



# GNSS Software Extensions

## User Guide

1W0301544 Rev. 7 – 2021-10-26

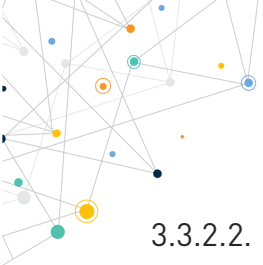
## APPLICABILITY TABLE

PRODUCTS
SL869-V2
SL869L-V2
SL871
SL871L
SE868-a
SE868K3-A
SE868K3-AL
SE878K3-A
SC872-A
SC874-A
SE868-v3
SE873
SE873Q5
SE876Q5-A
SL869-V3
SL869-ADR
SE868SY-D

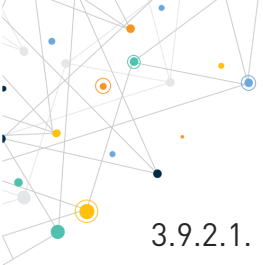
SOFTWARES
V13-2.3.2-STD-5.1.14
V26-1.0.0-STD-5.7.11P4 and subsequent versions
V33-1.0.6-STD-4.5.10
V33-1.0.4-CLDR-4.7.10
V50-1.0.0

## CONTENTS

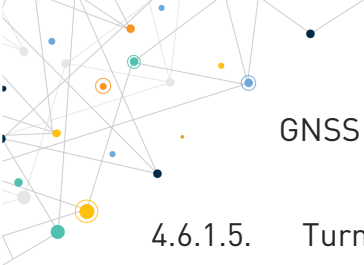
<b>APPLICABILITY TABLE</b>	<b>2</b>
<b>CONTENTS</b>	<b>3</b>
<b>1. INTRODUCTION</b>	<b>7</b>
1.1. Scope	7
1.2. Audience	7
1.3. Contact Information, Support	7
1.4. Symbol Conventions	8
1.5. Related Documents	8
<b>2. COMMUNICATION INTERFACE</b>	<b>9</b>
2.1. Serial Communication	9
2.2. Telit Proprietary NMEA Messages Format	9
2.2.1. Telit Proprietary NMEA Messages Applicability Table	11
<b>3. TELIT NMEA MESSAGES</b>	<b>12</b>
3.1. PTWSVER - Telit Software Version Message	12
3.1.1. Input Message	12
3.1.2. Output Message	12
3.2. PTWSLNA – LNA Message	13
3.2.1. Input Message	13
3.2.1.1. Set LNA Gain	14
3.2.1.2. Query LNA Gain	14
3.2.2. Output Message	14
3.2.2.1. Set LNA Gain Responses	14
3.2.2.2. Query LNA Gain Responses	15
3.3. PTWSMODE – MODE Messages	15
3.3.1. CONST Message Type	15
3.3.1.1. Input Message	15
3.3.1.2. Output Message	17
3.3.2. NAVRATE Message Type	20
3.3.2.1. Input Message	20



3.3.2.2.	Output Message	21
3.4.	PTWSRLM – RLM Messages	22
3.4.1.	Input Message	22
3.4.1.1.	Configure RLM Message	22
3.4.1.2.	Query RLM Message Configuration	23
3.4.2.	Output Message	24
3.4.2.1.	Configure RLM Message Response	24
3.4.2.2.	Query RLM Message Configuration Response	24
3.5.	PTWSEPE – EPE Messages	25
3.5.1.	Input Message	25
3.5.2.	Output Message	26
3.5.2.1.	Input Message Response	26
3.5.2.2.	EPE Reporting Message	26
3.6.	PTWSANT – Antenna Status Messages	27
3.6.1.	Input Message	27
3.6.2.	Output Message	28
3.6.2.1.	Antenna Status Reporting Message	28
3.6.2.2.	Antenna Status Reporting Mode Configuration Response	29
3.6.3.	Antenna Status Error and Acknowledge Responses	30
3.7.	PTWSDGPS – DGPS Messages	31
3.7.1.	SOURCE Message Type	31
3.7.1.1.	Input Message	31
3.7.1.2.	Output Message	32
3.8.	PTWSSBAS – SBAS Messages	33
3.8.1.	CONFIG Message Type	33
3.8.1.1.	Input Message	33
3.8.1.2.	Output Message	34
3.9.	PTWSFENCE – Geofencing Messages	36
3.9.1.	CONFIG Message Type	36
3.9.1.1.	Input Messages	36
3.9.1.2.	Output Messages	38
3.9.2.	STATUS Message Type	39



