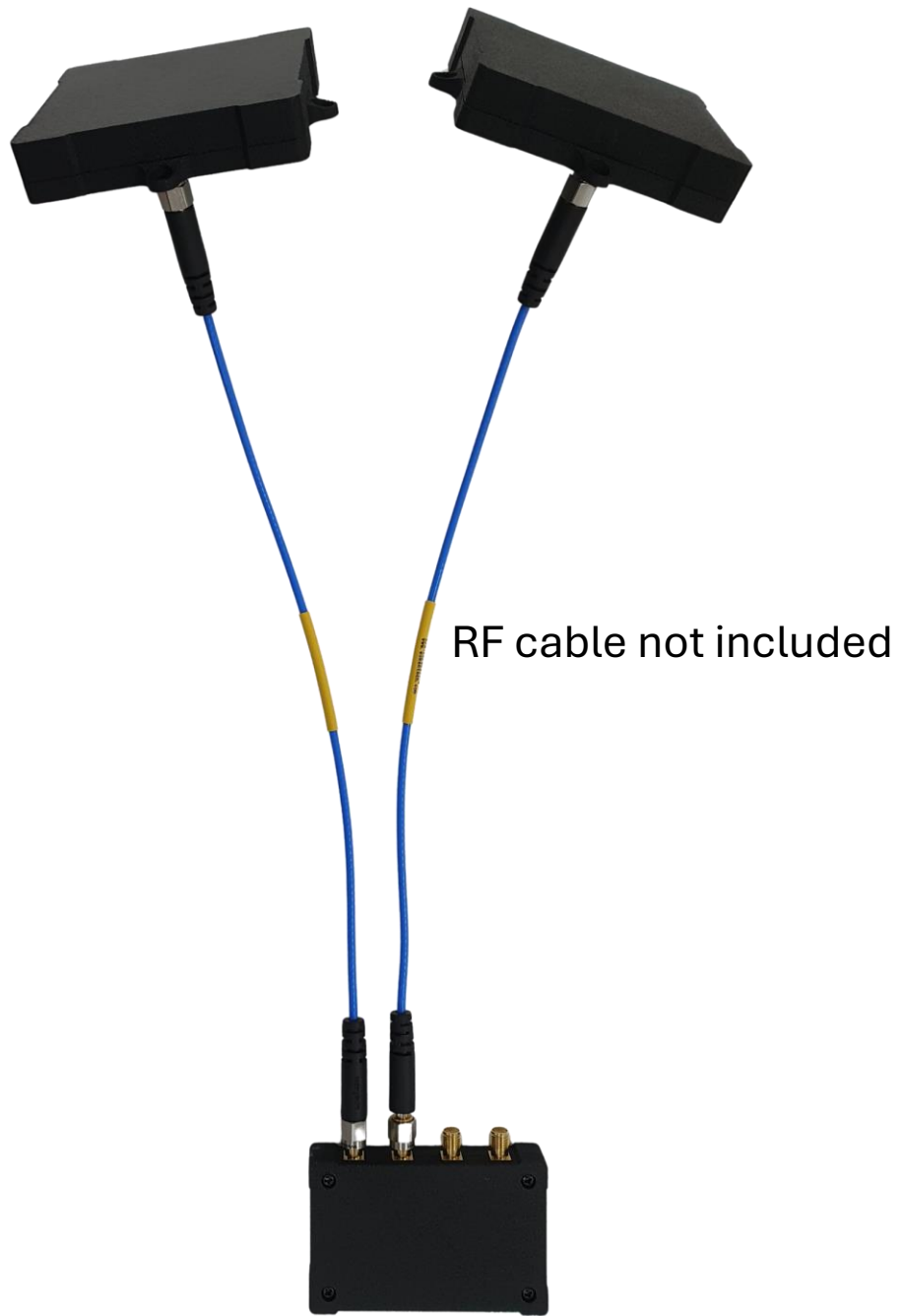


PX1175S-L1AJ-K1

L1 Jammer Resilient GNSS Receiver



RF cable not included

