L1/L5
Sub-Meter Accuracy
GNSS Receiver Module

Features

- 230 acquisition/tracking channels
- GPS L1/L5, Galileo E1/E5a, BDS B1/B2a signal reception
- Supports regional QZSS, SBAS
- 16 million time-frequency hypothesis testing per sec
- -147dBm cold start sensitivity
- -162dBm tracking sensitivity
- 29 second cold start TTFF
- 3.5 second TTFF with AGPS
- 1 second hot start
- < 1.0m CEP accuracy
- Multipath detection and suppression
- Jamming detection and mitigation
- AGPS Support
- Complete receiver in 12.2mm x 16.0mm size
- Operating temperature -40 ~ +85ºC
- Pb-free RoHS compliant

Applications

- Navigation and asset tracking
- Timing reference

The PX1125S-02 is a satellite navigation receiver capable of using GPS/QZSS L1/L5, Galileo E1/E5a, BDS B1/B2a dual frequency signal to remove ionospheric error to provide sub-meter level accuracy navigation result in a compact SMD module. It is fully autonomous such that once power is applied, the receiver automatically searches, acquires and tracks satellite signals. When a sufficient number of satellites are tracked with valid measurements, the receiver produces 3D position and velocity outputs.

Using wide-band L5 10MHz signal, PX1125S-02 has better accuracy under multipath signal environments.

Single-chip Phoenix positioning engine is inside the receiver module. It features high sensitivity and fast TTFF. The PX1125S-02 can acquire, track, and get position fix autonomously in difficult weak signal environment. Its high tracking sensitivity allows continuous position coverage in nearly all outdoor application environments. The high performance signal parameter search engine is capable of testing 16 million time-frequency hypotheses per second, offering superior signal acquisition and TTFF speed.

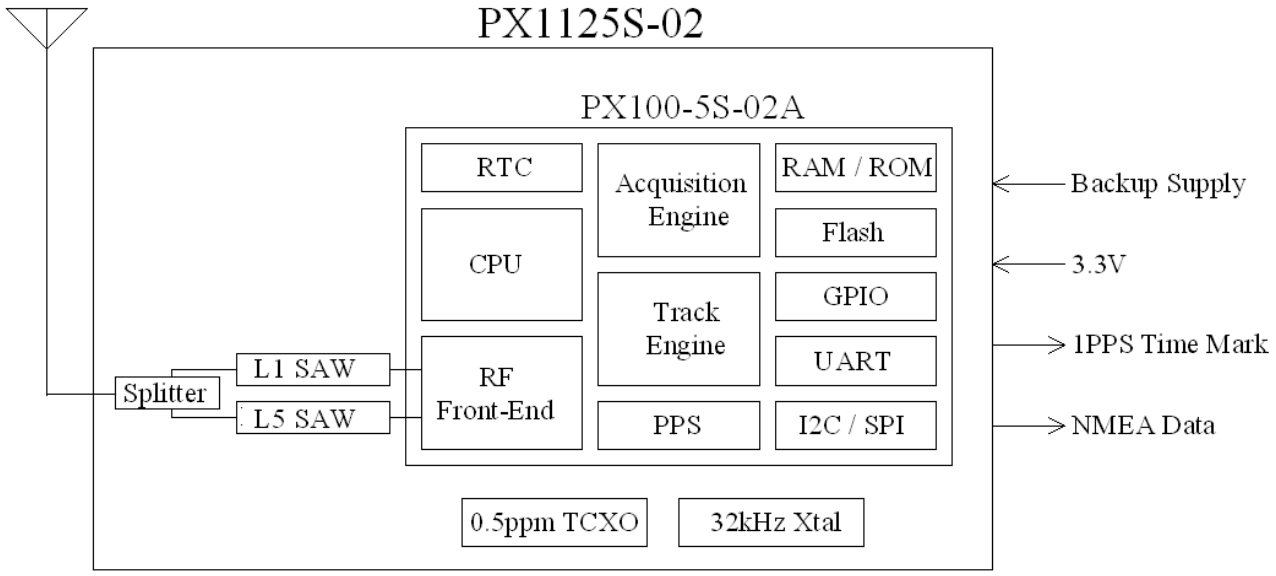
PX1125S-02 is backward pin-to-pin compatible with earlier SkyTraq 12mm x 16mm form factor GNSS module, allowing easy migration.

PX1125S-02 use GNSS chips qualified according to AEC-Q100 and are manufactured in ISO/TS 16949 certified sites.

