



# GlobalTop

## PMTK command packet

### Rev.A05

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#### **GlobalTop Tech Inc.**

3<sup>rd</sup> Floor., No.7 Nan-ke 3<sup>rd</sup> Rd Science-based Ind. Park, Tainan 741-47, Taiwan, R.O.C.  
Tel:+886-6-6007799 Fax:+886-6-5053381 <http://www.gtop-tech.com/> email: sales@gtop-tech.com  
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## Revision History

Revision	Date	Author	Description
A03	2010-07-13	Brian	
A04	2010-09-09	Gavin	Add 001,605,705 command packet Add :Notice section
A05	2010-10-20	Gavin	Page 4 :Modify the description about ack feedback situation Add : Nav Speed threshold command (packet 397,447,527 )

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### MTK NMEA Packet List:

MTK NMEA Packet List: ..... 3

MTK NMEA Packet Format ..... 4

    Packet Type: 001 PMTK\_ACK ..... 5

    Packet Type: 101 PMTK\_CMD\_HOT\_START..... 5

    Packet Type: 102 PMTK\_CMD\_WARM\_START ..... 5

    Packet Type: 103 PMTK\_CMD\_COLD\_START ..... 6

    Packet Type: 104 PMTK\_CMD\_FULL\_COLD\_START..... 6

    Packet Type: 220 PMTK\_SET\_NMEA\_UPDATERATE ..... 6

    Packet Type : 250 PMTK\_SET\_DPort..... 7

    Packet Type : 251 PMTK\_SET\_NMEA\_BAUDRATE..... 7

    Packet Type: 300 PMTK\_API\_SET\_FIX\_CTL..... 8

    Packet Type: 301 PMTK\_API\_SET\_DGPS\_MODE ..... 8

    Packet Type: 313 PMTK\_API\_SET\_SBAS\_ENABLED..... 9

    Packet Type : 314 PMTK\_API\_SET\_NMEA\_OUTPUT ..... 9

    Packet Type: 319 PMTK\_API\_SET\_SBAS\_Mode..... 10

    Packet Type: 413 PMTK\_API\_Q\_SBAS\_ENABLED ..... 10

    Packet Type: 513 PMTK\_DT\_SBAS\_ENABLED..... 11

    Packet Type: 605 PMTK\_Q\_RELEASE ..... 11

    Packet Type: 705 PMTK\_DT\_RELEASE ..... 11

    Packet Type:397 PMTK\_SET\_Nav Speed threshold..... 12

    Packet Type: 447 PMTK\_Q\_Nav\_Threshold..... 12

    Packet Type: 527 PMTK\_DT\_Nav\_Threshold..... 12

Notice: ..... 13

    How to acquire that CheckSum value by checksum tool..... 13

    Command Setting Reset Notice ..... 13

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## MTK NMEA Packet Format

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

Maximum packet length is restricted to 255 bytes.

Field	Length	Type	Description
Preamble	1 byte	Character	"\$"
TalkerID	4 byte	Character string	"PMTK"
PktType	3 byte	Character string	From "000" to "999", an identifier used to tell the decoder how to decode the packet
DataField	Variable		A "," must be inserted before each data field to help decoder process the DataField
*	1 byte	Character	The star symbol is used to mark the end of DataField
CHK1, CHK2	2 byte	Character string	Checksum of the data between preamble "\$" and "*"
CR, LF	2 byte	Binary data	Used to identify the end of a packet

Sample Packet: \$PMTK000\*32<CR><LF>

To inform the sender whether or not the module has received the packet, an acknowledge packet PMTK\_ACK should be returned after the command is successfully given.

Pkt Type	Abbreviation / Syntax	Data Field	meaning / Example / Return
000	PMTK_TEST	None	Test Packet \$PMTK000*32<CR><LF>
001	PMTK_ACK PMTK001,Cmd,Flag	Cmd: Command / packet type the acknowledge responds Flag: 0 = Invalid command / packet 1 = Unsupported command / packet type 2 = Valid command / packet, but action failed 3 = Valid command / packet, and action succeeded	Acknowledge of PMTK command \$PMTK001,604,3*32<CR><LF>
010	PMTK_SYS_MSG PMTK001,Msg	Msg: System message. 0 : Unknown 1: Startup	Output system message \$PMTK010,001*2E<CR><LF>

In addition, when the GPS module is powered-on or restarted via command, both "\$PMTK010,001\*2E<CR><LF>" and "\$PMTK011,MTKGPS\*08<CR><LF>" will be returned at the same time after GPS engine has successfully completed boot-up stage.

