Beeta™ Box

Hub/Gateway/Edge Computer for indoor IoT

MADE IN ITALY

short manual – v. 4.6d

Summary

1 Introduction

Beeta™ Box, or simply BeetaBox, is an electronic control unit, classifiable as Gateway/Edge Computer, designed for IoT ecosystems. It is based on LINUX Embedded platform, which allows implementing software solutions which can run in a standalone mode or interfaced to remote web services. The use of standardized protocols and communication interfaces allows full configurability, modularity and scalability of BeetaBox, whose embedded SW can be upgraded remotely (OTA). This feature is of great value for the maintenance and upgrading of the BeetaBox, in particular, to ensure that the number of devices and protocols supported are compatible and aligned with the market evolutions.

It can be used in combination with third party software systems, for the implementation of an integrated management and control systems, in applications like Smart Home (Behind the meter), Smart Metering, asset management, (Building/Energy Management System), Smart Grid services, security, automation.

2 Main features and peripherals

BeetaBox is an edge computer characterized by a range of features, performances and communication interfaces that is one of a kind, being however able to be customized for different applications, configuring its equipment from the top of the range up to ad-hoc versions (outfittings).
BeetaBox is based on ARM Cortex A7 processor, with several embedded IoT wireless modules (Wifi, 802.15.4, Bluetooth, Z-wave, WM-Bus 169MHz, NB-IoT or 868MHz LoRaWAN) and wired connectivity like RS485 (e.g. Modbus, Sunspec and others for photovoltaic/battery management inverters etc.), Gigabit Ethernet (Bacnet, Modbus, KNX, Daikin, ecc), USB, S0 and dedicated I/O (Dry Contact, Open Collector).

Moreover additional 3 USB ports cab be used to easily expand the BeetaBox to include modules like GPRS/UMTS/4G, etc…
The available I/Os, make it possible also to get data from smart meter directly or to drive load or boiler through relay modules.
BeetaBox has also internal devices (sensors for Temperature, Rh and air pressure, microphones, TPM, speakers); sensors can be used in combination to visual and acoustic embedded actuators for smart feedbacks to the users.

- Multiprotocol, Linux inside
- OTA upgradable
- Physical feedback (visual and acoustic)
- Interoperable with off-the-shelf devices
- Internal rechargeable battery

ZigBee THREAD

Zwave LoWPAN

On/off key

WPS Join key SD slot

M-Bus wireless

Programmable key NB-IoT

LoRaWAN

BAC net

WiFi

Modbus

Bluetooth

Power State LED Local device Network LED

LAN/Internet LED

3x USB port

Pressure Sensor Temperature /Humitidy Sensor

Speaker Speaker

Microphones

Gigabit Ethernet Power supply/ microUSB OTG

Rechargeable internal battery (5hrs @1GHz)

2x RS485
4 x S0 input
2 x Dry Contact input
1 x Open Coll. Output
1x Dry Contact (Max 0.2 A @250Vac) Output

