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# IronLink LoRa

## Specifications

| | |
|---|---|
| **Modem** | LoRa: **Microchip RN2483A** |
| **Proccessor** | Cortex-M0 |
| **Dimensions** | |
| **Power** | Input Voltage: **2.4-5.5V**<br>Battery Input Voltage:**3.6-4.2V** |
| **Power Consumption** | Idle: **< 7uA**<br>Averge: **20mA**<br>Max: **200mA(Lora) 250mA(NB-IoT)** |
| **Input Voltage Range** | **2.4V - 5.5V** **77.043mA**<br>Max current draw - **200mA(Lora Tranmission) 250mA(NB-IoT Tranmission)** |

## Connectors

| | |
|---|---|
| **Micro USB** | Com port & power |
| **Jtag Header** | Programming header |
| **GPIO Connector** | Communications header |
| **Battery Connector** | Terminal blocks |
| **GPS** | SMA connector |
| **LoRa/NB-IoT Antenna** | SMA connector |

## Core Features

- GPS with Easy Mode*
  Or on-board GPS with 1second lock time (*When in easy mode)
- 28 pin header for add ons board
- Fuel Gauge for accurate battery tracking
- 6 channel 12bit adc for sensor addons
- Optional external GPS antenna for greater range
- Lora Antennta 868Mhz
- Integrated EEProm
- HAL software for easy programming
- USB serial interface for debugging
- Battery Support for 4.2V LiPo's

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# IronLink LoRa

| | |
|---|---|
| **Product Name** | **IronLink LoRa 434 & 868MHz** |
| **Product Description** | IronLink LoRa is an industrail Low-Power Long Range LoRa® Technology Transceiver with GPS capabilities. A Rugged LoRaWAN Development Board for challenging applications. Integrated battery management, GPS and Fault Detection. IronLink is suitable for simple long range sensor applications with external host MCU. |

## LoRa Specs

| | |
|---|---|
| **Frequency Band** | 863.000 MHz to 870.000 MHz; 433.050 MHz to 434.790 MHz |
| **Modulation Method** | FSK, GFSK, and LoRa® Technology modulation |
| **Max Over the Air Data Rate** | 300 kbps with FSK modulation; 10937 bps with LoRa Technology modulation |
| **Operation Range** | Up to 15 km coverage at suburban; up to 5 km coverage at urban area |
| **Sensitivity at 1% PER** | -146 dBm Dependent on modulation settings, Receiver Bandwidth (RBW), and Spreading Factor (SF). |
| **RF TX Power** | Adjustable up to max. 10 dBm on 433 MHz band (limited to meet regulations); max. 14 dBm on the 868 MHz band. TX power is adjustable. |

For more information, refer to the "RN2483 LoRa® Technology Module CommandReference User's Guide" (DS40001784).

## GPS Specs

### L1 Band Receiver (1575.42MHz)

Channel: **22 (Tracking) / 66 (Acquisition)**
C/A Code:
SBAS: **WAAS, EGNOS MSAS, GAGA**

**Horizontal Position Accuracy**

Autonomous: **<2.5m CEP**

**Acceleration Accuracy**

Without aid: **0.1m/s²**

**Velocity Accuracy**

Without aid: **<0.1m/s**

**Timing Accuracy**

1PPS out: **10ns**

**Reacquisition Time**

**TTFF@-130dBm with EASY™:**

| | |
|---|---|
| Cold start: | **<15s** |
| Warm start: | **<5s** |
| Hot start: | **<1s** |

**TTFF@-130dBm without EASY™:**

| | |
|---|---|
| Cold start: | **<35s** |
| Warm start: | **<30s** |
| Hot start: | **<1s** |

**Sensitivity:**

| | |
|---|---|
| Acquisition : | **-148dBm** |
| Tracking: | **-165dBm** |
| Reacquisition: | **-160dBm** |

**Dynamic Performance:**

| | |
|---|---|
| Maximum Altitude: | **Max.18,000m** |
| Maximum Velocity: | **Max.515m/s** |
| Maximum Acceleration: | **4G** |

