Wirnet Station 923 (PDTIOT-ISS02)

LoRaWAN™ gateway for smart IoT chain

- 918.4-923 MHz band Long Range™ bidirectional communications capabilities
- Embedded, remote and open low power communication gateway
- Open development framework based on standard Linux OS
- WAN connectivity over 2G/3G or Ethernet

1. Hardware Key Features

1.1 System

CPU:

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

Volatile memory:

- Low power DDRAM 128 MB
- 10 MB used for system firmware

Non-volatile memory

- 128 MB NAND flash (40 MB used for system firmware and auto recovery mechanism)
- 8 GB eMMC

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1.2 User interfaces

Internal LEDs:

- Operational status: power, WAN signal strength level, WAN connectivity indicator

USB host interface allowing:

- Local software upgrade with simple USB key
- USB/NET local configuration/maintenance access

Internal push buttons:

- Manual station resets
- Manual test or installation procedure launch

1.3 Communication

LongRange:

- Incorporates LoRa™ bidirectional communications technology (918.4-923 MHz)
- Sensitivity: up to -141 dBm
- Tx conducted power from 0dBm to +14dBm
- 25mW max ERP
- 49 LoRa™ demodulators over 9 channels
- More than 15 km range in sub-urban situation
- More than 2km range in urban situation

WWAN:

- HSDPA/UMTS (900/2100MHz) : DL 7,2 Mbps / UL 5,6 Mbps (HSDPA), UL/DL 384Kbps (UMTS)
- GPRS/EDGE (900/1800MHz) : UL/DL 85.6Kbps (GPRS), UL/DL 236.8Kbps (EDGE)
- IMEI inside
- Internal antenna

Ethernet:

- PowerOverEthernet IEEE 802.3af alternative compliant

1.4 Positioning & Timing

GPS:

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

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1.5 Sensors
- Embedded temperature sensor
- Door opening detection system

1.6 Power
- PowerOverEthernet supply: 48V class 0 (Max: 15Watts, nominal: 3 Watts (LoRa™ Rx mode with GSM network attached)
- DC power supply (ex: solar panel use): 11 to 30 Volts
- Power control: ignition detection, software off switching
- Back up battery (up to about 1 minute allowing safe power down)

1.7 Mechanical
Polycarbonate enclosure

Dimension: 315 x 170 x 215 (including mounting kit) - Weight: about 2 kg (including mounting kit)

N connector

Cable gland

1.8 Mounting
The provided mounting kit allow three different mounting options:

- Wall mounting by screwing
- Pole mounting by U-bolt (max diameter: 80mm)
- Metallic strapping mounting (tube, pipe, flue…)

