**DATASHEET**

Wirnet iFemtocell

Preliminary

Indoor LoRa nano gateway for IoT chain

- Unlicensed band Long Range (Lora™) bidirectional communications capabilities
- Supported bands : 863-873MHz, 902-928MHz, 915-928MHz (depending on the version)
- Backhaul connectivity Ethernet, Wifi or 4G modem (in option)
- Highly secured device relying on an hardware secure core

1. Hardware Key Features

1.1 Hardware block diagram
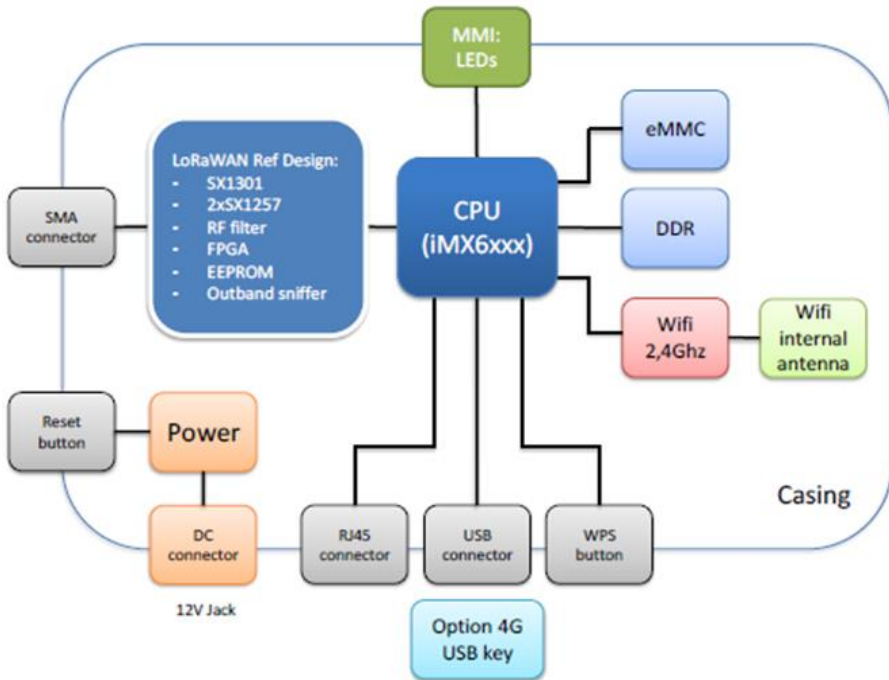
1.2 CPU module

1.2.1 System

CPU:
- Based on ARM cortex A9 core processor (Up to 800 MHz)
- Hardware watchdog
- Optimised power consumption management
- Embedded hardware secure core

Volatile memory:
- DDRAM 256 MB

Non-volatile memory:
- 8 GB eMMC

1.2.2 User interfaces

External LEDs:
- Operational status : power, backhaul, LoRa RF activity

External push buttons :
- Reset
- WPS

USB host interface allowing :
- Local secured software upgrade with simple USB key
- External 4G modem

Web local interface allowing :
- Configuration

1.2.3 Communication

Ethernet :
- Ethernet 10/100 Base-T compliant

WLAN :
- Chipset 2.4GHz
- Internal antenna without diversity
- Client and adhoc modes, AP mode
- WPS

WWAN :
- In option, by connecting a 4G modem dongle on the external USB connector

1.2.4 Power

- Power supply AC/DC 220/12V with jack connector (provided)

1.3 LoRa capabilities

- Incorporate LoRa (TM) bidirectional communications technology
- 49 LoRa Demodulators over 9 channels

Antenna (provided):
- Type: omni-directionnal
- Gain: 2-3dBi
- Size: 135.6x20.1mm

1.3.1 868 MHz version

Capabilities:
- RX range: 863-873MHz,
- TX range: 863-873MHz
- Sensitivity: up to -141 dBm
- Tx conducted power from 0dBm to +28dBm

1.3.2 923 MHz version

Capabilities:
- RX range: 915- 928MHz,
- TX range: 920-928MHz
- Sensitivity: up to -141 dBm
- Tx conducted power from 0dBm to +30dBm

1.3.3 915 MHz version

Capabilities:
- RX range: 902- 928MHz,
- TX range: 902-928MHz
- Sensitivity: up to -141 dBm
- Tx conducted power from 0dBm to +30dBm

2. Mechanical

- Plastic enclosure
- Dimensions : maximum 160x90x35mm
- Weight : less than 500g
- Connectors :
  - RJ45 (Ethernet 10/100)
  - SMA for LoRa antenna
  - Jack DC 12V for power supply
  - USB Type A

External connectors:

RJ45 Connector (Ethernet)

USB Connector

Jack Connector (Power Supply)

Radio Antenna

WIFI Push button

Reset push button

2.1 Mounting

- Wall mounting by 2 oblong holes
- Lay on a table (4 domes)

2.2 Environmental

- Full operating range : -20°C to +55°C
- Humidity : 5% to 95%
- Ingress protection : IP31
- For indoor use only
- Flammability rating : UL94-V0

3. Software key features

3.1 Operating system

- Based on Yocto/Poky 2.1
- Standard Long Term Support Linux version 4.1
- File system : EXT4, Squashfs
- Support of all GNU/Linux tools (cross-compiled for ARM)
- TCP/IP BSD4.4 socket on network bearer

3.2 Software packages included (non-exhaustive)

- Embedded Base Station Controller (BSC)
- LoRa packet Forwarder
- LoRa test tools
- Python
- Busybox
- Ntp

Networking :
- DHCP client
- Firewalling (iptables) and IP routing (layer 3)
- OpenVPN
- IPSEC (StrongSwan)
- Connman
- Ofono

3.3 Software security

- Secure boot (software authentication and integrity control) relying on an hardware secure core
- Critical information storage (private keys, certificates...) inside an hardware secure core
- Critical software execution protection (encryption, decryption,) relying on a Trust zone embedded inside an hardware secure core
- Firewall
- Read Only file system preventing unexpected file system coruption
- Software auto-recovery mechanism to protect against software update failure
- Secured firmware upgrade (usb key or over the air)

3.4 BSC services

BSC (Base Station Controller) interfaces are relying on standard SNMP (v2c) protocol and provide the following services :
- Alarm notifications
- Firmware upgrade
- File transfer
- Remote shell control
- Configuration
- Monitoring (platform statistics, RF statistics, RF spectrum analyzer...)

The BSC interface is securized through an SSL tunnel (openVPN)

3.5 Software development tools

- C/C++ Linux cross compilation toolchain based on GNU tools (GCC 5.3.0, Glibc 2.23)
- On-line Wiki

4. Certifications (according to radio frequency)

- CE (R&TTE, EN-300-220, EN-300-440, EN-301-489…)
- FCC/IC
- Specific countries on demand

5. Contacts : For more information please contact:

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