

GNSS SDK

Commands Manual

GNSS Module Series

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About the Document

History

Revision	Date	Author	Description
1.0	2015-09-11	Hyman DING	Initial
1.1	2016-01-18	Connie ZHOU	Added the current supported SDK commands in Table 1.
1.2	2016-05-20	Simon HU	<ol style="list-style-type: none"> Added the following new commands: PQECEP, PQODO, PQPZ90, PQGLP, PQVEL. Added L76 and L76-L in Table 1. Added the Chapter 3: Appendix References.
1.3	2016-08-15	Simon HU	<ol style="list-style-type: none"> Added L26 in Table 1. Improved the function of PQODO to enable initial distance setting.
1.4	2017-07-21	Matt YE/ Simon HU	<ol style="list-style-type: none"> Updated notes for PQODO in Chapter 2.8 Added the following new commands: <ul style="list-style-type: none"> ● PQJAM (Chapter 2.12) ● PQRLM (Chapter 2.13) ● PQGEO (Chapter 2.14) ● PQPREC (Chapter 2.15) ● PQGBS (Chapter 2.16)

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1 Introduction

Quectel GNSS modules support SDK commands which are defined and developed by Quectel. This document describes these SDK commands. The configuration parameters saved by SDK commands will still exist in flash even after upgrading the modules' firmware.

This document is applicable to Quectel L70, L80, L76, L76-L, L86 and L26 modules. Their supported SDK commands are shown in the table below:

Table 1: Current Supported SDK Commands

SDK Commands	Description	L70	L80	L76	L76-L	L86	L26
PQBAUD	Change NMEA Port Default Baud Rate	Y	Y	Y	Y	Y	Y
PQEPE	Enable/Disable PQEPE Sentence Output	Y	Y	Y	Y	Y	Y
PQ1PPS	Set the Type and Pulse Width of 1PPS Output	Y	Y	Y	Y	Y	Y
PQFLP	Set the Module into FLP (Fitness Low Power) Mode	Y	Y	N	N	N	N
PQTXT	Enable/Disable GPTXT Sentence Output	N	Y	N	N	Y	Y
PQECEF	Enable/Disable ECEFPOSVEL Sentence Output	N	N	Y	Y	Y	Y
PQODO	Start/Stop Odometer Reading	N	N	Y	Y	Y	Y
PQPZ90	Enable/Disable Switching from WGS84 to PZ-90.11	N	N	Y	Y	Y	Y
PQGLP	Set the Module into GLP (GNSS Low Power) Mode	N	N	Y	Y	Y	Y
PQVEL	Enable/Disable 3 Ways Velocity Sentence Output	N	N	Y	Y	Y	Y
PQJAM	Enable/Disable Jamming Detection Function	N	N	Y	Y	Y	Y
PQRLM	Enable/Disable Return Link Message Output	N	N	Y	Y	Y	Y
PQGEO	Configure Parameters of Geo-fence	Y	N	Y	Y	Y	Y

PQPREC	Configure Parameter Precision in NMEA Sentences	N	N	Y	Y	Y	Y
--------	---	---	---	---	---	---	---

PQGBS	Enable/Disable GBS Sentence Output	N	N	Y	Y	Y	Y
-------	------------------------------------	---	---	---	---	---	---

NOTES

1. Y means supported; N means not supported.
2. For more details about the usage of PQFLP and PQGLP commands, please refer to **document [1]**.

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2 Quectel NMEA Packet Protocol

This chapter introduces the Quectel NMEA packet protocol which is a set of extension messages of the standard NMEA packet protocol. These messages are used to control and configure Quectel L70, L80, L76, L76-L, L86 and L26 modules.

The structure of Quectel NMEA packet is shown as below:

2.1. Quectel NMEA Packet Format

Preamble	TalkerID	PktType	DataField	*	CHK1	CHK2	CR	LF
----------	----------	---------	-----------	---	------	------	----	----

Packet Contents:

Preamble: One byte character.

‘\$’

TalkerID: Two bytes character string.

“PQ”

PktType: 1-10 bytes character string.

An identifier used to tell the decoder how to decode the packet.

DataField: The DataField has variable lengths depending on the packet type.

A command symbol ‘;’ must be inserted ahead of each data field to help the decoder process the DataField.

*: 1 byte character.

The star symbol is used to mark the end of DataField.

CHK1, CHK2: Two bytes character string.