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**Note:**

When the power of device (module) is removed, any modified setting will be lost and reset to factory default setting. If the device (module) has backup power supply through VBACKUP or coin battery, it will be able to keep the modified setting until the backup power is exhausted.

## Packet Type: 001 PMTK\_ACK

**Packet Meaning:**

Acknowledge of PMTK command

**DataField:**

PMTK001, Cmd, Flag

Cmd: The command / packet type the acknowledge responds.

Flag: '0' = Invalid command / packet.

'1' = Unsupported command / packet type

'2' = Valid command / packet, but action failed

'3' = Valid command / packet, and action succeeded

**Example:**

\$PMTK001,604,3\*32<CR><LF>

## Packet Type: 101 PMTK\_CMD\_HOT\_START

**Packet Meaning:**

Hot Restart: Use all available data in the NV Store.

**DataField:**

None

**Example:**

\$PMTK101\*32<CR><LF>

## Packet Type: 102 PMTK\_CMD\_WARM\_START

**Packet Meaning:**

Warm Restart: Don't use Ephemeris at re-start.

**DataField:**

None

**Example:**

\$PMTK102\*31<CR><LF>



## Packet Type: 103 PMTK\_CMD\_COLD\_START

**Packet Meaning:**

Cold Restart: Don't use Time, Position, Almanacs and Ephemeris data at re-start.

**DataField:**

None

**Example:**

\$PMTK103\*30<CR><LF>

## Packet Type: 104 PMTK\_CMD\_FULL\_COLD\_START

**Packet Meaning:**

Full Cold Restart: It's essentially a Cold Restart, but additionally clear system/user configurations at re-start. That is, reset the receiver to the factory status.

**DataField:**

None

**Example:**

\$PMTK104\*37<CR><LF>

## Packet Type: 220 PMTK\_SET\_NMEA\_UPDATERATE

**Packet Meaning:**

Set NMEA port update rate

**DataField:**

Position fix interval(msec). The possible interval values range between 100 and 10000 msec.

**Example:**

\$PMTK220,1000\*1F<CR><LF>

\$PMTK220,200\*2C<CR><LF>

\$PMTK220,100\*2F<CR><LF>

**Note :**

1000(msec) = 1(sec) → 1/1 = 1Hz  
200(msec) = 0.2(sec) → 1/0.2 = 5 Hz  
100(msce) = 0.1(sec) → 1/0.1 = 10 Hz

- 1F is checksum
- CR, LF : Two bytes binary data
- The two bytes are used to identify the end of a packet



## Packet Type : 250 PMTK\_SET\_DPort

### Packet meaning

Set data port's (RTCM PORT or 2<sup>nd</sup> UART PORT) baud rate and input/output type

### DataField:

PMTK250, InType, OutType, Baudrate

InType : Data port input data type

'0' = DPORT\_IN\_NONE (No data input)

'1' = DPORT\_IN\_RTCM (RTCM input)

'3' = DPORT\_IN\_NMEA (MTK NMEA)

OutType : Data port output data type

'0' = DPORT\_OUT\_NONE (No data output)

'3' = DPORT\_OUT\_NMEA (MTK NMEA)

Baudrate : 4800,9600,14400,19200,38400,57600,115200

### Example :

```
$PMTK250,1,0,9600*17<CR><LF>
```

## Packet Type : 251 PMTK\_SET\_NMEA\_BAUDRATE

### Packet Meaning :

Set NMEA port baud rate

### DataField :

PMTK251, Baudrate

Baudrate setting : 4800,9600,14400,19200,38400,57600,115200

### Example :

```
$PMTK251,38400*27<CR><LF>
```

### Note :

27 is checksum

CR, LF : Two bytes binary data

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



## Packet Type: 300 PMTK\_API\_SET\_FIX\_CTL

**Packet Meaning:**

API\_Set\_Fix\_Ctl

This parameter controls the rate of position fixing activity.

**DataField:**

PMTK300,FixInterval,0,0,0,0

FixInterval: Position fix interval [msec]. Must be larger than 200.