GSM GPRS UMTS Lte C-Bus KNX NB-IoT M-Bus wireless dlms device language message specification
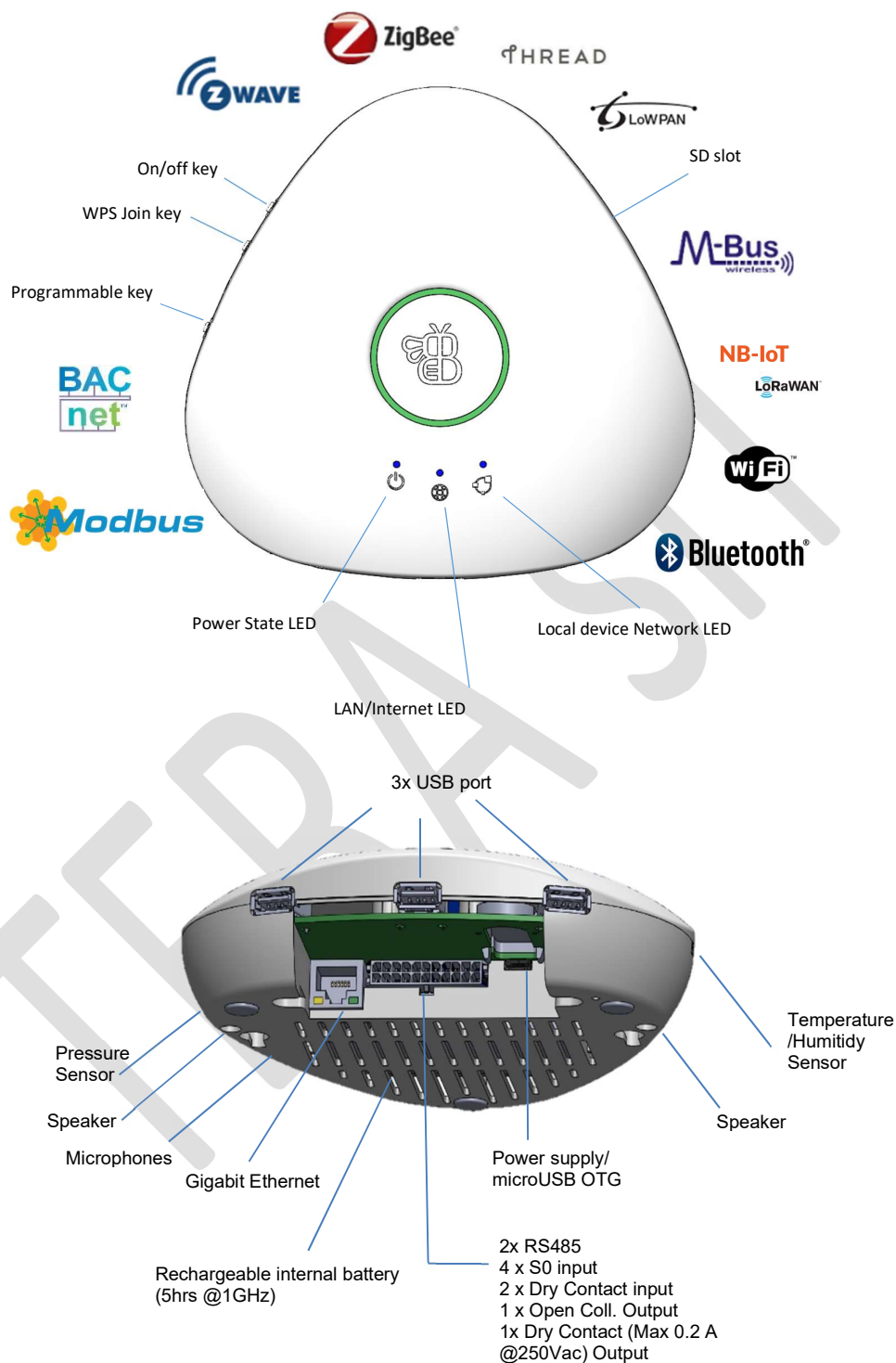
Beeta™

The BeetaBox is able to receive and store the data provided by the smart meters "1G" and "2G" installed in Italy by e-distribution via Power Line, connected via USB port:

- in "A" band, when connected to devices such as the e-distribution "Smart Info" (or other devices equipped with an e-distribution "MOME" card, such as the Beeta Power in the MOME version), communicating with the first generation counters (also called "1G", for example GEM, GEMIS) or even with 2G generation meters (2.1), enabled to send data on band "A";

- in band "C", when connected with devices such as the Beeta Power "2G" version, in this case communicates only with the "second generation" meters, or "2.0 electronic meters" or "smart meter 2.0", or simply "2G" (eg models CEG2, CE2G, "gen2"); it should be noted that, for those of the second generation, new features will be activated which are currently being tested.

Beeta Power, a device developed by TERA, is a power converter (Input: 230Vac , plug for wall-sockets, Output 5Vdc, 2.5A) able to supply the BeetaBox by means of USB 2.0 cable, equipped with integrated PLC modem; together with Beeta Box, it is a plug&play solution that allows the reading of the general electricity consumption of the meter by inserting the single plug into an electrical socket.

