

NEO-7P

u-blox 7 GPS/GNSS module with Precise Point Positioning

Highlights

- High precision GPS < 1 m
- DGPS by SBAS or RTCM
- Combines low power consumption and high sensitivity
- Simple integration with u-blox wireless modules
- Backward compatible with NEO-6 and NEO-5 families
- Raw measurement data (GPS)



NEO-7P:
12.2 x 16.0 x 2.4 mm

Product description

The NEO-7P module combines the high performance of the u-blox 7 multi-GNSS engine with Precise Point Positioning (PPP) technology for GPS. u-blox' industry-proven PPP algorithm, in combination with SBAS, provides exceptional precision in clear-sky applications without the need for a reference station. This makes NEO-7P the ideal solution for many applications in surveying, marine navigation, agriculture, sports and leisure.

For application world-wide, the NEO-7P supports Differential GPS (DGPS) operation as an alternative to SBAS and PPP, using RTCM correction messages from a local reference station or aiding network. Ionospheric corrections received from regional SBAS satellites (WAAS, EGNOS, MSAS) enable the highest stand-alone positioning accuracy from the PPP algorithm. u-blox' PPP also provides useful improvements in stand-alone precision even without SBAS. PPP delivers its full benefits after the first few minutes of operation with an unobstructed sky view.

The entire NEO-7 series combines excellent sensitivity with low power and includes variants optimised for cost and performance. The industry-proven NEO form factor allows easy migration from previous NEO generations. The NEO-7P features a front-end SAW RF filter for increased jamming immunity. This is reinforced by sophisticated RF-architecture and interference suppression, ensuring maximum performance even in hostile signal environments. UART, USB and DDC (I2C compliant) interfaces provide flexible connectivity and synergies with u-blox SARA, LEON and LISA cellular wireless modules. The NEO-7P's internal Flash allows simple firmware upgrades.

u-blox 7 modules use GPS/GNSS chips qualified according to AEC-Q100 and are manufactured in ISO/TS 16949 certified sites. Qualification tests are performed as stipulated in the ISO16750 standard: "Road vehicles – Environmental conditions and testing for electrical and electronic equipment".

Product selector

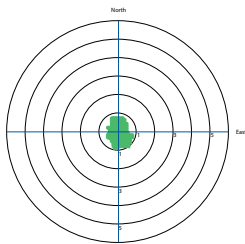
Model	Type	Supply	Interfaces	Features
	GPS QZSS GLONASS Timing Dead Reckoning Precise Point Positioning	2.7 V – 3.6 V 1.65 V – 3.6 V Lowest power (DC/DC)	UART USB SPI DDC (I ² C compliant)	Programmable (Flash) Data logger Extra front-end LNA Front-end SAW filter Oscillator RTC crystal Antenna supply Antenna short circuit detection / protection Antenna open circuit detection pin Timepulse External interrupt / Wakeup
NEO-7P	• S •	• •	• • Sel •	• • • C • • • • • •

S = Standard Point Positioning only
C = Crystal / T = TCXO

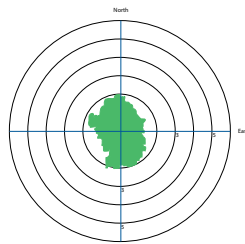
○ = Optional, not activated per default or requires external components
Sel = Select for either SPI or UART/DDC by HW configuration pin (D_SEL)

Features

Receiver type	56-channel u-blox 7 engine GPS L1 C/A, GLONASS L1 FDMA, QZSS L1 C/A, SBAS: WAAS, EGNOS, MSAS		
Navigation update rate	Up to 10 Hz		
Accuracy	GPS	GLONASS	
	Position:	2.5 m CEP	4 m
	SBAS:	2.0 m CEP	n.a.
Acquisition	SBAS + PPP:	< 1 m CEP	n.a.
	Cold starts:	29 s	30 s
	Aided starts:	5 s	n.a.
Sensitivity	Reacquisition:	1 s	3 s
	Tracking:	-162 dBm	-158 dBm
	Cold starts:	-148 dBm	-140 dBm
Assistance	Warm starts:	-148 dBm	-145 dBm
	AssistNow Online		
	AssistNow Offline		
Oscillator	AssistNow Autonomous		
	OMA SUPL & 3GPP compliant		
	Crystal		
RTC crystal	Built-In		
Anti jamming	Active CW detection and removal		
Memory	Flash		
Supported antennas	Active		



Accuracy with PPP+SBAS
(units in m)



Accuracy with GPS and SBAS
(units in m)

Interfaces

Serial interfaces	1 UART 1 USBV2.0 full speed 12 Mbit/s 1 SPI (optional) 1 DDC (I ² C compliant)
Digital I/O	Configurable timepulse 1 EXTINT input for Wakeup
Timepulse	Configurable 0.25 Hz to 1 kHz
Protocols	NMEA, UBX binary, RTCM

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Package

24 pin LCC (Leadless Chip Carrier): 12.2 x 16.0 x 2.4 mm, 1.6 g

Pinout

13	GND	GND	12
14	ANT_ON	RF_IN	11
15	Reserved	GND	10
16	Reserved	VCC_RF	9
17	Reserved	RESET_N	8
NEO-7P Top View			
18	SDA	VDD_USB	7
19	SCL	USB_DP	6
20	TxD	USB_DM	5
21	RxD	EXTINT	4
22	V_BCKP	TIMEPULSE	3
23	VCC	D_SEL	2
24	GND	Reserved	1

Environmental data, quality & reliability

Operating temp.	-40° C to 85° C
Storage temp.	-40° C to 85° C
RoHS compliant (lead-free)	
Qualification according to ISO 16750	
Manufactured in ISO/TS 16949 certified production sites	
Uses u-blox 7 chips qualified according to AEC-Q100	

Electrical data

Supply voltage	2.7 V to 3.6 V
Power Consumption	70 mW @ 3 V (Continuous)
Backup Supply	1.4 to 3.6V

Ordering information

NEO-7P-0	u-blox 7 LCC Module, GPS/GNSS Precise Point Positioning, Raw Data 12x16 mm, 250 pcs/reel, 3 V
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Available as samples and tape on reel

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