MTK NMEA Packet User Manual

Revision: 0.3
Linked FW Version: 1.902_06
Release Date: 2006/05/02

MediaTek Inc.

MTK NMEA Packet Format

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

Packet Length:
The maximum length of each packet is restricted to **255 bytes**

Packet Contents:

**Preamble**: One byte character.

'$

**TalkerID**: Four bytes character string.

"PMTK"

**PktType**: Three bytes character string.

From "000" to "999"

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

**DataField**: The DataField has variable length depending on the packet type.

A comma symbol ',' must be inserted ahead each data filed 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 checksum of the data between Preamble and '*'.

**CR, LF**: Two bytes binary data.

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

**Sample Packet:**

$PMTK000*32<CR><LF>
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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Packet Type: 000 PMTK_TEST

Packet Meaning:
Test Packet.

DataField:
None

Example:
$PMTK000*32<CR><LF>

Packet Type: 001 PMTK_ACK

Packet Meaning:
Acknowledge Packet

DataField:
PktType: The packet type the acknowledge responds.
Flag: '0' = Invalid packet.
   '1' = Unsupported packet type
   '2' = Valid packet, but action failed
   '3' = Valid packet, and action succeeded

Example:
$PMTK001,101,0*33<CR><LF>

Packet Type: 010 PMTK_SYS_MSG

Packet Meaning:
Output system message

DataField:
Msg: The system message.
   '0': UNKNOWN
   '1': STARTUP

Example:
$PMTK010,001*2E<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: 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.


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:
$PMTK301,1*2D<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 17 data fields that present output frequencies for the 17 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 Pseudorange 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
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:
$PMTK314,1,1,1,1,5,1,1,1,1,0,1,1,1,1*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: 320 PMTK_API_SET_PWR_SAV_MODE
Packet Meaning:

API_Set_Pwr_Sav_Mode
Set power saving operation mode.

DataField:

PMTK320,Mode
Mode: 0: PWR_SAV_OFF: power saving mode off
1: PWR_SAV_ON: power saving mode on

Example:
$PMTK320,0*26<CR><LF>

Packet Type: 401 PMTK_API_Q_DGPS_MODE
Packet Meaning:

API_Query_Dgps_Mode

DataField:

None

Return:

PMTK_DT_DGPS_MODE

Example:
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>

Packet Type: 414 PMTK_API_Q_NMEA_OUTPUT

Packet Meaning:
API_Query_NMEA_Out
Query current NMEA sentence output frequencies.

DataField:
None

Return:
PMTK_DT_NMEA_OUTPUT

Example:
$PMTK414*33<CR><LF>

Packet Type: 420 PMTK_API_Q_PWR_SAV_MODE

Packet Meaning:
API_Query_Pwr_Sav_Mode
Query power saving operation mode.

DataField:
None

Return:
PMTK_DT_PWR_SAV_MODE

Example:
$PMTK420*3F<CR><LF>

Packet Type: 501 PMTK_DT_DGPS_MODE
DGPS Data Source Mode

**DataField:**

Mode: DGPS data source mode
- ‘0’: No DGPS source
- ‘1’: RTCM
- ‘2’: WAAS

**Example:**

`$PMTK501,1*2B<CR><LF>`

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: 514 PMTK_DT_NMEA_OUTPUT

**Packet Meaning:**

NMEA sentence output frequency setting

**DataField:**

There are totally 17 data fields that present output frequencies for the 17 supported NMEA sentences individually. Please refer to PMTK_API_SET_NMEA_OUTPUT for the Supported NMEA Sentences and Frequency Setting.

**Example:**

`$PMTK514,1,1,1,1,1,5,1,1,1,1,1,0,1,1,1,0*2A<CR><LF>`

Packet Type: 520 PMTK_DT_PWR_SAV_MODE

**Packet Meaning:**

Power saving operation mode.

**DataField:**

`PMTK520,Mode`
Mode: 0: PWR_SAV_OFF: power saving mode off
   1: PWR_SAV_ON: power saving mode on

Example:
$PMTK520,0*24<CR><LF>

Packet Type: 604 PMTK_Q_VERSION
Packet Meaning:
Query the version information of FW
DataField:
NONE
Return:
   PMTK_DT_VERSION
Example:
$PMTK604*6D<CR><LF>

Packet Type: 704 PMTK_DT_VERSION
Packet Meaning:
Version information of FW.
DataField:
   PMTK704,FWVrsn1, FWVrsn2, FWVrsn3
   Vrsn: MainVersion_ReleaseNumber
Example:
$PMTK704,1.881_06,0606_m0138,0000*52<CR><LF>