TECHNICAL SPECIFICATIONS

Receiver Type	L1 /L5 frequency, 230-channel Phoenix engine
Supported Satellites	GPS, Galileo, BDS
Augmentation System	QZSS, WAAS, EGNOS, MSAS, GAGAN
Accuracy	Position < 1.0m CEP Velocity 0.1m/sec Time 10ns
Startup Time	1 / 28 / 29 second hot / warm / cold start under open sky average
Reacquisition	1s
Sensitivity	-147dBm cold-start -158dBm re-acquisition -162dBm tracking
Multi-path Mitigation	Advanced multi-path detection and suppression
A-GPS	Server-based AGPS
Update Rate	1 / 2 / 4 / 5 / 8 / 10 / 20 / 25 Hz (default 1Hz)
Dynamics	4G (39.2m/sec^2)
Operational Limits	Altitude < 80,000m and velocity < 515m/s
Serial Interface	3.3V LVTTL level
Protocol	NMEA-0183 V4.1, SkyTraq binary, 115200 baud, 8, N, 1
Datum	Default WGS-84, User definable
Input Voltage	3.3V DC +/-10%
Current Consumption	Acquisition 85mA @ 3.3V, Tracking 75mA @ 3.3V
Dimension	16.0mm L x 12.2mm W x 2.9mm H
Weight:	1.6g
Operating Temperature	-40^{o}C ~ +85^{o}C
Storage Temperature	-55 ~ +100^{o}C
Humidity	5% ~ 95%

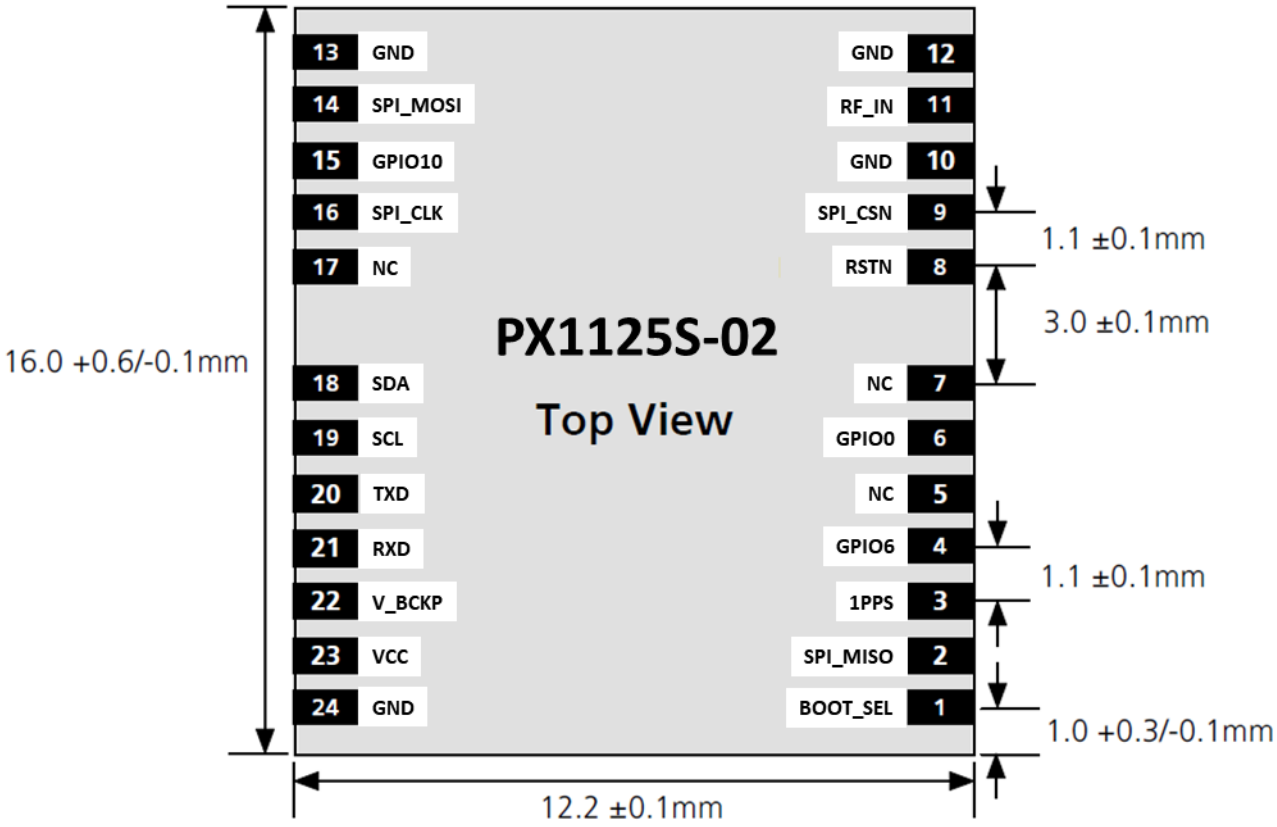
BLOCK DIAGRAM



The PX1125S-02 is a sub-meter accuracy L1/L5 dual frequency capable satellite navigation receiver in a compact surface mount package. It is based on the latest single-chip Phoenix GNSS receiver technology, providing high performance signal acquisition and tracking. The simple UART serial interface and the standard NMEA-0183 protocol make usage of PX1125S-02 very easy and straightforward.

