DATASHEET

Wirnet Station 915

LoRa gateway for IoT chain

- **915 MHz FCC Hybrid Mode ISM band LongRange™ bidirectional communications capabilities**
- **Embedded, remote and open low power communication station**
- **Open development framework based on standard Linux OS**
- **WAN connectivity over GPRS/EDGE/3G or Ethernet**

1. Hardware Key Features

1.1 System

CPU:
- Based on ARM 926EJS core processor
- Up to 230 MIPS
- Real-time clock saved by battery
- Hardware watchdog
- Optimised power consumption management

Volatile memory:
- Low power DDRAM 128 MB
- 10 MB used for system firmware

Non-volatile memory:
- 128 MB NAND flash (40MB used for system firmware and autorecovery mechanism)
- 8 GB eMMC

1.2 User interfaces

Internal LEDs:
- Operational status : power, GSM signal strenght level, WAN connectivity indicator

Internal push buttons:
- Manual station reset
- Manual test or installation procedure launch

USB host interface allowing :
- Local software upgrade with simple USB key
- USB/NET local configuration/maintenance access

1.3 Communication

LongRange:
- Incorporate LoRa (TM) bidirectional communications technology (902-928 MHz ISM band-hybrid mode)
- Sensitivity : up to -141 dBm
- Tx conducted power from 0dBm to +30dBm
- 49 LoRa Demodulators over 9 channels
- More than 15km range in sub-urban situation
- More than 2km range in urban situation

WWAN:
- HSDPA/UMTS (850/1900MHz) : DL 3.6 Mbps / UL 384 Kbps (HSDPA), UL/DL 384Kbps (UMTS)
- GPRS/EDGE (850/1900MHz) : UL/DL 85.6Kbps (GPRS), UL/DL 236.8Kbps (EDGE)
- IMEI inside
- Internal antenna

Ethernet :
- PowerOverEthernet IEEE 802.3af alternative B 10/100 Base T compliant

1.4 Positionning/Timing

GPS:
- Integrated GNSS high sensitivity GPS module
- NMEA 2.0 compliant
- Internal antenna

1.5 Sensors

- Embedded temperature sensor
- Door opening detection system

1.6 Power

- PowerOverEthernet supply : 48V class 0 (Max : 15Watts, Nominal : 3Watts (Lora Rx mode with GSM network attachement)
- DC power supply (ex : solar panel use) : 11 to 30Volts
- Power control : ignition detection, software OFF switching
- Back-up battery (up to about 1 minute allowing safe powerdown)

1.7 Mechanical

• Polycarbonate enclosure - Dimensions : 315 x 170 x 215 (including mounting kit) - Weight: about 2 kg (including mounting kit)

