

G10A-F30

Standard precision GNSS module Data sheet



Overview

G10A-F30 module features the [u-blox](#) M10 standard precision GNSS platform and provides exceptional sensitivity and acquisition time for all L1 GNSS signals. G10A-F30 is a highly cost-effective GNSS L1 solution.

The M10 platform supports concurrent reception of four GNSS (GPS, GLONASS, Galileo, and BeiDou). The high number of visible satellites enables the receiver to select the best signals. This maximizes the position availability, in particular under challenging conditions such as in deep urban canyons.

u-blox Super-S (Super-Signal) technology offers great RF sensitivity and can improve the dynamic position accuracy with small antennas or in non-line-of-sight scenarios.

Performance

Parameter	Specification	Value
Chipset	UBX M10 GNSS Engine	UBX-M10050-KB
GNSS constellations	GPS L1	L1C/A (1575.42 MHz)

	QZSS L1	L1S (SLAS)
	GLONASS	L1OF (1602 MHz + k*562.5 kHz, k = -7,..., 5, 6)
	BeiDou	B1I (1561.098 MHz), B1C (1575.42 MHz)
	Galileo	E1-B/C (1575.42 MHz)
	SBAS L1 C/A	L1 C/A: WAAS, EGNOS, MSAS, GAGAN
Protocols	UBX	Input/output, binary, ublox proprietary
	NMEA 2.1, 2.3, 4.0, 4.10 4.11	Input/output, ASCII
Accuracy	Position accuracy (CEP)	1.5 m
	Velocity accuracy	0.05 m/s
	Dynamic heading accuracy	0.3 deg
	Time pulse signal	30ns RMS 60ns 99%
Frequency of time pulse signal	/	Default 1PPS (0.25 Hz to 10 MHz)
Max navigation update rate	Normal mode	1-18Hz
	High performance mode	1-25Hz
Operational limits	Dynamics	≤ 4 g
	Altitude	≤ 80,000 m
	Velocity	≤ 500 m/s
Time To First Fix (TTFF)	Cold start	23 s
	Hot start	1 s
Sensitivity	Tracking and navigation	-167 dBm
	Reacquisition	-160dBm
	Cold Start	-148dBm
	Hot start	-159 dBm
Interface	Signal level	Uart TTL
	Baud rate	4800-921600
Electrical	Supply voltage	3.3V-5.0V

	Consumption	30mA
Mechanical	Size	L28mm*W28mm*H8mm
	Weight	12.5 g
	Connector	1.25mm 6pins

Supported GNSS constellations

G10A-F30 is a concurrent GNSS receiver that can receive and track multiple GNSS systems. The single RF front-end architecture enables concurrent reception of multiple GNSS constellations. The receiver can be configured for a subset of GNSS constellations to achieve lower power consumption. The factory configuration on G10A-F30 is concurrent reception of GPS, Galileo, GLONASS and BeiDou B1C with QZSS and SBAS enabled.

The following GNSS and their signals are supported:

System	Signals
GPS / QZSS	L1C/A (1575.42 MHz)
Galileo	E1-B/C (1575.42 MHz)
GLONASS	L1OF (1602 MHz + $k \cdot 562.5$ kHz, $k = -7, \dots, 5, 6$)
BeiDou ¹³	B1I (1561.098 MHz), B1C (1575.42 MHz)

The following augmentation systems are supported:

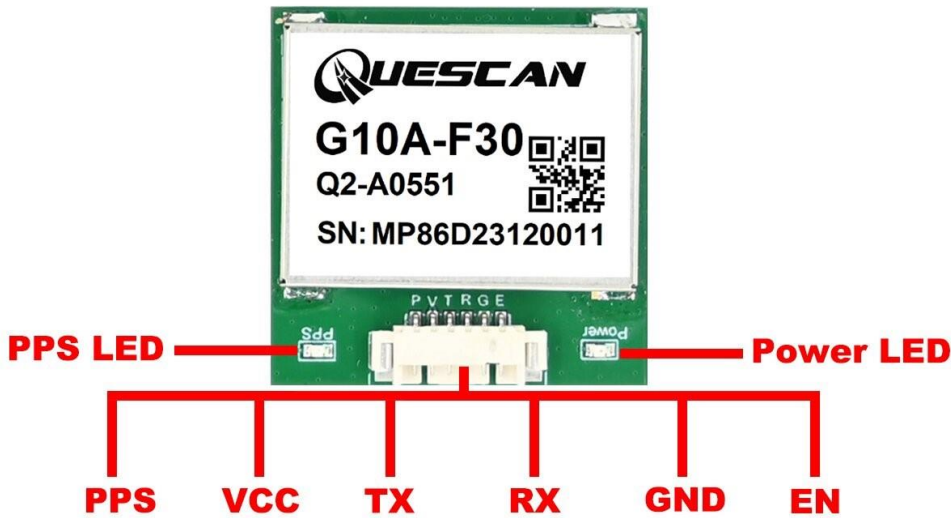
System	Support
SBAS	EGNOS, GAGAN, MSAS, WAAS and BDSBAS
QZSS	L1S (SLAS)