CHK1 and CHK2 are the check sum of the data between Preamble and ‘*’.

CR, LF: Two bytes binary data.

The two bytes are used to identify the end of a packet.

NOTE

The maximum length of each packet is restricted to 255 bytes.

2.2. PQBAUD Change NMEA Port Default Baud Rate

PQBAUD Change NMEA Port Default Baud Rate

Write Command \$PQBAUD,W,<baudrate>*Checksum<CR><LF>	Response \$PQBAUD,W,OK*Checksum<CR><LF> If there is any error, response: \$PQBAUD,W,ERROR*Checksum<CR><LF>
Reference	

Parameter

<baudrate> NMEA port baud rate, default value is 9600bps, and can be set to 4800bps, 14400bps, 19200bps, 38400bps, 57600bps and 115200bps

Example

```
$PQBAUD,W,115200*43 //Change NMEA port default baud rate to 115200bps
$PQBAUD,W,OK*40 //Set OK
```

NOTES

1. The command will be effective immediately after setting.
2. Parameter is automatically saved.
3. If the baud rate is changed, then there is no response returned in the current baud rate.

2.3. POEPE Enable/Disable PQEPE Sentence Output

PQEPE Enable/Disable PQEPE Sentence Output

Write Command \$PQEPE,W,<mode>,<save>*Checksum<CR><LF>	Response \$PQEPE,W,OK*Checksum<CR><LF> If there is any error, response: \$PQEPE,W,ERROR*Checksum<CR><LF>
URC Message	\$PQEPE,<EPE_hori>,<EPE_vert>*Checksum<CR><LF> Parameter <EPE_hori> Estimated horizontal position error

	<EPE_vert> Estimated vertical position error
	Example \$PQEPE,5.3050,3.2000*53
Reference	

Parameter

<mode>	Operation 0 Disable the URC including EPE data 1 Enable the URC including EPE data
<save>	Save operation 0 Parameter is not saved, and ineffective after restart 1 Parameter is saved in flash, and effective after restart

Example

```
$PQEPE,W,1,1*2A //Enable the URC including EPE data, and save parameters into flash
$PQEPE,W,OK*02 //Set OK
```

NOTE

The command will be effective immediately after setting.

2.4. PQ1PPS Set the Type and Pulse Width of 1PPS Output

PQ1PPS Set the Type and Pulse Width of 1PPS Output

Write Command \$PQ1PPS,W,<type>,<width>*Checksum<CR><LF>	Response \$PQ1PPS,W,OK*Checksum<CR><LF> If there is any error, response: \$PQ1PPS,W,ERROR*Checksum<CR><LF>
Reference	

Parameter

<type>	The type of 1PPS output 0 Disable 1PPS output
---------------------	--

	1	Send 1PPS after the first fix
	2	Send 1PPS after 3D fix
	3	Send 1PPS after 2D fix
	4	Send 1PPS always
<width>		PPS pulse width in millisecond Range: 2-998

Example

```
$PQ1PPS,W,4,100*1D //Set the type of 1PPS output and PPS pulse width
$PQ1PPS,W,OK*30 //Set OK
$PQ1PPS,W,0,0*18 //Disable 1PPS output
$PQ1PPS,W,OK*30 //Set OK
```

NOTES

1. The command will be effective immediately after setting.
2. The parameters is automatically saved.
3. If <type> is set as 0, <width> could be set as 0-998.

2.5. PQFLP Set the Module into FLP Mode

PQFLP Set the Module into FLP Mode

Write Command	Response
\$PQFLP,W,<mode>,<save>*Checksum m<CR><LF>	\$PQFLP,W,OK*Checksum<CR><LF> If there is any error, response: \$PQFLP,W,ERROR*Checksum<CR><LF>
Read Command	Response
\$PQFLP,R*Checksum<CR><LF>	\$PQFLP,R,<mode>*Checksum<CR><LF>
Reference	

Parameter

<mode>	Module operation mode
	0 Normal mode
	1 FLP mode
<save>	Save operation
	0 Parameter is not saved, and ineffective after restart
	1 Parameter is saved in flash, and effective after restart

Example

```
$PQFLP,W,1,1*20 //Change to FLP mode
$PQFLP,W,OK*08 //Set OK

$PQFLP,R*25 //Read mode
$PQFLP,R,1*38 //Read OK, FLP mode is enabled
```

NOTE

The command will be effective immediately after setting.