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3   BeetaBox technical specification – *full outfitting*

General features	
Hardware	ARM Cortex A7 dual core @1GHz processor
	1 (up to 2) GB DDR3 RAM
	8 (up to 32) GB onboard eMMC Flash
	up to 128 GB microSDHC internal memory
	up to 128 GB microSDHC externally accessible (without removing enclosure)
	Real Time Clock (72 hours backup)
	1 RGB LED for smart visualization programmable events
	3 status LED: 1 power state (power on/battery low), LDN (Local device Network), LAN/internet
Software	Linux Embedded & JVM, OTA upgrade capable, OSGi compliant, FIN ™ FRAMEWORK compliant
	MQTT(s) publication/subscription

	Software on board for a local interaction: - hub/gateway/edge computing configuration - local device configuration - data monitoring
Connectivity	
Wired	1x 10/100/1000 Ethernet (RJ-45)
	2x isolated (5kV) RS485 on I/O expansion connector
	3x USB 2.0 Host Ports (one of this can be used to communicate with electricity smart meters 1G by e-distribuzione, by means of "Smart-Info")
	1xFPC internal connector for LVDS 1xFPC internal connector for SPI+TWI/I2C
Wireless	Embedded Wi-Fi 802.11 b/g/n (concurrent client and access point functionality) with onboard antenna; optional 802.11ac
	Embedded Bluetooth 2.1/3.0 EDR/4.2 BLE with onboard antenna;
	Embedded 802.15.4 (ZigBee and 6LoWPAN ready) transceiver with onboard antenna; THREAD ready
	Embedded Z-wave
	Embedded 169MHz WM-Bus
	Embedded NB-IoT (cat NB1) or alternately 868MHz LoRaWAN
Input/output	
Input	4xS0 on I/O expansion connector
	2x Dry Contact on I/O expansion connector
Output	1x Open Collector on I/O expansion connector
	1x Dry Contact (Max 0.2A @250Vac) on I/O expansion connector
Environment	
Operating	Temperature Range -20 ÷ 70 °C (or 0-50°C if battery operated), RH range 10%-90% not condensing
Storage	Temperature Range -25 ÷ 85 °C (or 0-55°C if battery operated), RH range 5%-95% not condensing
Power	
Input power	5 Volt DC micro-usb input power (external power supply 230Vac/5Vdc ≥ 2000 mA) *Note: Power can be delivered by a common plug/wall Socket power converter or by means of the "Beeta Power" converter that can be used to communicate with electricity smart meters 1G (band A) and 2G "chain2" (Band C, by e-distribuzione with the following features: C Band, Interface: H1, compliant with CEI CEN / CLC / ETSI / TR 50572 standards; EN 62056-7-5 (updateable for two-way mode); application layer compliant with the DLMS*

		standard COSEM IEC 62056-5-3; data model compliant with the DLMS COSEM standard (IEC 62056-6-1 obis, classes of interfaces compliant with the IEC 62056-6-2 standard).
Internal Optional Battery		Lipo 3,7V 2000mAh; battery life: 5hrs @1GHz (16hrs @350 MHz)
Case		
Material		Plastic (ABS or optionally other)
Dimensions		max: 155mm x 150mm x 46mm; weight 0,3 Kg

As a powerful edge computer, there are several options in using BeetaBox:

a. without SW: our partner installs Linux and other SW tools;

b. equipped with pre-installed Linux arranged and tuned by us (ArmBian); several open source software tools and frameworks can be used, like NodeRed, Home Assistant etc.

c. equipped with pre-installed Linux arranged and tuned by us (ArmBian) plus a middleware (OSGI compliant) customized by TERA and some "drivers" developed by Tera;

d. equipped with pre-installed Linux arranged and optimized by us (ArmBian) plus some middleware (OSGI compliant) customized by TERA and some "drivers" developed by Tera, including MQTT configured to send data to an MQTT broker (a sort of "IoT" platform " that some potential partners have);

e. equipped with pre-installed Linux arranged and optimized by us (ArmBian) **plus "FIN FRAMEWORK" (by J2 Innovation- A Siemens Company);** thanks to FIN framework is compliant with the open source initiative Project Haystack to streamline working with data from the Internet of Things.

