



GlobalTop

MT3337(E)

PMTK Command Packet

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Revision History

Revision	Date	Author	Description
A01	2012.11.16	Hector	1 st Release for MT3337
A02	2015.05.13	Hector	2 nd Release only for MT3337(E).

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MTK NMEA Packet Protocol

In order to inform the sender whether the receiver has received the packet, an acknowledge packet

PMTK_ACK should return after the receiver receives a packet.

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MTK NMEA Packet Format

Preamble	Talker ID	Pkt Type	Date Field	*	CHK1	CHK2	CR	LF
----------	-----------	----------	------------	---	------	------	----	----

Maximum packet length is restricted to **255** bytes

Field	Length	Type	Description
Preamble	1 byte	Character	"\$"
Talker ID	4 byte	Character string	"PMTK"
Pkt Type	3 byte	Character string	From "000" to "999", an identifier used to tell the decoder how to decode the packet
Data Field	variable		A "," must be inserted ahead each data field to help decoder process the Data Field
*	1 byte	Character	The star symbol is used make the end of Data Field
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>

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	Command/ packet type the acknowledge responds Flag: 0 = invalid command/ packet type 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 PMTK010,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

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after GPS engine has successfully completed boot-up stage.

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

Support Chip Type:

MT3337

Packet Meaning:

Acknowledge of PMTK command

Data Field:

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: 010 PMTK_SYS_MSG

Support Chip Type:

MT3337

Packet Meaning:

Output system message

Data Field:

Msg: The system message

'0' = UNKNOWN

'1' = STARTUP

'2' = Notification: Notification for the host aiding EPO

'3' = Notification: Notification for the transition to Normal mode is successfully done

Example:

\$PMTK010,001*2E<CR><LF>

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Packet Type: 011 PMTK_TXT_MSG

Support Chip Type:

MT3337

Packet Meaning:

Output system message

Example:

\$PMTK011,MTKGPS*08<CR><LF>

Packet Type: 101 PMTK_CMD_HOT_START

Support Chip Type:

MT3337

Packet Meaning:

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

Data Field:

None

Example:

\$PMTK101*32<CR><LF>

Packet Type: 102 PMTK_CMD_WARM_START

Support Chip Type:

MT3337

Packet Meaning:

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

Data Field:

None

Example:

\$PMTK102*31<CR><LF>



Packet Type: 103 PMTK_CMD_COLD_START

Support Chip Type:

MT3337

Packet Meaning:

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

Data Field:

None

Example:

\$PMTK103*30<CR><LF>

Packet Type: 104 PMTK_CMD_FULL_COLD_START

Support Chip Type:

MT3337

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.

Data Field:

None

Example:

\$PMTK104*37<CR><LF>

Packet Type: 220 PMTK_SET_NMEA_UPDATERATE

Support Chip Type:

MT3337

Packet Meaning:

Set NMEA port update rate

Data Field:

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

**Example:**

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

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

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

Note :

Before user input this command for update rate setting, it needs to see if the baud rate is enough or not.

User can use PMTK251 command for baud rate setting

1000(millisecond) = 1(sec) $\rightarrow 1/1 = 1\text{Hz}$

200(millisecond) = 0.2(sec) $\rightarrow 1/0.2 = 5\text{ Hz}$

100(millisecond) = 0.1(sec) $\rightarrow 1/0.1 = 10\text{ Hz}$

Packet Type: 400 PMTK_API_Q_FIX_CTL

Support Chip Type:

MT3337

Packet Meaning:

Query update rate

Data Field:

None

Return:

PMTK_DT_FIX_CTL

Example:

\$PMTK400*36<CR><LF>

Packet Type: 500 PMTK_DT_FIX_CTL

Support Chip Type:

MT3337

Packet Meaning:

The parameter means which update is set currently

Data Field:

Fixinterval: Position fix interval. (msec). [≥ 100]

1000 $\rightarrow$ 1Hz

200 $\rightarrow$ 5Hz

100 $\rightarrow$ 10Hz

**Example:**

\$PMTK500,1000,0,0,0,0,0.0*1A<CR><LF>

Packet Type: 251 PMTK_SET_NMEA_BAUDRATE

Support Chip Type:

MT3337

Packet Meaning:

Set NMEA port baud rate

Data Field:

PMTK251, Baudrate

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

Example:

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

Note :

1. You can also restore the system default setting via issue : \$PMTK251,0*28<CR><LF>
2. The setting of baud rate will be back to default value in two conditions:
 - a. Full cold start command issued
 - b. Enter standby mode

Packet Type: 314 PMTK_API_SET_NMEA_OUTPUT

Support Chip Type:

MT3337

Packet Meaning:

API_Set_NMEA_Out

Set NMEA sentence output frequencies

Data Field:

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

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6 //Reserved
7 //Reserved
13 //Reserved
14 //Reserved
15 //Reserved
16 //Reserved
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:

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

Note:

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: 414 PMTK_API_Q_NMEA_OUTPUT

Support Chip Type:

MT3337

Packet Meaning:

API_Query_NMEA_Out
Query current NMEA sentence output frequencies

Data Field:

None

Return:

PMTK_API_DT_NMEA_OUTPUT

Example:

\$PMTK414*33<CR><LF>



Packet Type: 514 PMTK_API_DT_NMEA_OUTPUT

Support Chip Type:

MT3337

Packet Meaning:

NMEA sentence output frequency setting

Data Field:

There are totally 19 data fields that present output frequencies for the 19 supported NMEA sentences individually. Please refer to PMTK_API_SET_NMEA_OUTPUT for the supported NMEA sentence and frequency setting.

Example:

\$PMTK514,0,1,1,1,1,5,0,0,0,0,0,0,0,0,0,0*2B<CR><LF>

Packet Type: 605 PMTK_Q_RELEASE

Support Chip Type:

MT3337

Packet Meaning:

Query the firmware release information.

