



fseg (/s/profile/0052p00000AKKgNAAX) (Customer) asked a question.

Edited February 10, 2021 at 2:21 PM (/s/question/0D52p0000AOK91vCQD/can-neom9n-only-use-16-satellites-with-nav-update-rate-5hz).

## Can NEO-M9N only use 16 satellites with nav. update rate >5Hz?

I am using a MATEKSYS GNSS M9N-5883 board (<http://www.mateksys.com/?portfolio=m9n-5883> (<http://www.mateksys.com/?portfolio=m9n-5883>)).

In u-center 20.06.01 I experience glitches when using this module in a multi-gnss-constellation (GPS, GLONASS, GALILEO) with a nav. update rate of >10Hz.

The module is connected via UART1 with a baudrate of 115200 and only UBX-NAV-PVT and UBX-NAV-SAT are enabled.

When I asked the MATEK support to share their configuration to archive a nav. update rate of 25 Hz, they referred to this post <https://github.com/PX4/PX4-GPSDrivers/pull/57> (<https://github.com/PX4/PX4-GPSDrivers/pull/57>) saying that the M9N chip can only use 16 satellites simultaneously when a nav. update rate of higher than 5Hz is applied. I cannot find anything about this in the NEO-M9N documentation. Am I overseeing something?

In other words: Is there additional information on hardware restrictions of the NEO-M9N module that I haven't found yet?

Positioning

(/s/topic/OTO2p000000Hr7dGAC/).

NEO-M9N

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clive1 (/s/profile/0052p000008HYMwAAO) (Customer)

5 years ago

Yes, looks to be a thing, although my testing suggests that 8 Hz is the inflection point. I can get 28-30 satellites in a solution. Quick test on SPG 4.03

At 10 Hz it is tracking the same number, but solving for 16, no residuals are generated for the remaining, so I suspect it is reducing the math load, but could still be picking the best available subset. Still generating raw measurements for all.

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#### All Answers



[clive1 \(/s/profile/0052p000008HYMwAAO\)](/s/profile/0052p000008HYMwAAO) (Customer)

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[clive1 \(/s/profile/0052p000008HYMwAAO\)](/s/profile/0052p000008HYMwAAO) (Customer)

Edited February 10, 2021 at 3:19 PM

Also worked at 9.9 Hz (101 ms), given zero attention seems to be paid to the time-domain via TIMEPULSE, probably not that critical it syncs

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[fseg \(/s/profile/0052p00000AKKgNAAX\)](/s/profile/0052p00000AKKgNAAX) (Customer)

Edited February 10, 2021 at 4:50 PM

I understood your first reply, but struggle with the second.

Are you saying that @9.9Hz it is possible to get a solution for 28-30 satellites as well, but the information given via UBX-TIM-TP will not be updated correctly?

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[clive1 \(/s/profile/0052p000008HYMwAAO\)](/s/profile/0052p000008HYMwAAO) (Customer)

5 years ago

In my experience most GNSS used in flight controllers don't connect the TIMEPULSE pin, so there's no systemic understanding of time.

With a 9.9 Hz update rate, I'd expect the reporting to precess wrt to the timepulse, top-of-second.

Like Reply



[fseg \(/s/profile/0052p00000AKKgNAAX\)](/s/profile/0052p00000AKKgNAAX) (Customer)

5 years ago

Thanks for the clarification. I did not know about the TIMEPULSE pin.

Like Reply



clive1 (/s/profile/0052p000008HYMwAAO) (Customer)

a year ago

[https://github.com/cturvey/RandomNinjaChef/blob/main/M9\\_channels.c](https://github.com/cturvey/RandomNinjaChef/blob/main/M9_channels.c)  
([https://github.com/cturvey/RandomNinjaChef/blob/main/M9\\_channels.c](https://github.com/cturvey/RandomNinjaChef/blob/main/M9_channels.c))

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fseg (/s/profile/0052p00000AKKgNAAX) (Customer)

Edited February 11, 2021 at 11:14 AM

So, seems like I did not only send UBX-NAV-PVT & UBX-NAV-SAT, but also UBX-NAV-POSECEF & UBX-NAV-SBAS.

The problem that I had, where I saw dropouts in the satellite history view and high latency in the message view, I wrongly described as "glitches".

The actual problem I had was that I tried to squeeze too much data through the UART-Port.

Message name	Data length per send
UBX-NAV-PVT	8+92 = <b>100</b>
UBX-NAV-POSECEF	8+20 = <b>28</b>
UBX-NAV-SAT	8+8+12*numSvs = <b>460</b> (with numSvs=37)
UBX-NAV-SBAS	8+12+12*cnt = <b>248</b> (with cnt=19)
<b>TOTAL</b>	<b>836</b>

\*data lenght can be found in the [M9N interface description \(https://www.u-blox.com/sites/default/files/NEO-M9N\\_InterfaceDescription\\_%28UBX-19035940%29.pdf\)](https://www.u-blox.com/sites/default/files/NEO-M9N_InterfaceDescription_%28UBX-19035940%29.pdf).

\*\*the additional 8 bytes come from the ubx header and checksum

\*\*\*numSvs and cnt are numbers i got, when holding the module out of the window

@10Hz nav. update rate i get a throughput of 836byte\*8\*10Hz = 66.880 bit/s -> no problems with a baudrate of 115200.

@20Hz it will be 133.760 bit/s -> to much data -> tx buffer overflow

Under clear sky conditions the data that needs to be sent will further increase.

Note to myself: Check UBX-MON-COMMS to check the state of the UART port.

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