For this powerful combination, BeetaBox and FIN Framework, see functionalities on

https://www.j2inn.com/videos.

4 Manufacturing process

BeetaBox is a full "Made in Italy" product: coinceived in Italy, designed in Italy, manufactured and tested in Italy. The electronic manufacturing activities are located in italian factories which are committed in an international high-quality production scenario, compliant with the following standards:

- ISO 9001;
- ISO14001;
- IATF 16949;
- IPC Membership;

Manufacturing processes are oriented to high quality in the whole chain: electronic devices provisioning, storage, soldering preparation, picking and placing, soldering, testing and packaging.

Reliability test carried out in our production plants shows MTBF of 70.000 hrs @ 45°C and 50% RH. For specific info about the variation of reliability performances depending on temperature and other conditions, and for deepenings about internl batteries reliability performances, please contact TERA.

5 Embedded SW features – *standard outfitting*

If requested, the BeetaBox has a Linux Embedded operating system. In the standard outfitting, the management software consists of various modules integrated within an OSGi framework that uses a Java Virtual Machine (JVM).

The BeetaBox integrates the following embedded SW functionalities and modules:

1. Webserver for configuration, device connection, data visualization, WiFi Lan connection;
2. Internal DB;
3. Basic functionalities (backend services) for communication with external services/cloud. The BeetaBox basic functionalities are MQTT and REST communication. Additional communication protocols can be implemented based on customer requests
4. OSGi compliant framework

BeetaBox is able to work interoperating with third parties cloud infrastructures, as well as ad-hoc servers, so that flexibility is a global must, from the field to the highest software levels: final applications can by a hybrid solution to be packaged at will, running on-premise and/or cloud IaaS/PaaS/SaaS.

5.1 WEBSERVER

The BeetaBox web server, provides users with functionalities to configure the hub/gateway/edge computer, to connect devices to BeetaBox, to check and download warning and error logs of the embedded SW, to connect BeetaBox to the WiFi Lan. More info about Webserver functionalities are available in the BeetaBox user manual.

5.2 MQTT COMMUNICATION

- Remote server: Mqtt Broker (Mosquitto, etc…)
- Locally:
  The Beeta™ Box /device sends and receives **data** to/from a **topic.** The **topic** is built based on device/attribute features (e.g. position or device type):

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for example: *<IP address>:house/box/multisensor/temperature*
where:

- **house** is the location
- **box** is the position into the location
- **multisensor** is the device type
- **temperature** is the attribute

The **data** related to the attribute (temperature in the example) contains the value and related metadata if necessary. For instance if temperature measured is 70 °F to the address specified above can be sent:

1. Just the data: *"{temp: 70}"* even in unformatted version *"70"*
2. Or data plus metadata like measurement unit: "*{temp: 70, unit: "F"}*"

The data model depends from the sensor features (e.g. temperature, lighting, presence, contact etc…) and related user needs.

5.3 REST COMMUNICATION

- Remote server: Web Server (Apache, etc…)
- Locally:
  The BeetaBox/device <u>sends</u> and <u>reads</u> **data** to/from a **url. The url** is built based on device/attribute features (e.g. position or device type):
  for example: *<IP address>/house/box/multisensor/temperature*

The **data** could be read from the url with a GET request and it could be set/send with a PUT/POST request in different formats (json preferred).

The data model depends from the sensor features (e.g. temperature, lighting, presence, contact etc…) and related user needs.

5.4 OSGI COMPLIANT FRAMEWORK

The OSGi technology facilitates the componentization of software modules and applications and assures remote management and interoperability of applications and services over a broad variety of devices. Building systems from in-house and off-the-shelf OSGi modules increases development productivity and makes them much easier to modify and upgrade.