**Max Update Rate:** **Up to 10Hz, 1Hz by default**

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## IronLink LoRa

### GPIO Layout

| Pin# | Function |
|---|---|
| 1 | GND |
| 2 | VBATT |
| 3 | GPIO3 |
| 4 | GND |
| 5 | UART1_RX |
| 6 | UART1_TX |
| 7 | GPIO2 |
| 8 | GPIO7 |
| 9 | I2C2_SDA |
| 10 | I2C2_SCL |
| 11 | UART4_RTS |
| 12 | GPIO5 |
| 13 | GND |
| 14 | 3V3 |

| Pin# | Function |
|---|---|
| 1 | GND |
| 2 | GPIO1 |
| 3 | UART4_CTS |
| 4 | I2C1_SCL |
| 5 | I2C1_SDA |
| 6 | SPI_MISO |
| 7 | I2C1_SMBA |
| 8 | UART4_Rx |
| 9 | UART4_TX |
| 10 | SPI_SCK |
| 11 | SPI_MOSI |
| 12 | GPIO4 |
| 13 | GND |
| 14 | 3v3 |

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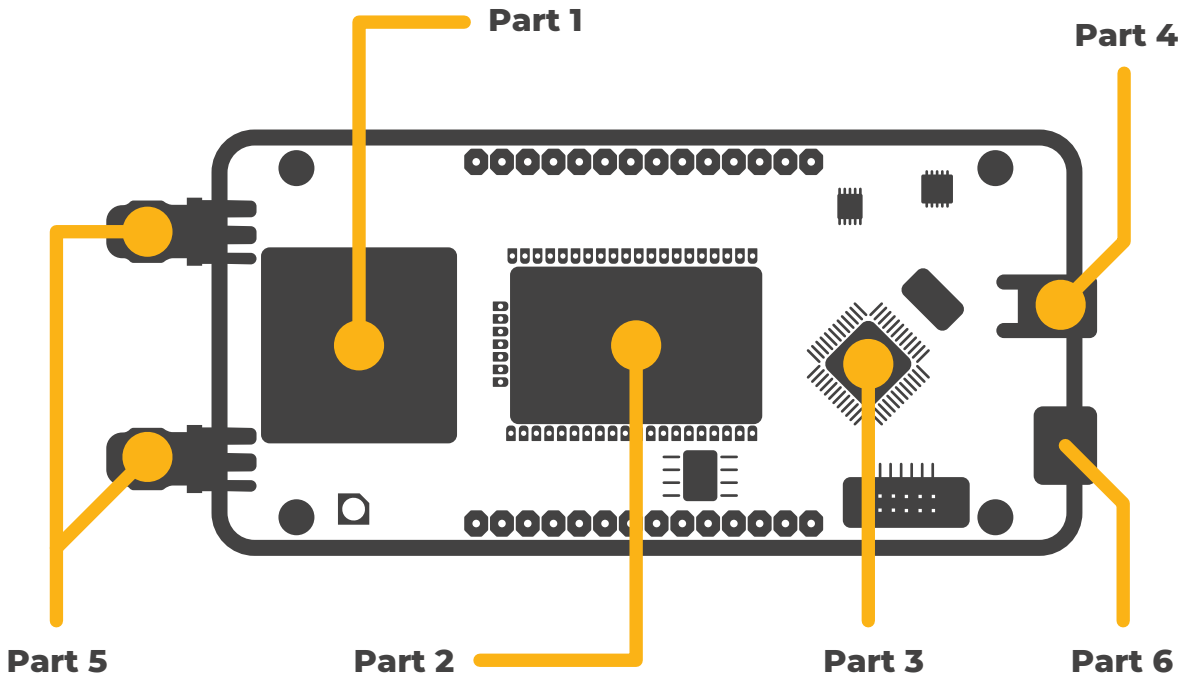
# IronLink LoRa

