L16

Quectel GNSS Engine

GNSS Protocol Specification

L16_GNSS_Protocol_Specification_V1.1

Document Title	L16 GNSS Protocol Specification
Version	1.1
Date	2012-06-21
Status	Released
Document Control ID	L16_GNSS_Protocol_Specification_V1.1

General Notes

Quectel offers this information as a service to its customers, to support application and engineering efforts that use the products designed by Quectel. The information provided is based upon requirements specifically provided to Quectel by the customers. Quectel has not undertaken any independent search for additional relevant information, including any information that may be in the customer's possession. Furthermore, system validation of this product designed by Quectel within a larger electronic system remains the responsibility of the customer or the customer's system integrator. All specifications supplied herein are subject to change.

Copyright

Contents

Table Index

0. Revision history

Revision	Date	Author	Description of change
1.0	2012-06-08	Derrick DAI	Initial
1.1	2012-06-20	Derrick DAI	Improved the description of the GSA NMEA message

1. Introduction

L16 GNSS module can use both GLONASS and GPS constellation and features accurate acquisition. The module also supports autonomous GNSS C/A and SBAS function (including WAAS and EGNOS). L16 can be used in the positioning, navigation and other industries.

This document describes the commands of L16, including NMEA 0183 standard commands and L16 proprietary commands.

1.1. Related documents

Table 1: Related documents

SN	Document name	Remark
[1]	L16_HD	L16 Hardware Design
[2]	L16_EVB_UGD	L16 EVB User Guide
[3]	L16_Reference_Design	L16 Reference Design

1.2. Terms and Abbreviations

Table 2: Terms and Abbreviations

Abbreviation	Description
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GLONASS	Global Navigation Satellite System(The Russian GNSS)
NMEA	National Marine Electronics Association
GGA	NMEA: Global Positioning System Fix Data
RMC	NMEA: Recommended Minimum Specific GPS/TRANSIT Data
GSA	NMEA: GNSS DOP and Active Satellites
GSV	NMEA: GNSS Satellites in View
GLL	NMEA: Geographic Position – Latitude/Longitude
VTG	NMEA: Track Made Good and Ground Speed
SBAS	Satellite-Based Augmentation System
DGPS	Differential Global Positioning System
PDOP	Position Dilution Of Precision
VDOP	Vertical Dilution Of Precision
HDOP	Horizontal Dilution Of Precision
NVM	Non Volatile Memory
PPS	Pulse Per Second

2. Standard NMEA messages

L16 supports NMEA 0183 standard V3.01. The structure of the NMEA protocol message is given as below:

Table 3: Structure of standard NMEA message

Field	Length (bytes)	Description
$	1	Each NMEA message starts with '$'
Talker ID	2	Talker IDs can be 'GP', 'GL' and 'GN' when the message ID is GSA or GSV. Otherwise, Talker ID is always 'GP'
NMEA message ID	3	NMEA message ID
Data Field	Variable, depend on the NMEA message type	Data field, delimited by comma ','
*	1	End character of data field
Checksum	2	A hexadecimal number calculated by exclusive OR of all characters between '$' and '*'
<CR><LF>	2	Each NMEA message ends with 'CR' and 'LF'
Example: $GPGGA,074350.000,3109.90080,N,12123.55306,E,1,06,1.3,016.32,M,8.0,M,,*5F <CR><LF>		

Note:

- ***The default output message of L16 has the following five sentences: RMC, GGA, GSA, GSV and GLL. The other NMEA sentences can be chosen to output by sending CDB-201 commands.***

2.1. GPGGA

GGA, Global Positioning System Fix Data, is the essential fix data which provides 3D location and accuracy data.

Format: **$GPGGA,<Timestamp>,<Lat>,<N/S>,<Long>,<E/W>,<GPSQual>,<Sats>,<HDOP>,<Alt>,<AltVal>,<GEOSep>,<GEOVal>,<DGPSAge>,<DGPSRef>*<Checksum><CR><LF>**		
Parameter	**Format**	**Description**
Timestamp	HHMMSS.SSS	UTC Time of GNSS Sample, example: 074350.000
Lat	DDMM.MMMMM	Lat in Degree-Minutes, example : 3109.90080