6   A lot of IoT Devices (sensors and actuators) for final applications

The interoperability of Beeta Box with off-the-shelf devices allow it to be the right solution to implement an IoT platform that can be used for monitoring of environmental conditions, utility energy meters, appliances, specific loads or to control actuators like for instance windows shutters, smart plug, lights or to generate alarms. The powerful processing unit allows to execute locally algorithms for controlling and monitoring the building.

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In the following a list of sensors and actuators already tested to be integrated with BeetaBox . The list is continuously integrated with new devices, therefore contact TERA to have updated info on the list of compatible devices.

ID	Type of sensor/actuator	Model	Manufacturer	Comm.
1	Smoke Sensor	FGSD-002	Fibaro	Zwave
2	Flood sensor	ST812	Everspring	Zwave
3	Radiator Thermostat	ES-42-DAN_LC13_014G0013	Danfoss	Zwave
4	The Button (Panic button)	FGPB-101-1	Fibaro	Zwave
5	Thermostatic Radiator Valve	POPE010101	POPP	Zwave
6	Relay	TZ78	TKB HOME	Zwave
7	Relay with power meter	TZ79	TKB HOME	Zwave
8	Roller shutter	FGR 221	Fibaro	Zwave
9	Smart Plugs	AN159	EverSpring	Zwave
10	Smart Plugs	TZ88	TBK	Zwave
11	Multisensor	Aeotech ZW100-A	Aeotec	Zwave
12	Electrical ON/OFF Actuator	ZME_05436	ZWaveMe	Zwave
13	Door Sensor	FGK-101	Fibaro	Zwave
14	Smart Plugs	PHI_PAN11	Philio	Zwave
15	Smart Plug Switch	DSC06106-ZWUS	Aeotec	Zwave
16	Multisensor (Motion, Door/Window, Illumination,Temperature)	PHI_PST02-1A	Philio	Zwave
17	Radiator Thermostat	ES-42-EUR_Stellaz	Eurotronic	Zwave
18	Multisensor	AEOEZW100	Aeotec	Zwave
19	Range Extender	AEOEZW117	Aeotec	Zwave
20	Motion Sensor	FIBEFGSM-001-ZW5	Fibaro	Zwave
21	Smart plug	PAN11-1B	GemPower	Zwave

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22	Sensor T,Hr	EVR_ST814	EverSpring	Zwave
23	Smart Plug	ZW096	Aeotec	Zwave
24	Energy meter	ZW095***C1A60	Aeotec	Zwave
25	Flood Water sensor 6	ZW122	Aeotec	Zwave
26	Smart Plug	FGWP-102	Fibaro	Zwave
27	Door/Window Sensor	FGK-106-ZW5	Fibaro	Zwave
28	Energy meter	ZW095C3A100	Aeotec	Zwave
29	Flush 1D relay	ZMNHAD1	Qubino	Zwave
30	Smart Plug	AN180	EverSpring	Zwave
31	Lamp holder	EVR_AN145	EverSpring	Zwave
32	Energy meter dimmer	ZMNHND1	Qubino	Zwave
33	Actuator	ZMNHDD1	Qubino	Zwave
34	Smart Plug	ZW075	Aeotec	Zwave
35	Siren	ZW080	Aeotec	Zwave
36	Universal binary sensor	FGBS-001	Fibaro	Zwave
37	Energy meter	ZW095C3A60	Aeotec	Zwave
38	IR Remote control extender for air conditioners	ZXT-120	Remotec	Zwave
39	Temperature sensor	ZMNHEA1	Qubino	Zwave
40	Door Sensor	ZW112	Aeotec	Zwave
41	Door Sensor	HSM02	Everspring	Zwave
42	TriSensor	ZWA005	Aeotec	Zwave
43	Dongle USB Zwave	ZMEEUZB	Z-wave.me	Zwave
44	Energy sub-meters Smart Plug	Din-Rail 1-phase	Meazon	ZigBee
45	Energy sub-meters Smart Plug	Din-Rail 3-phase	Meazon	ZigBee

