

# L86 GNSS

# Protocol Specification

**GNSS Module Series**

Rev. L86\_GNSS\_Protocol\_Specification\_V1.2

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|             |                                     |
|-------------|-------------------------------------|
| Packet Type | 622                                 |
| Type        | '1'=dump partial in used flash data |
| *           | End character of data field         |
| Checksum    | Hexadecimal checksum                |
| <CR><LF>    | Each of message                     |

### 3.13. Packet Type: 220 PMTK\_SET\_POS\_FIX

This message is used to set position fix interval.

Data Field:  
\$PMTK220, Interval  
Example:  
\$PMTK220,1000\*1F<CR><LF>  
Response:  
\$PMTK001,220,3\*30<CR><LF>

| Field       | Description  |
|-------------|--|
| \$          | Each NMEA message starts with '\$'                     |
| PMTK        | MTK proprietary message                                |
| Packet Type | 220  |
| Interval    | Position fix interval [msec]. Must be greater than 200 |
| *           | End character of data field                            |
| Checksum    | Hexadecimal checksum                                   |
| <CR><LF>    | Each of message  |

### 3.14. Packet Type: 223 PMTK\_SET\_AL\_DEE\_CFG

This message is used to config DEE.

Data Field:  
\$PMTK223,SV,SNR,Extension  
threshold,Extension gap  
Example:  
\$PMTK223,1,30,180000,60000\*3C<CR><LF>  
Response:  
\$PMTK001,223,3\*33<CR><LF>

| Field               | Description                                 |
|---------------------|---|
| \$                  | Each NMEA message starts with '\$'          |
| PMTK                | MTK proprietary message                     |
| Packet Type         | 223   |
| SV                  | Range: 1~4 (Default value: 1)               |
| SNR                 | Range: 25~30 (Default value: 30)            |
| Extension Threshold | Range: 40000~180000 (Default value: 180000) |
| Extension Gap       | Range: 0~3600000 (Default value: 60000)     |
| *                   | End character of data field                 |
| Checksum            | Hexadecimal checksum                        |
| <CR><LF>            | Each of message                             |

### 3.15. Packet Type: 225 PMTK\_SET\_PERIODIC\_MODE

This message is used to enter periodic mode for power saving.

Data Field:  
\$PMTK225,Type,Run time,Sleep time,Second run time,Second sleep time  
Example:  
\$PMTK225,8\*23<CR><LF>  
Response:  
\$PMTK001,225,3\*35<CR><LF>

| Field             | Description  |
|-------------------|--|
| \$                | Each NMEA message starts with '\$'   |
| PMTK              | MTK proprietary message  |
| Packet Type       | 225  |
| Type              | '0'=Back to normal mode<br>'1'=Periodic Backup mode<br>'2'=Periodic Standby mode<br>'4'=Perpetual Backup mode<br>'8'=AlwaysLocate Standby mode<br>'9'=AlwaysLocate Backup mode |
| Run Time          | '0': Disable<br>>='1000': Enable (Range: 1000~518400000)   |
| Sleep Time        | (Range: 1000~518400000)  |
| Second Run Time   | '0': Disable<br>>='1000': Enable (Range: 1000~518400000)   |
| Second Sleep Time | (Range: 1000~518400000)  |
| *                 | End character of data field  |
| Checksum          | Hexadecimal checksum   |
| <CR><LF>          | Each of message  |

**NOTE**

The unit of run time or sleep time is msec, the second run time should be larger than the first run time when the first run time is non-zero value.

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

This message is used to set NMEA port baud rate. Using PMTK251 command to setup baud rate setting, the setting will be back to default value in the condition: Full cold start command is issued.

Data Field:

\$PMTK251,Baudrate

Example:

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

| Field       | Description  |
|-------------|--|
| \$          | Each NMEA message starts with '\$'   |
| PMTK        | MTK proprietary message  |
| Packet Type | 251  |
| Baud Rate   | Baud rate setting:<br>9600 - default setting<br>4800<br>9600<br>14400<br>19200<br>38400<br>57600<br>115200 |
| *           | End character of data field  |
| Checksum    | Hexadecimal checksum   |
| <CR><LF>    | Each of message  |

### 3.17. Packet Type: 255 PMTK\_SET\_SYNC\_PPS\_NMEA

This message is used to enable or disable fix NMEA output time behind PPS function.(Default off)