2.6. PQTXT Enable/Disable GPTXT Sentence Output

PQTXT Enable/Disable GPTXT Sentence Output

Write Command

```
$PQTXT,W,<mode>,<save>*Checksum  
m <CR><LF>
```

Response

```
$PQTXT,W,OK*Checksum<CR><LF>
```

If there is any error, response:

```
$PQTXT,W,ERROR*Checksum<CR><LF>
```

URC Message

```
$GPTXT,01,01,02,<status>*Checksum<CR><LF>
```

Parameter

<status> Status of antenna

ANTSTATUS=OK: antenna is well connected

ANTSTATUS=OPEN: antenna has been disconnected

ANTSTATUS=SHORT: antenna is short-circuited

Example

```
$GPTXT,01,01,02,ANTSTATUS=OK*3B
```

Reference

Parameter

<mode>	Operation
	0 Disable GPTXT sentence output 1 Enable GPTXT sentence output
<save>	Save operation
	0 Parameter is not saved, and ineffective after restart 1 Parameter is saved in flash, and effective after restart

Example

```
$PQTXT,W,1,1*22 //Enable GPTXT sentence output and save the parameter into flash
$PQTXT,W,OK*0A //Set OK
```

NOTE

The command will be effective immediately after setting.

2.7. PQECEF Enable/Disable ECEFPOSVEL Sentence Output

PQECEF Enable/Disable ECEFPOSVEL Sentence Output

Write Command	Response
\$PQECEF,W,<mode>,<save>*ChkSum<CR><LF>	\$PQECEF,W,OK*ChkSum<CR><LF>
	If there is any error, response: \$PQECEF,W,ERROR*ChkSum<CR><LF>
Read Command	Response
\$PQECEF,R*ChkSum<CR><LF>	\$PQECEF,R,<mode>*ChkSum<CR><LF>
URC Message	\$ECEFPOSVEL,<time>,<x>,<y>,<z>,<v_x>,<v_y>,<v_z>*ChkSum<CR><LF>
	Parameter
	<time> UTC from the internal real-time clock
	<x> The value of X axis in ECEF
	<y> The value of Y axis in ECEF
	<z> The value of Z axis in ECEF
	<v_x> Velocity component of X axis in ECEF
	<v_y> Velocity component of Y axis in ECEF
	<v_z> Velocity component of Z axis in ECEF
	Example
	\$ECEFPOSVEL,052743.000,-1526672.867459,6191083.982801,143008.780911,0,0,0*14
Reference	

Parameter

<mode>	Operation 0 Disable ECEFPOSVEL sentence output 1 Enable ECEFPOSVEL sentence output
<save>	Save operation 0 Parameter is not saved, and ineffective after restart 1 Parameter is saved in flash, and effective after restart

Example

```
$PQCECF,W,1,1*7F //Enable ECEFPOSVEL sentence output, and save the parameter into flash
$PQCECF,W,OK*57 //Set OK
$PQCECF,R*7A //Read mode
$PQCECF,R,1*67 //Read OK, ECEFPOSVEL sentence output is enabled
```

NOTE

The command will be effective immediately after setting.

2.8. PQODO Start/Stop Odometer Reading

PQODO Start/Stop Odometer Reading

Write Command \$PQODO,W,<mode>[,<initial distance>]*ChkSum<CR><LF>	Response \$PQODO,W,OK*ChkSum<CR><LF> If there is any error, response: \$PQODO,W,ERROR*ChkSum<CR><LF>
Read Command \$PQODO,R*ChkSum<CR><LF>	Response \$PQODO,R,<mode>*ChkSum<CR><LF> If there is any error, response: \$PQODO,R,ERROR*ChkSum<CR><LF>
Query Command \$PQODO,Q*ChkSum<CR><LF>	Response \$PQODO,Q,<distance>*ChkSum<CR><LF> If there is any error, response \$PQODO,Q,ERROR*ChkSum<CR><LF>
Reference	

Parameter

<mode>	Start or stop odometer reading 0 Stop odometer reading and remember the distance value 1 Start odometer reading and initialize the distance according to the <initial distance>
<initial distance>	Set the initial distance, range: 0-1e09, unit: meter When <mode> is 1, this parameter can be omitted, and its default value is 0 When <mode> is 0, this parameter must be omitted
<distance>	Current distance. Unit: meter

