

# 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.

## 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.

The simpleRTK3B Micro **ETH-SD-COM3-GP1** extended version is not compatible with the USB-C Carrier Board. Please contact us directly before purchasing this version or if you already own one and need to configure it.

## 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.

## 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.

## Hardware

### Pinout


TOP VIEW



Description	Name	#	#	Name	Description
3.3-3.6V 400mA max	VCC	1	20	N/C	Don't connect
Data out VCC level	TX1	2	19	EXTINT	EXTINT INPUT 1.8V level
Data in VCC level	RX1	3	18	GPLED	Configurable GPLED out VCC level
Don't connect	N/C	4	17	N/C	Don't connect
Leave open for always ON	RESET	5	16	RX2	Data in VCC level
5V to enable USB	V_USB	6	15	N/C	Don't connect
	USB+	7	14	V_BKCP	V_BCKP
	USB-	8	13	TPS	Timepulse output VCC level
Don't connect	N/C	9	12	TX2	Data out VCC level
Must connect to GND	GND	10	11	GND	Must connect to GND

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.

TOP VIEW



Description	Name	#	#	Name	Description
Configurable GP1 out VCC level	GP1	2	1	RMII_CLK	LAN PHY Clock
SD card CMD line	SD_CMD	4	3	MDIO	LAN PHY control data
SD card CLK line	SD_CLK	6	5	MDC	LAN PHY control clock
SD card DAT0 line	SD_DAT0	8	7	RMII_RXD1	LAN PHY receive data 1
Must connect to GND		10	9	RMII_RXD0	LAN PHY receive data 0
	TX3	12	11	RMII_CRSDV	LAN PHY CRS
	RX3	14	13	RMII_RXER	LAN PHY RX error
	LOGLED	16	15	RMII_TXEN	LAN PHY transmit enable
Log on/off or mount/unmount SD	LOGBUTTON	18	17	RMII_TXD0	LAN PHY transmit data 0
LAN reset (low to reset the PHY)	nRST_LAN	20	19	RMII_TXD1	LAN PHY transmit data 1

### PCB Footprint

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

## 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.

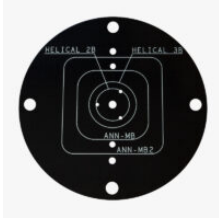




Please follow our guide on [How to configure Septentrio Mosaic-X5 and Mosaic-H](#) and use one of our [Mosaic configuration files](#) as a starting point for your project. If you need any help, do not hesitate to [contact us](#).

## Accessories

Here you can find affordable accessories for your simpleRTK3B Micro board.



Accessories  
[Ground Plate for GNSS antenna](#)



Accessories  
[JST Carrier Board for XBee Plugs](#)



Accessories  
[USB-C Carrier Board for XBee Plugs](#)



Cables  
[SMA antenna RF cable extender](#)



Cables  
[uFL to SMA antenna cable](#)



Accessories  
[Magnetic Stand for Survey GNSS Antenna](#)



Accessories  
[mPCIe Carrier Board for XBee Plugs](#)



Accessories  
[Marine thread adapter for survey GNSS Multiband antenna](#)



Accessories  
[RS232 Carrier Board for XBee Plugs](#)



Antennas  
[u-blox ANN-MB2-00 Tripleband GNSS Antenna](#)



Antennas  
[Budget Survey Tripleband GNSS Antenna](#)