GlobalTop

PMTK command packet

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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)
A06	2011-05-23	Gavin	Page 9: Modify PMTK 314 Item 6、7、13、14、15、16、17 as reserved item
A07	2011-07-22	Hector	Modify the description of tail page Page 7: Modify PMTK251. Add description of baud rate setting
A08	2011-09-01	Hector	Add new command for MT3339 chip

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MTK NMEA Packet List:

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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 filed 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 ***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 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:
MT3318、MT3329、MT3339

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

Support Chip Type:
MT3318、MT3329、MT3339

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

DataField:
None

Example:
$PMTK101*32<CR><LF>

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Packet Type: 102 PMTK_CMD_WARM_START

Support Chip Type:
MT3318、MT3329、MT3339

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

Support Chip Type:
MT3318、MT3329、MT3339

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

Support Chip Type:
MT3318、MT3329、MT3339

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

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Example:
$PMTK104*37<CR><LF>

Packet Type: 220 PMTK_SET_NMEA_UPDATERATE

Support Chip Type:
MT3318、MT3329、MT3339

Packet Meaning:
Set NMEA port update rate

DataField:
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 PMTK250 command for baud rate setting
1000(millisecond) = 1(sec) → 1/1 = 1Hz
200(millisecond) = 0.2(sec) → 1/0.2 = 5 Hz
100(millisecond) = 0.1(sec) → 1/0.1 = 10 Hz

Packet Type : 250 PMTK_SET_DPort

Support Chip Type:
MT3318、MT3329、MT3339

Packet meaning
Set data port's (RTCM PORT or 2nd 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

Support Chip Type:
MT3318、MT3329、MT3339

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：
You can also restore the system default setting via issue：$PMTK251,0*28<CR><LF>

Packet Type: 300 PMTK_API_SET_FIX_CTL

Support Chip Type:
MT3318、MT3329、MT3339

Packet Meaning:
API_Set_Fix_Ctl
This parameter controls the rate of position fixing activity.

DataField:
PMTK300,FixInterval,0,0,0,0
FixInterval (millisecond): Position fix interval, it must be larger than 200.

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

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Packet Type: 301 PMTK_API_SET_DGPS_MODE

Support Chip Type:
MT3318、MT3329、MT3339

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

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Packet Type: 313 PMTK_API_SET_SBAS_ENABLED

Support Chip Type:
MT3318、MT3329、MT3339

Packet Meaning:
API_Set_Sbas_Enabled
Enable to search a SBAS satellite or not.

DataField:
PMTK313,Enabled
'0' = Disable
'1' = Enable

Example:
$PMTK313,1*2E<CR><LF>

Packet Type：314 PMTK_API_SET_NMEA_OUTPUT

Support Chip Type:
MT3318、MT3329、MT3339

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 //Reserved
7 //Reserved
13 //Reserved
14 //Reserved
15 //Reserved

16 //Reserved
17 //Reserved
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:
$PMTK314,1,1,1,1,1,5,0,0,0,0,0,0,0,0,0,0,0,0,0*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: 319 PMTK_API_SET_SBAS_Mode

Support Chip Type:
MT3318、MT3329、MT3339

Packet Meaning:
API_Set_Sbas Mode_Selection
Choose SBAS satellite test mode

DataField:
PMTK319,Mode
'0' = testing mode
'1' = Integrity mode

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

Packet Type: 413 PMTK_API_Q_SBAS_ENABLED

Support Chip Type:
MT3318、MT3329、MT3339

Packet Meaning:

API_Query_Sbas_Enabled

DataField:
None

Return:
PMTK_DT_SBAS_ENABLED

Example:
$PMTK413*34<CR><LF>

Packet Type: 513 PMTK_DT_SBAS_ENABLED

Support Chip Type:
MT3318、MT3329、MT3339

Packet Meaning:
Enable to search a SBAS satellite or not.

DataField:
PMTK513,Enabled
'0' = Disable
'1' = Enable

Example:
$PMTK513,1*28<CR><LF>

Packet Type: 605 PMTK_Q_RELEASE

Support Chip Type:
MT3318、MT3329、MT3339

Packet Meaning:
Query the firmware release information.

DataField:
NONE

Return:
PMTK_DT_RELEASE

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

Packet Type: 705 PMTK_DT_RELEASE

Support Chip Type:
MT3318、MT3329、MT3339

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

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

Packet Type:397 PMTK_SET_Nav Speed threshold

Support Chip Type:
MT3318、MT3329、MT3339

Packet Meaning:
If the speed is slower than the specified threshold, the output position will stay freezed.
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

Support Chip Type:
MT3318、MT3329、MT3339

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

Support Chip Type:
MT3318、MT3329、MT3339

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>

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Packet Type: 161 PMTK_CMD_STANDBY_MODE

Support Chip Type:
MT3339

Packet Meaning:
Enter standby mode for power saving.