Data Field:

None

Return:

PMTK_DT_RELEASE

Example:

\$PMTK605*31<CR><LF>

Packet Type: 705 PMTK_DT_RELEASE

Support Chip Type:

MT3337

Packet Meaning:

Firmware release information.

Data Field:

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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

Example:

\$PMTK705,AXN_1.3,2102,ABCD,*14<CR><LF>

Packet Type: 386 PMTK_SET_Nav Speed threshold

Support Chip Type:

MT3337

Packet Meaning:

Set the speed threshold for static navigation. If the actual speed is below the threshold, output position will keep the same and output speed will be zero. If threshold value is set to 0, this function is disabled.

Data Field:

PMTK386,Nav Speed Threshold

Nav Speed threshold: 0~2.0 (m/s)

The minimum is 0.1 m/s, the maximum value is 2.0 m/s

Example:

\$PMTK386,0.2*3F<CR><LF>

\$PMTK386,2.0*3F<CR><LF>

Note :

1. The setting of Nav Speed Threshold will be back to default value in two conditions:
 - a. Full cold start command issued
 - b. Enter standby mode

Packet Type: 447 PMTK_Q_Nav_Threshold

Support Chip Type:

MT3337

Packet Meaning:

Query current Nav Speed threshold setting.

Data Field:

None

**Return:**

PMTK_DT_Nav_Threshold

Example:

\$PMTK447*35<CR><LF>

Packet Type: 527 PMTK_DT_Nav_Threshold

Support Chip Type:

MT3337

Packet Meaning:

Current Nav Speed Threshold setting

Data Field:

PMTK527,Current Nav_Threshold

Current Nav_Threshold:

The range is 0~2.0 (m/s)

Example:

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

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

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

Packet Type: 161 PMTK_CMD_STANDBY_MODE

Support Chip Type:

MT3337

Packet Meaning:

Enter standby mode for power saving.

Data Field:

PMTK161,Type

Type: Standby type

'0' =Sleep mode

Example:

\$PMTK161,0*28<CR><LF>

Note :

Software on Host side sends any byte to wake up from standby mode.



Packet Type: 286 PMTK_CMD_AIC_MODE

Support Chip Type:

MT3337

Packet Meaning:

Active Interference Cancellation (AIC) feature provides effective narrow-band interference and jamming elimination.

Data Field:

PMTK286,Mode

Mode:

'0' = disable AIC function

'1' = enable AIC function

Example:

\$PMTK286,1*23<CR><LF>

Note :

The AIC function is enabled for default factory setting.

Packet Type: 330 PMTK_API_SET_DATUM

Support Chip Type:

MT3337

Packet Meaning:

Configure Datum

Data Field:

PMTK330,Datum

Datum:

'0' = WGS84

'1' = TOKYO-M

'2' = TOKYO-A

Example:

\$PMTK330,0*2E<CR><LF>

Note :

1. It supports 222 different datum. Please refer to GTOPI Datum List.



Packet Type: 430 PMTK_API_Q_DATUM

Support Chip Type:

MT3337

Packet Meaning:

Query which Datum is set at present

Data Field:

None

Return:

PMTK_API_DT_DATUM

Example:

\$PMTK430*35<CR><LF>

Packet Type: 530 PMTK_API_DT_DATUM

Support Chip Type:

MT3337

Packet Meaning:

Current datum used

Data Field:

PMTK530,Datum

Datum:

'0' = WGS84

'1' = TOKYO-M

'2' = TOKYO-A

Example:

\$PMTK530,0*28<CR><LF>



Packet Type: 255 PMTK_SET_SYNC_PPS_NMEA

Support Chip Type:

MT3337

Packet Meaning:

Enable or disable fix NMEA output time behind PPS function. (Default off)

Data Field:

PMTK255,Enabled

Enabled:

'0' = Disable

'1' = Enable

Example:

\$PMTK255,1*2D<CR><LF> ←To enable PPS vs. NMEA

\$PMTK255,0*2C<CR><LF> ←To disable PPS vs. NMEA

Note :

1. This function only support 1Hz NMEA output and baud rate at 115200~14400, at baud rate of 9600 and 4800 we only support RMC NMEA sentence. Because at low baud rate, if there are many NMEA sentences output, per second transmission may exceed one second.



Packet Type: 869 PMTK_EASY_ENABLE

Support Chip Type:

MT3337

Packet Meaning:

Enable or disable EASY function. Query if EASY is enabled or disabled.

Data Field:

PMTK869,CmdType,[Enabled]

CmdType:

'0' = Query

'1' = Set

'2' = Result for Query operation

Enabled:

'0' = Disable

'1' = Enable

Example:

\$PMTK869,0*29<CR><LF> ⬅ To query if EASY is enabled or disabled

\$PMTK869,2,1*36<CR><LF> ⬅ If EASY is enabled, the receiver returns

\$PMTK869,2,0*37<CR><LF> ⬅ If EASY is disabled, the receiver returns

\$PMTK869,1,1*35<CR><LF> ⬅ To enable EASY

\$PMTK869,1,0*34<CR><LF> ⬅ To disable EASY

Notice:**How to calculate the checksum value**

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

31 is the checksum, and it is calculated by **Xor** all characters between \$ and *.

CR, LF : Two bytes binary data

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

How to acquire that checksum value by checksum tool.

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

1. Key in command contents**2. Click Translation****3. That checksum will display****Command setting reset**

Those command packet for module, just like **baud rate** and **update rate** only changed temporary. When module power reset, those **update rate** and **baud rate** must be back to original setting. If user want to change those items of module for factory default setting that need GlobalTop provide new firmware and burning it to module.