netvox R816B Wireless Wall-Mounted Power Socket User Manual

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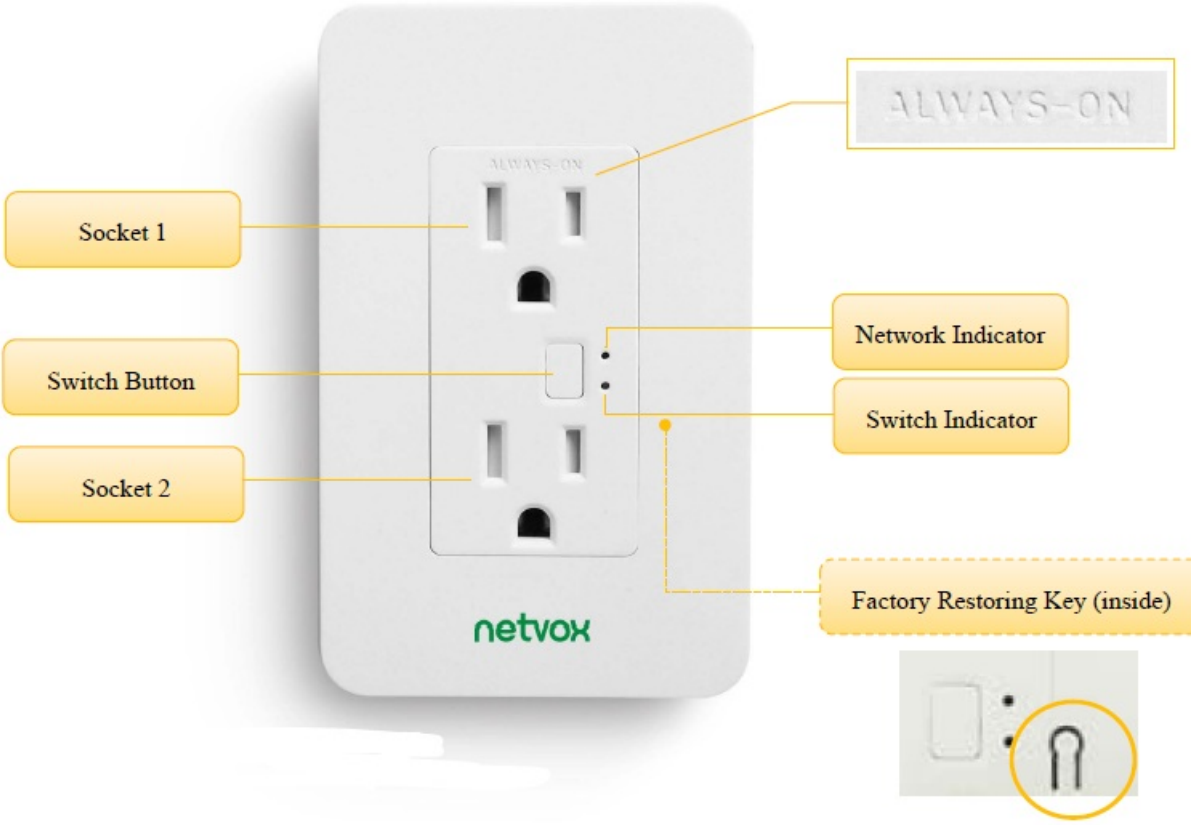
Introduction

