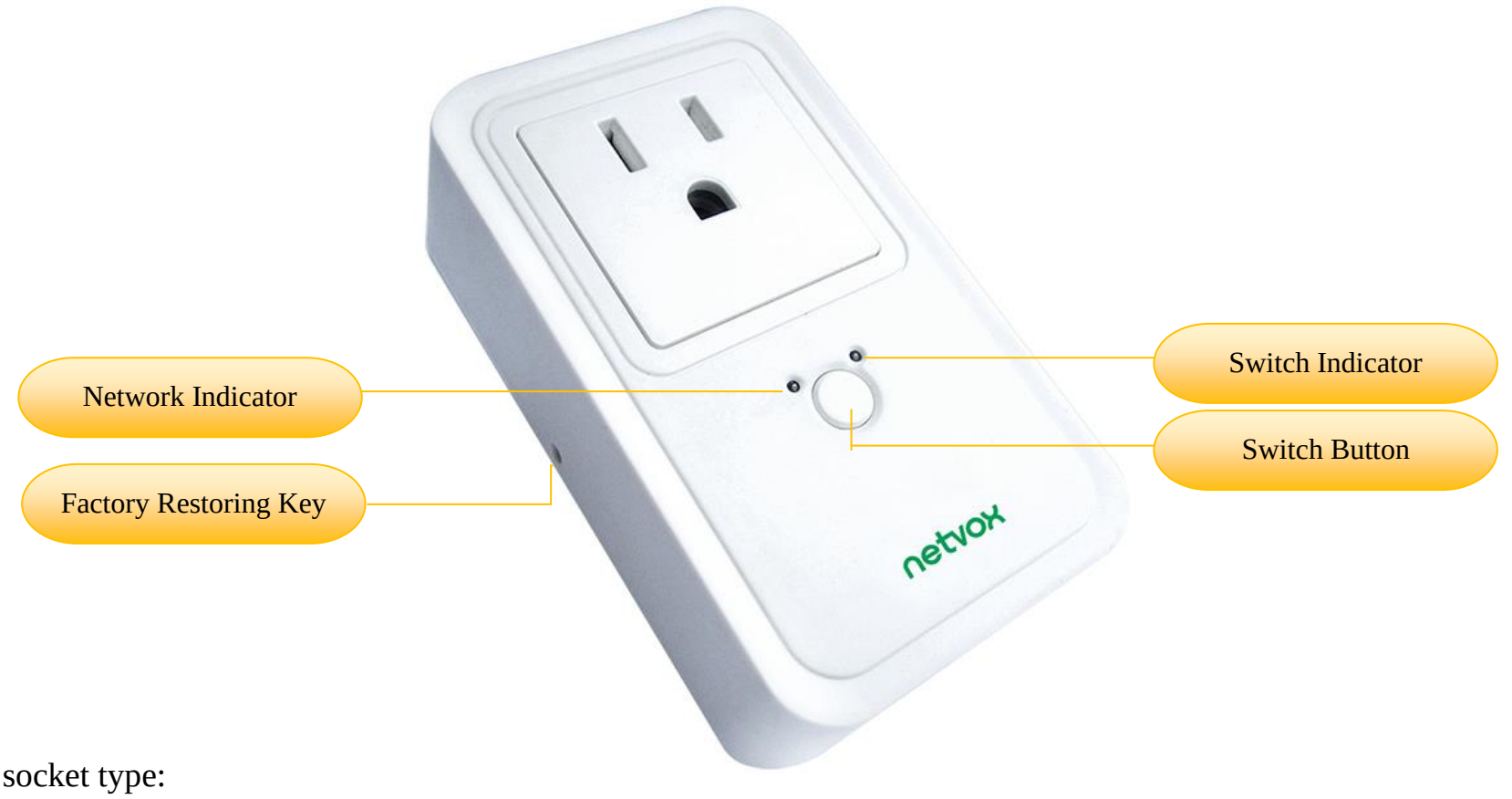
LoRa Wireless Technology:

LoRa is a wireless communication technology famous for its long-distance transmission and low power consumption. Compared with other communication methods, LoRa spread spectrum modulation technique greatly extend the communication distance. It can be widely used in any use case that requires long-distance and low-data wireless communications. For example, automatic meter reading, building automation equipment, wireless security systems, industrial monitoring. It has features like small size, low power consumption, long transmission distance, strong anti-interference ability and so on.

LoRaWAN:

LoRaWAN uses LoRa technology to define end-to-end standard specifications to ensure interoperability between devices and gateways from different manufacturers.