The provided mounting kit can be split to install the antenna apart

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1.9   Environmental

- Full operating range: -20° 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
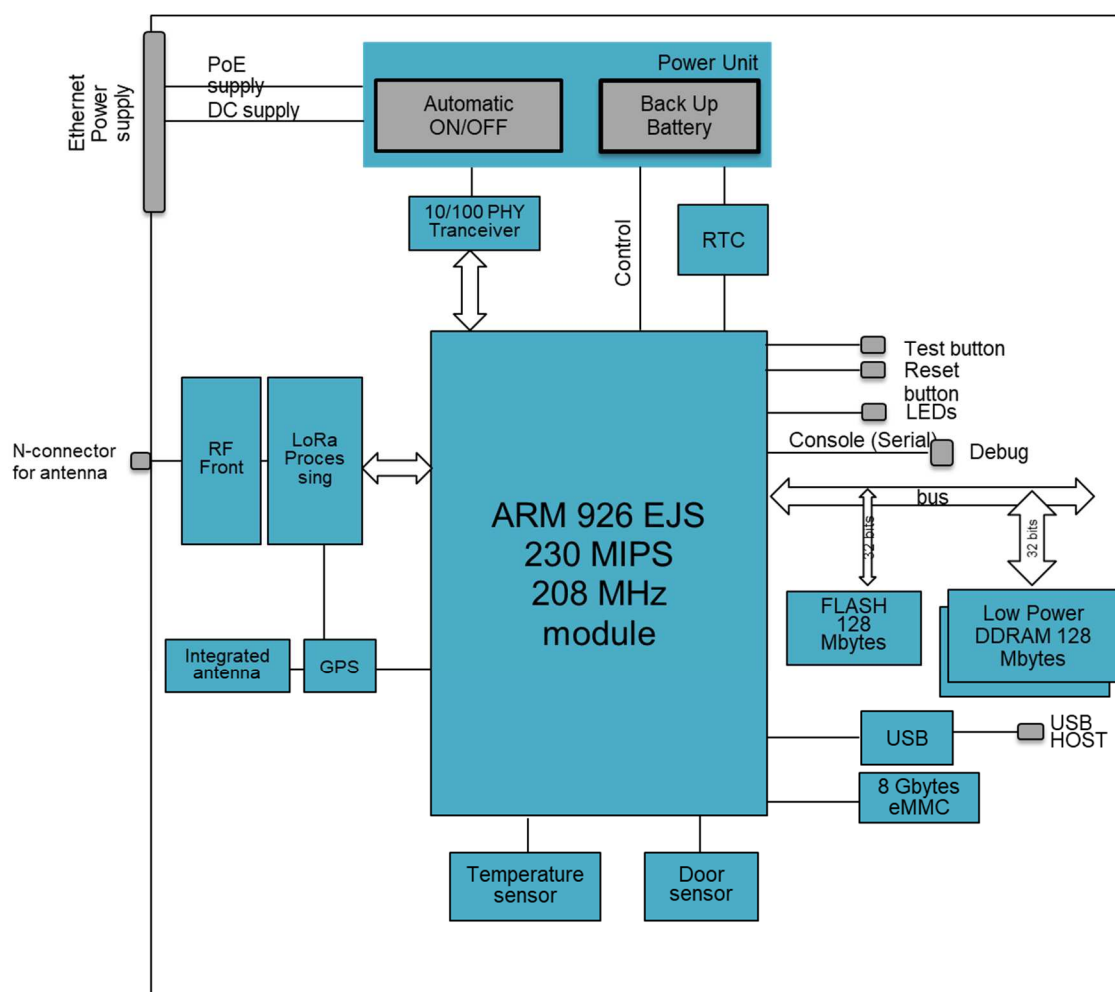- Flammability rating: UL94-V0

1.10 Certification

- QCVN 12 : 2015/BTTTT (2G)
- QCVN 86 : 2015/BTTTT (EMC)
- QCVN 15 : 2015/BTTTT (3G)
- QCVN 18 : 2014/BTTTT (EMC)
- QCVN 47 : 2015/BTTTT (918-923 MHz)
- QCVN 96 : 2015/BTTTT (EMC)

Compatibility in normal and severe conditions (-20°C to +60°C)

1.11 Spurious emission limit

Frequency (f)	Limit at operation mode	Limit at standby mode
47 MHz ≤ f ≤ 74 MHz; 87.5 MHz ≤ f ≤ 118 MHz; 174 MHz ≤ f ≤ 230 MHz; 470 MHz ≤ f ≤ 862 MHz	-54 dBm (4nW)	-57 dBm (2nW)
At other frequencies below 1000 MHz	-36 dBm (250nW)	-57 dBm (2nW)
At frequencies f > 1000 MHz	-30 dBm (1µW)	-47 dBm (20nW)

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1.12 Hardware block diagram

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

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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, maintenance and HQ data transfer.

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 examples for remote and embedded application
- On-line wiki
- Optional debug probe

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3. Optional accessories

- **Antennas**: various antenna can be offered to adapt to environment (omnidirectional, directional, high gain…)

- **External cavity filters**: Radio filtering can be adjusted adding optional external cavity filter according to specific colocation constraints

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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