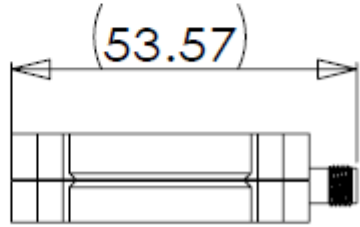
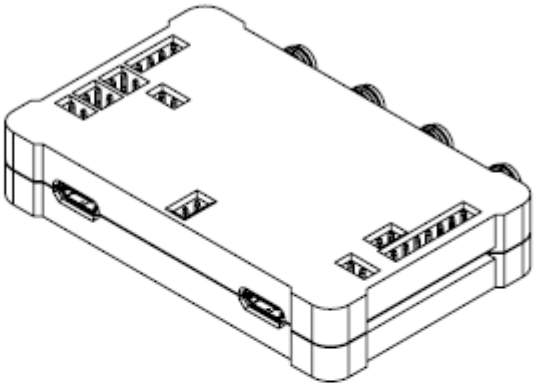
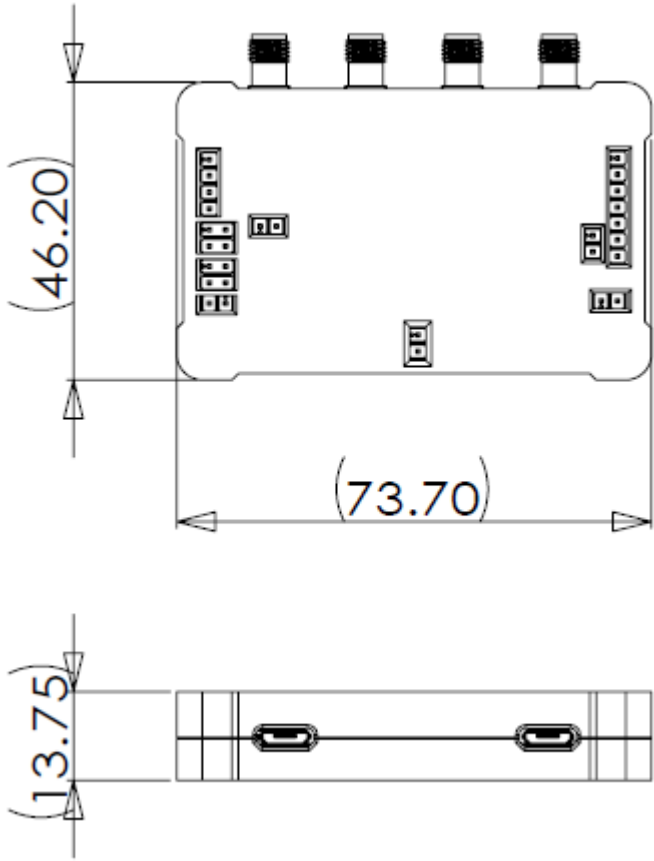