## Board Layout




**Part 1 - GPS**

**Part 2 - Communication Model**

**Part 3 - Processor**

**Part 4 - Battery Port**

**Part 5 - SMA Antenna**

**Part 6 - Micro usb**

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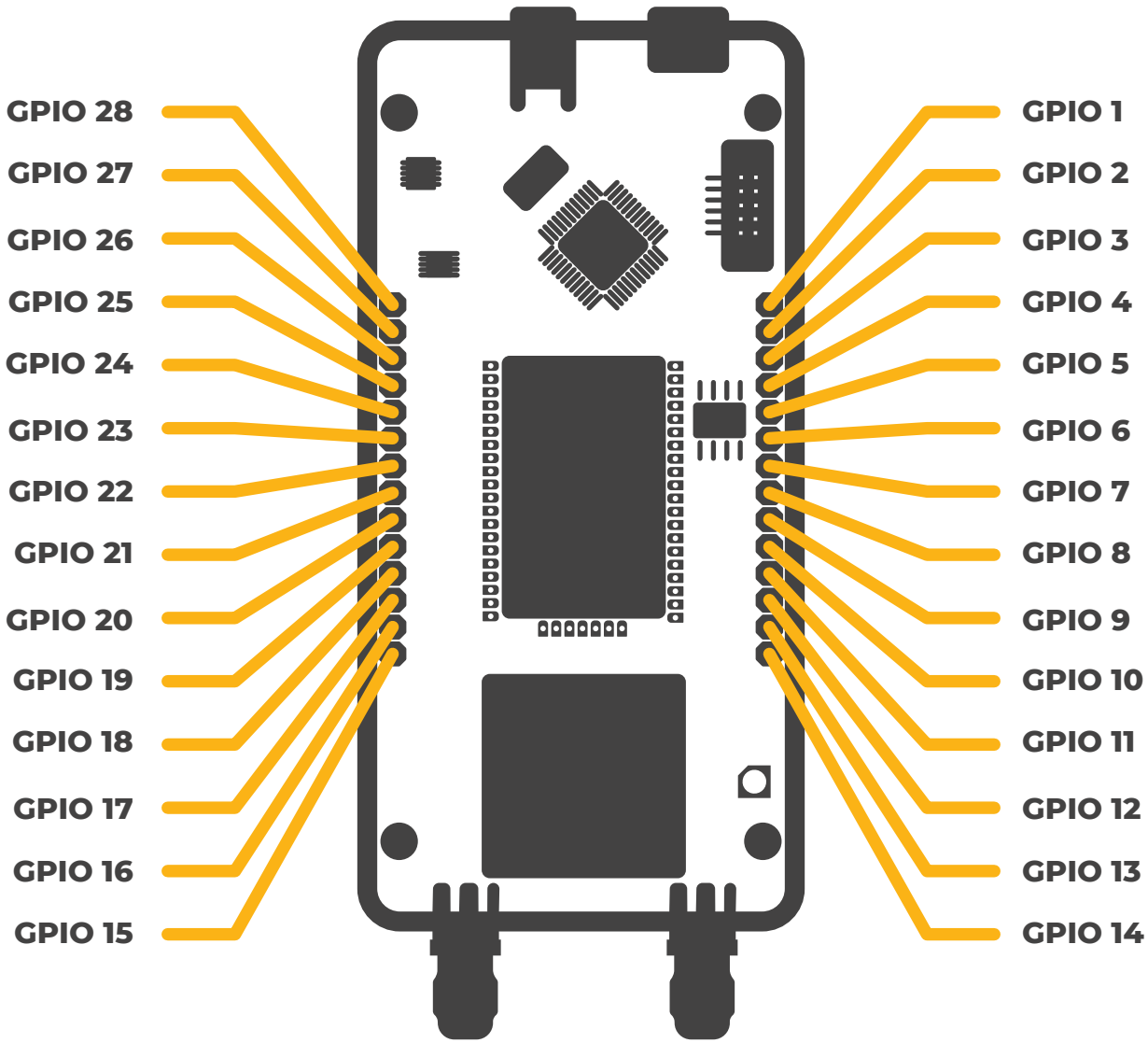
# IronLink LoRa