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46	Smart Plug	BIZY TYPE F PLUG	Meazon	ZigBee
47	Occupancy Sensor	WZB-SPM05	Nietzsche (NHR)	ZigBee
48	CO2 Sensor	SG-02-CO2-H1	Nietzsche (NHR)	ZigBee
49	Router	WZB-01 USBR/WZB-01 USBC	Nietzsche (NHR)	ZigBee
50	Control Modules	WZB-03	Nietzsche (NHR)	ZigBee
51	Sensor (T, RH)	STH-03ZB-HB	Nietzsche (NHR)	ZigBee
52	Smart Switch Plug	A08	Nietzche (NHR)	ZigBee
53	Smoke Sensor	SG-01-SK-SB	Nietzsche (NHR)	ZigBee
54	Air Quality Sensor	SG-02-IAQ-H1	Nietzsche (NHR)	ZigBee
55	EnergyCam	1000, 1003, 1010, 1011	FAST FORWARD AG / Q-loud GmbH	wM-Bus
56	Display	Fire 7	Amazon	WiFi
57	Wi-Fi Camera	DCS-935L	D-Link	WiFi
58	Energy Smart Meter Reader	Utility meter interface device	ENEL	WiFi
59	Bulbs	Hue white A60 9W E27 (trough Philips Hue Bridge 324131201801)	Philips	WiFi
60	Cellular Network Modem	E353 USB dongle HSDPA+	Huawei	USB
61	Cellular Network Modem	BC95 NB-IoT	Quectel	USB
62	Cellular Network Modem	Sara-N2 Series NB-IoT	U-Blox	USB
63	Z-Wave USB Stick	ZMEEUZB1	Z-WAVE.ME	USB
64	Optical blinking sensor	UM1OBR	Terasrl	S0
65	Inverter	PowerOne PowerOne PVI-3.0/3.6/4.2/-TL-OUTD; PVI-5000/6000-TL-OUTD; PVI-10.0-I/12.0-I	ABB	ModBus RS485
66	Energy meter	NEMO D4-LE - MFD4422	IME	ModBus RS485
67	Control Modules	MAMI -100	M.lg. Electronics	ModBus RS485
68	Module (I/O)	S6116	SHJ Electronic Co., Ltd.	ModBus RS485

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69	Calorimeter Contacalorie	IFX-M0-03	Isoil	ModBus RS485
70	Energy Meter	EM210	Carlo Gavazzi	ModBus RS485
71	Energy meter	MIG SDM630	Eastron	ModBus RS485
72	Expansion module (I/O)	S5134	SHJ Electronic Co., Ltd.	ModBus RS485
73	Expansion module (I/O)	S5140	SHJ Electronic Co., Ltd.	ModBus RS485
74	Energy meter	NEMO D4-LE - MFD4421	IME	ModBus RS485
75	External Speaker	DA-E550	Samsung	Bluetooth
76	Fotocellula a Tasteggio	S50-PA-5-C21-NN (throughI/O module S5134/S5140)	Datalogic	Analogic
77	IR temperature sensor	OPTCSLT15K (throughI/O module S5134/S5140)	Optris	Analogic
78	volume soil moisture sensor	MAS-1 (throughI/O module S5134/S5140)	DECAGON	Analogic
79	piranometer	PIRSC-I (throughI/O module S5134/S5140)	Geoves	Analogic
80	soil water potential	MPS-6 (through SDI-12 converter and I/O module S5134/S5140)	DECAGON	Analogic
81	NTC Sensor	IKE#02XE3000XXXXX (throughI/O module S5140)	Italcoppie	Analogic

7 Product standard and regulation

Beeta Box is in compliance to Directive 2014/53/EU and Directive 2011/65/EU.