N/S	'N' or 'S'	Lat Direction: North or South
Long	DDMM.MMMMM	Long in Degree-Minutes, example: 12123.55306
E/W	'E' or 'W'	Long Direction: East or West
GPSQual	Decimal, 1digit	0 = invalid 1 = GPS 2 = DGPS
Sats	Decimal, 2 digits	Satellites in view: example: 06
HDOP	Decimal, 3 digits	Horizontal Dilution of Precision, max : 99.0
Alt	Decimal, 5 digits	Height above WGS84 ellipsoid, max: 999.99
Alt-Val	'M'	Height measure in 'M' = meters
GEOSep	Decimal, 2 digits	Geoid-to-ellipsoid separation. Ellipsoid altitude = Alt + GEOSep, example: 8.0
GEOVal	'M'	Fixed field, meter
DGPSAge		Age of DGPS data in second, null when DGPS is not used
DGPSRef		DGPS reference station ID
Checksum	Hexadecimal,2 digits	Hexadecimal checksum
Example: $GPGGA,074350.000,3109.90080,N,12123.55306,E,1,06,1.3,016.32,M,8.0,M,,*5F <CR><LF>		

2.2. GPRMC

RMC, Recommended Minimum Specific GPS/TRANSIT Data, is the essential GNSS data including position, velocity, course and time. The output depends on the datum selected currently. The default datum is WGS84.

Format: $GPRMC,<Timestamp>,<Status>,<Lat>,<N/S>,<Long>,<E/W>,<Speed>,<Trackgood>,<Date>,<MagVar>,<MagVarDir>,< Position mode >***<Checksum><CR><LF>**		
Parameter	**Format**	**Description**
Timestamp	HHMMSS.SSS	UTC Time of GNSS Sample, example: 074350.000
Status	'A' or 'V'	Receiver warning: 'A' = valid, 'V' = Warning
Lat	DDMM.MMMMM	Lat in Degree-Minutes, example : 3109.90080
N/S	'N' or 'S'	Lat Direction: North or South
Long	DDMM.MMMMM	Long in Degree-Minutes, example: 12123.55306
E/W	'E' or 'W'	Long Direction: East or West
Speed	Decimal, 4 digits	Speed over ground in 'km/h', max: 999.9
Trackgood	Decimal, 4 digits	Course made good, max: 999.9
Date	Decimal, 6 digits	Date of Fix: DDMMYYYY

MagVar	Decimal, 4 digits	Magnetic Variation, max: 090.0
MagVarDir	‘E’ or ‘W’	Height measure in ‘M’ = meters
Position mode	‘A’ , ‘D’ , ‘N’ , ‘E’ or ‘R’	‘N’ =output data not valid ‘A’ =Autonomous ‘D’=DGPS ‘E’=DR ‘R’=Coarse Position[1]
Checksum	Hexadecimal,2 digits	Hexadecimal checksum
Example: $GPRMC,074350.000,A,3109.90080,N,12123.55306,E,0.2,0.0,230412,,,A*63 <CR><LF>		

[1]. Position was calculated based on the satellites in view, which have their states derived from almanac parameters, as opposed to ephemeris.

2.3. --GSA

GNSS DOP and Active Satellites. The talker ID for this NMEA message depends on the enabled constellation as follows:

- ‘GP’ if only GPS constellation is enabled.
- ‘GL’ if only GLONASS constellation is enabled.
- ‘GN’ if both GPS and GLONASS constellation are enabled. If NMEA GNGSA was enabled(see CDB-200-bit20), two GNGSA messages would be output no matter only GPS constellation is enabled or only GLONASS constellation is enabled.

Format: **$--GSA,<Mode>,<CurrentMode>,<SatPRN1>,...,<SatPRNN>,<PDOP>,<HDOP>,<VDOP>*<Checksum><CR><LF>**		
Parameter	**Format**	**Description**
Mode	‘M’ or ‘A’	Operating Mode: M = Manual, A = Auto (2D/3D)
CurrentMode	Decimal, 1 digit	Current Mode: 1 = no fix available 2 = 2D 3 = 3D
SatPRN1...N	Decimal, 2 digits	Satellites list used in position fix
PDOP	Decimal, 3 digits	Position Dilution of Precision, max: 99.0
HDOP	Decimal, 3 digits	Horizontal Dilution of Precision, max: 99.0
VDOP	Decimal, 3 digits	Vertical Dilution of Precision, max: 99.0
Checksum	Hexadecimal, 2 digits	Hexadecimal checksum
Example: $GNGSA,A,3,25,14,16,29,30,,,,,,,,3.0,1.3,2.7*25<CR><LF>		

2.4. --GSV

GSV, GNSS Satellites in View. The Talker ID for this NMEA message depends on the enabled constellation as follows:

- 'GP' is used only for GPS satellites.
- 'GL' is used only for GLONASS satellites.
- 'GN' would be output if NMEA GNGSV was enabled (see CDB-200-bit19), including GPS satellites and GLONASS satellites.