Data Field:  
\$PMTK255,Enable  
Example:  
\$PMTK255,0\*2C<CR><LF>  
Response:  
\$PMTK001,255,3\*32<CR><LF>

| Field       | Description                        |
|-------------|------------------------------------|
| \$          | Each NMEA message starts with '\$' |
| PMTK        | MTK proprietary message            |
| Packet Type | 255                                |
| Enable      | '0'=Disable<br>'1'=Enable          |

|          |                             |
|----------|-----------------------------|
| *        | End character of data field |
| Checksum | Hexadecimal checksum        |
| <CR><LF> | Each of message             |

### 3.18. Packet Type: 256 PMTK\_SET\_TIMING\_PRODUCT

This message is used to enable or disable timing product mode.(Default off)

Data Field:  
\$PMTK256,Enable  
Example:  
\$PMTK256,0\*2F<CR><LF>  
Response:  
\$PMTK001,256,3\*31<CR><LF>

| Field       | Description                        |
|-------------|------------------------------------|
| \$          | Each NMEA message starts with '\$' |
| PMTK        | MTK proprietary message            |
| Packet Type | 256                                |
| Enable      | '0'=Disable<br>'1'=Enable          |
| *           | End character of data field        |
| Checksum    | Hexadecimal checksum               |
| <CR><LF>    | Each of message                    |

### 3.19. Packet Type: 285 PMTK\_SET\_PPS\_CONFIG

This message is used to set PPS type.

Data Field:  
\$PMTK285,Type,PPSPulseWidth  
Example:  
\$PMTK285,4,100\*38<CR><LF>

Response:  
\$PMTK001,285,3\*3F<CR><LF>

| Field         | Description   |
|---------------|---|
| \$            | Each NMEA message starts with '\$'  |
| PMTK          | MTK proprietary message   |
| Packet Type   | 285   |
| Type          | '0'=Disable<br>'1'=After the first fix<br>'2'=3D fix only<br>'3'=2D/3D fix only<br>'4'=Always |
| PPSPulseWidth | 2~998 (Unit: ms)  |
| *             | End character of data field   |
| Checksum      | Hexadecimal checksum  |
| <CR><LF>      | Each of message   |

### 3.20. Packet Type: 286 PMTK\_SET\_AIC\_ENABLED

This message is used to enable or disable AIC function. It is suggested to set cold start command first and then PMTK command.

Data Field:  
\$PMTK286,Enable  
Example:  
\$PMTK286,0\*22<CR><LF>  
Response:  
\$PMTK001,286,3\*3C<CR><LF>

| Field       | Description                        |
|-------------|------------------------------------|
| \$          | Each NMEA message starts with '\$' |
| PMTK        | MTK proprietary message            |
| Packet Type | 286                                |
| Enable      | '0'=Disable<br>'1'=Enable          |

|          |                             |
|----------|-----------------------------|
| *        | End character of data field |
| Checksum | Hexadecimal checksum        |
| <CR><LF> | Each of message             |

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

This message is used to configure the source mode of DGPS correction data.

Data Field:  
\$PMTK301,Mode  
Example:  
\$PMTK301,2\*2E<CR><LF>  
Response:  
\$PMTK001,301,3\*32<CR><LF>

| Field       | Description   |
|-------------|---|
| \$          | Each NMEA message starts with '\$'  |
| PMTK        | MTK proprietary message   |
| Packet Type | 301   |
| Mode        | DGPS data source mode.<br>'0'=No DGPS source<br>'1'=RTCM<br>'2'=SBAS(Include WAAS/EGNOS/GAGAN/MSAS) |
| *           | End character of data field   |
| Checksum    | Hexadecimal checksum  |
| <CR><LF>    | Each of message   |

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

This message is used to enable or disable to search a SBAS satellite. SBAS (Satellite Based Augmentation Systems) is a system that supports wide-area or regional augmentation through geostationary satellite broadcast messages. The geostationary satellite broadcast GNSS integrity and correction data with the assistance of multiple ground stations which are located at accurately-surveyed



points.

Data Field:  
\$PMTK313,Enable  
Example:  
\$PMTK313,1\*2E<CR><LF>  
Response:  
\$PMTK001,313,3\*31<CR><LF>

| Field       | Description                        |
|-------------|------------------------------------|
| \$          | Each NMEA message starts with '\$' |
| PMTK        | MTK proprietary message            |
| Packet Type | 313                                |
| Enable      | '0'=Disable<br>'1'=Enable          |
| *           | End character of data field        |
| Checksum    | Hexadecimal checksum               |
| <CR><LF>    | Each of message                    |

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

This message is used to set NMEA sentence output frequencies. There are totally 19 data fields that present output frequencies for the 19 supported NMEA sentences individually.

