User Guide: simpleRTK2B Micro

Overview

Let simpleRTK2B Micro (featuring u-blox ZED-F9P and ZED-F9R modules) accelerate your RTK project thanks to its easy to integrate footprint, integrated RF connector and high availability. We take care of the RF design and complex module integration so you can focus on your PCB design and the application.

Variants

The board is available in several formats. The options are:

1. Receiver.
    - **ZED-F9P**: For high-precision applications where you need centimeter-level accuracy in open-sky environments.
    - **ZED-F9R**: For automotive or robotics projects, which uses dead reckoning sensors to maintain centimeter-level accurate positioning even when the signal is lost in tunnels or urban canyons.
2. Antenna connector.
    - **SMA**: durable threaded antenna connection that can withstand frequent handling and suitable for external mounts.
    - **uFL**: an ultra-small and lightweight option for compact internal designs, but it is meant for permanent setups because it can wear out or break if plugged and unplugged too many times.
3. Soldering to motherboard.
    - **Through Hole**: The board includes soldered pins to be inserted in a XBee socket or pin holes of your PCB. In this case you can choose between uFL and SMA as antenna connectors.
    - **Surface Mount**: The board is expected to be soldered directly to corresponding pins present on your PCB. In this case only uFL is available as the antenna connector.

Installation

When installing the simpleRTK2B Micro with the **Through Hole** configuration you have several options with pros and cons.

- **Using a motherboard socket**: This option makes very easy to plug and un-plug the board, but on the other hand this installation is weak and prone to failure in case of vibrations.
- **Soldering through motherboard pin holes**: This method is way more resistant to vibrations and hence suitable for long-term applications but still allows relatively easy desoldering.

On the other hand, the **Surface Mount** option is less flexible and challenging to mount.

- Use this method for final production of embedded systems or if the board is not planned to be reused or repaired.
- This installation method adds an extra amount of resistance to shock and vibrations, and hence it is recommended for heavy-duty applications where reliability of components is a must.

Integration considerations

Installation of GNSS systems have their own specifications to have into consideration for optimal performance. The main source of issues is the fact that the RF signals involved are very weak (down to -170dBm), and hence easily affected by noise interference. Here are some integration tips:

- On the GNSS receiver it is important to avoid direct airflow, fast temperature changes and shock-vibration. So, place it as far as possible from fans, processors and memory chips, and consider putting it inside a case and use a vibration damping mount.
- The most critical part for a GNSS system is the antenna installation, so we have for this subject a specific Antenna Installation Guide. Note that the simpleRTK2B Micro provides up to 100mA@3V for active antennas.

Hardware

Pinout

Description	Name	#
3.3-3.6V 200mA max	VCC	1
Data out VCC level	TX1	2
Data in VCC level	RX1	3
	N/C	4
Leave open for always ON	RESET	5
5V to enable USB	V_USB	6
	USB+	7
	USB-	8
I2C Clock VCC level	I2C_SCL	9
Must connect to GND	GND	10