One GSV sentence can only provide data for at most 4 satellites, so several sentences might be required for the full information. Since GSV includes satellites that are not used as part of the solution, GSV sentence contains more satellites than GGA does.

Format:
$--GSV,<GSVAmount>,<GSVNumber>,<TotSats>,
[<Sat1PRN>,<Sat1Elev>,<Sat1Azim>,<Sat1C/N0>],
...
[<SatNPRN>,<SatNElev>,<SatNAzim>,<SatNC/N0>]*
<Checksum><CR><LF>

Parameter	Format	Description
GSVAmount	Decimal, 1 digit	Total amount of GSV messages, max: 8
GSVNumber	Decimal, 1 digit	Continued GSV number of this message
TotSats	Decimal, 2 digits	Total number of satellites in view, max : 32
SatxPRN	Decimal, 2 digits	PRN number of satellite x
SatxElev	Decimal, 2 digits	Elevation of satellite x in degree, 0 … 90
SatxAzim	Decimal, 3 digits	Azimuth of satellite x in degree, ref. 'North', 000 …359
SatxC/N0	Decimal, 2 digits	Carrier to noise ratio for satellite x in dB, 00 … 99
Checksum	Hexadecimal, 2 digits	Hexadecimal checksum

Example:
$GPGSV,3,1,10,06,08,189,20,14,55,127,44,16,33,229,45,20,15,304,15*7D<CR><LF>
$GPGSV,3,2,10,22,10,181,23,25,22,042,38,29,33,076,41,30,58,249,26*71<CR><LF>
$GPGSV,3,3,10,31,57,002,27,32,34,284,18,,,,,,,*7E<CR><LF>
$GLGSV,3,1,10,82,00,170,,81,28,126,19,68,35,205,,78,28,043,*69<CR><LF>
$GLGSV,3,2,10,70,14,329,,80,15,281,,79,43,327,,69,48,280,*6E<CR><LF>
$GLGSV,3,3,10,88,28,065,,87,02,022,,,,,,,,*60<CR><LF>

2.5. GPGLL

GLL, Geographic Latitude and Longitude, contains position information, time of fix position and status. The output of this message is dependent on the currently selected datum. The default datum is WGS84.

Format: **$GPGLL,<Lat>,<N/S>,<Long>,<E/W>,<Timestamp>,<Status>*<Checksum><CR><LF>**		
Parameter	**Format**	**Description**
Lat	DDMM.MMMMM	Latitude in Degree-Minutes, example:3109.89955
N/S	'N' or 'S'	Latitude Direction: North or South
Long	DDMM.MMMMM	Longitude in Degree-Minutes, example: 12123.57102
E/W	'E' or 'W'	Longitude Direction: East or West
Timestamp	HHMMSS.SSS	UTC Time of GNSS Sample, example: 015037.000
Status	'A'	Validity of Data: 'A' = valid, 'V' = invalid
Checksum	Hexadecimal, 2 digits	Hexadecimal checksum
Example: $GPGLL,3109.89955,N,12123.57102,E,015037.000,A*35 <CR><LF>		

2.6. GPVTG

VTG, Track Made Good and Ground Speed.

Format: $GPVTG,<TMGT>,T,<TMGM>,M,<SoGN>,N,<SoGK>,K*<checksum><cr><lf>		
Parameter	**Format**	**Description**
TMGT	ddd.d in degrees	Course in reference to 'true' earth poles
T		Indicate 'true'
TMGM	ddd.d in degrees	Course in reference to 'magnetic' earth poles
M		Indicate 'magnetic'
SoGN	ddd.d in knots	Speed over Ground in knots
N		Indicate 'knots'
SoGK	ddd.d in k m/h	Speed over Ground in kilometers per hour
K		Indicates 'kilometers'
Checksum	Hexadecimal, 2 digits	Hexadecimal checksum
Example: $GPVTG,0.0,T,,M,0.2,N,0.3,K,A*0C<CR><LF>		

3. ST Proprietary NMEA messages

The ST GNSS System can provide additional messages with more detailed data content. This is required to transmit GNSS and System information content which is not defined in the NMEA standard output.

Proprietary Messages of ST start with **$PSTM.**

3.1. NMEA commands

3.1.1. $PSTMCOLD

Perform a Cold start.