2 antenna + receiver 3pcs set

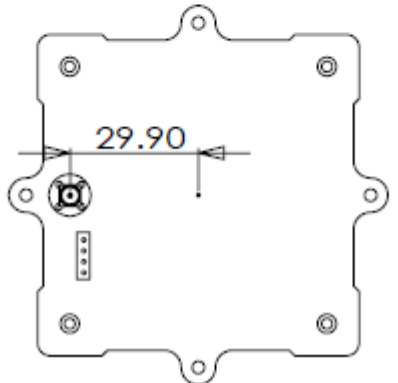
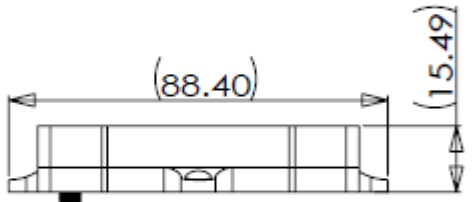
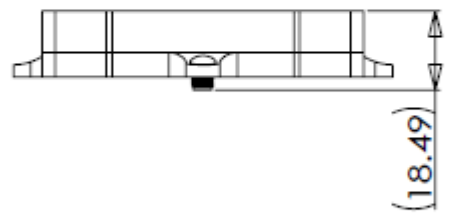
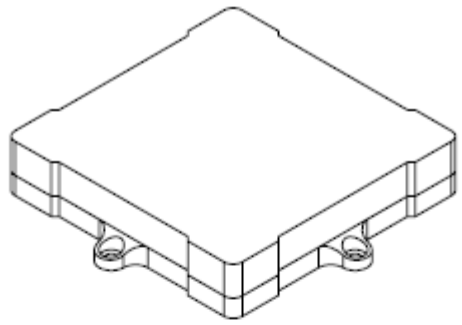
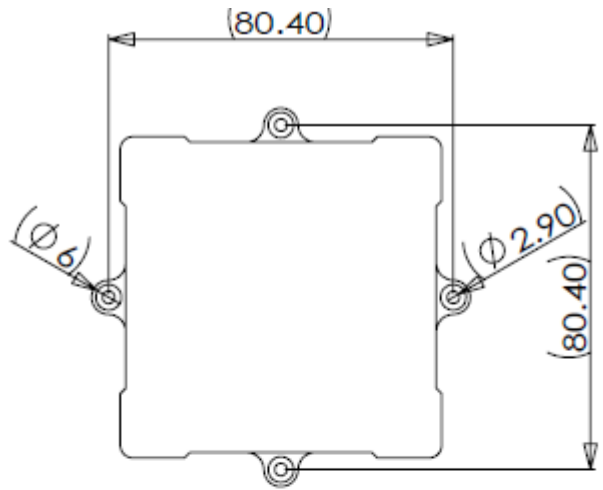
Technical Specification

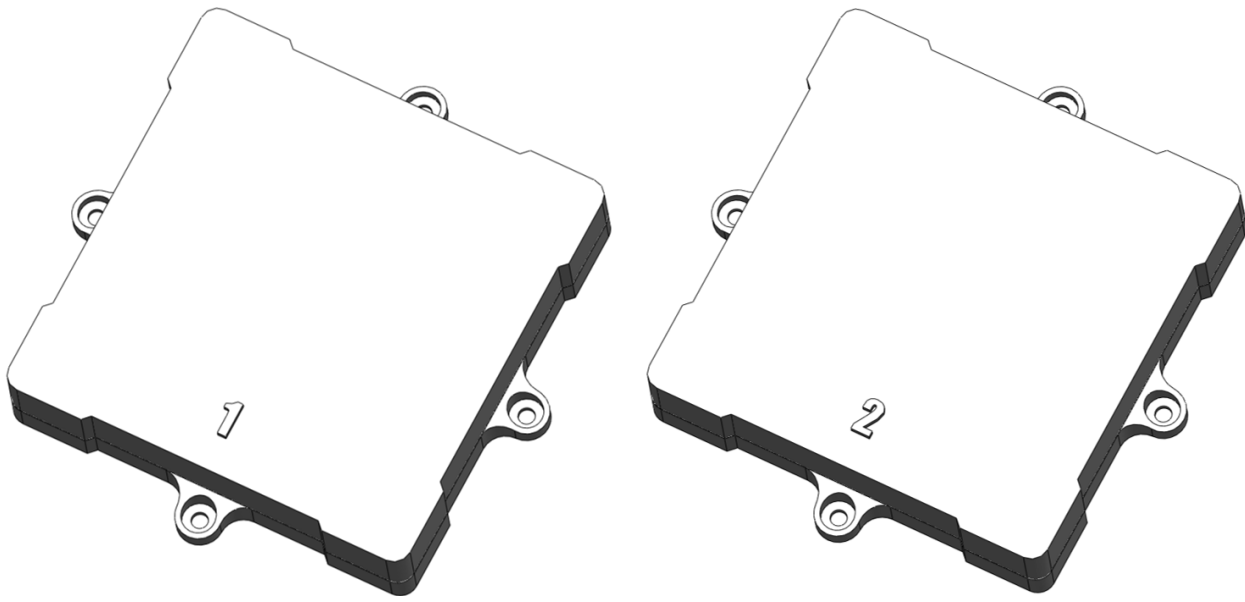
Receiver Type	GPS, Galileo, Beidou, NavIC
Accuracy	Position 2m CEP Velocity 0.1m/sec
Startup Time	1 / 28 / 29 second hot / warm / cold start under open sky average
Reacquisition	1s
Sensitivity	-147dBm cold-start -158dBm re-acquisition -162dBm tracking
Update Rate	1 / 2 / 4 / 5 / 8 / 10 / 20 / 25 Hz (default 1Hz)
Dynamics	4G (39.2m/sec ²)
Operational Limits	Altitude < 80,000m and velocity < 515m/s
Serial Interface	3.3V LVTTTL 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	150mA @ 3.3V
Dimension	antenna 80.4mm x 80,4mm receiver 46.2mm x 73.7mm
Weight:	antenna 55g x 2 receiver 38g
Operating Temperature	-40°C ~ +85°C
Humidity	5% ~ 95%