2. Appearance



The other socket type:

3. Main Characteristic

- 100-240VAC 50/60HZ power supply
- Frequency Hopping Spread Spectrum (FHSS)
- LoRaWAN™ Class C compatible
- Configuration parameters can be configured through a third-party software platform.
- Available third-party platform: Actility/ThingPark, TTN, MyDevices/Cayenne
- Current, voltage, power and energy detection
- Over-current alarm and power off alarm
- Automatically disconnect the load when over-current

4. Operation

On/Off

Power on/Turn on	Plug the R809A01 into the power supply of the AC 100-240V, power on the device and all the indicators flash once.
Power off	When the R809A01 is removed from the socket, the R809A01 will be powered off and stopped. *When the R809A01 is powered off, the R809A01 will issue a power-off alarm command.

Network Joining

Never joined the network	Turn on the device to search the network to join. The green indicator stays on: success The green indicator remains off: fail
Had joined the network	Turn on the device to search the previous network to join. The green indicator stays on: success The green indicator remains off: fail
Fail to join the network	Suggest to check the device verification information on the gateway or consult your platform server provider.

Function Key

Restore to factory setting	Press and hold the factory restoring key for **5 seconds** to restore to factory setting: The green indicator will flash once at the fifth second, and release the button, the green indicator will quickly flash for 10 times, and it would restore to factory setting.
Erase the electrical energy	Press and hold the factory restoring key for **10 seconds** to clear the historical data of electrical energy: The green indicator will flash once at the fifth second, and the second flash would be at the tenth second. Release the button at this moment, the green indicator will quickly flash for 5 times, and it would clear the historical electrical energy data.
Press the switch button	Control the relay switch on R809A01 for Toggle operation: When R809A01 is on, the switch indicator is green. When R809A01 is off, the switch indicator is red

5. Data Report

The device will immediately send a version packet report along with two uplink packets including ON/OFF status, energy, over current alarm, power off alarm, voltage, current and power.

The device sends data in the default configuration before any configuration is done.

Default setting:

MaxTime: Max Interval = 900s (15 min)

MinTime: Min Interval = 2 s

Current Change: 0x0064 (100mA)

Power Change: 0x14 (20W)

Note:

1. The device reports the ON/OFF status, energy, over current alarm and power off alarm first, and after 10 seconds reports the voltage, current and power.
2. When happened the over-current alarm, it will disconnect the load and the network indicator will quickly flash about 25 times.
3. When the detected current exceeds the rated load current range for 2 seconds, the device will automatically disconnect the load.
4. Short press the switch or receive the switch command: The device will be reported immediately.
5. Please refer Netvox LoRaWAN Application Command document and Netvox Lora Command Resolver http://cmddoc.netvoxcloud.com/cmddoc to resolve uplink data.

Data report configuration and sending period are as following:

Min Interval (Unit:second)	Max Interval (Unit:second)	Reportable Change	Current Change≥ Reportable Change	Current Change＜ Reportable Change
Any number between 1~65535	Any number between 1~65535	Can not be 0.	Report per Min Interval	Report per Max Interval

5.1 Example of ReportDataCmd

FPort：0x06

Bytes	1	1	1	Var(Fix=8 Bytes)
	Version	DeviceType	ReportType	NetvoxPayLoadData

Version– 1 bytes –0x01——the Version of NetvoxLoRaWAN Application Command Version

DeviceType– 1 byte – Device Type of Device (The devicetype is listed in Netvox LoRaWAN Application Devicetype doc)

ReportType – 1 byte –the presentation of the NetvoxPayLoadData，according the devicetype

NetvoxPayLoadData– Fixed bytes (Fixed =8bytes)

Version	Device Type	Report Type	NetvoxPayLoadData				
0x01	0x0E	0x00	SoftwareVersion(1Byte) Eg.0x0A—V1.0	HardwareVersion (1Byte)	DateCode (4Bytes,eg0x20170503)	Reserved (2Bytes,fixed 0x00)	
		0x01	OnOff (1Byte) OFF_0x00,ON_0x01	Energy (4Bytes) unit:1wh	OverCurrentAlarm (1Byte) 0:noalarm 1:alarm	※1DashCurrentAlarm (1Byte) 0:noalarm 1:alarm	PowerOffAlarm (1Byte) 0:noalarm1:alarm
		0x02	Vol (2Bytes,Unit:1V)	Current (2Bytes,Unit:1ma)	※2Power (2Bytes,Unit:1W)	Reserved (2Bytes,fixed 0x00)	

※1 Only CLAA version support *Dash Current Alarm*.