Format: **$PSTMCOLD,<Mask>*<Checksum><CR><LF>**		
Parameter	**Format**	**Description**
Mask	Hexadecimal, 1 digits	Optional parameter to invalidate time, position, ephemeris and almanac: 0x 1 – clear almanac 0x 2 – clear ephemeris 0x 4 – clear position 0x 8 – clear time
Example: $PSTMCOLD,E*77<CR><LF>		

Note:

- ***Cold start initialization and system restart.***
- ***Selected GNSS data would be invalidated after cold start. For example, after '$PSTMCOLD, E*77 <CR><LF>' is executed, ephemeris & position & time data are invalidated.***

3.1.2. $PSTMWARM

Perform a Warm start.

Format: **$PSTMWARM*<Checksum><CR><LF>**
Example: $PSTMWARM*13<CR><LF>

Note:

- ***Warm start initialization and system restart.***

3.1.3. $PSTMHOT

Perform a Hot start.

Format: **$PSTMHOT*<Checksum><CR><LF>**
Example: $PSTMHOT*13<CR><LF>

Note:

- ***Hot start initialization and system restart.***

3.1.4. $PSTMSRR

Execute a system reset. The GNSS firmware is rebooted.

Format: **$PSTMSRR*<Checksum><CR><LF>**
Example: $PSTMSRR*49<CR><LF>

Note:

- ***The GNSS firmware reboots.***
- ***No message will be sent as reply.***

3.1.5. $PSTMSBASONOFF

Suspend / resume the SBAS software execution.

Format: **$ PSTMSBASONOFF *<Checksum><CR><LF>**
Example: $ PSTMSBASONOFF *57<CR><LF>

Note:

- ***If SBAS was running, it will be suspended. If SBAS was suspended, it will start to run.***

3.2. System configuration commands

The GNSS Software utilizes a "Configuration Data Block (CDB)" that holds the working parameters for the system. The parameters can be set, read or stored (in NVM) using the system configuration commands: $PSTMSETPAR, $PSTMGETPAR and $PSTMSAVEPAR.

At run-time, it could be possible to have up to three different configuration blocks:

- Current configuration: it is placed in RAM memory and it includes the current configuration of each parameter. This configuration block can be modified with the $PSTMSETPAR command. The $PSTMSAVEPAR command stores the current Configuration Data Block (CDB) into the NVM memory. At startup the current configuration block is loaded from NVM (if a stored data block is available) or it is loaded from default one embedded in the code (factory settings).
- Default configuration: it is generally placed in the FLASH/ROM memory. It includes the factory setting for each parameter. This configuration is used at system startup if there is no configuration data in the NVM memory.
- NVM stored configuration: it is available in the NVM backup memory as soon as the $PSTMSAVEPAR command is executed. It includes all parameters modified and stored by the user. At system startup the SW configuration managements checks if a valid configuration is available, it will be used for system configuration. If not available the default setting will be used.

Note:

- ***Other "Configuration Data Block (CDB)" parameters which are not documented in this manual must be considered as reserved and must not be modified. Modifying any other parameter intentionally or unintentionally may stop the system from working and /or degrading the system performance.***

3.2.1. $PSTMSETPAR

This command sets the defined parameter (indicated by 'ID') to the value provided as 'parameter value' in the commands parameter. Command '$PSTMSAVEPAR*58 <CR><LF>' is needed to save the new setting.

Format: **$PSTMSETPAR,<ConfigBlock><ID>,<parameter value> *<Checksum><CR><LF>**		
Parameter	**Format**	**Description**
ConfigBlock	Decimal,1 digit	Indicates one of configuration blocks: 1=Current Configuration, 2 = Default Configuration, 3 = NVM Stored configuration.
ID	Decimal, 3 digits	ID – CDB Identifier

		Refer to Chapter-3.3 Configuration Data Block (CDB)
Parameter value	1 up to 80 bytes	Parameter to be set, see 'Allowed values '
Checksum	Hexadecimal, 2 digits	Hexadecimal checksum
Example: $PSTMSETPAR,1121,10*19<CR><LF>		

Note:

- ***The parameter indicated by the ID value is set according to the parameters included in parameter value. In case of no errors, the following message is returned: $PSTMSETPAROK,1121*30. In case of errors, the error message is returned: $PSTMSETPARERROR*43.***
- ***The configuration block parameter is ignored by the 'SET' command because only the current configuration, stored in the RAM memory, can be written. It is used only to keep same syntax as for the 'GET' command. The configuration block stored in NVM will be overwritten by current configuration after the $PSTMSAVEPAR command.***
- ***There is no comma and no space between ConfigBlock and ID parameters.***
- ***The input parameter value must be expressed in hexadecimal format without '0x' prefix for any integer value expect DOP configuration. It must be decimal for any not integer value and DOP setting.***

3.2.2. $PSTMGETPAR

This command reads the defined parameter (indicated by 'ID') from the Configuration Data Block (CDB) and returns it as a specific message.