1. BeiDou B1I cannot be enabled simultaneously with BeiDou B1C or GLONASS L1OF.
2. The augmentation systems SBAS and QZSS can be enabled only if GPS operation is also enabled.

Supported protocols

Protocol	Type
UBX	Input/output, binary, u-blox proprietary
NMEA versions 2.1, 2.3, 4.0, 4.10 and 4.11 (default)	Input/output, ASCII

Pin definition



Pin NO.	Pin Name	Pin Description
1 (P)	1PPS	Time pulse signal
2 (V)	VCC	Main power DC3.3-5.0V
3 (T)	TX	Transmit data
4 (R)	RX	Receive data
5 (G)	GND	GROUND
6 (E)	EN	Power enable,default(N C)is high level module works, into sleep mode when low level

Name	Colour	Status
Power LED	Red	Always on after module powered on
PPS LED	Green	Flash once when powered on,flash at 1Hz after 3D lock

Dynamic platform

The dynamic platform model can be configured through the CFG-NAVSPG-DYNMODEL configuration item. For the supported dynamic platform models and their details please refer to the table below. The default dynamic model is Portable.

Dynamic platform models:

Platform	Description
Portable	Applications with low acceleration, e.g. portable devices. Suitable for most situations.
Stationary	Used in timing applications (antenna must be stationary) or other stationary applications. Velocity restricted to 0 m/s. Zero dynamics assumed.
Pedestrian	Applications with low acceleration and speed, e.g. how a pedestrian would move. Low acceleration assumed.
Automotive	Used for applications with equivalent dynamics to those of a passenger car. Low vertical acceleration assumed.
At sea	Recommended for applications at sea, with zero vertical velocity. Zero vertical velocity assumed. Sea level assumed.
Airborne <1g	Used for applications with a higher dynamic range and greater vertical acceleration than a passenger car. No 2D position fixes supported.
Airborne <2g	Recommended for typical airborne environments. No 2D position fixes supported.
Airborne <4g	Only recommended for extremely dynamic environments. No 2D position fixes supported.
Wrist	Only recommended for wrist-worn applications. Receiver will filter out arm motion.

Dynamic platform model details:

Platform	Max altitude [m]	Max horizontal velocity [m/s]	Max vertical velocity [m/s]	Sanity check type	Max position deviation
Portable	12000	310	50	Altitude and velocity	Medium
Stationary	9000	10	6	Altitude and velocity	Small
Pedestrian	9000	30	20	Altitude and velocity	Small
Automotive	6000	100	15	Altitude and velocity	Medium
At sea	500	25	5	Altitude and velocity	Medium
Airborne <1g	80000	100	6400	Altitude	Large
Airborne <2g	80000	250	10000	Altitude	Large
Airborne <4g	80000	500	20000	Altitude	Large
Wrist	9000	30	20	Altitude and velocity	Medium

Factory Settings

GPS+Galileo+GLONASS+BeiDou+QZSS+SBAS

- 38400 baud, 8 bits, no parity bit, 1 stop bit.
- 1Hz navigation update rate.
- 1PPS time pulse
- NMEA version 4.11.
- Input messages: NMEA and UBX.
- Output messages: NMEA GGA, GLL, GSA, GSV, RMC, VTG and TXT.

NMEA ver4.11

NMEA Message	Description	Enable
\$Talker ID+GGA	Time, position, and fix related data	Y
\$Talker ID+GLL	Position data: position fix, time of position fix, and status	Y
\$Talker ID+GSA	GNSS DOP and active satellites	Y
\$Talker ID+GSV	Number of SVs in view, PRN, elevation, azimuth, and SNR	Y

\$Talker ID+RMC	Position, Velocity, and Time	Y
\$Talker ID+VTG	Course over ground and ground speed	Y
ZDA GNS DTM GBS GST GRS etc.		N
The main talker ID includes: GP-GPS/BD or GB-Beidou/GA-Galileo/GL-GLONASS/GQ-QZSS/GN-More than one constellation		