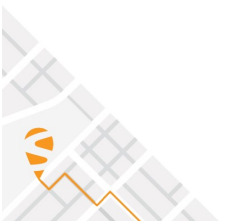




How to upgrade from AsteRx-m2 and AsteRx-m2a to AsteRx-m3

Version 1.0.0



How to upgrade from AsteRx-m2 and AsteRx-m2a to AsteRx-m3

Version 1.0.0

October 4, 2020

© Copyright 2000-2020 Septentrio nv/sa. All rights reserved.

Septentrio
Greenhill Campus, Interleuvenlaan 15i
3001 Leuven, Belgium

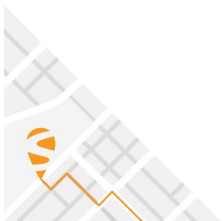
<http://www.septentrio.com>

Phone: +32 16 300 800

Fax: +32 16 221 640



@septentrio



1 Table of contents

1	TABLE OF CONTENTS.....	3
2	INTRODUCING THE ASTERX-M3.....	4
3	WHAT DOES THE ASTERX-M3 BRING?	5
4	ASTERX-M3 AS A DROP-IN REPLACEMENT FOR ASTERX-M2/ASTERX-M2A: INTEGRATION CONSIDERATIONS	6
4.1	MOUNTING	6
4.1.1	ANTENNA CONNECTORS	6
4.1.2	HEIGHT PROFILE	6
4.2	POWER CONSUMPTION	7
4.3	RF INTERFACE	8
4.4	FREQUENCY REFERENCE OUTPUT (REF OUT).....	8
4.5	USB.....	8
4.6	ETHERNET	8
5	SOFTWARE.....	10
6	USING THE ASTERX-M3 WITH AN EXISTING ASTERX-M2/M2A INTEGRATOR KIT.....	11

2 Introducing the AsteRx-m3

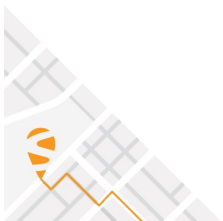
The AsteRx-m3 is a state-of-the-art GNSS receiver family using triple frequency and multi-constellation GNSS technology both for maximal positioning availability and reliability in challenging conditions. The AsteRx-m3 product family includes both base station and rover receivers in single or dual antenna configuration. It provides RTK positioning at the lowest power consumption of any comparable device on the market.

The new product family includes 3 types of GNSS OEM boards which are listed below.

AsteRx-m3 Pro is a rover receiver capable of tracking signals from all available GNSS constellations on 3 frequencies. Simple and powerful, it operates both in single and dual antenna modes.

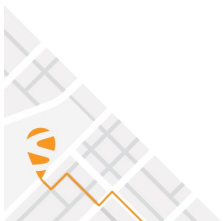
The AsteRx-m3 ProBase, as its name suggests, is a product designed to operate as a reference station for RTK and PPP-RTK networks. It can be used as a base station or for network densification.

Last but not least is the AsteRx-m3 Pro+, the best-in-class full-feature OEM receiver board flexible enough to fit into any application and to be used either as a rover or a base station in a single or a dual antenna mode.



3 What does the AsteRx-m3 bring?

Compared to the current AsteRx-m2 and AsteRx-m2a the AsteRx-m3 brings improved performances on GNSS tracking with an increased number of channels and a band plan that always allows triple frequency tracking also for dual antenna receivers.



4 AsteRx-m3 as a drop-in replacement for AsteRx-m2/AsteRx-m2a: integration considerations

The AsteRx-m3 product family is designed as a drop-in replacement for the current AsteRx-m2 and AsteRx-m2a, using the same connectors (30 and 60 pins connectors), the same footprint and increased height due to the adoption of MMCX connectors rather than u.FL for additional robustness and reliability.

4.1 Mounting

4.1.1 Antenna connectors

The default RF connectors mounted on AsteRx-m3 are of the MMCX straight type. With this design the AsteRx-m3 board is 9.32 mm thick, which is 1.72 mm more than the AsteRx-m2 and m2a.

The thickness of the board with Septentrio supplied mating connectors is ~14 mm.

Note that, variants with u.FL connectors and 90 deg MMCX connectors are foreseen for volume integrations. Contact your sales representative (sales@septentrio.com) for MOQ, pricing, part numbers and availability.

4.1.2 Height profile

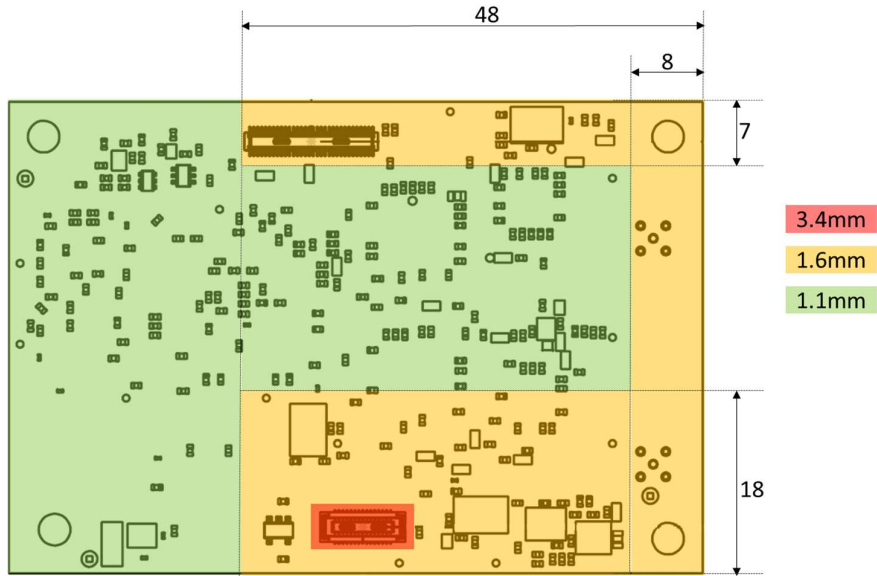
The AsteRx-m3 was designed to be a slot-in upgrade of the AsteRx-m2.