DataField:
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：223 PMTK_CMD_EPH_RECEIVE

Support Chip Type:
MT3339

Packet Meaning：
It means the module needs to extend the time for ephemeris data receiving under what situation.

DataField：
PMTK223,SV,SNR,Extension threshold, Extension gap

SV: it means the module need extend the time to receive more ephemeris data while the number of satellite without ephemeris data.
SNR: it means the module needs to enable the ephemeris data receiving while the SNR of satellite is more than the setting value.
Extension threshold (millisecond): extension time for ephemeris data receiving
Extension (millisecond): gap time between EPE data receiving

Example：
$PMTK225,0*2B<CR><LF>
$PMTK223,1,25,180000,60000*38<CR><LF>
$PMTK225,1,3000,12000,18000,72000*16<CR><LF>

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Note：
The command is recommended with **PMTK225** command.

Packet Type：225 PMTK_CMD_PERIODIC_MODE

Support Chip Type:
MT3339

Packet Meaning：
Enter Standby or Backup mode for power saving.

DataField：
PMTK225,Type,Run time,Sleep time, Second run time,Second sleep time

Type: operation mode
- '0' = go back to normal mode
- '1' = Periodic backup mode
- '2' = Periodic standby mode
- '4' = Perpetual backup mode
- '8' = AlwaysLocate™ standby mode
- '9' = AlwaysLocate™ backup mode

Run time (millisecond): Duration to fix for (or attempt to fix for) before switching from running mode back to a minimum power sleep mode.
- '0': disable
- >='1,000': enable [Range: 1,000~2704,000]

Sleep time (millisecond): Interval to come out of a minimum power sleep mode and start running in order to get a new position fix.
- '0': disable
- >='1,000': enable [Range: 1,000~2704,000]

Second run time (millisecond): Duration to fix for (or attempt to fix for) before switching from running mode back to a minimum power sleep mode.
- '0': disable
- >='1,000': enable [Range: 1,000~2704,000]

Second sleep time (millisecond): Interval to come out of a minimum power sleep mode and start running in order to get a new position fix.
- '0': disable
- >='1,000': enable [Range: 1,000~2704,000]

Example：How to enter periodic modes
Periodic Backup mode
$PMTK225,0*2B<CR><LF>
$PMTK223,1,25,180000,60000*38<CR><LF>
$PMTK225,1,3000,12000,18000,72000*16<CR><LF>

Periodic Standby mode
$PMTK225,0*2B<CR><LF>
$PMTK223,1,25,180000,60000*38<CR><LF>
$PMTK225,2,3000,12000,18000,72000*15<CR><LF>

Example：How to enter AlwaysLocate modes
AlwaysLocateTM Standby
$PMTK225,0*2B<CR><LF>
$PMTK225,8*23<CR><LF>

AlwaysLocateTM Backup
$PMTK225,0*2B<CR><LF>
$PMTK225,9*22<CR><LF>

Note：
1. The second run time should larger than first run time when non-zero value.
2. The purpose of second run time and sleep time can let module to catch more satellite ephemeris data in cold boot condition. The value of them can be null. Then it will use the first run time and sleep time for ephemeris data receiving.
3. AlwaysLocate™ is an intelligent controller of MT3339 power saving mode. Depending on the environment and motion conditions, MT3339 can adaptive adjust the on/off time to achieve balance of positioning accuracy and power consumption.
4. This command needs to work normal with some hardware circuits. Please contact us for more details.

Packet Type：286 PMTK_CMD_AIC_MODE

Support Chip Type:
MT3339

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

DataField：
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 setting.

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Packet Type：869 PMTK_CMD_EASY_ENABLE

Support Chip Type:
MT3339

Packet Meaning：
Enable or disable EASY function. Query if EASY is enabled or disabled

DataField：
PMTK869,CmdType,Enable
CmdType:
‘0’ = Query
‘1’ = Set
‘2’ = Result for Query operation

Enable:
‘0’ = disable
‘1’ = enable

Example：
To query if EASY is enabled or disabled, use
$PMTK869,0*29<CR><LF>
If EASY is disabled, the receiver returns
$PMTK869,2,0*37<CR><LF>

Note：
1. The EASY function is enabled for default setting.
2. The “VBACKUP” pin needs to connect to a coin-battery for this feature. Please contact us for more details.
3. The EASY function only support update rate 1Hz.

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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>

Command setting reset

Those command packet for module baud rate 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.