**Example :**

\$PMTK300,1000,0,0,0,0\*1C<CR><LF>

## Packet Type: 301 PMTK\_API\_SET\_DGPS\_MODE

**Packet Meaning:**

API\_Set\_Dgps\_Mode

DGPS correction data source mode.

**DataField:**

PMTK301,Mode

Mode: DGPS data source mode.

'0': No DGPS source

'1': RTCM

'2': WAAS

**Example:**

\$PMTK301,1\*2D<CR><LF>

**Note:**

If you wish to use set DGPS mode to RTCM, please use PMTK250 first to set RTCM baud rate before using this command





## Packet Type: 313 PMTK\_API\_SET\_SBAS\_ENABLED

**Packet Meaning:**

API\_Set\_Sbas\_Enabled  
Enable to search a SBAS satellite or not.

**DataField:**

Enabled: Enable or disable  
'0' = Disable, '1' = Enable

**Example:**

\$PMTK313,1\*2E<CR><LF>

## Packet Type : 314 PMTK\_API\_SET\_NMEA\_OUTPUT

**Packet Meaning :**

API\_Set\_NMEA\_Out  
Set NMEA sentence output frequencies

**DataField :**

There are totally 19 data fields that present output frequencies for the 19 supported NMEA sentences individually.

**Supported NMEA Sentences**

- 0 NMEA\_SEN\_GLL, // GPGLL interval - Geographic Position - Latitude longitude
- 1 NMEA\_SEN\_RMC, // GPRMC interval - Recommended Minimum Specific GNSS Sentence
- 2 NMEA\_SEN\_VTG, // GPVTG interval - Course over Ground and Ground Speed
- 3 NMEA\_SEN\_GGA, // GPGGA interval - GPS Fix Data
- 4 NMEA\_SEN\_GSA, // GPGSA interval - GNSS DOPS and Active Satellites
- 5 NMEA\_SEN\_GSV, // GPGSV interval - GNSS Satellites in View
- 6 NMEA\_SEN\_GRS, // GPGRS interval - GNSS Range Residuals
- 7 NMEA\_SEN\_GST, // GPGST interval - GNSS Pseudo range Errors Statistics
- 13 NMEA\_SEN\_MALM, // PMTKALM interval - GPS almanac information
- 14 NMEA\_SEN\_MEPH, // PMTKEPH interval - GPS ephemeris information
- 15 NMEA\_SEN\_MDGP, // PMTKDGP interval - GPS differential correction information
- 16 NMEA\_SEN\_MDBG, // PMTKDBG interval – MTK debug information
- 17 NMEA\_SEN\_ZDA, // GPZDA interval – Time & Date
- 18 NMEA\_SEN\_MCHN, // PMTKCHN interval – GPS channel status



## Supported Frequency Setting

- 0 - Disabled or not supported sentence
- 1 - Output once every one position fix
- 2 - Output once every two position fixes
- 3 - Output once every three position fixes
- 4 - Output once every four position fixes
- 5 - Output once every five position fixes

### Example:

```
$PMTK314,1,1,1,1,1,5,1,1,1,1,1,0,1,1,1,1,1*2C<CR><LF>
```

This command set GLL output frequency to be outputting once every 1 position fix, and RMC to be outputting once every 1 position fix, and so on. You can also restore the system default setting via issue : \$PMTK314,-1\*04<CR><LF>

## Packet Type: 319 PMTK\_API\_SET\_SBAS\_Mode

### Packet Meaning:

API\_Set\_Sbas Mode\_Selection  
Choose SBAS satellite test mode

### DataField:

Mode=0: testing mode  
Mode=1: Integrity mode

### Example:

```
$PMTK319,0*25<CR><LF>  
$PMTK319,1*24<CR><LF>
```

## Packet Type: 413 PMTK\_API\_Q\_SBAS\_ENABLED

### Packet Meaning:

API\_Query\_Sbas\_Enabled

### DataField:

None

### Return:

PMTK\_DT\_SBAS\_ENABLED

### Example:

```
$PMTK413*34<CR><LF>
```

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## Packet Type: 513 PMTK\_DT\_SBAS\_ENABLED

**Packet Meaning:**

Enable to search a SBAS satellite or not.