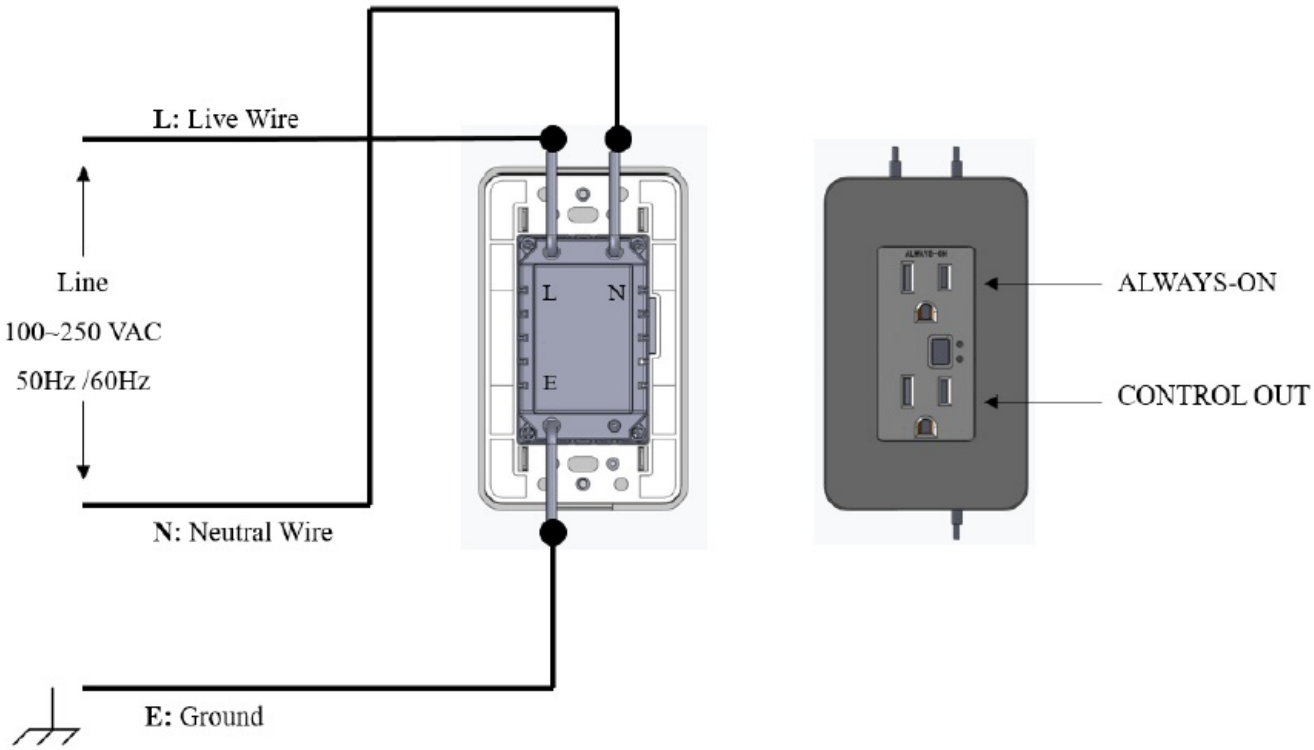
R816B is a long-distance wireless socket device for Netvox ClassC type devices based on the LoRaWAN open protocol, compatible with the LoRaWAN protocol. The AppServer can be used to control the opening and closing of the external load of the R816B, and the external load can also be controlled by the switch that comes with the R816B device itself. The current, voltage, power and energy values of the current load can be viewed through the AppServer. R816B supports automatic disconnection of load and over-current alarm.

LoRa wireless technology
LoRa is a wireless communication technology dedicated to long-distance low-power consumption. Its spread-spectrum modulation method greatly increases the communication distance compared with other communication methods, and can be widely used in long-distance low-rate IoT wireless communication fields in various occasions. Such as automatic meter reading, building automation equipment, wireless security systems, industrial monitoring and control. It has the characteristics of small size, low power consumption, long transmission distance and strong anti-interference ability.

LoRaWAN
LoRaWAN defines an end-to-end standard specification using LoRa technology to ensure interoperability between devices from different vendors.

Appearance





Note: Socket 1 is a general socket and cannot be controlled.

Main Characteristic

- Compatible with LoRaWAN standard
- 100-240VAC 50/60HZ power supply

- Simple operation and setting
- Compatible with LoRaWANTM Class C
- Frequency hopping spread spectrum
- Applicable to third-party platforms: Actility/ThingPark, TTN, MyDevices/Cayenne
- Over current alarm
- Automatically disconnect the load due to over current

Operation

On/Off

Power on/Turn on	Socket the R816B into the power supply of the AC 100-240V, power on th e device and all the indicators flash once.
Power off	When the R816B is removed from the power supply interface, the R816B will be powered off and stopped.
Network Joining	
Never joined the network	Turn on the device to search the network to join. The network indicator st ays on: success The network indicator remains off: fail
Had joined the network	Turn on the device to search the previous network to join. The network in dicator stays on: success The network indicator remains off: fail
Fail to join the network (when the device is on)	Suggest to check the device verification information on the gateway or co nsult your platform server provider.
Function Key	
Press and hold the factory restoring key for 5 seconds	Restore to factory setting The network indicator flashes for 10 times: success The network indicator remains off: fail

Press and hold the factory restoring key for 10 seconds (The network indicator flashes once when the button is pressed for 5s, a nd flashes again when the button is pressed for 10s), and then release t he key to clear the power information)	Clear electric energy cumulative value The network indicator flashes for 5 times If the network indicator does not flash, the clearing of the accumulated el ectric energy value fails
Press the switch button	Control the relay switch on R816B for Toggle operation When R816B is o n, the switch indicator is on; When R816B is off, the switch indicator is off.

Data Report

The device will immediately send a version packet report along with two uplink packets including ON/OFF status, energy, over current alarm, voltage, current and power.
The device sends data in the default configuration before any configuration is done.