Example

```
$PQODO,W,1*23 //Start odometer reading, and initial distance is 0m.
$PQODO,W,OK*16 //Set OK
$PQODO,W,1,1000000*3E //Start odometer reading, and initial distance is 1,000,000m.
$PQODO,W,OK*16 //Set OK
$PQODO,R*3B //Read mode
$PQODO,R,1*26 //Read OK, odometer reading has already been started
$PQODO,Q*38 //Query the distance value
$PQODO,Q,123.45*0B //Current distance value is returned
```

NOTES

1. The command will be effective immediately after setting.
2. After module is restarted, the **PQODO** write command must be executed again to re-start odometer reading.
3. The command is not supported in backup mode.

2.9. PQPZ90 Enable/Disable Switching from WGS84 to PZ-90.11

PQPZ90 Enable/Disable Switching from WGS84 to PZ-90.11

Write Command	Response
\$PQPZ90,W,<mode>,<save>*ChkSum <CR><LF>	\$PQPZ90,W,OK*ChkSum<CR><LF> If there is any error, response: \$PQPZ90,W,ERROR*ChkSum<CR><LF>
Read Command	Response
\$PQPZ90,R*ChkSum<CR><LF>	\$PQPZ90,R,<mode>*ChkSum<CR><LF>
URC Message	\$GNDTM,P90,x,xx.xxxx,x,xx.xxxx,x,xxx,W84*hh<CR><LF> >

	Parameter definition is available in Table 4 .
Reference	Chapter 3.3

Parameter

<mode>	Operation 0 Disable switching from WGS84 to PZ-90.11 1 Enable switching from WGS84 to PZ-90.11
<save>	Save operation 0 Parameter is not saved, and ineffective after restart 1 Parameter is saved in flash, and effective after restart

Example

```
$PQPZ90,W,1,1*79 //Enable switching from WGS84 to PZ-90.11, and save the parameter into flash
$PQPZ90,W,OK*51 //Set OK
$PQPZ90,R*7C //Read mode
$PQPZ90,R,0*60 //Read OK, switching from WGS84 to PZ-90.11 is enabled
```

NOTES

1. The command will be effective immediately after setting <save> to 0. However, when <save> is set to 1, it will be effective only after restart for versions earlier than L76NR03A01S (on L76 module), L76LNR02A01S (on L76-L module), L86NR02A01S (on L86 module) and L26NR02A01S (on L26 module).
2. If switching from WGS84 to PZ-90.11 is enabled and effective, the coordinate values in RMC and GGA sentences will be switched to PZ-90.11 after fixing. Also, a DTM sentence will be displayed to identify the datum used.

2.10. PQGLP Set the Module into GLP Mode

PQGLP Set the Module into GLP Mode	
Write Command \$PQGLP,W,<mode>,<save>*ChkSum <CR><LF>	Response \$PQGLP,W,OK*ChkSum<CR><LF> If there is any error, response: \$PQGLP,W,ERROR*ChkSum<CR><LF>
Read Command \$PQGLP,R*ChkSum<CR><LF>	Response \$PQGLP,R,<mode>*ChkSum<CR><LF>

Reference

Parameter

<mode>	Module operation mode 0 Normal mode 1 GLP mode
<save>	Save operation 0 Parameter is not saved, and ineffective after restart 1 Parameter is saved in flash, and effective after restart

Example

```
$PQGLP,W,1,1*21 //Change to GLP mode
$PQGLP,W,OK*09 //Set OK

$PQGLP,R*24 //Read mode
$PQGLP,R,1*39 //Read OK, GLP mode is enabled
```

NOTE

The command will be effective immediately after setting.

2.11. PQVEL Enable/Disable 3 Ways Velocity Sentence Output

PQVEL Enable/Disable 3 Ways Velocity Sentence Output

Write Command \$PQVEL,W,<mode>,<save>*ChkSum <CR><LF>	Response \$PQVEL,W,OK*ChkSum<CR><LF> If there is any error, response: \$PQVEL,W,ERROR*ChkSum<CR><LF>
Read Command \$PQVEL,R*ChkSum<CR><LF>	Response \$PQVEL,R,<mode>*ChkSum<CR><LF>
URC Message	\$PQVEL,<north_vel>,<east_vel>,<down_vel>*ChkSum<CR><LF> Parameter <north_vel> North velocity <east_vel> East velocity