**DataField:**

Enabled: Enable or disable

'0' = Disable, '1' = Enable

**Example:**

\$PMTK513,1\*28<CR><LF>

## Packet Type: 605 PMTK\_Q\_RELEASE

**Packet Meaning:**

Query the firmware release information.

**DataField:**

NONE

**Return:**

PMTK\_DT\_RELEASE

**Example:**

\$PMTK605\*31<CR><LF>

## Packet Type: 705 PMTK\_DT\_RELEASE

**Packet Meaning:**

Firmware release information.

**DataField:**

PMTK705,ReleaseStr,Build\_ID,Internal\_USE\_1,( Internal\_USE\_2)

ReleaseStr: Firmware release name and version

3318 : Mcore\_x.x

3329 : AXN\_x.x

Build\_ID: for firmware version control

Internal\_USE\_1: Internal only

Internal\_USE\_2: Internal only

PMTK705,AXN\_1.3,2102,ABCD,\*14<CR><LF>



## Packet Type:397 PMTK\_SET\_Nav Speed threshold

**Packet Meaning:**

If the speed is slower than the specified threshold, the output position will stay free zed.

For Car navigation application (high speed),the suggestion is that set the threshold to prevent some position drift phenomenon

for Sport or Bike application or stationary application (low speed),the suggestion is that disable the function to get the real position change information

User can test the appropriate parameters based on specified application

**DataField:**

PMTK397,Nav Speed threshold

Nav Speed threshold: 0/ 0.2/ 0.4/ 0.6/ 0.8/ 1.0/1.5/2.0 (m/s)

Disable:Nav Speed threshold is set to 0 m/sec

**Example:**

```
$PMTK397,0.2*3F<CR><LF>
```

```
$PMTK397,2.0*3F<CR><LF>
```

## Packet Type: 447 PMTK\_Q\_Nav\_Threshold

**Packet Meaning:**

Query current Nav Speed threshold setting.

**DataField:**

NONE

Return:

PMTK\_DT\_Nav\_Threshold

**Example:**

```
$PMTK447*35<CR><LF>
```

## Packet Type: 527 PMTK\_DT\_Nav\_Threshold

**Packet Meaning:**

Current Nav Speed threshold setting

**DataField:**

PMTK527,Current Nav\_Threshold

Current Nav\_Threshold:

The range is 0/ 0.2/ 0.4/ 0.6/ 0.8/ 1.0/1.5/2.0 (m/s)

**Example:**

```
$PMTK527,0.20*02<CR><LF>
```

```
$PMTK527,2.00*02<CR><LF>
```

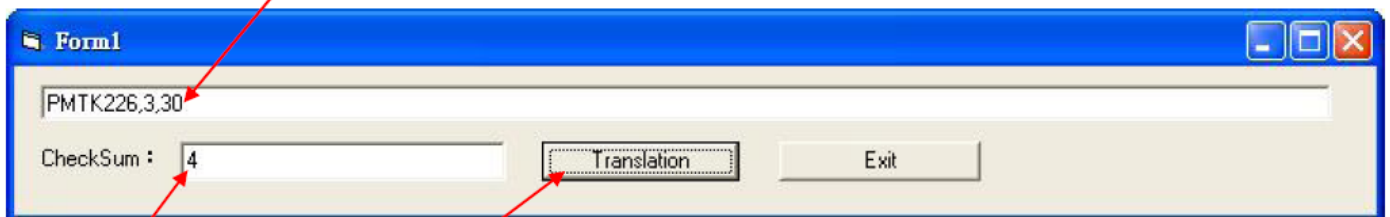
```
$PMTK527,0.00*00<CR><LF>
```

## Notice:

How to acquire that CheckSum value by checksum tool.

Example: `$PMTK226,3,30*4<CR><LF>`

### 1. Key in command contents



The screenshot shows a window titled 'Form1' with a text input field containing 'PMTK226,3,30'. Below it is a 'CheckSum' field containing '4'. To the right of the CheckSum field is a 'Translation' button, which is highlighted with a red arrow. Further right is an 'Exit' button. A red arrow also points to the 'Translation' button from the text '2. Click Translation' below the window.

### 2. Click Translation

### 3. That checksum will display

## Command Setting Reset Notice

Those command packet for module baud and update rate changed only temporary, when module power reset those update rate and baud rate must be back to original setting. If user want to change baud rate and update rate of module to other value that need Gtop re-edit new firmware and burning it to module.