The PX1125S-02 module performs all the necessary system initialization, signal acquisition, signal tracking, data demodulation, and calculation of navigation solution autonomously.

MECHANICAL CHARACTERISTICS



PINOUT DESCRIPTION

Pin No.	Name	Description
1	BOOT_SEL	No connection for normal use. Pull-low for loading firmware into empty or corrupted Flash memory from ROM mode.
2	SPI_MISO	Not used. Leave unconnected
3	1PPS	One-pulse-per-second (1PPS) time mark output, 3.3V LVTTL. The rising edge synchronized to UTC second when getting 3D position fix. The pulse duration is about 100msec at rate of 1 Hz.
4	GPIO6	Not used. Leave unconnected
5	NC	No connection, empty pin
6	GPIO0	Not used. Leave unconnected
7	NC	No connection, empty pin
8	RSTN	External active-low reset input to the baseband. Only needed when power supply rise time is very slow or software controlled reset is desired.
9	SPI_CSN	Not used. Leave unconnected
10	GND	Ground
11	RF_IN	RF signal input, connect to active L1/L5 GNSS antenna. 3.2V active antenna bias on RF_IN.
12	GND	Ground
13	GND	Ground

14	SPI_MOSI	Not used. Leave unconnected
15	GPIO10	Not used. Leave unconnected
16	SPI_CLK	Not used. Leave unconnected
17	NC	No connection, empty pin
18	SDA	Not used. Leave unconnected
19	SCL	Not used. Leave unconnected
20	TXD	UART serial data output, 3.3V LVTTL. One full-duplex asynchronous serial UART port is implemented. This UART output is normally used for sending position, time and velocity information from the receiver in NMEA-0183 format. When idle, this pin output HIGH.
21	RXD	UART serial data input, 3.3V LVTTL. One full-duplex asynchronous serial UART port is implemented. This UART input is normally for sending commands or information to the receiver in SkyTraq binary protocol. In the idle condition, this pin should be driven HIGH. If the driving circuitry is powered independently of PX1125S-02, ensure that this pin is not driven to HIGH when primary power to PX1125S-02 is removed, or a 10K-ohm series resistor can be added to minimize leakage current from application to the powered off module.
22	V_BCKP	Backup supply voltage for internal RTC and backup SRAM, 1.3V ~ 3.6V. V_BCKP must be applied whenever VCC is applied. This pin should be powered continuously to minimize the startup time. If VCC and V_BCKP are both removed, the receiver will be in factory default mode upon power up, all user configuration set is lost. For applications the does not care cold starting every time, this pin can be connect to VCC.
23	VCC	Main power supply, 3.3V +/- 10%
24	GND	Ground

ELECTRICAL SPECIFICATIONS

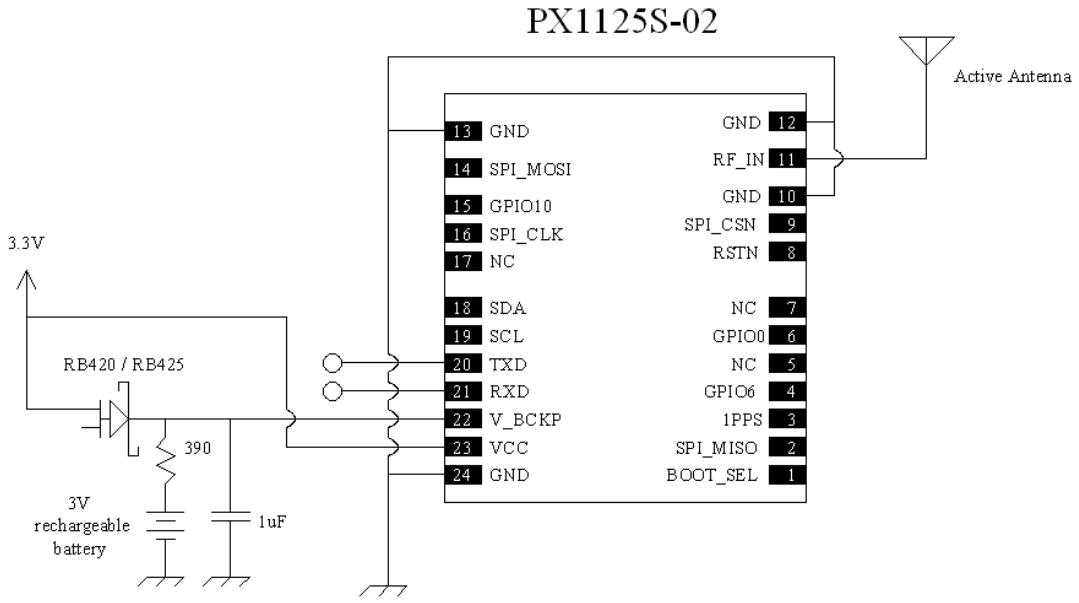
ABSOLUTE MAXIMUM RATINGS

Parameter	Minimum	Maximum	Condition
Supply Voltage (VCC)	-0.5	3.6	Volt
Backup Battery Voltage (V_BCKP)	-0.5	3.6	Volt
Input Pin Voltage	-0.5	VCC+0.5	Volt
Input Power at RF_IN		+5	dBm
Storage Temperature	-40	+100	degC