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

Data Field:  
None  
Example:  
The module only output RMC once every one position fix.

```
$PMTK314,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0*29<CR><LF>
```

Response:

```
$PMTK001,314,3*36<CR><LF>
```

| Field       | Description   |
|-------------|---|
| \$          | Each NMEA message starts with '\$'                        |
| PMTK        | MTK proprietary message                                   |
| Packet Type | 314   |
| 0 GLL       | GLL interval - Geographic Position - Latitude longitude   |
| 1 RMC       | RMC interval - Recommended Minimum Specific GNSS Sentence |
| 2 VTG       | VTG interval - Course Over Ground and Ground Speed        |
| 3 GGA       | GGA interval - GPS Fix Data                               |
| 4 GSA       | GSA interval - GNSS DOPS and Active Satellites            |
| 5 GSV       | GSV interval - GNSS Satellites in View                    |
| 6 GRS       | GRS interval – GNSS Range Residuals                       |
| 7 GST       | GST interval – GNSS Pseudorange Error Statistics          |
| 8 Reserved  | Always 0  |
| 9 Reserved  | Always 0  |
| 10 Reserved | Always 0  |
| 11 Reserved | Always 0  |
| 12 Reserved | Always 0  |
| 13 Reserved | Always 0  |
| 14 Reserved | Always 0  |
| 15 Reserved | Always 0  |
| 16 Reserved | Always 0  |
| 17 ZDA      | ZDA interval - Time and Date                              |
| 18 MCHN     | PMTKCHN interval - GNSS channel status                    |

|          |                             |
|----------|-----------------------------|
| *        | End character of data field |
| Checksum | Hexadecimal checksum        |
| <CR><LF> | Each of message             |

To restore the system default setting, use below message:

Example:  
\$PMTK314,-1\*04<CR><LF>

| Field       | Description                        |
|-------------|------------------------------------|
| \$          | Each NMEA message starts with '\$' |
| PMTK        | MTK proprietary message            |
| Packet Type | 314                                |
| Restore     | Always -1                          |
| *           | End character of data field        |
| Checksum    | Hexadecimal checksum               |
| <CR><LF>    | Each of message                    |

### 3.24. Packet Type: 351 PMTK\_API\_SET\_SUPPORT\_QZSS\_NMEA

The receiver support new NMEA format for QZSS. The command allow user enable or disable QZSS NMEA format. Default is disable QZSS NMEA format.

Data Field:  
\$PMTK351,Enable  
Example:  
\$PMTK351,1\*28<CR><LF>  
Response:  
\$PMTK001,351,3\*37<CR><LF>

| Field | Description                        |
|-------|------------------------------------|
| \$    | Each NMEA message starts with '\$' |
| PMTK  | MTK proprietary message            |

|             |                             |
|-------------|-----------------------------|
| Packet Type | 351                         |
| QZSS_Enable | '0'=Disable<br>'1'=Enable   |
| *           | End character of data field |
| Checksum    | Hexadecimal checksum        |

### 3.25. Packet Type: 352 PMTK\_API\_SET\_STOP\_QZSS

QZSS is regional positioning service. This command is used to enable or disable QZSS function. Default is enabled.

Data Field:  
\$PMTK352,Enable  
Example:  
\$PMTK352,0\*2A<CR><LF>  
Response:  
\$PMTK001,352,3\*34<CR><LF>

| Field       | Description                        |
|-------------|------------------------------------|
| \$          | Each NMEA message starts with '\$' |
| PMTK        | MTK proprietary message            |
| Packet Type | 352                                |
| QZSS_Enable | '0'=Enable<br>'1'=Disable          |
| *           | End character of data field        |
| Checksum    | Hexadecimal checksum               |

### 3.26. Packet Type: 353 PMTK\_API\_SET\_GNSS\_SEARCH\_MODE

This command is used to configure the receiver to start searching satellite system.

