User Guide: simpleRTK3B Micro

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Overview

Let simpleRTK3B Micro (featuring the Septentrio Mosaic-X5 or Mosaic-H module) 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.

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Variants

The board is available in several variations. You can choose:

1. Receiver.
    ○ **Mosaic-X5**: For high-precision applications where you need centimeter-level positioning in open-sky environments.
    ○ **Mosaic-H**: For projects that require not only accurate positioning but also heading direction.
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. Extra Interfaces.
    ○ **None**: No extra interfaces included. This option is good enough if you only need access to the main interfaces: 2x UARTs, USB and some I/Os.
    ○ **ETH-SD-COM3-GP1**: If you also want to have a third UART and access to the Ethernet and SD card capabilities from the module.

Installation

The simpleRTK3B Micro comes in a **Through Hole** configuration which has different installation options, each 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 allowing desoldering.

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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 simpleRTK3B Micro provides up to 100mA@3V for active antennas.

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Hardware

Pinout

If you need extra interfaces like Ethernet, SD card, and an extra GPIO output, you can go for the version with an extra header and extended functionality. Below you will find the pinout. When developing a PCB footprint, it is always easier to do it from a top view; for this reason, we also provide the pinout in this way.

PCB Footprint

The simpleRTK3B Micro uses the common 2mm pin separation in 2 rows/10 pins distribution, including dan optional extra 20 pin connector for extended feature set. Please find here the PCB Footprint and if in doubt contact us.

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Configuration

With this product you have direct access to Septentrio Mosaic 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 Septentrio web interface. Make sure to install the simpleRTK3B Micro board in the correct orientation with the antenna connector on the opposite side of the USB-C connector.

Please follow our guide on How to configure Septentrio Mosaic-X5 and Mosaic-H and use one of our Mosaic configuration files as a starting point for your project. If you need any help, do not hesitate to contact us.

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Accesories

Here you can find affordable accessories for your simpleRTK3B 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-MB2-00 Tripleband GNSS Antenna

Antennas
Budget Survey Tripleband GNSS Antenna

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