Below the list of relevant EU legislation to which Beeta Box complies:

EN55024	Information technology equipment - Immunity characteristics - Limits and methods of measurement
EN55032	Electromagnetic compatibility of multimedia equipment - Emission Requirements
EN 61000-3-2	Electromagnetic compatibility (EMC) Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
EN 61000-3-3	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection
EN 61000-4-2	Electrostatic Discharge Immunity
EN 61000-4-3	Radiated, radio-frequency, electromagnetic field immunity
EN 300 220-1 V2.4.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW;

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EN 300 220-2 V2.4.1	Part 1: Technical characteristics and test methods Part 2: Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive
EN 300 328 V2.1.1	Electromagnetic Compatibility and Radio spectrum Matters (ERM); Wideband transmission systems; Data Transmission equipment operating in the 2.4GHz ISM band and using wide band modulation techniques
EN 300 330 V2.1.1[2]	Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU
EN 301 908-1 V11.1.1[1]	IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 1: Introduction and common requirements
EN 301 908-13 V11.1.1[1]	IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 13: Evolved Universal Terrestrial Radio Access (E-UTRA) User Equipment (UE)
EN301 489-1 V2.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements
EN301 489-3 V2.1.1[3]	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 40 GHz
EN301 489-17 V3.2.0	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment; Part 17: Specific conditions for Broadband Data Transmission Systems
EN301 489-52 V1.1.0[1]	Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 52: Specific conditions for Cellular Communication Mobile and portable (UE) radio and ancillary equipment; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU [Draft]
EN60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013	Safety of information technology equipment
EN62311:2008	Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)

[1] Applied for product revision BE_BB-3-7 revB
[2] Applied for product revision BE_BB-3-7 revC
[3] Applied for product revisions BE_BB-3-7 revB and BE_BB-3-7 revC

Below the list of frequencies and output power of radio protocol included in Beeta Box:

Radio Protocol/Standard	Frequency	RF Output Power
802.11b/g/n	2412-2472 MHz	20 dBm max
802.11n	2422-2462 MHz	20 dBm max
Bluetooth	2402-2480 MHz	20 dBm max
Zwave	868.42, 868.4, 869.85 MHz	14 dBm max
Zigbee	2405-2480 MHz	20 dBm max
WM-bus 169	169.4 – 169.475 MHz	27 dBm max
NB-IoT	832 - 862 MHz, 880 - 915 MHz	24 dBm max 24 dBm max
LoRaWAN	863 - 870 MHz	14 dBm max

8   Warranty

Italian Product Warranty

The BeetaBox product is covered by a guarantee for a defined period of time by TERA srl (hereafter simply TERA). The guarantee is not transferable, it is valid only for the first end user of the product. The warranty is valid for 24 months from the date of purchase with receipt or invoice on tax code, 36 months (standard, extensible to 50 months) with invoice on VAT.

This warranty covers each product and ensures that it is free from defects in workmanship, in normal conditions of use and service, for the period of time defined from the date of purchase by the first end user. On the basis of this guarantee, Tera will repair or replace, at its sole discretion, any unit that does not function according to the specifications published by TERA srl during the warranty period.

The warranty does not cover software not originating from TERA or damage to the product caused by modifications, alterations, incorrect application, improper use or physical abuse of the product; or damage due to repairs or product assistance by anyone not expressly authorized by TERA. This warranty also excludes any damage to the product caused by circumstances beyond the control of TERA, as for lightning or power supply fluctuations (non-exhaustive example).

Should the product prove to be defective within the warranty period, return the product:
- giving advance notice via email to info@terasrl.it and / or by phone call to +390802147776;
- then, waiting for an answer by e-mail about the shipping address of the product and the method of delivery and / or delivery to an expressly authorized center;
- then, carrying out the delivery and waiting for the reply;
TERA may, at its discretion, repair or replace the product, depending on how much TERA deems necessary to restore the correct functioning of the product, without any charge to the user, if the warranty conditions are met.

If the product has been purchased from a Reseller, contact the Reseller and agree the warranty assistance arrangements with it.
Warranty conditions can be tailored for B2B OEM, special agreements, non-Italian customer.

9   Disclaimer

Tera reserves the right to modify, improve or otherwise change its products and/or Information in this short manual without prior written notice.

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