	<down_vel>	Down velocity
	Example	
		\$PQVEL,1.000000,2.000000,-0.000000*42
Reference		

Parameter

<mode>	Enable/disable 3 ways velocity sentence output
	0 Disable
	1 Enable
<save>	Save operation
	0 Parameter is not saved, and ineffective after restart
	1 Parameter is saved in flash, and effective after restart

Example

```

$PQVEL,W,1,1*25 //Enable 3 ways velocity sentence output
$PQVEL,W,OK*0D //Set OK

$PQVEL,R*20 //Read mode
$PQVEL,R,1*3D //Read OK, 3 ways velocity sentence output is enabled
    
```

NOTE

The command will be effective immediately after setting.

2.12. PQJAM Enable/Disable Jamming Detection Function

PQJAM Enable/Disable Jamming Detection Function

Write Command	Response
\$PQJAM,W,<mode>,<save>*ChkSum <CR><LF>	\$PQJAM,W,OK*ChkSum<CR><LF>
	If there is any error, response: \$PQJAM,W,ERROR*ChkSum<CR><LF>
Read Command	Response
\$PQJAM,R*ChkSum<CR><LF>	\$PQJAM,R,<mode>*ChkSum<CR><LF>
URC Message	\$PMTKSPF, <status>*ChkSum<CR><LF>

	<p>Parameter</p> <p><status> Jamming status</p> <p>1 No jamming, healthy status.</p> <p>2 Warning status.</p> <p>3 Critical status</p> <p>Example</p> <p>\$PMTKSPF,1*5A</p>
Reference	

Parameter

<mode>	Operation mode
	0 Disable jamming detection function
	1 Enable jamming detection function
<save>	Save operation
	0 Parameter is not saved, and ineffective after restart
	1 Parameter is saved in flash, and effective after restart

Example

\$PQJAM,W,1,1*3C	//Enable jamming detection function
\$PQJAM,W,OK*14	//Set OK
\$PQJAM,R*39	//Read operation mode
\$PQJAM,R,1*24	//Read OK

NOTES

1. The command will be effective immediately after setting.
2. The command is not supported in backup mode.

2.13. PQRLM Enable/Disable Return Link Message Output

PQRLM Enable/Disable Return Link Message Output

Write Command	Response
\$PQRLM,W,<mode>,<save>*ChkSum	\$PQRLM,W,OK*ChkSum<CR><LF>
<CR><LF>	
	If there is any error, response:
	\$PQRLM,W,ERROR*ChkSum<CR><LF>

Read Command \$PQRLM,R*ChkSum<CR><LF>	Response \$PQRLM,R,<mode>*ChkSum<CR><LF>
URC Message	\$PQRLM,<beacon_id>,<gps_second>,<msg_code>,<para>*ChkSum<CR><LF> Parameter <beacon_id> Beacon ID of RLM <gps_second> The GPS second when receiving RLM <msg_code> Message code <para> The data parameters provided by RLS. (short message contains 4 hex characters, long message contains 24 hex characters) Example \$PQRLM,0a0a0a0a0a0a0a8,955065733,1,8aa1*3E \$PQRLM,050505050505052,955065709,15,5555555555555555 55555
Reference	

Parameter

<mode>	Enable/disable return link message output <u>0</u> Disable 1 Enable
<save>	Save operation 0 Parameter is not saved, and ineffective after restart 1 Parameter is saved in flash, and effective after restart

Example

```

$PQRLM,W,1,1*29 //Enable return link message output
$PQRLM,W,OK*01 //Set OK

$PQRLM,R*2C //Read mode
$PQRLM,R,1*31 //Read OK
  
```

NOTE

The command will be effective immediately after setting.