OPERATING CONDITIONS

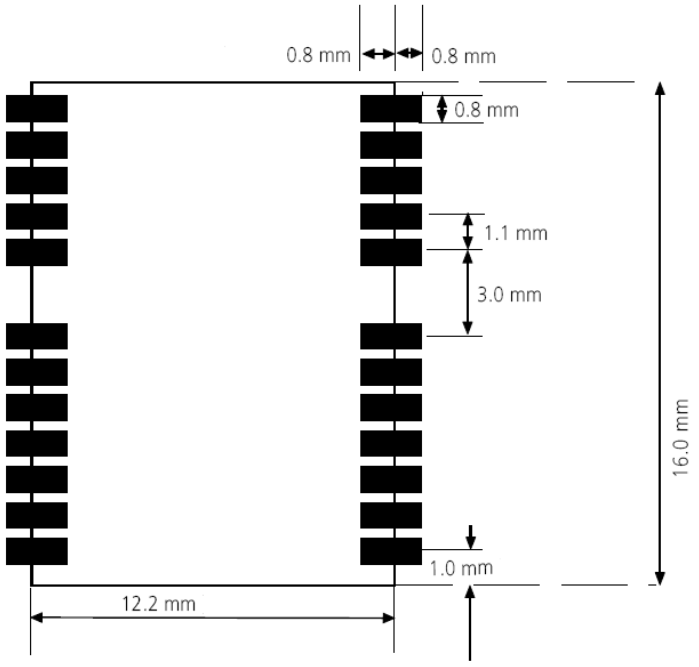
Parameter	Min	Typ	Max	Unit
Supply Voltage (VCC)	3	3.3	3.6	Volt
Acquisition Current (exclude active antenna current)		85		mA
Tracking Current (exclude active antenna current)		75		mA
Backup Voltage (V_BCKP)	1.3		3.6	Volt
Backup Current (VCC voltage applied)		54		uA
Backup Current (VCC voltage off)		13		uA
Output Low Voltage			0.4	Volt
Output HIGH Voltage	2.4			Volt
Input LOW Voltage			0.8	Volt
Input HIGH Voltage	2			Volt
Input LOW Current	-10		10	uA
Input HIGH Current	-10		10	uA
RF Input Impedance (RFIN)		50		Ohm

APPLICATION CIRCUIT

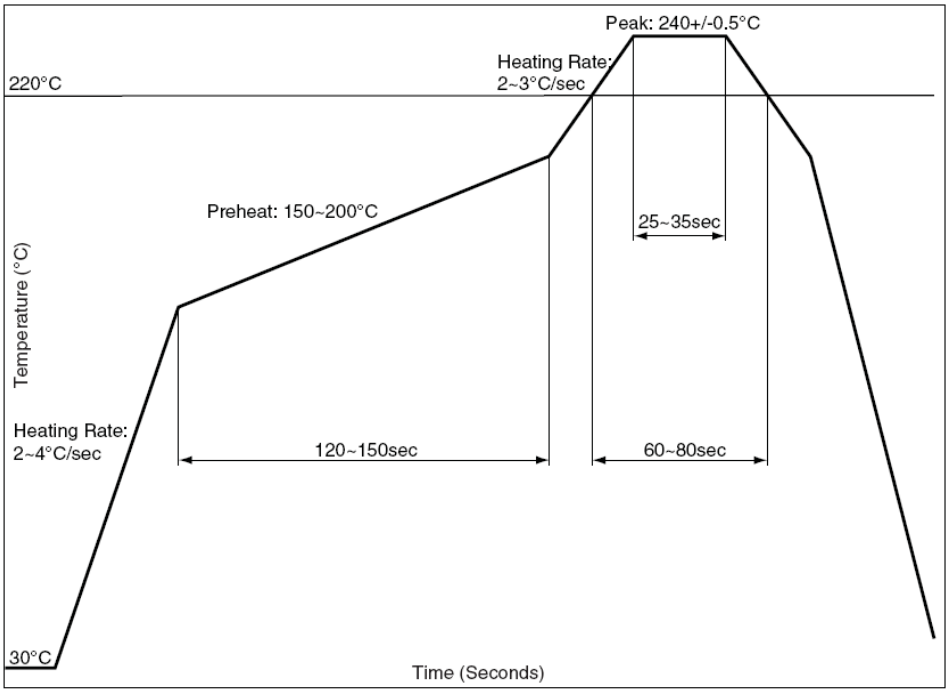


When PX1125S-02 has previously been used within 2 hour, for faster time to first fix powering up without needing to decoded ephemeris data from signal, V_BCKP should be connected to non-volatile supply; above figure with V_BCKP connected to rechargeable battery is an example implementation. If cold starting every time powering up is not an issue, V_BCKP can be connect to VCC.