Format: **$PSTMGETPAR,<ConfigBlock><ID>*<Checksum><CR><LF>**		
Parameter	**Format**	**Description**
ConfigBlock	Decimal,1 digit	Indicates one of configuration blocks: 1=Current Configuration, 2 = Default Configuration, 3 = NVM Stored configuration.
ID	Decimal, 3 digits	ID – CDB Identifier refer to Chapter-3.3 Configuration Data Block (CDB)
Checksum	Hexadecimal, 2 digits	Hexadecimal checksum
Example: $PSTMGETPAR,1121*20<CR><LF>		

Note:

- ***In case of no errors, the following message is returned: $PSTMSETPAR,1121,10*19. In case of errors, the error message is returned: $PSTMGETPARERROR*57.***

- ***There is no comma and no space between ConfigBlock and ID parameters.***
- ***In case of no errors the answer is deliberately $PSTMSET and not $PSTMGET.***
- ***If the parameter ID is '000', all the configuration block is printed out using one message for each parameter. The message syntax is the same as reported above.***

3.2.3. $PSTMSAVEPAR

Save current Configuration Data Block (CDB) into the backup memory.

Format: $PSTMSAVEPAR*<Checksum><CR><LF>		
Parameter	**Format**	**Description**
Checksum	Hexadecimal, 2 digits	Hexadecimal checksum
Example: $PSTMSAVEPAR*58<CR><LF>		

Note:

- ***The following message is returned: $PSTMSAVEPAROK*5C. The current Configuration Data Block (CDB), including changed parameters, will be stored into the backup memory (NVM).***

3.3. Configuration data block (CDB)

All configuration parameters are grouped in a data block. Each field is addressed by a unique ID. The IDs are made by three digits. The most significant one represent the parameter type and the others are used to identify different parameters of the same type.

The table below includes all parameters which can be changed to apply a different configuration.

Note:

- ***The CDB IDs that are not reported in the table below should be considered as reserved and must be left untouched to avoid unexpected system behaviors.***

Table 4: CDB IDs description

ID	Parameter	Allowed values	Default	Description
102	NMEA port baud rate	0x4…0xA	0x5	Set NMEA port baud rate
121	GSV NMEA	0…99	1	Set the GSV NMEA message

	message update interval			update interval. Unit is seconds.
135	SBAS default PRN	120…138	124	Set the SBAS default PRN
200	Application ON/OFF	0x00000000 … 0xFFFFFFFF	0x01639644	Activates/Deactivates application features
201	NMEA message list	0x00000000 … 0xFFFFFFFF	0x00180045	Set NMEA message list
301	PPS pulse duration	0.2 …1.0 seconds	0.5	PPS pulse width. It is the time interval between PPS rising edge and next PPS falling edge. Unit is seconds.
303	NMEA messages update interval	0.2 …1.0 seconds	1.0	Set the NMEA messages update interval. Unit is seconds.

3.3.1. CDB-ID102 NMEA port baud rate

Allow setting the baud rate for the NMEA port. The parameter value is reported as below.

Parameter Value	Baud Rate
0x4	4800
0x5	9600
0x6	14400
0x7	19200
0x8	38400
0x9	57600
0xA	115200
Example: $PSTMSETPAR,1102,4*2D<CR><LF> $PSTMSAVEPAR*58 <CR><LF> $PSTMSRR*49<CR><LF> Set the baud rate of NMEA port to 4800.	

3.3.2. CDB-ID121 GSV NMEA message update interval

Allow setting the update interval of the GSV NMEA messages. The parameter value is valid from 0 to 99.

Example:
$PSTMSETPAR,1121,5*2D<CR><LF>
$PSTMSAVEPAR*58 <CR><LF>
$PSTMSRR*49<CR><LF>
Set GSV NMEA messages output every five seconds.

3.3.3. CDB-ID135 SBAS default PRN

Allow setting the default PRN for the SBAS library. The parameter value is just the SBAS satellite PRN.