Default setting

MaxTime: 0x0384 (900s)
MinTime: 0x0002 (2s)
Mintime is recommended to set by default 2 seconds. Need to control to reduce frequent Report recommendations by adjusting reportchange and Max Interval)

- **Current Change:** 0x0064 (100mA)
- **Power Change:** 0x0014 (20W)

Note:

1. The device reports the ON/OFF status, energy, over current 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. Press the switch button or receive the switch command: The device will be reported immediately.
4. The uplink data reported by the device is referenced by the Netvox LoraWAN Application Command document and http://www.netvox.com.cn:8888/page/index

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

Example of ReportDataCmd

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)
- **PayLoadData:** var bytes (Max=9bytes)

<table>
<tr><th>Version</th><th>Device Type</th><th>Report Type</th><th colspan="5">NetvoxPayLoadData</th></tr>
<tr><td rowspan="2">0x01</td><td rowspan="2">0x73</td><td>0x01</td><td>OnOff (1Byte)
OFF_0x00
ON_0x01</td><td>Energy (4 Bytes)
unit:1wh</td><td>OverCurrentAlarm (1Byte)
0:noalarm 1:alarm</td><td>※1DashCurrentAlarm
(1Byte) 0:noalarm 1:alarm</td><td>※2PowerOffAlarm
(1Byte) 0:noalarm 1:alarm</td></tr>
<tr><td>0x02</td><td>Vol
(2Bytes,Unit:1V)</td><td colspan="2">Current
(2Bytes,Unit:1mA)</td><td>Power
(2Bytes,Unit:1W)</td><td colspan="2">Reserved
(2Bytes,fixed 0x00)</td></tr>
</table>

- 1 R816B does not support Dash Current Alarm.
- 2 R816B does not support Power Off Alarm.

First uplink reports 0173010000000006000000 and after 10 seconds, the second uplink reports 01730200DB006400160000

- The status of the switch is off.
- The accumulated value of the energy is 6WH.
- The over current does not alarm
- **The voltage is 219V:** 00DB(Hex)=219 (Dec)
- **The current is 100mA:** 0064(Hex)=100(Dec)
- **The power is 22W:** 0016(Hex)=22(Dec)

Example of ConfigureCmd

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)

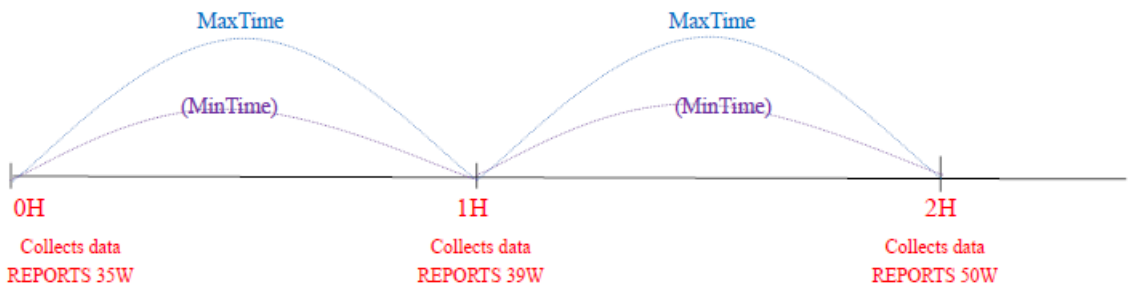
Description	Device	Cmd ID	Device Type	NetvoxPayLoadData
Off		0x90		Reserved (9Bytes,Fixed 0x00)
On		0x91		Reserved (9Bytes,Fixed 0x00)
Toggle		0x92		Reserved (9Bytes,Fixed 0x00)
Clear Energy		0x93		Reserved (9Bytes,Fixed 0x00)

Read CurrentStatus	R816B	0x94	0x73	Reserved (9Bytes,Fixed 0x00)					
Config ReportReq		0x01		MinTime (2bytes Unit:s)	MaxTime (2bytes Unit:s)	CurrentChange (2byte) Unit:1mA	PowerChange (2byte) Unit: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 (2byte) Unit:1W	Reserved (1Byte) Fixed 0x00)