※2 *Power* is Active Power

Uplink example 1: 010E010000000006000001

1st byte (01): Version

2ndbyte (0E): DeviceType 0x0E ― R809A01 (R809A)

3rdbyte (01): ReportType

4thbyte (00): On Off status - Off

5th6 th7 th8th byte (00000006): Energy - 6 wh

9th byte (00): Over Current Alarm – No alarm

10th byte (00): Dash Current Alarm – No alarm

11th byte (01): Power Off Alarm- Alarm

Uplink example 2: 010E0200DB006400140000

1st byte (01): Version

2ndbyte (0E): DeviceType 0x0E ― R809A01 (R809A)

3rdbyte (02): ReportType

4th5th byte (00DB): Voltage - DB Hex=219 Dec, 219V

6 th7th byte (0064): Current- 64 Hex=100 Dec, 100mA

8th 9th byte (0014): Power - 14 Hex=20 Dec, 20W

10th11th byte (0000): Reserved

5.2 Example of ConfigureCmd

FPort：0x07

Bytes	1	1	Var(Fix =9 Bytes)
	CmdID	DeviceType	NetvoxPayLoadData

CmdID– 1 byte

DeviceType– 1 byte – Device Type of Device

NetvoxPayLoadData– var bytes (Max=9bytes)

Description	Device	Cmd ID	Device Type	NetvoxPayLoadData				
Off	R809A01	0x90	0x0E	Reserved (9Bytes,Fixed 0x00)				
On		0x91		Reserved (9Bytes,Fixed 0x00)				
Toggle		0x92		Reserved (9Bytes,Fixed 0x00)				
ClearEnergy		0x93		Reserved (9Bytes,Fixed 0x00)				
ReadCurrent Status		0x94		Reserved (9Bytes,Fixed 0x00)				
Config ReportReq		0x01		MinTime (2bytes Unit:s)	MaxTime (2bytes Unit:s)	CurrentChange (2byteUnit:1mA)	PowerChange (2byteUnit:1W)	Reserved (1Byte,Fixed 0x00)
Config ReportRsp		0x81		Status (0x00_success)		Reserved (8Bytes,Fixed 0x00)		
ReadConfig ReportReq		0x02		Reserved (9Bytes,Fixed 0x00)				
ReadConfig ReportRsp		0x82		MinTime (2bytes Unit:s)	MaxTime (2bytes Unit:s)	CurrentChange (2byte Unit:1mA)	PowerChange (2byteUnit:1W)	Reserved (1Byte,Fixed 0x00)

(1) Turn off the R809A01 switch button

Downlink: 900E000000000000000000

(2) Turn on the R809A01 switch button

Downlink: 910E000000000000000000

(3) Toggle turn on/off switch button

Downlink: 920E000000000000000000

(4) Clear the historical electrical energy data

Downlink:930E000000000000000000

(5) Setting Min Interval = 2 seconds, Max Interval = 300 seconds, Current Change = 100mA,Power Change = 20W

Downlink:010E0002012C0064001400

Response: 810E000000000000000000 (successful)