Mechanical Dimension - Receiver (mm)



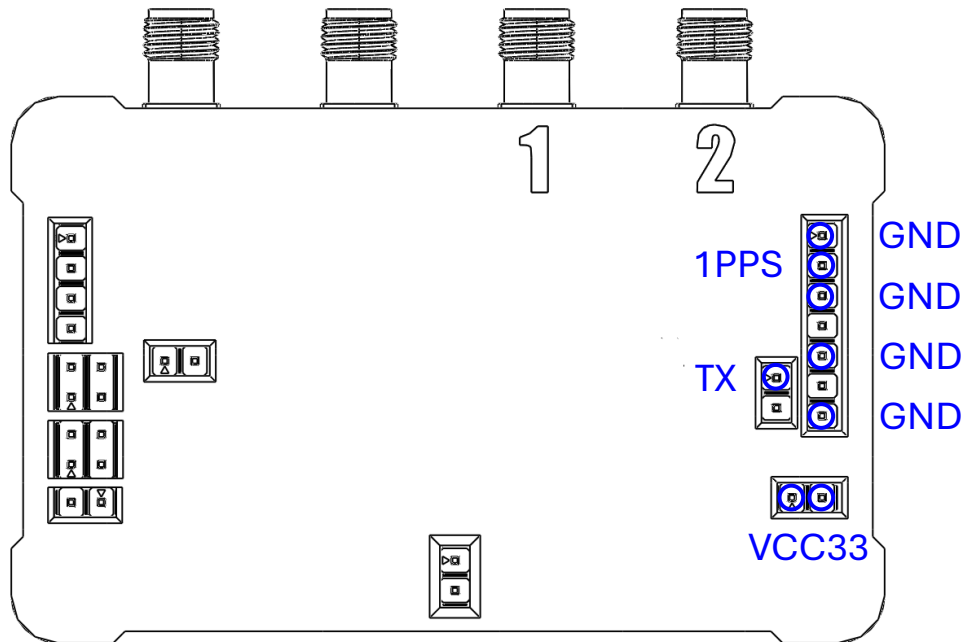
Mechanical Dimension – Antenna (mm)





Usage

1. Connect Antenna 1 to RF connector 1
2. Connect Antenna 2 to RF connector 2
3. Connect TX & GND to application processor
4. Connect VCC33 & GND to power source



Pin Description

VCC33: 3.3V Power Input

GND: Ground Return

1PPS: 1 Pulse Per Sec Output

TX: NMEA output

NMEA Output

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 of 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,x.x,x.x,x.x,x*hh<CR><LF>  
1 2 3 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	

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 101112

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