ETEK NAVIGATION,INC.

PROFESSIONAL IN NAVIGATION & COMMUNICATION

MTK NMEA Packet User Manual

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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.

'**$**'

TalkderID: 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.

MTK NMEA Packet List:

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.

'0': No DGPS source

'1': RTCM

'2': WAAS

Example:

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

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 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 ephmeris 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:

$PMTK314,1,1,1,1,1,5,1,1,1,1,1,1,0,1,1,1,1*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:

$PMTK401*37<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>

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

Packet Meaning:

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:

$PMTK514,1,1,1,1,1,5,1,1,1,1,1,1,0,1,1,1,1*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>