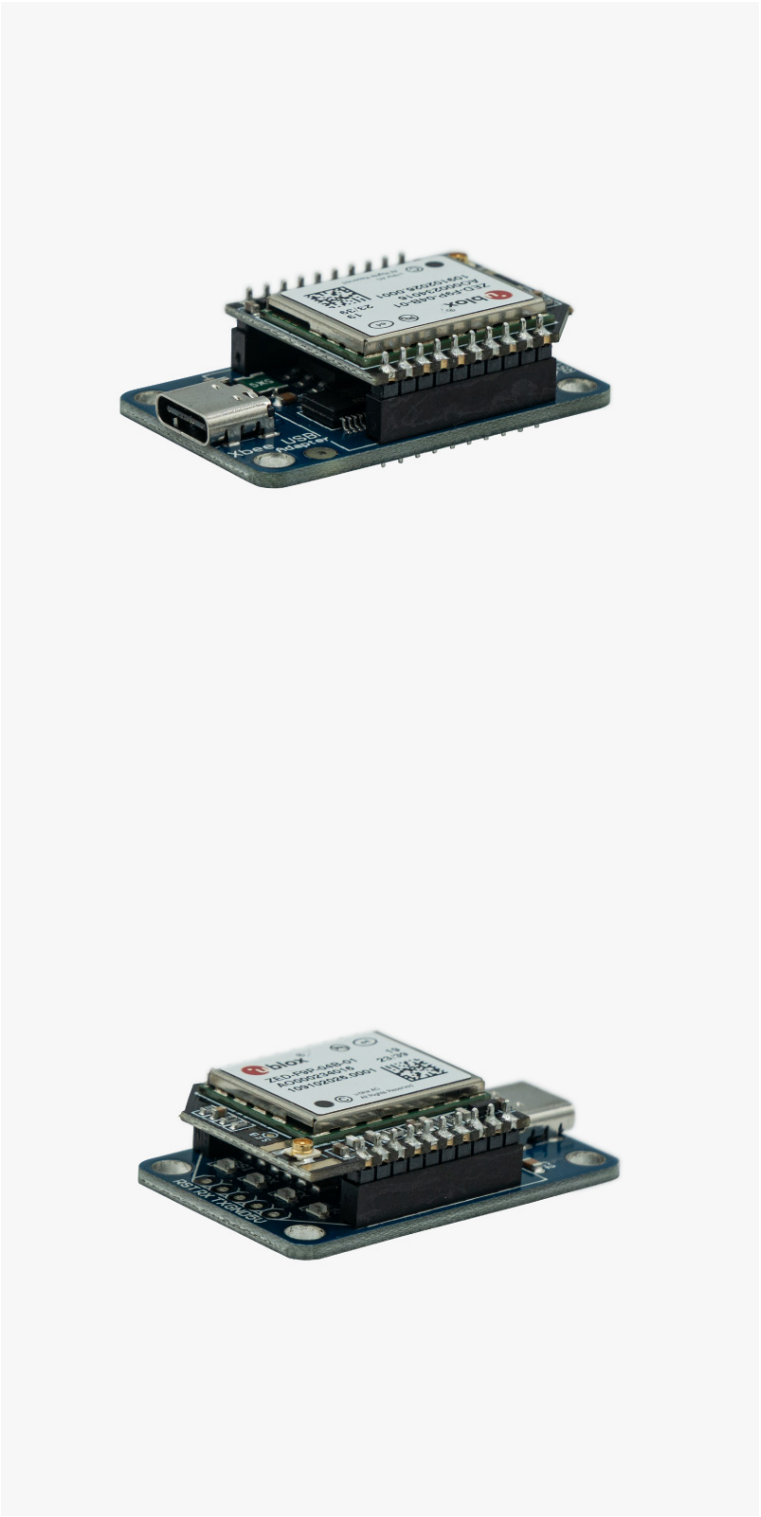
#	Name	Description
20	N/C	
19	EXTINT	EXTINT INPUT VCC level
18	RTKFIX	RTK FIX output VCC level
17	I2C_SDA	I2C Data VCC level
16	RX2	Data in VCC level
15	N/C	
14	V_BKCP	V_BCKP
13	TPS	Timepulse output VCC level
12	TX2	Data out VCC level
11	GND	Must connect to GND

PCB Footprint

The simpleRTK2B Micro uses the common 2mm pin separation in 2 rows/10 pins distribution. Please find here the PCB Footprint and if in doubt contact us.

Configuration

With this product you have direct access to ZED-F9P functionalities. The easiest way to configure the receiver is by inserting it into a USB-C Carrier Board for XBee Plugins, connect to a PC and use the u-center software.

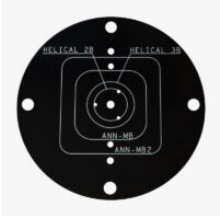


Make sure to install the simpleRTK2B Micro board in the correct orientation with the antenna connector on the opposite side of the USB-C connector.

Please follow our guide how to configure ZED-F9P, and use one of our configuration files as a starting point for your project. If you need any help, do not hesitate to contact us.

Accesories

Here you can find affordable accessories for your simpleRTK2B Micro board.



Accessories
Ground Plate for GNSS antenna

Accessories
USB-C Carrier Board for XBee Plugins

Accessories
JST Carrier Board for XBee Plugins

Cables
uFL to SMA antenna cable

Cables
SMA antenna RF cable extender

Accessories
mPCIe Carrier Board for XBee Plugins

Accessories
Marine thread adapter for survey GNSS Multiband antenna

Accessories
Magnetic Stand for Survey GNSS Antenna

Accessories
RS232 Carrier Board for XBee Plugins

Antennas
u-blox ANN-MB1-00 Dualband (L1/L5) GNSS Antenna

Antennas
Calibrated Survey Multiband GNSS Antenna