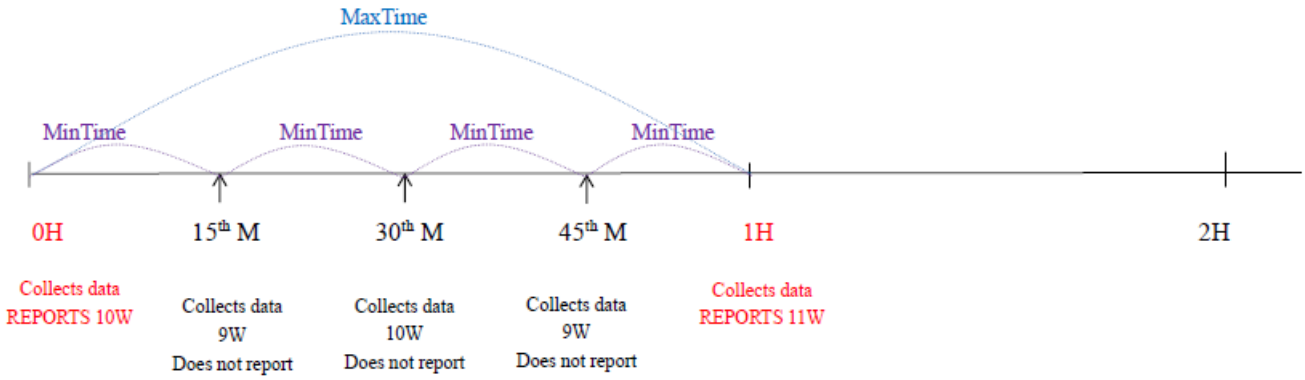
1. **Turn off the R816B switch button Downlink:** 907300000000000000000
2. **Turn on the R816B switch button Downlink:** 917300000000000000000
3. **Toggle turn on/off switch button**
   Downlink: 927300000000000000000
4. **Clear the historical electrical energy data**
   Downlink: 937300000000000000000
5. **Setting Min Interval = 2 seconds, Max Interval = 300 seconds, Current Change = 100mA,Power Change = 20W**
   Downlink:01730002012C0064001400
   Response: 817300000000000000000 (successful)
6. **Read the current report interval**
   Downlink: 027300000000000000000
   Response: 82730002012C0064001400

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

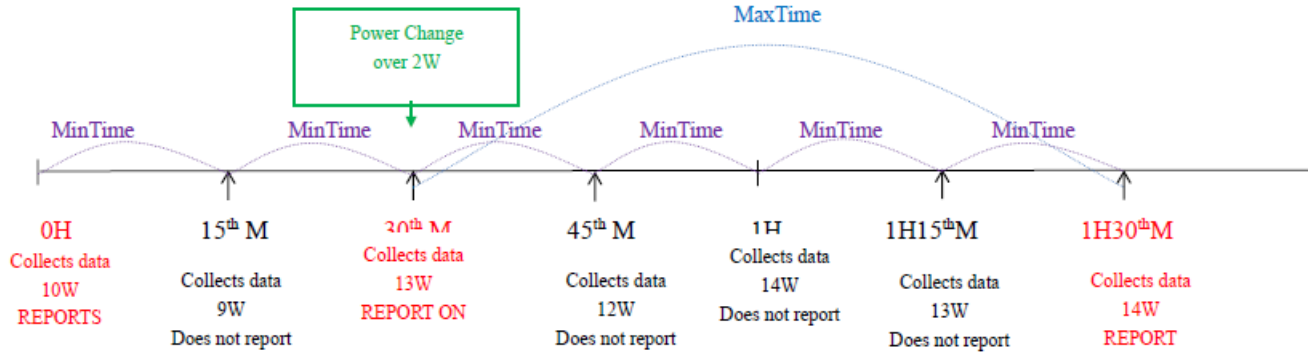


Note: MaxTime=MinTime. Data will only be report according to MaxTime (MinTime) duration regardless PowerChange value.

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.

Product Installation

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

Note: The energy data of R816B is saved once every 10 seconds if the memory chip is AT24C02, once every 10 seconds for AT2402. After power off, the data within 10 seconds will be gone.

Important Maintenance Instruction

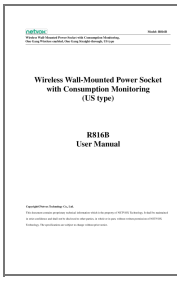
Kindly pay attention to the following in order to achieve the best maintenance of the product:

- Keep the device dry. Rain, moisture, or any liquid, might contain minerals and thus corrode electronic circuits. If the device gets wet, please dry it completely.
- Do not use or store the device in dusty or dirty environment. It might damage its detachable parts and electronic components.
- Do not store the device under excessive heat condition. High temperature can shorten the life of electronic devices, destroy batteries, and deform or melt some plastic parts.
- Do not store the device in places that are too cold. 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. Rough handling of equipment can destroy internal circuit boards and delicate structures.
- Do not clean the device with strong chemicals, detergents or strong detergents.
- Do not apply the device with paint. Smudges might block in the device and affect the operation.
- Do not throw the battery into the fire, or the battery will explode. Damaged batteries may also explode.

All of the above applies to your device, battery and accessories. If any device is not working properly, please take it to the nearest authorized service facility for repair.

Wireless Wall-Mounted Power Socket with Consumpt ion Monitoring, One Gang Wireless enabled, One Gang Straight-thro ugh, US type

Documents / Resources

 Wireless Wall-Mounted Power Socket with Consumption Monitoring (US type) R816B User Manual	netvox R816B Wireless Wall-Mounted Power Socket [pdf] User Manual R816B Wireless Wall-Mounted Power Socket, R816B, Wireless Wall-Mounted Power Socket, Wall-Mounted Power Socket, Power Socket

References

- Lora Command Resolver