2.14. PQGEO Configure Parameters of Geo-fence

PQGEO Configure Parameters of Geo-fence

<p>Write Command \$PQGEO,W,<GEO ID>,<mode>,<shape>,<latitude0>,<longitude0>,<latitude1/radius>,<longitude1>,<latitude2>,<longitude2>,<latitude3>,<longitude3>*ChkSum<CR><LF></p>	<p>Response \$PQGEO,W,OK*ChkSum<CR><LF></p> <p>If there is any error, response: \$PQGEO,W,ERROR*ChkSum<CR><LF></p>
<p>Read Command \$PQGEO,R,<GEO ID>*ChkSum<CR><LF></p>	<p>Response \$PQGEO,R,<GEO ID>,<mode>,<shape>,<latitude0>,<longitude0>,<latitude1/radius>,<longitude1>,<latitude2>,<longitude2>,<latitude3>,<longitude3>*ChkSum<CR><LF></p> <p>If there is any error, response: \$PQGEO,R,ERROR*ChkSum<CR><LF></p>
<p>Inquire Command \$PQGEO,Q,<GEO ID>*ChkSum<CR><LF></p>	<p>Response \$PQGEO,Q,<GEO ID>,<status>*ChkSum<CR><LF></p> <p>If there is any error, response: \$PQGEO,Q,ERROR*ChkSum<CR><LF></p>
<p>URC Message</p>	<p>\$PQGEO,<GEO ID>,<action>,<Fix status>,<UTC date & Time>,<Latitude>,<Longitude>,<MSL Altitude>,<Speed Over Ground>,<Course Over Ground>,<Fix Mode>,<Reserved1>,<HDOP>,<PDOP>,<VDOP>,<Reserved2>,<GPS Satellites in View>,<GPS Satellites Used>,*ChkSum<CR><LF></p> <p>Parameters</p> <p><GEO ID> Geo-fence ID is from 0 to 9.</p> <p><action> The current action of the module</p> <p> 1 Enters a geo-fence</p> <p> 2 Leaves a geo-fence</p> <p><Fix status> Fix status</p> <p> 0 No fix</p> <p> 1 2D fix</p> <p> 2 3D fix</p> <p><UTC date & Time> UTC time</p> <p> Format: DyyMMddThhmmss.sss</p> <p> D: char 'D', refers to date</p>

	yy: current year-2000 MM: 1-12 dd: 1-31 T: char 'T', refers to time hh: 0-23 mm: 0-59 ss.sss: 00.000-59.9999
<Latitude>	The latitude of current position Unit: degree Format: ±dd.dddddd Range: -90.000000~90.000000
<Longitude>	The longitude of current position Unit: degree Format: ±ddd.dddddd Range: -180.000000~180.000000
<MSL Altitude>	Mean sea level (MSL) altitude Unit: meter
<Speed Over Ground>	Speed over ground. Unit: km/h
<Course Over Ground>	Course over ground Unit: degree Range: 0-360.00
<Fix Mode>	Fix mode 0 No fix 1 Estimated mode 2 Position fixed 3 Position fixed in DGPS mode
<Reserved1>	Reserved1
<HDOP>	Horizontal dilution of precision
<PDOP>	Position dilution of precision
<VDOP>	Vertical dilution of precision
<Reserved2>	Reserved2
<GPS Satellites in View>	GPS satellites in view
<GPS Satellites Used>	GPS satellites used
	Example \$PQGEO,0,1,2,D150506T070127.000,31.856038,117.197110,49.4,14.92,0.18,2,,1.11,2.95,2.74,,14,9*5D
Reference	

Parameter

<GEO ID>	Geo-fence ID, range: 0-9
<mode>	Report mode

	0 Do not report when to enter or leave the geo-fence
	1 Report when to enter the geo-fence
	2 Report when to leave the geo-fence
	3 Report when to enter or leave the geo-fence
	If <mode> is 0, the parameters after <mode> can be omitted.
<shape>	Fence shape
	0 Circularity with center and radius
	1 Circularity with center and one point on the circle
	2 Triangle
	3 Quadrangle
<latitude0>	The latitude of a point which is defined as the center of the geo-fence circular region or the first point, Unit: degree
	Format: ±dd.dddddd, range: -90.000000~90.000000
<longitude0>	The longitude of a point which is defined as the center of the geo-fence circular region or the first point. Unit: degree
	Format: ±ddd.dddddd, range: -180.000000~180.000000
<latitude1/radius>	When <shape> is 0, this parameter is radius, unit: meter, range: 0-6000000.0
	When <shape> is other values, this parameter is latitude1, Unit: degree
	Format: ±dd.dddddd, range: -90.000000~90.000000
	If <shape> is 0, the parameters after <latitude1/radius> must be omitted.
<longitude1>	The longitude of second point. Unit: degree
	Format: ±ddd.dddddd, range: -180.000000~180.000000
	If <shape> is 1, the parameters after <longitude1> must be omitted.
<latitude2>	The latitude of third point. Unit: degree
	Format: ±dd.dddddd, range: -90.000000~90.000000
<longitude2>	The longitude of third point. Unit: degree
	Format: ±ddd.dddddd, range: -180.000000~180.000000
	If <shape> is 2, the parameters after <longitude2> must be omitted.
<latitude3>	The latitude of fourth point. Unit: degree
	Format: ±dd.dddddd, range: -90.000000~90.000000
<longitude3>	The longitude of fourth point. Unit: degree
	Format: ±ddd.dddddd, range: -180.000000~180.000000
<status>	The status of current position.
	0 Unknown position
	1 Inside the geo-fence
	2 Outside the geo-fence