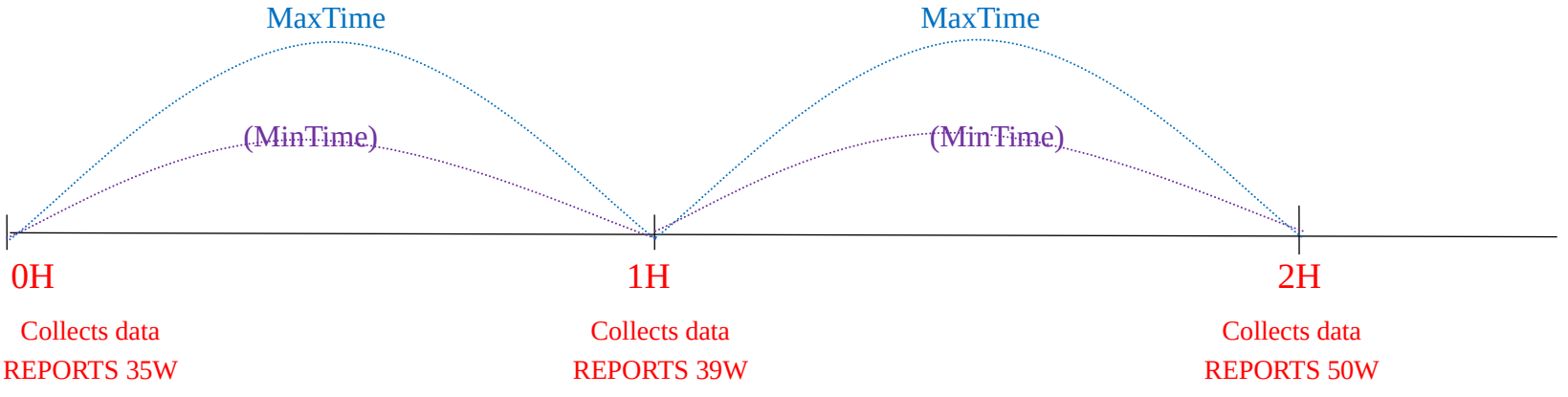
(6) Read the current report interval

Downlink: 020E000000000000000000

Response:820E0002012C0064001400

5.3 Example for MinTime/MaxTime logic

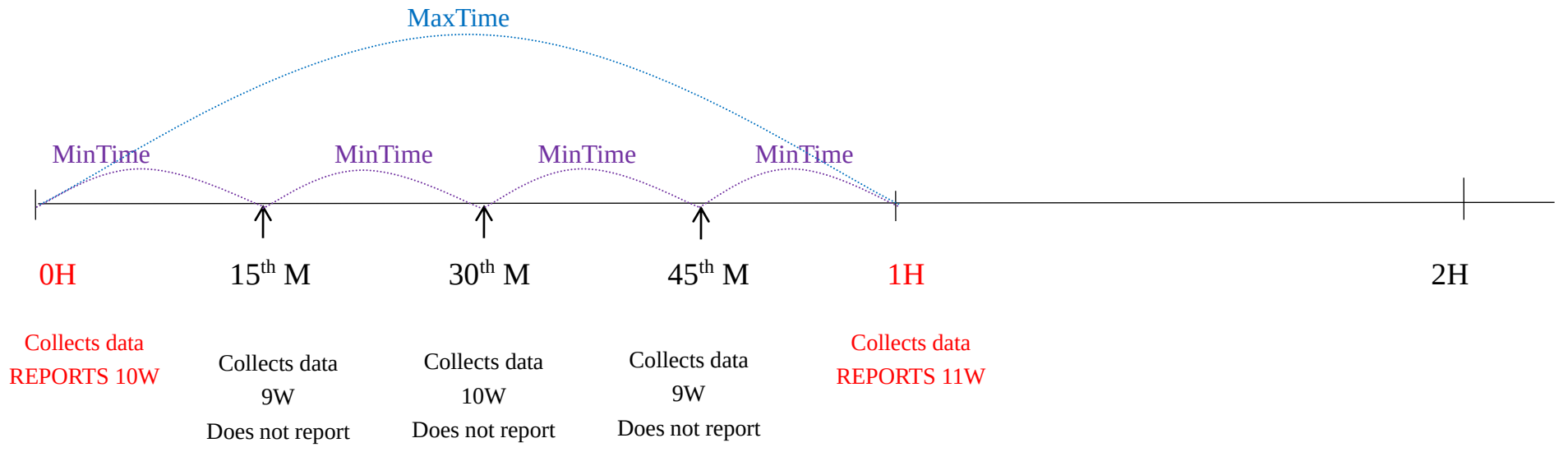
Example#1 based on MinTime = 1 Hour, MaxTime= 1 Hour, PowerChange=2W



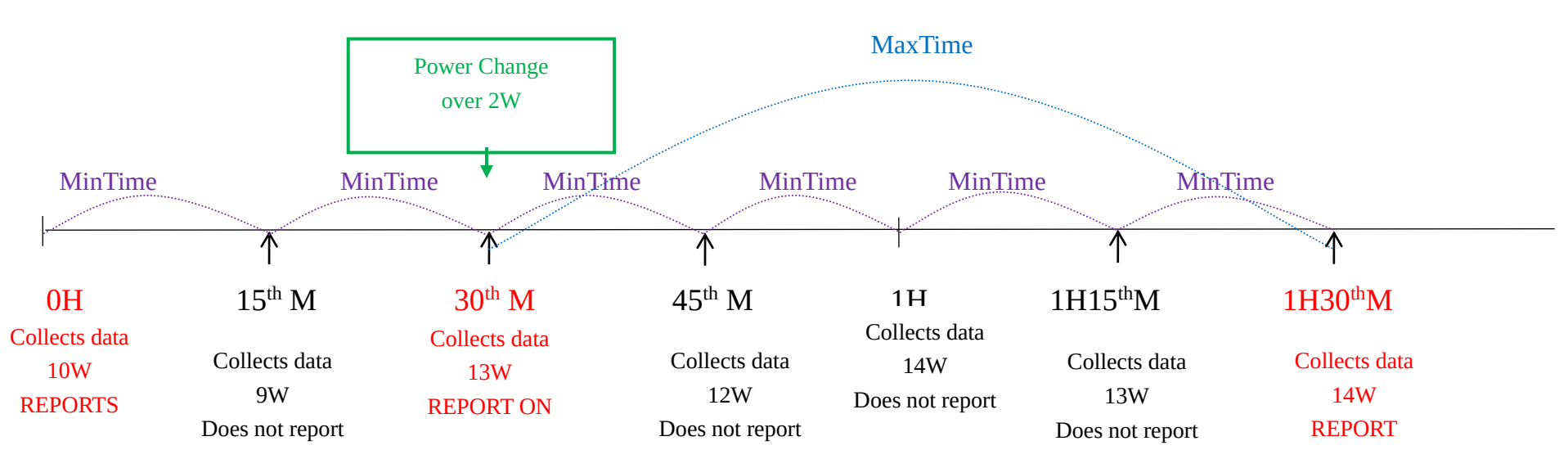
Note:

MaxTime=MinTime. Data will only be report according to MaxTime (MinTime) duration regardless PowerChange value.

Example#2 based on MinTime = 15 Minutes, MaxTime= 1 Hour, PowerChange=2W



Example#3 based on MinTime = 15 Minutes, MaxTime= 1 Hour, PowerChange=2W



Remarks:

1. Compare the collected data with the last reported data. If the amount of data change is greater than ReportableChange, the device will report based on the MinTime interval. If the data change is not greater than the last reported data, the device will report based on the MaxTime interval.

2. For the energy consumption detection device, because the device is a constant power supply device, it is not recommended to set the MinTime interval value too high in order to obtain the status information in real time. It is recommended to use the default 2 seconds. If users need to control frequent report recommendations to adjust ReportableChange and MaxTime.
3. After the device sends a packet (regardless of whether the data has changed, such as pressing a button or the maximum time is due), another MinTime / MaxTime calculation cycle is initiated.

6. Load Property

Rated Load（AC）	**Max. Load**	**Max. Inductive Load（cosφ=0.4）**	**Max. Load with Electric Motors**	**Overload Protection with Auto Power Cutoff**
UK Type：13A/250V AU Type：10A/250V US Type：15A/125V	< 400W	8A/250V	1.5HP/250V	YES

*When the detected current exceeds the rated load current range for 2 seconds, the device will automatically disconnect the load.

7. Installation

This product does not have a waterproof function. After the screening is completed, please place it indoors.

The Wireless Power Outlet (R809A01) is a removable, plug-and-play socket that plugs into a traditional socket or extension cord for use.

Note:

(1) The device is a high voltage equipment so be careful when installing or using it.

(2) Do not install the device in a metal shielded box or other electrical equipment around it to avoid affecting the wireless transmission of the device.

(3) Please stay away from magnetic fields, high temperature, humidity, etc.

(4) Do not wipe the device with a wet cloth or a volatile reagent. It is recommended to clean with a dry cloth.

(5) When installing the R809A01, please operate it by professionals.

(6) Do not disassemble the housing by yourself.

(7) Do not install the R809A01 in a possible happened water leak place.

Applicable use cases for R809A01 Wireless Power Outlet include but are not limited to the following:

- Family
- School,
- Hospital
- Shopping mall

When electrical equipment needs turn on/off regularly, remote, and scene control.

When the R809A01 switch button turn on or turn off, the load is connected to the power supply, the uplink packet will report ON/OFF status, energy, over current alarm and after 10 seconds reporting voltage, current and power.

Note:

When disconnecting the load power, the current and power data will report "0"

Note:

R809A01 saves the electric energy data every 10 second in memory IC AT24C02, it could loss the electric energy data in 10 seconds when power off.

8. Important Maintenance Instruction

Kindly pay attention to the following in order to achieve the best maintenance of the product:

- Keep the equipment dry. Rain, moisture and various liquids or water may contain minerals that can corrode electronic circuits. In case the device is wet, please dry it completely.
- Do not use or store in dusty or dirty areas. This way can damage its detachable parts and electronic components.
- Do not store in excessive heat place. High temperatures can shorten the life of electronic devices, destroy batteries, and deform or melt some plastic parts.
- Do not store in excessive cold place. Otherwise, when the temperature rises to normal temperature, moisture will form inside which will destroy the board.
- Do not throw, knock or shake the device. Treating equipment roughly can destroy internal circuit boards and delicate structures.
- Do not wash with strong chemicals, detergents or strong detergents.
- Do not paint the device. Smudges can make debris block detachable parts up and affect normal operation.
- Do not throw the battery into the fire to prevent the battery from exploding.

  Damaged batteries may also explode.

All the above suggestions apply equally to your device, batteries and accessories.

If any device is not operating properly.

Please take it to the nearest authorized service facility for repairing.