

User Manual

On/Off Light Switch

Model: Z311B

Table of Contents

1. Introduction.....	2
2. Product Appearance.....	3
3. Specification.....	4
4. Installation.....	4
5. Setting up Z311B.....	5
5-1. Turn On/ Turn Off Z311B.....	5
5-2. Join the ZigBee Network.....	5
5-3. Binding.....	5
5-4. Sleeping Mode.....	6
5-5. Wake up Z311B.....	6
5-6. Battery.....	6
5-7. Change the Light Source Mode.....	6
5-8. Calibration.....	7
5-9. Change the Light Detection Interval.....	7
5-10. Light Sensitivity.....	7
5-11. Restore to Factory Setting.....	7
5-12. Report Configuration.....	8
6. Home Automation Clusters for Z311B.....	9
7. Netvox APP Control Interface.....	10
8. Important Maintenance Instructions.....	13
9. The Device Installation Location.....	13

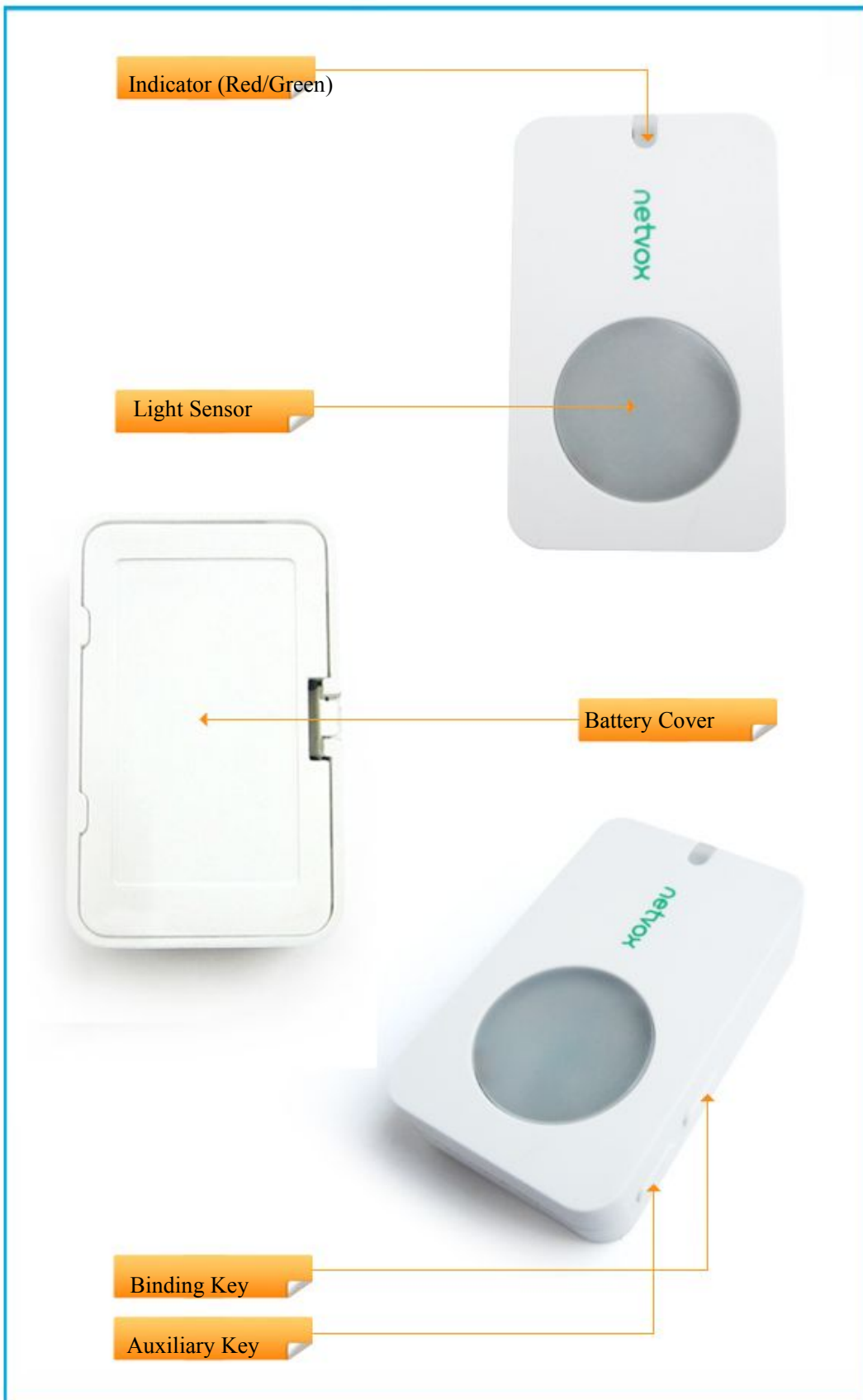
1. Introduction

Netvox Z311B, an ON/OFF light switch, acts as an End Device in ZigBee network. It does not perform permit-join function as a coordinator or a router for other devices to join the network. When Z311B detects that the brightness level is low (at nightfall), it sends the command to the ZigBee network to turn the light on. The light sensitivity can be adjusted by user.