Data Field:  
\$PMTK353,GPS\_Enable,GLONASS\_Enable,GALILEO\_Enable,GALILEO\_FULL\_Enable,BEIDOU\_Enab

le  
Example:  
\$PMTK353,1,1,0,0,0\*2B<CR><LF>: Search GPS+GLONASS  
Response:  
\$PMTK001,353,3,1,1,0,0,0,3\*36<CR><LF>

| Field               | Description  |
|---------------------|--|
| \$                  | Each NMEA message starts with '\$'   |
| PMTK                | MTK proprietary message  |
| Packet Type         | 353  |
| GPS_Enable          | '0'=Disable (DO NOT search GPS satellites)<br>'1' or non-ZERO: search GPS satellites                   |
| GLONASS_Enable      | '0'=Disable (DO NOT search GLONASS satellites)<br>'1' or non-ZERO: search GLONASS satellites           |
| GALILEO_Enable      | '0'=Disable (DO NOT search Galileo satellites)<br>'1' or non-ZERO: search Galileo satellites           |
| GALILEO_FULL_Enable | '0'=Disable (DO NOT search Galileo full mode satellites)<br>'1' or non-ZERO: search Galileo satellites |
| BEIDOU_Enable       | '0'=Disable<br>'1' or non-ZERO: search BeiDou satellites   |
| *                   | End character of data field  |
| Checksum            | Hexadecimal checksum   |

**NOTE**

1. If the receiver is fixed by GPS only, it will print GPRMC, GPVTG, GPGGA, GPGSA, GPGSV, GPGLL and GPTXT.
2. If the receiver is fixed by GPS only, and can also search QZSS satellite, it will print GPRMC, GPVTG, GPGGA, GPGSA, QZQSA, GPGSV, QZGSV, GPGLL and GPTXT.
3. If the receiver is fixed by GLONASS only, it will print GNRMC, GPVTG, GPGGA, GNGSA, GPGSV, GLGSV, GNGLL and GPTXT.
4. If the receiver is fixed by multi-GNSS, it will print GNRMC, GPVTG, GPGGA, GNGSA, GPGSV, GLGSV, GNGLL and GPTXT.
5. In the state of no satellite positioning, it will print initial state of NMEA, such as GPRMC, GPVTG, GPGGA, GPGSA, GPGSV, GPGLL and GPTXT. The time before satellite positioning after cold start, warm start or hot start belongs to this situation.
6. We use GPS+GLONASS or one of them. At present Galileo and BeiDou are not supported yet.

### 3.27. Packet Type: 386 PMTK\_API\_SET\_STATIC\_NAV\_THD

This message is used to 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,Speed\_threshold  
Example:  
\$PMTK386,0.3\*3E<CR><LF>  
Response:  
\$PMTK001,386,3\*3D<CR><LF>

| Field           | Description                        |
|-----------------|------------------------------------|
| \$              | Each NMEA message starts with '\$' |
| PMTK            | MTK proprietary message            |
| Packet Type     | 386                                |
| Speed_threshold | 0~2m/s                             |
| *               | End character of data field        |
| Checksum        | Hexadecimal checksum               |
| <CR><LF>        | Each of message                    |

### 3.28. Packet Type: 400 PMTK\_API\_Q\_FIX\_CTL

This message is used to query the rate of position fixing activity.

Refer to PMTK\_API\_SET\_FIX\_CTL for setting the rate.

Refer to PMTK\_DT\_FIX\_CTL for the result of the query.

Data Field:  
None  
Example:  
\$PMTK400\*36<CR><LF>

| Field       | Description                        |
|-------------|------------------------------------|
| \$          | Each NMEA message starts with '\$' |
| PMTK        | MTK proprietary message            |
| Packet Type | 400                                |
| *           | End character of data field        |
| Checksum    | Hexadecimal checksum               |
| <CR><LF>    | Each of message                    |

### 3.29. Packet Type: 401 PMTK\_API\_Q\_DGPS\_MODE

This message is used to query the setting of DGPS mode.

Refer to PMTK\_API\_SET\_DGPS\_MODE for setting the DGPS mode.

Refer to PMTK\_DT\_DGPS\_MODE for the result of the query.

Data Field:

None

Example:

\$PMTK401\*37<CR><LF>

| Field       | Description                        |
|-------------|------------------------------------|
| \$          | Each NMEA message starts with '\$' |
| PMTK        | MTK proprietary message            |
| Packet Type | 401                                |
| *           | End character of data field        |
| Checksum    | Hexadecimal checksum               |
| <CR><LF>    | Each of message                    |

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

This message is used to query the setting of SBAS.