Connectors

Cable gland

N connector
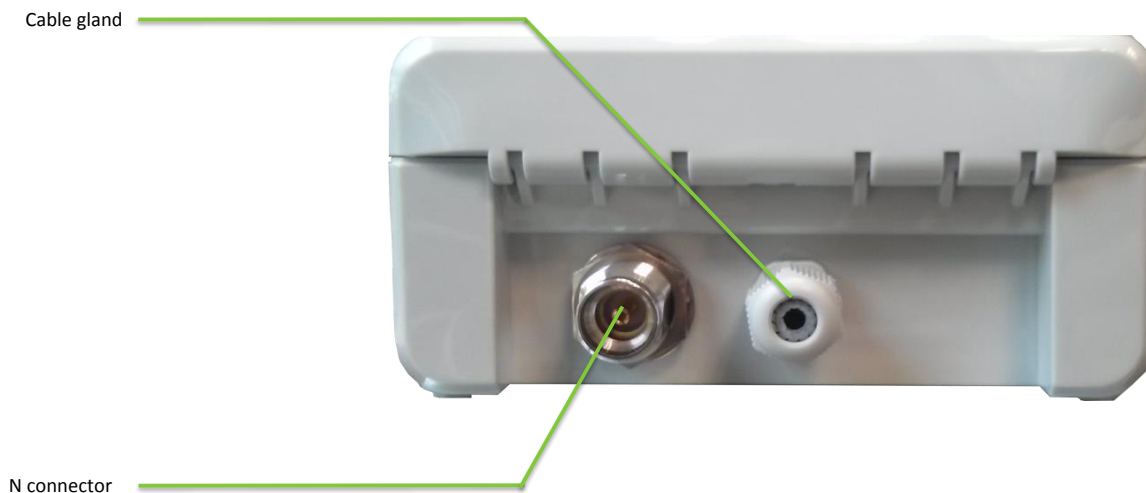
1.8 Mounting

The provided mouting kit allows three different mounting options:
• Wall mounting by screwing
• Pole mounting by U-bolt (max diameter : 60mm)
• Metallic strapping mounting (tube, pipe, flue...)

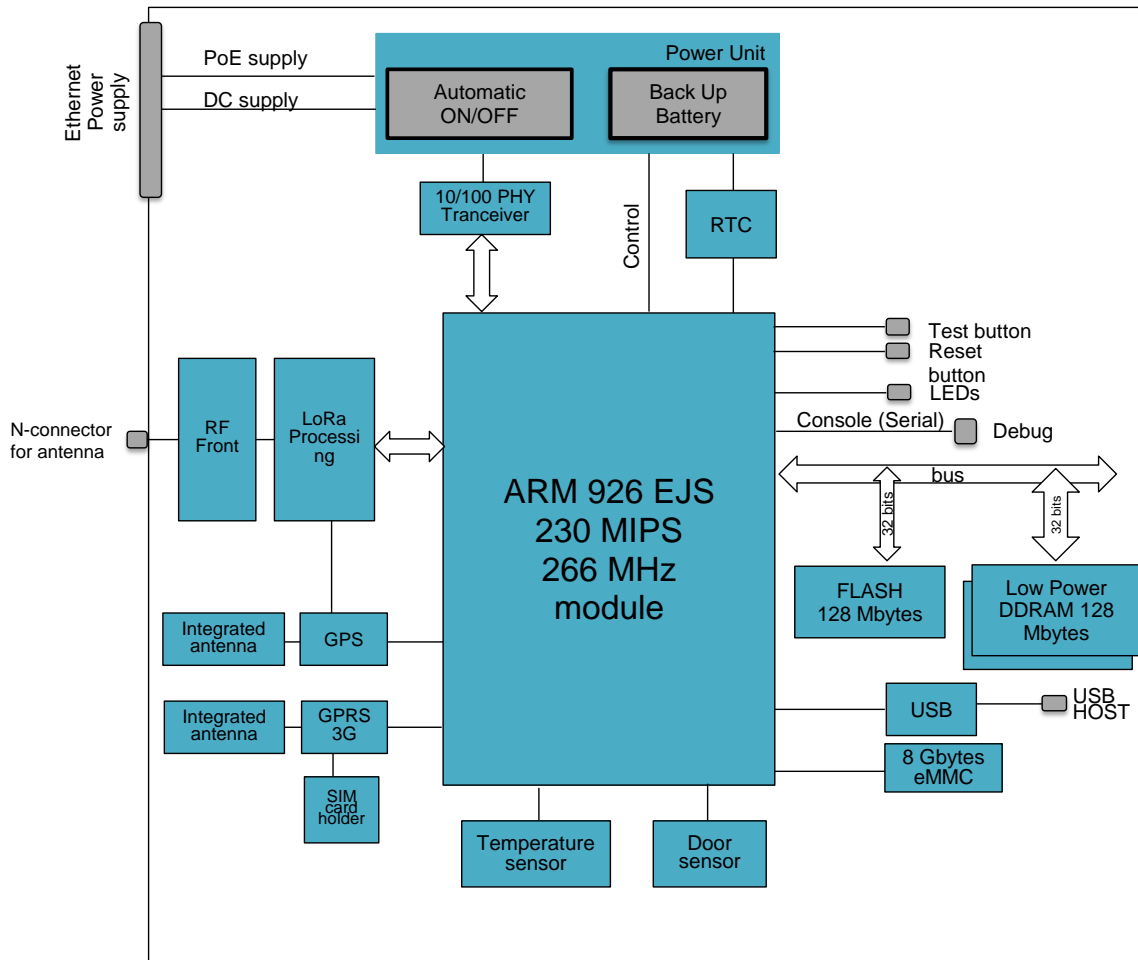The provided mouting kit can be splitted to install apart the antenna.