What is ZigBee?

ZigBee is a short range wireless transmission technology based on IEEE802.15.4 standard and supports multiple network topologies such as point-to-point, point-to-multipoint, and mesh networks. It is defined for a general-purpose, cost-effective, low-power-consumption, low-data-rate, and easy-to-install wireless solution for industrial control, embedded sensing, medical data collection, smoke and intruder warning, building automation and home automation, etc.

2. Product Appearance



3. Specification

- Fully IEEE 802.15.4 compliant
- Utilizes 2.4GHz ISM band; up to 16 channels
- Power supply: 2 CR2450 button cell batteries. 715 days battery life*
- Operating consumption: Tx: 43mA; Rx: 28mA
- Standby consumption: $\leq 1.0\mu\text{A}$
- Sensing level range: 1~3000 lux
- Sensing accuracy: Natural light: $\pm 5\%$ @1~600 lux; $\pm 10\%$ @600~1000 lux
Energy saving lamp: $\pm 10\%$ @1~1000 lux
Filament lamp: $\pm 5\%$ @1~600 lux; $\pm 11\%$ @600~1000 lux

At a certain calibration environment, it can not adapt to another environment. Under different light sources, it is required to be calibrated

- Up to 100 meters wireless transmission range in non-obstacle space
- Easy installation and configuration

** Battery life may vary based on operating conditions.*

4. Installation

- Remove the battery cover, insert the batteries, and then mount the cover to complete the installation.
- Do not aim the sensor to the light/lamp which Z311B controls.

5. Setting up Z311B

5-1. Turn On/ Turn Off Z311B

Under the circumstances Z311B is first time used or after resetting, when it is powered on and cannot successfully search a network, Z311B will go into **turn-off mode**.

To manually turn on or turn off Z311B, please use the following instructions:

- A. **Turn it on:** Press the *Binding Key* once. The indicators will flash **red once**, and the device is ready to be used.
- B. **Turn it off:** Press the *Binding Key*. The indicator will flash **10 times** within 5 seconds. Press the *Binding Key* again **within the 10 flashes** to turn the device off.

5-2. Join the ZigBee Network

After Z311B is turned on, it will search for an existing ZigBee network and send a request to join the network automatically. While Z311B is under the coverage from a coordinator or a router whose **permit-join feature is enabled**, Z311B will be permitted to join the network.

- Step1. Enable the permit-join function (valid for 60 seconds) of a coordinator or a router (please refer to the user manual of the coordinator or the router to enable the permit-join feature).
- Step2. Turn on Z311B. It will start to search and join the network.
- Step3. The indicator will flash **green once** when it finds out a network to join.
- Step4. The indicator will flash **green 5 times** after it is joined successfully. Otherwise, the indicator will not flash.

Z311B will go into the sleeping mode after it is failed to join the network for 3 times.

5-3. Binding

To make Z311B work with the ON/OFF device such Z801RX, users need to bind the two devices:

- Step1. Press and hold the *Binding Key* for 3 seconds to broadcast the binding request. The indicator will flash **red once**.
- Step2. Within 13 seconds, enable the binding feature of the ON/OFF device.
- Step3. The indicator flashes **red 5 times** after the binding is completed; otherwise, it flashes **red 10 times**.

5-4. Sleeping Mode

Z311B is designed to go into sleeping mode for power-saving in some situations:

- A. While the device is in the network → the sleeping period is 5 minutes; it will wake up every 5 minutes to keep online.
- B. When it doesn't find a network to join after turning on → Z311B will go into turn-off mode.
- C. Once Z311B was joined to a network and by any chance the network is no longer existed or the device is out of the network → Z311B will wake up every 15 minutes to find the network it joined before. It never keeps in sleeping mode and continues to find out a network every 15 minutes. This condition would consume up to 30 times power spending compared to normal-operating status. To prevent this unwanted power consumption, we recommend that users turn it off or remove the batteries to power off the device.