Example

```

$PQGEO,W,0,1,0,31.85913,117.1933,500.0*26 //<shape> is 0.
$PQGEO,W,OK*1F
$PQGEO,W,4,3,1,31.91133,117.1129,31.994856,117.070281*1C //<shape> is 1.
$PQGEO,W,OK*1F
$PQGEO,W,3,0*34 //Delete geo-fence 3.

```

\$PQGEO,W,OK*1F

\$PQGEO,R,0*2E

\$PQGEO,R,0,1,0,31.859130,117.193300,500.0*13

\$PQGEO,R,4*2A

\$PQGEO,R,4,3,1,31.911330,117.112900,31.994856,117.070281*29

\$PQGEO,Q,0*2D

\$PQGEO,Q,0,1*30

\$PQGEO,Q,4*29

\$PQGEO,Q,4,2*37

NOTES

1. If <mode> is 0 and there are no parameters after <mode>, this command can delete the geo-fence.
2. If <mode> is 1 (or 2), when the module enters (or leaves) the geo-fence, the Reserved2 pin (pin 17) level will change from high to low; when the module leaves (or enters) the geo-fence, the Reserved2 pin (pin 17) level will change from low to high or keep unchanged. If <mode> is 0 or 3, the Reserved2 (17th) pin level will always keep high. This function is only supported on L76 module and the <GEO ID> must be 0.
3. \$PQGEO,R,10*1F command can inquire parameters of all geofences.
4. The command will be effective immediately after setting, and the parameters will be automatically saved into flash.
5. Input the latitude and longitude in sequence in clockwise or counter-clockwise order.

2.15. PQPREC Configure Parameter Precision in NMEA Sentences

The command is used to configure the parameter (latitude/longitude/altitude) precision in NMEA sentences, through setting the number of digits after the decimal point.

PQPREC Configure Parameter Precision in NMEA Sentences

Write Command
\$PQPREC,W,<latitude bits>,<longitude bits>[,<altitude bits>],<save>*ChkSum<CR><LF>

Response
\$PQPREC,W,OK*ChkSum<CR><LF>

If there is any error, response:
\$PQPREC,W,ERROR*ChkSum<CR><LF>

Read Command
\$PQPREC,R*ChkSum<CR><LF>

Response
\$PQPREC,R,<latitude bits>,<longitude bits>,<altitude bits>*ChkSum<CR><LF>

Reference

Parameter

<latitude bits>	The number of digits after the decimal point of latitude in NMEA sentences <u>4</u> - 6 The default value is 4
<longitude bits>	The number of digits after the decimal point of longitude in NMEA sentences <u>4</u> - 6 The default value is 4
<altitude bits>	The number of digits after the decimal point of altitude and geoidal separation in NMEA sentences. This parameter can be omitted <u>1</u> - 3 The default value is 1
<save>	Save operation 0 Configuration is not saved, and ineffective after restart 1 Configuration is saved in flash, and effective after restart

Example

```
$PQPREC,W,5,5,2,1*7D //Set the number of digits after the decimal point of latitude and longitude
                        to 5, and altitude to 2, then save the parameter into flash.
$PQPREC,W,OK*56 //Set OK

//The following parameters in bold are variables:
$xxRMC,030037.000,A,3150.77801,N,11711.95112,E,0.00,37.74,070816,,A*xx
$xxGGA,030037.000,3150.77801,N,11711.95112,E,1,6,1.66,96.54,M,0.01,M,,*xx
$xxGLL,3150.77801,N,11711.95112,E,030037.000,A,A*xx

$PQPREC,R*7B //Read parameter precision setting in NMEA sentences.
$PQPREC,R,5,5,2*65 //Read OK
```

NOTE

The command will be effective immediately after setting.