Refer to PMTK\_API\_SET\_SBAS\_ENABLE for SBAS setting.

Refer to PMTK\_DT\_SBAS\_ENABLED for the result of the query.

| Data Field:          |                                    |
|----------------------|------------------------------------|
| None                 |                                    |
| Example:             |                                    |
| \$PMTK413*34<CR><LF> |                                    |
| Field                | Description                        |
| \$                   | Each NMEA message starts with '\$' |
| PMTK                 | MTK proprietary message            |
| Packet Type          | 413                                |
| *                    | End character of data field        |
| Checksum             | Hexadecimal checksum               |
| <CR><LF>             | Each of message                    |

### 3.31. Packet Type: 414 PMTK\_API\_Q\_NMEA\_OUTPUT

This message is used to query the current NMEA sentence output frequencies.

Refer to PMTK\_API\_SET\_NMEA\_OUTPUT for the frequencies setting.

Refer to PMTK\_DT\_NMEA\_OUTPUT for the result of the query.

| Data Field:          |             |
|----------------------|-------------|
| None                 |             |
| Example:             |             |
| \$PMTK414*33<CR><LF> |             |
| Field                | Description |



|             |                                    |
|-------------|------------------------------------|
| \$          | Each NMEA message starts with '\$' |
| PMTK        | MTK proprietary message            |
| Packet Type | 414                                |
| *           | End character of data field        |
| Checksum    | Hexadecimal checksum               |
| <CR><LF>    | Each of message                    |

### 3.32. Packet Type: 605 PMTK\_Q\_RELEASE

This message is used to query the firmware release information.

Refer to PMTK\_DT\_RELEASE for the result of the query.

| Data Field:<br>None<br>Example:<br>\$PMTK605*31<CR><LF> |                                    |
|---|------------------------------------|
| Field   | Description                        |
| \$  | Each NMEA message starts with '\$' |
| PMTK  | MTK proprietary message            |
| Packet Type   | 605                                |
| *   | End character of data field        |
| Checksum  | Hexadecimal checksum               |
| <CR><LF>  | Each of message                    |

### 3.33. Packet Type: 500 PMTK\_DT\_FIX\_CTL

This message is the response to PMTK\_API\_Q\_FIX\_CTL.

| Data Field:<br>\$PMTK500,Fix interval<br>Example:<br>\$PMTK500,1000,0,0,0,0*1A<CR><LF> |  |
|--|--|
| Field  | Description                                    |
| \$   | Each NMEA message starts with '\$'             |
| PMTK   | MTK proprietary message                        |
| Packet Type  | 500  |
| Fix Interval   | Position fix interval [msec]. Greater than 100 |
| Reserved   | Always 0                                       |
| Reserved   | Always 0                                       |
| Reserved   | Always 0                                       |
| Reserved   | Always 0                                       |
| *  | End character of data field                    |
| Checksum   | Hexadecimal checksum                           |
| <CR><LF>   | Each of message                                |

### 3.34. Packet Type: 501 PMTK\_DT\_DGPS\_MODE

This message is the response to PMTK\_API\_Q\_DGPS\_MODE.

| Data Field:<br>\$PMTK513,Enable<br>Example:<br>\$PMTK513,1*28<CR><LF> |             |
|---|-------------|
| Field   | Description |

|             |  |
|-------------|--|
| \$          | Each NMEA message starts with '\$'                                   |
| PMTK        | MTK proprietary message  |
| Packet Type | 501  |
| Mode        | DGPS data source mode.<br>'0'=No DGPS source<br>'1'=RTCM<br>'2'=SBAS |
| *           | End character of data field  |
| Checksum    | Hexadecimal checksum   |
| <CR><LF>    | Each of message  |

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

This message is the response to PMTK\_API\_Q\_SBAS\_ENABLED.