5-5. Wake up Z311B

When users would like to setup or acquire data from the device which is in sleeping mode, we have to wake up the device as the following steps:

- Step1. Press and hold both *Binding Key* and *Auxiliary Key*.
- Step2. Until the indicator flashes **red twice**, release both buttons.
- Step3. The indicator will flash **5 times** while broadcasting.

After waking up Z311B, it would be in activated mode for 2 minutes.

5-6. Battery

When the operating voltage is lower than 2.1V, the indicator will flash **red once** per hour. Z311B will send a low-power report to the ZigBee network.

5-7. Change the Light Source Mode

Users could change the Light Source Mode via ZiG-BUTLER to enhance the light sensing accuracy. It includes:

1. Natural Light
2. Energy Saving Lamp
3. Filament Lamp
4. User-defined

5-8. Calibration

Users could change the calibration setting via ZiG-BUTLER while the default Light Source Mode does not suit your needs.

5-9. Change the Light Detection Interval

Z311B detects the light level every 5 minutes by default after binding. Users can switch the detection interval to 5-minute or 2-second. There are 2 methods to switch the light detection interval:

- A. Using netvox ZigBee application ZiG-BUTLER (please refer to Chapter 7).
- B. Through the *Auxiliary Key*. Press and hold the *Auxiliary Key* for 3 seconds to switch the interval.
 - The indicator flashes **red once** → Z311B is in 2-second interval
 - The indicator flashes **red 3 times** → Z311B is in 5-minute interval

5-10. Light Sensitivity

After Z311B joins the ZigBee network, it will detect the surrounding brightness level right away and send the ON/OFF command once. Then, it will detect the brightness according to the light detection interval (default: 5 minutes)

The default settings for brightness level of Z311B:

- The light level is lower than 50 lux → Z311B sends the ON task
- The light level is higher than 100 lux → Z311B sends the OFF task

Users could adjust the settings for light level through netvox ZigBee application ZiG-BUTLER (please refer to Chapter 7). The light level which Z311B can detect is 1~3000 lux.

Z311B features to keep the surrounding brightness.

- When Z311B detects that the brightness level is low, it sends the ON command once to turn the light on. It will not send the commands when the surrounding brightness level keeps low.
- When Z311B detects that the brightness level is high, it sends the OFF command once to turn the light off. It will not send the commands when the surrounding brightness level keeps high.

5-11. Restore to Factory Setting

To restore it to factory setting, please follow the steps:

- Step1. Press and hold both *Binding Key* and *Auxiliary Key* for 5 seconds.
- Step2. Release the button after the indicator shows fast **red** flashes.
- Step3. The indicator will flash **red 20 times**, and the restore is completed.

5-12. Report Configuration

10 seconds after powering on, Z311B will detect battery voltage, if the device report has been previously configured, it will issue 1 or 2 reports within 1-60 seconds randomly on the device, and thereafter it will report according to the configuration.

If the device was already bound related report clusterID to report according to configuration, it would issue a corresponding report (Max! = 0xFFFF) immediately after completed configuration.

Battery voltage report Default: min = 3600s, max = 3600s, reportchange = 0.1,

Battery status report Default: min = 3600s, max = 0xFFFF (off), reportchange = 0.

Report setting table:

Min Interval (Unit:second)	Max Interval (Unit:second)	Reportable Change	Change rate \geq Reportable Change	Change rate $<$ Reportable Change
1-65534	1-65534	$\neq 0$	To report per Minimum interval	To report per Maximum interval
		0	To report per Minimum interval	To report per Minimum interval
0	1-65534	$\neq 0$	To report instantly	To report per Maximum interval
		0	To report per second	To report per second
1-65534	0	$\neq 0$	To report per Minimum interval	No report
		0	To report per Minimum interval	To report per Minimum interval
0	0	$\neq 0$	To report instantly	No report
		0	To report per second	To report per second
Any	65535	Any	Stop reporting	
65535	Any	Any	Stop reporting	

Note: (1) It is not suggested to set:

Min Interval =0,

Reportable Change=0.

Otherwise, ZB311B will report very densely (every second) to block up the network.

(2) Different attributes have different units, please refer to the product specific instructions for units of reportable change.

6. Home Automation Clusters for Z311B

A cluster is a set of related attributes and commands which are grouped together to provide a specific function. A simple example of a cluster would be the On/Off cluster which defines how an on/off switch behaves. This table lists the clusters which are supported by Z311B.