2.16. PQGBS Enable/Disable GBS Sentence Output

The packet can enable or disable the output of GBS sentence which is used to support receiver autonomous integrity monitoring (RAIM).

PQGBS Enable/Disable GBS Sentence Output

Write Command	Response
\$PQGBS,W,<mode>,<save>*ChkSum <CR><LF>	\$PQGBS,W,OK*ChkSum<CR><LF>

	If there is any error, response: \$PQGBS,W,ERROR*ChkSum<CR><LF>
Read Command \$PQGBS,R*ChkSum<CR><LF>	Response \$PQGBS,R,<mode>*ChkSum<CR><LF>
URC Message	\$--GBS,hhmmss.ss,x.x,x.x,x.x,xx,x.x,x.x,x.x*hh<CR><LF> > Parameter definition is available in Table 5 . Example \$GNGBS,035459.000,8.30,4.43,9.41,22,0.0,-162.6,29.2,1,0*6D
Reference	

Parameter

<mode>	Module operation mode 0 Disable GBS sentence output 1 Enable GBS sentence output
<save>	Save operation 0 Parameter is not saved, and ineffective after restart 1 Parameter is saved in flash, and effective after restart

Example

```

$PQGBS,W,1,1*2C //Enable GBS sentence output and saved into flash
$PQGBS,W,OK*04 //Set OK

$PQGBS,R*29 //Read mode
$PQGBS,R,1*34 //Read OK, GBS sentence output is enabled
    
```

NOTE

The command will be effective immediately after setting.

3 Appendix References

3.1. Related Documents

Table 2: Related Documents

SN	Document Name	Remark
[1]	Quectel_GNSS_Low_Power_Mode_Application_Note	GNSS Low Power Mode Application Note

3.2. Terms and Abbreviations

Table 3: Terms and Abbreviations

Abbreviation	Description
1PPS	1 Pulse Per Second
ECEF	Earth-centered, Earth-fixed
EPE	Estimated Position Error
FLP	Fitness Low Power
GBS	GNSS Satellite Fault Detection
GGA	Global Positioning System Fixed Data
GLP	GNSS Low Power
GNSS	Global Navigation Satellite System
MLS	Mean Sea Level
NMEA	National Marine Electronics Association
ODO	Odometer

PZ90	Parametry Zemli 1990
RAIM	Receiver Autonomous Integrity Monitoring
RMC	Recommended Minimum Specific GNSS Data
RLM	Return Link Message
RLS	Return Link Service
URC	Unsolicited Result Code

3.3. Datum Sentence Definition

The datum sentence definition for \$GNDTM,xxx,x,xx.xxxx,x,xx.xxxx,x,xxx,xxx*hh<CR><LF> is illustrated below:

Table 4: Datum Sentence Definition

Field	Meaning
1	Local datum code (xxx): W84 - WGS84 W72 - WGS72 S85 - SGS85 P90 - PZ-90
2	Local datum sub code (x)
3	Latitude offset in minutes (xx.xxxx)
4	Latitude offset mark (N: +, S: -) (x)
5	Longitude offset in minutes (xx.xxxx)
6	Longitude offset mark (E: +, W: -) (x)
7	Altitude offset in meters.
8	Datum (xxx): W84 - WGS84 W72 - WGS72 S85 - SGS85 P90 - PZ-90
9	Checksum

3.4. GBS Sentence Definition

The GBS sentence definition for \$--GBS,hhmmss.ss,x.x,x.x,x.x,xx,x.x,x.x,x.x,x*x*hh<CR><LF> is illustrated below:

Table 5: GBS Sentence Definition

Field	Meaning
1	UTC time of the GGA or GNS fix associated with this sentence.
2	Expected Error in latitude
3	Expected Error in longitude
4	Expected Error in altitude
5	ID number of most likely failed satellite
6	Probability of missed detection for most likely failed satellite
7	Estimate of bias in meters on most likely failed satellite
8	Standard deviation of bias estimate
9	GNSS system ID
	1 - GPS
	2 - GLONASS
	3 - Galileo
10	4 - RESERVED
	GNSS signal ID
	0 - All channel
11	1 - G1 C/A
	Checksum

NOTE

If only GPS, GLONASS, etc. is used for the reported position solution, the talker ID of GBS is GP, GL, etc., and the errors pertain to the individual system. If satellites from multiple systems are used to obtain the reported position solution, the talker ID is GN and the errors pertain to the combined solution.