Example:
$PSTMSETPAR,1135,128*26<CR><LF>
$PSTMSAVEPAR*58 <CR><LF>
$PSTMSRR*49<CR><LF>
Set the default PRN for the SBAS satellite is 128.

3.3.4. CDB-ID200 Application ON/OFF

Allow enabling/disabling different features in the GNSS library.
For each bit:

- 0 means feature is disabled.
- 1 means feature is enabled.

Bit	Bitmask	Function
1	0x2	2D position fix
2	0x4	SBAS(WAAS/EGNOS) augmentation system
3	0x8	Enabling SBAS satellite reporting in the GSV messages
9	0x200	Send ‘config text’ in the ‘Header Message’ at start up
10	0x400	Send standard ST NMEA Headers
16	0x10000	GPS constellation enable
17	0x20000	GLONASS constellation enable
18	0x40000	QZSS constellation enable
19	0x80000	NMEA GNGSV enable
20	0x100000	NMEA GNGSA enable
21	0x200000	GLONASS usage for positioning enable
22	0x400000	GPS usage for positioning enable
23	0x800000	QZSS usage for positioning enable
24	0x1000000	PPS enable
Example: $PSTMSETPAR,1200,01030004*1E<CR><LF>		

$PSTMSAVEPAR*58 <CR><LF> $PSTMSRR*49<CR><LF> Open application features described in Bit2&Bit16&Bit17&Bit24.

3.3.5. CDB-ID201 NMEA message list

Allow enabling/disabling each NMEA message in the message list.
For each bit:

- 0 means feature is disabled.
- 1 means feature is enabled.

Bit	Bitmask	Function
0	0x1	$GPGGA
1	0x2	Not used
2	0x4	$GPGSA
3	0x8	Not used
4	0x10	$GPVTG
5	0x20	Not used
6	0x40	$GPRMC
7	0x80	$PSTMRF
8	0x100	$PSTMTG
9	0x200	$PSTMTS
10	0x400	$PSTMPA
11	0x800	$PSTMSAT
12	0x1000	$PSTMRES
13	0x2000	$PSTMTIM
14	0x4000	$PSTMWAAS
15	0x8000	$PSTMDIFF
16	0x10000	Not used
17	0x20000	$PSTMSBAS
18	0x40000	$PSTMTESTRF
19	0x80000	$GPGSV
20	0x100000	$GPGLL
21	0x200000	Not used
22	0x400000	Not used
23	0x800000	$PSTMCPU
24	0x1000000	$GPZDA
25	0x2000000	Not used
26	0x4000000	$PSTMPOSHOLD
27	0x8000000	$PSTMKFCOV
28	0x10000000	Not used

29	0x20000000	Not used
30	0x40000000	Not used
31	0x80000000	Not used
Example: $PSTMSETPAR,1201,0X00180045*79<CR><LF> $PSTMSAVEPAR*58 <CR><LF> $PSTMSRR*49<CR><LF> Output NMEA commands described in Bit0&Bit2&Bit6&Bit19&Bit20.		

3.3.6. CDB-ID301 PPS pulse duration

Allow setting the pulse duration of the PPS signal. The pulse duration is intended to be the time distance between the PPS rising edge and the next falling edge.

Example:
$PSTMSETPAR,1301,0.5*33<CR><LF>
$PSTMSAVEPAR*58 <CR><LF>
$PSTMSRR*49<CR><LF>
Set the PPS Pulse Duration as 0.5 second.

3.3.7. CDB-ID303 NMEA messages update interval

Allow setting the NMEA messages update interval. This is the time interval of the NMEA messages output through the NMEA port. The parameter value is valid from 0.2 to 1.

Example:
$PSTMSETPAR,1303,1*2B<CR><LF>
$PSTMSAVEPAR*58 <CR><LF>
$PSTMSRR*49<CR><LF>
Set the NMEA messages output once a second.

Note:

- ***If the data output per second is too large, the user need to increase NMEA port baud rate or decrease the amount of output date to avoid data loss.***
- ***Can control the update interval of NMEA messages except GSV NMEA message. GSV NMEA message update interval setting can refer to CDB-121.***

4. Default configurations

Table 5: Default configurations

Item	Default
NMEA port baud rate	9600bps
Datum	WGS84
Rate of position fixing	1Hz
SBAS enable	Enable
NMEA output messages	GGA,RMC, GSA, GSV and GLL

Shanghai Quectel Wireless Solutions Co., Ltd.

Room 501, Building 13, No.99, Tianzhou Road, Shanghai, China 200233

Tel: +86 21 5108 6236

Mail: info@quectel.com