PRECOMMENDED LAYOUT PAD



RECOMMANDED REFLOW PROFILE



The reflow profile shown above should not be exceeded, since excessive temperatures or transport times during reflow can damage the module. Cooling temperature fall rate: max 3°C / sec

ANTENNA CONSIDERATIONS

To have sub-meter accuracy good quality active antenna covering L1 frequency band (1559MHz ~ 1577MHz) and L5 frequency band (1166MHz ~ 1187MHz) need to be used. Antenna with gain of 25 ~ 40 dB and noise figure less than 2dB can be used.

POWER SUPPLY REQUIREMENT

PX1125S-02 requires a stable power supply, avoid ripple on VCC pin (<50mVpp). Power supply noise can affect the receiver's sensitivity. Bypass capacitors of 10uF and 0.1uF is recommended to be placed close to the module VCC pin; the values could be adjusted according to the amount and type of noise present on the supply line.

BACKUP SUPPLY

The purpose of backup supply voltage pin (V_BCKP) is to keep the SRAM memory and the RTC powered when the module is powered down. This enables the module to have a faster time-to-first-fix when the module is powered on again. The backup current drain is less than 15μA. In normal powered on state, the internal processor access the SRAM and current drain is higher in active mode

1PPS OUTPUT

A 1 pulse per second signal (100msec HIGH duration) is generated on 1PPS pin when the receiver has 3D position fix using 4 or more satellites. The rising edge of the pulse is aligned with UTC second, with accuracy of about 10nsec. It outputs constant LOW when no position fix is available initially.

LAYOUT GUIDELINES

Separate RF and digital circuits into different PCB regions.

It is necessary to maintain 50-ohm impedance throughout the entire RF signal path. Try keeping the RF signal path as short as possible.

Do not route the RF signal line near noisy sources such as digital signals, oscillators, switching power supplies, or other RF transmitting circuit. Do not route the RF signal under or over any other components (including PX1125S-02), or other signal traces. Do not route the RF signal path on an inner layer of a multi-layer PCB to minimize signal loss.

Avoid sharp bends for RF signal path. Make two 45-deg bends or a circular bend instead of a single 90-degree bend if needed.

Avoid vias with RF signal path whenever possible. Every via adds inductive impedance. Vias are acceptable for connecting the RF grounds between different layers. Each of the module's ground pins should have short trace tying immediately to the ground plane below through a via.

The bypass capacitors should be low ESR ceramic types and located directly adjacent to the pin they are for.

HANDLING GUIDELINE

The PX1125S-02 modules are rated MSL4, must be used for SMT reflow mounting within 72 hours after taken out from the vacuumed ESD-protective moisture barrier bag in factory condition < 30degC / 60% RH. If this floor life time is exceeded, or if the received ESD-protective moisture barrier bag is not in vacuumed state, then the device need to be pre-baked before SMT reflow process. Baking is to be done at 85degC for 8 to 12 hours. Once baked, floor life counting begins from 0, and has 72 hours of floor life at factory condition < 30degC / 60% RH. Do not bake the module in tape-on-reel form; for baking, place parts individually onto oven tray

PX1125S-02 module is ESD sensitive device and should be handled with care.

NMEA Output Description

The output protocol supports NMEA-0183 standard. The implemented messages include GGA, GLL, GSA, GSV, VTG, RMC, and ZDA messages. The NMEA message output has the following sentence structure:

$aaccc,c–c*hh<CR><LF>

The detail of the sentence structure is explained in Table 1.

Table 1: The NMEA sentence structure

character	HEX	Description
"$"	24	Start of sentence.
Aaccc		Address field. "aa" is the talker identifier. "ccc" identifies the sentence type.
","	2C	Field delimiter.
C–c		Data sentence block.
"*"	2A	Checksum delimiter.
Hh		Checksum field.
<CR><LF>	0D0A	Ending of sentence. (carriage return, line feed)

Table 2: Overview of SkyTraq receiver's NMEA messages

$GPGGA	Time, position, and fix related data of the GPS receiver.
$GNGLL	Position, time and fix status.
$GNGSA	Used to represent the ID's of satellites which are used for position fix. When GPS satellites are used for position fix, $GNGSA sentence is output with system ID 1. When GLONASS satellites are used for position fix, $GNGSA sentence is output with system ID 2. When Galileo satellites are used for position fix, $GNGSA sentence is output with system ID 3. When BDS satellites are used for position fix, $GNGSA sentence is output with system ID 4.
$GPGSV **$GLGSV** **$GAGSV** **$GBGSV**	Satellite information about elevation, azimuth and CNR, $GPGSV is used for GPS satellites, while $GLGSV is used for GLONASS satellites, while $GAGSV is used for GALILEO satellites, while $GBGSV is used for BEIDOU satellites.
$GNRMC	Time, date, position, course and speed data.
$GNVTG	Course and speed relative to the ground.
$GNZDA	UTC, day, month and year and time zone.