1.9 Environmental

• Full operating range: -20°C to +60°C
• Humidity: 95%, non condensing (protective vent)
• MTBF: 20 years (according to MIL-HDBK-217F) - *non contractual*

• Ingress protection: IP67
• Impact resistance: IK08
• UV resistance: UL508

1.10 Certifications

• CFR 47 FCC Part 15
   FCC 47 CFR Part 15 : 2014 - Part 15- Radio frequency devices
   FCC PART 15.247 - Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz. (frequency hopping and digitally modulated)
      FCC Part 15.207 conducted emissions on AC mains in the band 150kHz – 30MHz
      FCC Part 15.247 intentional radiated emissions
      FCC Part 15.215 Additional provisions to the general radiated emissions limitations

• RSS 247
   RSS-Gen – Issue 4, November 2014- General requirements and Information for the Certification of radio Apparatus
   RSS-247 Issue 1, May 2015 - Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSS) and Licence-Exempt Local Area Network (LE-LAN) Devices

• IEC 60950 -1

1.11 Hardware block diagram

Figure: Hardware block diagram showing Ethernet Power supply with PoE supply and DC supply feeding the Power Unit (Automatic ON/OFF and Back Up Battery), 10/100 PHY Tranceiver, RTC, connecting to the ARM 926 EJS 230 MIPS 266 MHz module. Connected blocks include RF Front (N-connector for antenna), LoRa Processing, GPS with Integrated antenna, GPRS 3G with Integrated antenna and SIM card holder, Temperature sensor, Door sensor, Test button, Reset button, LEDs, Console (Serial), Debug bus, FLASH 128 Mbytes (32 bits), Low Power DDRAM 128 Mbytes (32 bits), USB, USB HOST, and 8 Gbytes eMMC.

2. Software key features

2.1 Operating system

- Standard Long Term Support Linux version 3.10
- File system YAFFS2 (NAND) and EXT4 (eMMC)
- Support of all GNU/Linux tools (cross-compiled for ARM)
- POSIX1 file system
- TCP/IP BSD4.4 socket on network bearer

2.2 Software packages included (non-exhaustive)

- PYTHON
- SQLITE

Optional
- JAVA ORACLE OJEC VM (J2M2 compliant based on CDC 1.1.2 profile)

Networking:
- DHCP client and server
- FTP server
- SSH server
- NFS client
- Firewalling (iptables) and IP routing (layer 3)
- HTTP server
- TFTP server
- L2TP tunneling

2.3 Kerlink M2M services interfaces

- Simple and reduced interface using XML format over TCP/IP socket providing value added services based on action programming
- Mobile SMS management
- System alarm (memory and CPU usage, hardware failure)
- Internal statistic delivery
- Automatic or manual bearer selection
- Power control management

Optional
- Wanesy ready to remote supervision and maintenance.

2.4 Software development tools

- C/C++ Linux cross compilation toolchain based on GNU tools (GCC 4.5.2, Glibc 2.13)
- User manual and Kerlink M2M services description
- Complete C-source code set of example for remote and embedded applications
- On-line wiki

Optional
- Debug probe

3. Optional accessories

- **Antennas** : various antennas can be proposed to adapt to environment (omnidirectionnal, directionnal, high gain).

4. In option : Wanesy Ready

Wanesy is a M2M platform provided by Kerlink to :
- interconnect devices with customer ERP
- supervise remote device (status, alarm, log...)
- maintain (remote maintenance, update and control)

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