Data Field:  
\$PMTK513,Enable  
Example:  
\$PMTK513,1\*28<CR><LF>

| Field       | Description                        |
|-------------|------------------------------------|
| \$          | Each NMEA message starts with '\$' |
| PMTK        | MTK proprietary message            |
| Packet Type | 513                                |
| Enable      | '0'=Disable<br>'1'=Enable          |
| *           | End character of data field        |
| Checksum    | Hexadecimal checksum               |
| <CR><LF>    | Each of message                    |

### 3.36. Packet Type: 514 PMTK\_DT\_NMEA\_OUTPUT

This message is the response to PMTK\_API\_Q\_NMEA\_OUTPUT.

| Data Field:  |   |
|--|---|
| None   |   |
| Example:   |   |
| \$PMTK514,1,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0*2E<CR><LF> |   |
| Field  | Description   |
| \$   | Each NMEA message starts with '\$'                        |
| PMTK   | MTK proprietary message                                   |
| Packet Type  | 514   |
| 0 GLL  | GLL interval - Geographic Position - Latitude longitude   |
| 1 RMC  | RMC interval - Recommended Minimum Specific GNSS Sentence |
| 2 VTG  | VTG interval - Course Over Ground and Ground Speed        |
| 3 GGA  | GGA interval - GPS Fix Data                               |
| 4 GSA  | GSA interval - GNSS DOPS and Active Satellites            |
| 5 GSV  | GSV interval - GNSS Satellites in View                    |
| 6 GRS  | GRS interval – GNSS Range Residuals                       |
| 7 GST  | GST interval – GNSS Pseudorange Error Statistics          |
| 8 Reserved   |   |
| 9 Reserved   |   |
| 10 Reserved  |   |
| 11 Reserved  |   |
| 12 Reserved  |   |
| 13 Reserved  |   |
| 14 Reserved  |   |
| 15 Reserved  |   |

|             |  |
|-------------|--|
| 16 Reserved |  |
| 17 ZDA      | ZDA interval - Time and Date           |
| 18 MCHN     | PMTKCHN interval - GNSS channel status |
| *           | End character of data field            |
| Checksum    | Hexadecimal checksum                   |
| <CR><LF>    | Each of message                        |

### 3.37. Packet Type: 705 PMTK\_DT\_RELEASE

This message is the response to PMTK\_Q\_RELEASE.

| Data Field:<br>\$PMTK705, Release string, Build ID, Product Model(,SDK Version)<br>Example:<br>\$PMTK705,AXN_3.10_3333_12102201,0000,QUECTEL-L76,*18<CR><LF> |   |
|--|---|
| Field  | Description   |
| \$   | Each NMEA message starts with '\$'  |
| PMTK   | MTK proprietary message   |
| Packet Type  | 705   |
| Release String   | Firmware release name and version<br>3318: Mcore_x.x<br>3329: AXN_x.x<br>3339: AXN_x.x<br>3333: AXN_x.x |
| Build ID   | Build ID set in CoreBuilder for firmware version control  |
| Product Model  | Product Model set in CoreBuilder for product identification   |
| SDK Version<br>(Optional)  | Showing SDK version if the firmware is used for SDK   |
| *  | End character of data field   |
| Checksum   | Hexadecimal checksum  |
| <CR><LF>   | Each of message   |

### 3.38. Packet Type: 869 PMTK\_EASY\_ENABLE

This message is used to enable or disable EASY function, and it also can be used to query if EASY is enabled or disabled.

Data Field:  
\$PMTK869,CmdType[, Enabled]  
Example:  
\$PMTK869,1,1\*35<CR><LF>  
Response:  
\$PMTK001,869,3\*37<CR><LF>

| Field       | Description  |
|-------------|--|
| \$          | Each NMEA message starts with '\$'                     |
| PMTK        | MTK proprietary message                                |
| Packet Type | 869  |
| CmdType     | '0'=Query<br>'1'=Set<br>'2'=Result for Query operation |
| Enabled     | '0'=Disable<br>'1'=Enable                              |
| *           | End character of data field                            |
| Checksum    | Hexadecimal checksum                                   |
| <CR><LF>    | Each of message  |

#### NOTES

1. If EASY is disabled, the receiver returns:  
\$PMTK869,2,0,0\*2B<CR><LF>
2. If EASY is enabled and not finished yet, the receiver may return:  
\$PMTK869,2,1,0\*2A<CR><LF>
3. If EASY is enabled and finished after 1 day, the receiver may return:  
\$PMTK869,2,1,1\*2B<CR><LF>
4. If EASY is enabled and finished after 2 days, the receiver may return:  
\$PMTK869,2,1,2\*28<CR><LF>
5. If EASY is enabled and finished after 3 days, the receiver may return:  
\$PMTK869,2,1,3\*29<CR><LF>

### 3.39. Packet Type: 875 PMTK\_PMTKLSC\_STN\_OUTPUT

This message is used to enable or disable PMTKLSC Sentence output. Query if PMTKLSC Sentence output enabled or disabled.