The formats of the supported NMEA messages are described as follows:

GGA – Global Positioning System Fix Data
Time, position and fix related data for a GPS receiver.

Structure:
$GPGGA,hhmmss.sss,ddmm.mmmmm,a,dddmm.mmmmm,a,x,xx,x.x,x.x,M,x.x,M,x.x,xxxx*hh<CR><LF>
1 2 3 4 5 6 7 8 9 10 11 12 13

Example:
$GPGGA,092151.000,2447.08723,N,12100.52174,E,1,31,0.4,101.5,M,19.6,M,,0000*53<CR><LF>

Field	Name	Example	Description
1	UTC Time	092151.000	UTC of position in hhmmss.sss format, (000000.000 ~ 235959.999)
2	Latitude	2447.08723	Latitude in ddmm.mmmm mformat Leading zeros transmitted
3	N/S Indicator	N	Latitude hemisphere indicator, 'N' = North, 'S' = South
4	Longitude	12100.52174	Longitude in dddmm.mmmmm format Leading zeros transmitted
5	E/W Indicator	E	Longitude hemisphere indicator, 'E' = East, 'W' = West
6	Quality Indicator	1	GPS quality indicator 0: position fix unavailable 1: valid position fix, SPS mode 2: valid position fix, differential GPS mode 3: GPS PPS Mode, fix valid 4: Real Time Kinematic. System used in RTK mode with fixed integers 5: Float RTK. Satellite system used in RTK mode., floating integers 6: Estimated (dead reckoning) Mode 7: Manual Input Mode 8: Simulator Mode
7	Satellites Used	31	Number of satellites in use, (00 ~ 12)
8	HDOP	0.4	Horizontal dilution of precision, (0.0 ~ 99.9)
9	Altitude	101.5	mean sea level (geoid), (-9999.9 ~ 17999.9)
10	Geoidal Separation	19.6	Geoidal separation in meters
11	Age pf Differential GPS data		Age of Differential GPS data NULL when DGPS not used
12	DGPS Station ID	0000	Differential reference station ID, 0000 ~ 1023
13	Checksum	53	

GLL – Latitude/Longitude

Latitude and longitude of current position, time, and status.

Structure:

$GNGLL,ddmm.mmmmm,a,dddmm.mmmmm,a,hhmmss.sss,A,a*hh<CR><LF>

1 2 3 4 5 6 7 8

Example:

$GNGLL,2447.08723,N,12100.52174,E,092151.000,A,A*45<CR><LF>

Field	Name	Example	Description
1	Latitude	2447.08723	Latitude in ddmm.mmmmm format Leading zeros transmitted
2	N/S Indicator	N	Latitude hemisphere indicator 'N' = North 'S' = South
3	Longitude	12100.52174	Longitude in dddmm.mmmmm format Leading zeros transmitted
4	E/W Indicator	E	Longitude hemisphere indicator 'E' = East 'W' = West
5	UTC Time	092151.000	UTC time in hhmmss.sss format (000000.000 ~ 235959.999)
6	Status	A	Status, 'A' = Data valid, 'V' = Data not valid
7	Mode Indicator	A	Mode indicator 'A' = Autonomous mode 'D' = Differential mode 'E' = Estimated (dead reckoning) mode 'M' = Manual input mode 'S' = Simulator mode 'N' = Data not valid
8	Checksum	45	

GSA – GNSS DOP and Active Satellites

GNSS receiver operating mode, satellites used in the navigation solution reported by the GGA or GNS sentence and DOP values.

Structure:

$GNGSA,A,x,xx,xx,xx,xx,xx,xx,xx,xx,xx,xx,xx,xx,x.x,x.x,x.x,x*hh<CR><LF>

1 2 3 3 3 3 3 3 3 3 3 3 3 4 5 6 7 8

Example:

$GNGSA,A,3,05,06,13,15,19,20,29,30,,,,,0.7,0.4,0.6,1*33<CR><LF>

$GNGSA,A,3,03,07,08,13,15,,,,,,,,0.7,0.4,0.6,3*3C<CR><LF>

$GNGSA,A,3,04,07,09,10,11,13,14,16,27,28,33,34,0.7,0.4,0.6,4*32<CR><LF>

$GNGSA,A,3,38,39,40,41,42,43,,,,,,,0.7,0.4,0.6,4*30<CR><LF>

Field	Name	Example	Description
1	Mode	A	Mode 'M' = Manual, forced to operate in 2D or 3D mode 'A' = Automatic, allowed to automatically switch 2D/3D
2	Mode	3	Fix type 1 = Fix not available 2 = 2D 3 = 3D
3	Satellite used 1~12	05, 06, 13, 15, 19, 20, 29, 30,	01 ~ 32 are for GPS; 33 ~ 64 are for WAAS (PRN minus 87); 193 ~ 197 are for QZSS; 65 ~ 88 are for GLONASS (GL PRN) ; 01 ~ 36 are for GALILEO (GA PRN); 01 ~ 37 are for BDS (BD PRN). GPS, GLONASS, GALILEO and BDS satellites are differentiated by the GNSS system ID in table 3. Maximally 12 satellites are included in each GSA sentence.
4	PDOP	0.7	Position dilution of precision (0.0 to 99.9)
5	HDOP	0.4	Horizontal dilution of precision (0.0 to 99.9)
6	VDOP	0.6	Vertical dilution of precision (0.0 to 99.9)
7	GNSS System ID	1	GNSS system ID* 1 = GPS 2 = GLONASS 3 = GALILEO 4 = BDS 6 = IRNSS
8	Checksum	33	

*GNSS System ID identifies the GNSS system ID according to Table 3.

Table 3: GNSS Identification Table for GSA, GSV

System	System ID (Talker)	Signal ID	Signal Name
GPS	1 (GP)	0	All signals
		1	L1 C/A
		2	L1 P(Y)
		3	L1C
		4	L2 P(Y)
		5	L2C-M
		6	L2C-L
		7	L5-I
		8	L5-Q
GLONASS	2 (GL)	0	All signals
		1	G1 C/A
		2	G1P
		3	G2 C/A
		4	GLONASS (M) G2P
GALILEO	3 (GA)	0	All signals
		1	E5a
		2	E5b
		3	E5 a+b
		4	E6-A
		5	E6-BC
		6	L1-A
		7	L1-BC
BDS	4 (BD)	0	All signals
		1	B1
		5	B2A
		B	B2
		8	B3
		3	B1C
IRNSS	6 (GI)	0	All signals
		1	L5

GSV – GNSS Satellites in View

Number of satellites (SV) in view, satellite ID numbers, elevation, azimuth, and SNR value. Four satellites maximum per transmission.

Structure:

$GPGSV,x,x,xx,xx,xx,xxx,xx,…,xx,xx,xxx,xx,x *hh<CR><LF>

1 2 3 4 5 6 7 4 5 6 7 8 9

Example:

$GPGSV,2,1,08,05,46,285,46,06,43,077,44,20,41,286,44,13,38,184,44,1*6B<CR><LF>
$GPGSV,2,2,08,19,27,153,41,15,13,210,40,30,12,114,38,29,08,323,38,1*67<CR><LF>
$GPGSV,1,1,02,06,43,077,47,30,12,114,40,8*6D<CR><LF>
$GAGSV,2,1,06,08,78,171,46,15,60,067,45,13,42,334,43,03,41,044,43,7*70<CR><LF>
$GAGSV,2,2,06,07,27,210,41,14,05,146,36,7*77<CR><LF>
$GAGSV,2,1,06,08,78,171,47,15,60,067,47,13,42,334,44,03,41,044,44,1*75<CR><LF>
$GAGSV,2,2,06,07,27,210,42,14,05,146,38,1*7C<CR><LF>
$GBGSV,5,1,18,33,73,339,49,43,64,133,49,28,58,327,49,38,53,353,46,1*74<CR><LF>
$GBGSV,5,2,18,14,51,027,45,13,44,332,44,16,38,176,44,04,38,117,42,1*7F<CR><LF>
$GBGSV,5,3,18,41,38,242,47,11,37,135,44,39,36,184,44,10,30,224,39,1*7D<CR><LF>
$GBGSV,5,4,18,40,29,210,42,42,27,038,43,07,22,195,39,09,21,189,39,1*7B<CR><LF>
$GBGSV,5,5,18,34,14,138,40,27,07,320,40,1*74<CR><LF>
$GBGSV,3,1,10,33,73,339,48,43,64,133,47,28,58,327,46,38,53,353,45,5*7D<CR><LF>
$GBGSV,3,2,10,41,38,242,45,39,36,184,43,40,29,210,40,42,27,038,41,5*79<CR><LF>
$GBGSV,3,3,10,34,14,138,38,27,07,320,35,5*75<CR><LF>

Field	Name	Example	Description
1	Number of message	2	Total number of GSV messages to be transmitted (1-5)
2	Sequence number	1	Sequence number of current GSV message
3	Satellites in view	08	Total number of satellites in view (00 ~ 20)
4	Satellite ID	05	01 ~ 32 are for GPS; 33 ~ 64 are for WAAS (PRN minus 87); 193 ~ 197 are for QZSS; 65 ~ 88 are for GLONASS (GL PRN) ; 01 ~ 36 are for GALILEO (GA PRN); 01 ~ 37 are for BDS (BD PRN). GPS, GLONASS, GALILEO and BDS satellites are differentiated by the GNSS system ID in table 3. Maximally 4 satellites are included in each GSV sentence.
5	Elevation	46	Satellite elevation in degrees, (00 ~ 90)
6	Azimuth	285	Satellite azimuth angle in degrees, (000 ~ 359)
7	SNR	46	C/No in dB (00 ~ 99) Null when not tracking
8	GNSS System ID	1	Signal ID*
9	Checksum	6B	

*GNSS Signal ID identifies the GNSS signal name according to Table 3.