## Board Layout



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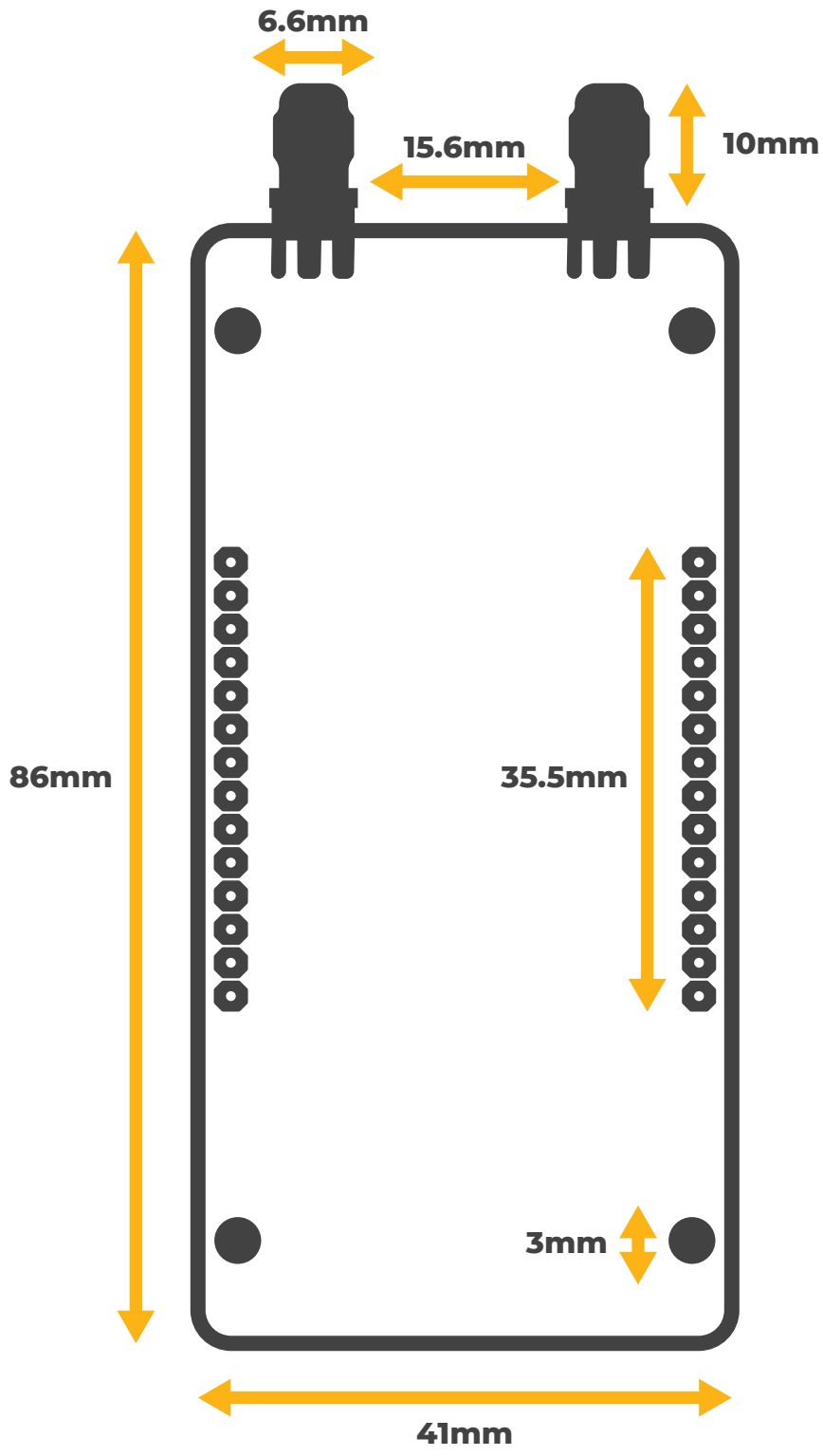
## IronLink LoRa

### Board Measurements



# IRONLINK
## LoRa

**A Rugged Development Board for Challenging Applications.**
**Integrated Battery Management, GPS and Fault Detection.**
**High temperature operations and ESD resistance.**
**Large range of fully supported sensors.**



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## LoRa + NB-IoT Add-on Boards

**Out of the Box Support**
**Large range of fully supported sensors.**

- Infrared Sensor (IR)
- Temperature, Pressure, Humidity, and Indoor Air Quality
- Proximity Sensor
- Ultrasonic Sensor
- Accelerometers & Gyroscope Sensor
- Hall Effect Sensor
- Load Cell
- PIR Motion Detector & Vibration Sensor
- Humidity, Soil Moisture & Rain
- Touch Sensor
- Light Sensor
- Colour Sensor
- Tilt Sensor
- Flow and Level Sensor
- Metal detector, Water Flow & Heartbeat Sensor
- Smoke, Fog, Gas, Ethanol & Alcohol Sensor

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