Data Field:

\$PMTK875,CmdType[,Enabled]

Example:

\$PMTK875,1,1\*38<CR><LF>: Enable PMTKLSC and PMTKLSCB Sentence output

Response:

\$PMTKLSC,Parameter1,Parameter2,Parameter3\*CS

\$PMTKLSB,Parameter1,Parameter2,Parameter3\*CS

Where Parameter1: current leap second

Parameter2: leap indicator, 1 means updated from broadcast data

Parameter3: next leap second

| Field       | Description  |
|-------------|--|
| \$          | Each NMEA message starts with '\$'                     |
| PMTK        | MTK proprietary message                                |
| Packet Type | 875  |
| CmdType     | '0'=Query<br>'1'=Set<br>'2'=Result for Query operation |
| Enabled     | '0'=Disable<br>'1'=Enable                              |
| *           | End character of data field                            |
| Checksum    | Hexadecimal checksum                                   |
| <CR><LF>    | Each of message  |

### 3.40. Packet Type: 886 PMTK\_FR\_MODE

This message is used to set navigation mode.

Data Field:

\$PMTK886,CmdType

Example:

\$PMTK886,3\*2B<CR><LF>

Response:

\$PMTK001,886,3\*36

| Field       | Description  |
|-------------|--|
| \$          | Each NMEA message starts with '\$'   |
| PMTK        | MTK proprietary message  |
| Packet Type | 886  |
| CmdType     | '0'=Normal mode: For general purpose<br>'1'=Fitness mode: For running and walking purpose that the low-speed (<5m/s) movement will have more effect on the position calculation.<br>'2'=Aviation mode: For high-dynamic purpose that the large-acceleration movement will have more effect on the position calculation.<br>'3'=Balloon mode: For high-altitude balloon purpose that the vertical movement will have more effect on the position calculation. |
| *           | End character of data field  |
| Checksum    | Hexadecimal checksum   |
| <CR><LF>    | Each of message  |



# 4 Appendix A Reference

**Table 3: Related Documents**

| SN  | Document Name                | Remark               |
|-----|------------------------------|----------------------|
| [1] | Quectel_L86_Hardware_Design  | L86 Hardware Design  |
| [2] | Quectel_L86_EVB_User Guide   | L86 EVB User Guide   |
| [3] | Quectel_L86_Reference_Design | L86 Reference Design |

**Table 4: Terms and Abbreviations**

| Abbreviation | Description  |
|--------------|--|
| GNSS         | Global Navigation Satellite System                   |
| GPS          | Global Positioning System                            |
| GLONASS      | Global Navigation Satellite System(The Russian GNSS) |
| NMEA         | National Marine Electronics Association              |
| PMTK         | Private protocol of MTK                              |
| GGA          | NMEA: Global Positioning System Fix Data             |
| RMC          | NMEA: Recommended Minimum Position Data              |
| GSA          | NMEA: GNSS DOP and Active Satellites                 |
| GSV          | NMEA: GNSS Satellites in View                        |
| GLL          | NMEA: Geographic Position – Latitude/Longitude       |
| VTG          | NMEA: Track Made Good and Ground Speed               |
| SBAS         | Satellite-Based Augmentation System                  |
| AGPS         | Assisted Global Positioning System                   |

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|      |  |
|------|--|
| DGPS | Differential Global Positioning System |
| EASY | Embedded Assist System                 |
| AIC  | Active Interference Cancellation       |
| PDOP | Position Dilution Of Precision         |
| VDOP | Vertical Dilution Of Precision         |
| HDOP | Horizontal Dilution Of Precision       |
| WAAS | Wide Area Augmentation System          |
| PPS  | Pulse Per Second                       |
| UTC  | Universal Time Coordinated             |

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# 5 Default Configurations

**Table 5: Default Configurations**

| Item                    | Default                              |
|-------------------------|--------------------------------------|
| NMEA Port Baud Rate     | 9600bps                              |
| Datum                   | WGS84                                |
| Rate of Position Fixing | 1HZ                                  |
| DGPS Mode               | SBAS                                 |
| SBAS Enable             | Enable                               |
| NMEA Output Messages    | GGA, RMC, GSA, GSV, VTG, GLL and TXT |
| AIC                     | On                                   |
| EASY                    | On                                   |