RMC – Recommended Minimum Specific GNSS Data

Time, date, position, course and speed data provided by a GNSS navigation receiver.

Structure:

$GNRMC,hhmmss.sss,A,dddmm.mmmmm,a,dddmm.mmmmm,a,x.x,x.x,ddmmyy,,,a,a*hh<CR><LF>

1 2 3 4 5 6 7 8 9 10 11 12

Example:

$GNRMC,092151.000,A,2447.08723,N,12100.52174,E,000.0,000.0,110621,,,A,V*0D<CR><LF>

Field	Name	Example	Description
1	UTC time	092151.000	UTC time in hhmmss.sss format (000000.00 ~ 235959.999)
2	Status	A	Status 'V' = Navigation receiver warning 'A' = Data Valid
3	Latitude	2447.08723	Latitude in dddmm.mmmmm format Leading zeros transmitted
4	N/S indicator	N	Latitude hemisphere indicator 'N' = North 'S' = South
5	Longitude	12100.52174	Longitude in dddmm.mmmmm format Leading zeros transmitted
6	E/W Indicator	E	Longitude hemisphere indicator 'E' = East 'W' = West
7	Speed over ground	000.0	Speed over ground in knots (000.0 ~ 999.9)
8	Course over ground	000.0	Course over ground in degrees (000.0 ~ 359.9)
9	UTC Date	110621	UTC date of position fix, ddmmyy format
10	Mode indicator	A	Mode indicator 'A' = Autonomous mode 'D' = Differential mode 'E' = Estimated (dead reckoning) mode 'F' = Float RTK. Satellite system used in RTK mode, floating integers 'M' = Manual Input Mode 'N' = Data not valid 'P' = Precise 'R' = Real Time Kinematic. System used in RTK mode with fixed integers 'S' = Simulator Mode
11	Navigation status	V	Navigation status indicator according to IEC61108 requirement on 'Navigational (or Failure) warnings and status indicators'. 'S' = Safe 'C' = Caution 'U' = Unsafe 'V' = Navigation status not valid, equipment is not providing navigation status indicator.
12	checksum	0D	

VTG – Course Over Ground and Ground Speed
The actual course and speed relative to the ground.

Structure:
GNVTG,x.x,T,,M,x.x,N,x.x,K,a*hh<CR><LF>
1 2 3 4 5

Example:
$GNVTG,000.0,T,,M,000.0,N,000.0,K,A*13<CR><LF>

Field	Name	Example	Description
1	Course	000.0	True course over ground in degrees (000.0 ~ 359.9)
2	Speed	000.0	Speed over ground in knots (000.0 ~ 999.9)
3	Speed	000.0	Speed over ground in kilometers per hour (000.0 ~ 1800.0)
4	Mode	A	Mode indicator 'A' = Autonomous mode 'D' = Differential mode 'E' = Estimated (dead reckoning) mode 'M' = Manual input mode 'N' = Data not valid 'P' = Precise 'S' = Simulator mode
5	Checksum	13	

ZDA – TIME AND DATE
UTC, day, month, year and local time zone

Structure:
$GNZDA,hhmmss.sss,xx,xx,xxxx,xx,xx*hh<CR><LF>
1 2 3 4 5 6 7

Example:
$GNZDA,092151.000,11,06,2021,00,00*41<CR><LF>

Field	Name	Example	Units	Description
1	UTC time	092151.000		UTC time in hhmmss.sss format (000000.00 ~ 235959.999)
2	UTC Day	11		UTC time: day (01 ~ 31)
3	UTC Month	06		UTC time: month (01 ~ 12)
4	UTC Year	2021		UTC time: year (4 digit format)
5	Local zone hour	00		Local zone hours (00 ~ +/- 13)
6	Local zone minutes	00		Local zone minutes (00 ~59)
7	Checksum	41		Checksum

ORDERING INFORMATION

Model Name	Description
PX1125S-02	L1/L5 GPS/QZSS/Galileo/Beidou Receiver Module
PX1125S-02A	L1/L5 GPS/QZSS/Galileo/Beidou/NavIC Receiver Module

Revision History

Revision	Date	Description
1	June 11, 2021	Initial release
2	June 6, 2022	Updated Ordering Information
3	December 27, 2024	Updated qualification status

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