Cluster ID for Z311B	
Server side	Client side
EP 0x01 (Device ID: On/Off Light Switch (0x0103))	
Basic(0x0000)	On/off (0x0006)
Identify(0x0003)	
Commissioning(0x0015)	
power configure(0x0001)	
Diagnostics Information(0x0B05)	
Poll Control(0x0020)	

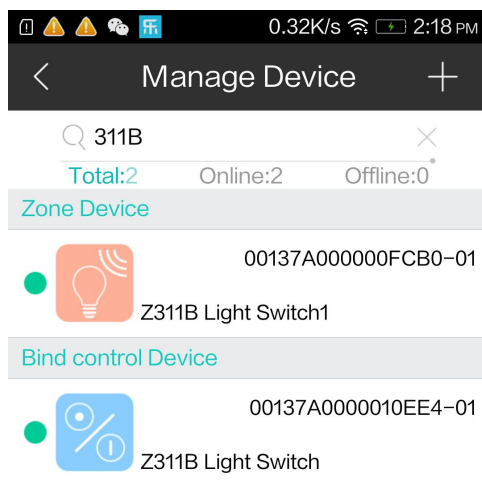
This lists the attributes of the basic information.

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	<i>ZCLVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x03	M
0x0001	<i>ApplicationVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	20	O
0x0002	<i>StackVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x33	O
0x0003	<i>HWVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x0B	O
0x0004	<i>ManufacturerName</i>	Character string	0 – 32 bytes	Read only	netvox	O
0x0005	<i>ModelIdentifier</i>	Character string	0 – 32 bytes	Read only	Z311BE2ED	O
0x0006	<i>DateCode</i>	Character string	0 – 16 bytes	Read only	20131227	O
0x0007	<i>PowerSource</i>	8-bit	0x00 –	Read only	0x03	M

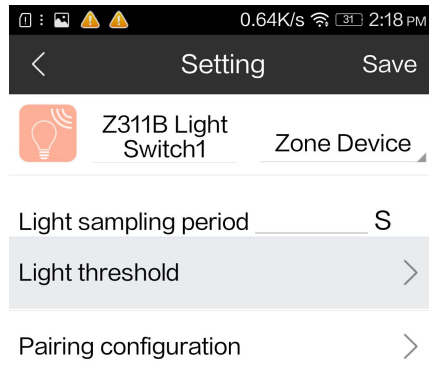
		Enumeration	0xff			
0x0010	<i>LocationDescription</i>	Character string	0 – 16 bytes	Read/write		O
0x0011	<i>PhysicalEnvironment</i>	8-bit Enumeration	0x00 – 0xff	Read/write	0x00	O
0x0012	<i>DeviceEnab</i>	Boolean	0x00 – 0x01	Read/write	0x01	M

7. Netvox APP Control Interface

1. After the device is added in Netvox App system, IEEE address will show up at device management interface in APP. Z311B shows an EP which is On / Off Light Switch as below figure:



2. Select EP1 (On/Off Switch) into configuration interface. In the setting interface, users are able to configurate respectively, light sampling period, binding equipment, lighting threshold setting. As shown below:

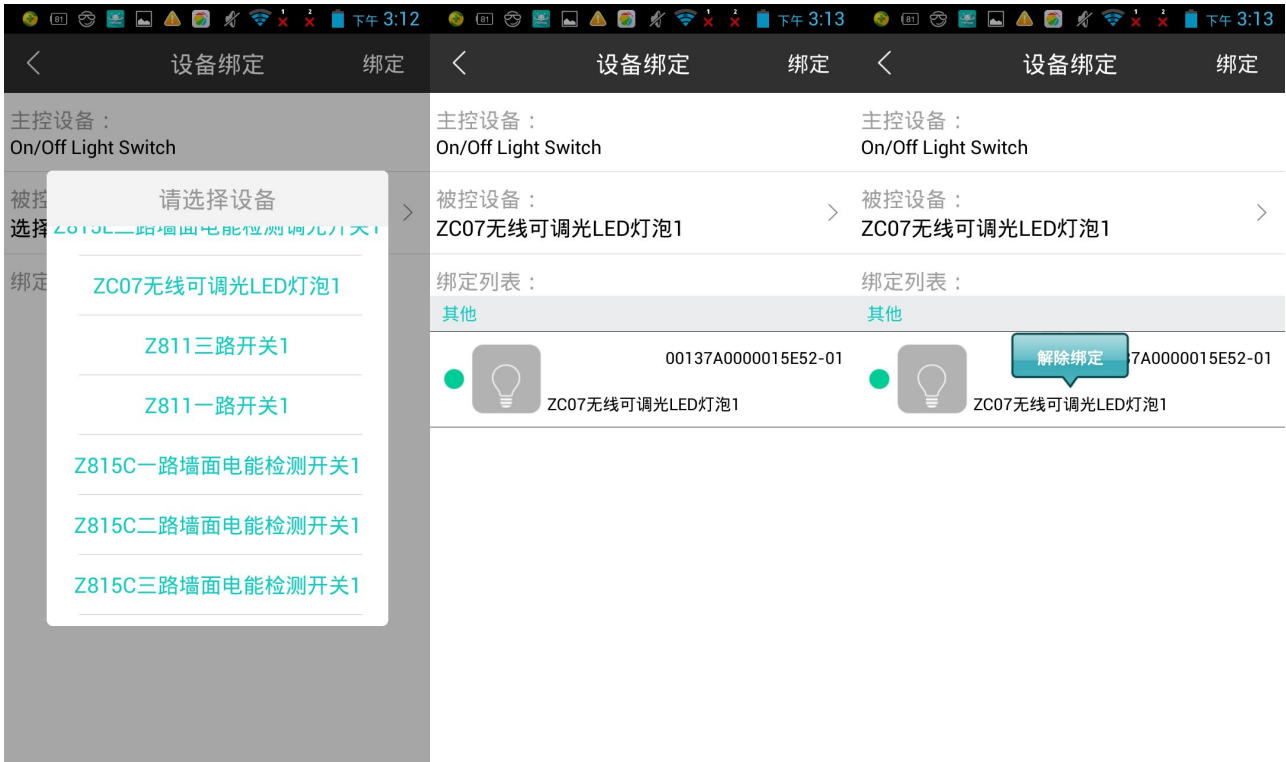


3. Select lighting threshold setting to configurate; enter light threshold setting interface: You can configurate LuxOn and LuxOff separately. Default value: LuxOn = 50lux, LuxOff = 100lux, as shown below:

4.




4. Enter device bind interface: Select the "controlled device" to binding devices. Select the device to be bound, such as wireless ZC07 dimmable LED bulb 1, and then click on the upper right corner to bind (before binding operation, make sure the device is in the activated state, if the device is in sleep mode, users need to activate the device). To unbind, touch and hold the bound device column till "unbind" shows up, click "unbind" (as shown below):





5. Click EPI into the basic information interface, by clicking on the bottom of the "Basic Information" "Settings" "About Device" interface to switch interfaces to check detail information of the device. As shown below.

0.58K/s 2:19 PM

< About

 Z311B Light Switch1 Type
EndDevice

Profile ID 0104	Model ID Z311BE2ED
End Point 01	IEEE Addr. 00137A00000FCB0
Network Addr. 7768	Power Mode Battery
Manufacturer netvox	Current Power Disposable Battery
Zcl version 03	Battery voltage -----
App version 0D	HW version 0B
Stack version 2F	Datecode 20130812

 Setting  About

8. Important Maintenance Instructions

- Please keep the device in a dry place. Precipitation, humidity, and all types of liquids or moisture can contain minerals that corrode electronic circuits. In cases of accidental liquid spills to a device, please leave the device dry properly before storing or using.
- Do not use or store the device in dusty or dirty areas.
- Do not use or store the device in extremely hot temperatures. High temperatures may damage the device or battery.
- Do not use or store the device in extremely cold temperatures. When the device warms to its normal temperature, moisture can form inside the device and damage the device or battery.
- Do not drop, knock, or shake the device. Rough handling would break it.
- Do not use strong chemicals or washing to clean the device.
- Do not paint the device. Paint would cause improper operation.

Handle your device, battery, and accessories with care. The suggestions above help you keep your device operational. For damaged device, please contact the authorized service center in your area.

9. The Device Installation Location

The device installation location:

- (1) Be sure to install at irradiated areas of the lamp which is controlled by Z311B.
- (2) It can be installed in the room to control on/off of the lamp.
- (3) It can be installed outdoor to control on/off of the street light.

FCC Statement:

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.

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.

Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note:

1. Use the product in the environment with the temperature between -10°C and 50°C.

For the following equipment:

CE 0700

Is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC,
The equipment was passed. The test was performed according to the following European standards:

EN 301 489-1 V1.9.2: 2011-09

ETSI EN 301 489-17 V2.1.1: 2009-05

ETSI EN 300 328 V1.7.1:2006-10

EN62311:2008

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

CAUTION
RISK OF EXPLOSION IF BATTERY IS REPLACED
BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING
TO THE INSTRUCTIONS