It has the same footprint (47.5 mm x 70.0 mm) with mounting holes in the same position. Besides the increased thickness due to the MMCX straight connectors, when moving from AsteRx-m2/m2a to AsteRx-m3, the following should be considered.

The maximum height of the components at the bottom side of the AsteRx-m3 OEM board is within the mask shown below.

The maximum component height is 1.1mm in the green area, 1.6mm in the yellow area and 3.4 mm in the red area.

The mask should be respected in the design to allow future revisions of the board.



4.2 Power Consumption

The following table shows the typical power consumption for selected sets of signals. The dual antenna configuration corresponds to a receiver where the option to track from the AUX antenna is enabled. Antenna power consumption is not accounted for.

Configuration		Power consumption		
		AsteRx-m2	AsteRx-m2a	AsteRx-m3
Single Antenna	GPS L1+L2	740 mW	NA	750 mW
	GPS L1+L2, GLO L1+L2	770 mW	NA	800 mW
	Max power consumption	950 mW	NA	1180 mW
Dual antenna	GPS L1+L2	NA	1000 mW	1050 mW
	GPS L1+L2, GLO L1+L2	NA	1050 mW	1100 mW
	Max power consumption	NA	1150 mW	1860 mW
Standby		10 mW	10 mW	3 mW

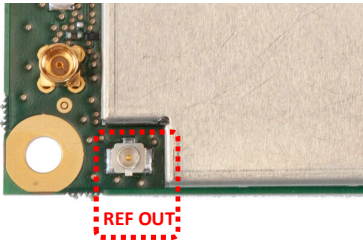
As specified in the HW manual, the power consumption in the above table represent average values, circumstantial variants are possible. To account for peak currents, the minimum power supply drive capability should be 1 Ampere.

4.3 RF Interface

The following changes apply to the RF interface:

- ▶ The antenna net gain range of the AsteRx-m3 is 15-45 dB as opposed to the 0-50 dB that is valid for the AsteRx-m2 and AsteRx-m2a.
This translates to no passive antenna support
- ▶ AsteRx-m2 had a dual-input with auto-detection for the antenna. AsteRx-m3 does not need this feature as the antenna allocation is predefined (MAIN and AUX1).
- ▶ The antenna names have changed from ANTA to MAIN and ANTB to AUX1. The naming has been aligned with the receiver configuration commands.
- ▶ The antenna current limit has changed from 200 mA per antenna to 150 mA.

4.4 Frequency Reference Output (REF OUT)



The frequency reference used by the receiver is available at the REFOUT u.FL connector. The signal provides a 10MHz square wave between 0 - 2.8 V with a 50 Ohm impedance.

The REFOUT signal – enabled by default - can be switched on and off via the **setREFOUTmode** command.

4.5 USB

By default, the AsteRx-m3 is configured in USB 2.0 mode while this is USB 1.1 on AsteRx-m2 and AsteRx-m2a receivers.

For both receivers, it is possible to change this default, as explained in the Hardware Manual.

4.6 Ethernet

The PHY supported by the AstRx-m2(a) is restricted to the ksz8041 model by Micrel. The AsteRx-mm3 can auto detect the connected Ethernet PHY if it's one models listed below. The units marked in orange have been validated by Septentrio.

- ▶ Giga phys: ksz9021, ksz9031
- ▶ 100/10 Phys : ksz8001, ksz8721, ksz8737, **ksz8041**
- ▶ ksz8021, ksz8031, ksz8051
- ▶ ksz8081, ksz8091
- ▶ ksz8061
- ▶ Switch : ksz8873, ksz886x

5 Software

The following aspects should be accounted for in software integration:

- ▶ The list of RTCM3 messages enabled by default in an output stream has changed:
AsteRx-m3: 1006, 1033, 1230, 1074, 1084, 1094 and 1194
AsteRx-m2/m2a: 1006, 1033, 1230, 1004, 1012
- ▶ While different product names exist to identify the AsteRx-m3 product variants, the hostname follows the same syntax as all our products, i.e. asterx-m3-1234567 where 1234567 represents the serial number of the receiver.
- ▶ Contrary to the AsteRx-m2 and m2a, notch filters for interference mitigation are enabled by default on AsteRx-m3.

6 Using the AsteRx-m3 with an existing AsteRx-m2 Integrator kit

The AsteRx-m3 product family is compatible with the AsteRx-m2 development kit, taking into account what was described in the previous chapters, and also all existing cables can be used with the exception of the antenna cables.