3.9.2.1.	Input Messages	39
3.9.2.2.	Output Messages	40
3.10.	PTWSRESET - Reset Message	42
3.10.1.	Input Message	42
3.10.2.	Output Message	42
3.11.	PTWSTSN – TSN Read Message	44
3.11.1.	Input Message	44
3.11.2.	Output Message	44
<b>4.</b>	<b>APPENDIX A – TELIT LEGACY NMEA MESSAGES</b>	<b>46</b>
4.1.	Telit Legacy NMEA Messages Format	46
4.1.1.	Telit Legacy NMEA Messages Applicability Table	47
4.2.	PTWS,VERSION – Telit Software Version Message	48
4.2.1.	Input Message	48
4.2.2.	Output Message	48
4.3.	PTWS,ANT – Antenna Status Message	48
4.3.1.	Input Message	49
4.3.2.	Output Message	49
4.4.	PTWS,JAM – Jamming Detection Status Message	49
4.4.1.	Input Message	50
4.4.2.	Output Message	50
4.5.	PTWS,LNA – LNA Gain Message	51
4.5.1.	Input Messages	51
4.5.1.1.	Set LNA Gain	51
4.5.1.2.	Query LNA Gain	51
4.5.2.	Output Message	52
4.6.	PTWS,ODO – ODO Messages	52
4.6.1.	Input Messages	52
4.6.1.1.	Start ODO Count	52
4.6.1.2.	Stop ODO Count	53
4.6.1.3.	Query ODO Count	53
4.6.1.4.	Turn ODO Output Messages On	53



4.6.1.5.	Turn ODO Output Messages Off	53
4.6.2.	Output Message	54
<b>5.</b>	<b>PRODUCT AND SAFETY INFORMATION</b>	<b>55</b>
5.1.	Copyrights and Other Notices	55
5.1.1.	Copyrights	55
5.1.2.	Computer Software Copyrights	55
5.2.	Usage and Disclosure Restrictions	56
5.2.1.	License Agreements	56
5.2.2.	Copyrighted Materials	56
5.2.3.	High Risk Materials	56
5.2.4.	Trademarks	57
5.2.5.	Third Party Rights	57
5.2.6.	Waiver of Liability	57
5.3.	Safety Recommendations	58
<b>6.</b>	<b>GLOSSARY</b>	<b>59</b>
<b>7.</b>	<b>DOCUMENT HISTORY</b>	<b>60</b>

# 1. INTRODUCTION

## 1.1. Scope

This document describes the Telit software extensions, which are custom commands from the proprietary Telit NMEA interface.

The interface described in this specification applies to the default or stock firmware for GNSS modules in the V13, V26, V33, and V50 firmware families that use flash program memory.

## 1.2. Audience

This document is intended for public distribution to potential customers who are evaluating a GNSS module from the above firmware family and which is listed in the Applicability Table. It can also be used by customers who are developing application software for a Host Processor contained within their product that incorporates one of the listed modules.

## 1.3. Contact Information, Support

For general contact, technical support services, technical questions and report of documentation errors contact Telit Technical Support at:

- [TS-EMEA@telit.com](mailto:TS-EMEA@telit.com)
- [TS-AMERICAS@telit.com](mailto:TS-AMERICAS@telit.com)
- [TS-APAC@telit.com](mailto:TS-APAC@telit.com)
- [TS-SRD@telit.com](mailto:TS-SRD@telit.com)
- [TS-ONEEDGE@telit.com](mailto:TS-ONEEDGE@telit.com)

Alternatively, use:

<https://www.telit.com/contact-us>

For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:

<https://www.telit.com>

Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.

Telit appreciates the user feedback on our information.

## 1.4. Symbol Conventions



**Danger:** This information **MUST** be followed or catastrophic equipment failure or personal injury may occur.



**Warning:** Alerts the user on important steps about the module integration.



**Note/Tip:** Provides advice and suggestions that may be useful when integrating the module.



**Electro-static Discharge:** Notifies the user to take proper grounding precautions before handling the product.

*Table 1: Symbol Conventions*

All dates are in ISO 8601 format, that is YYYY-MM-DD.

## 1.5. Related Documents

- [1] NMEA 0183, Version 3.00, National Marine Electronics Association
- [2] Interface Specification IS-GPS-200G, 2012-09-05
- [3] Galileo-OS-SIS-ICD
- [4] Galileo-SAR-SDD



## 2. COMMUNICATION INTERFACE

The serial communication interface between the GNSS receiver module and the host processor is based on the NMEA-0183 protocol standard specified by the National Marine Electronics Association (NMEA). It is an ASCII standard widely used throughout the GPS industry for serial communication with GNSS receivers [\[1\]](#).



**Note:** For a full comprehensive description of NMEA 0183 standard, please refer to [\[1\]](#).

### 2.1. Serial Communication

Serial communication with the GNSS receiver is primarily conducted over the serial port. There is no hardware flow control. The default port settings are:

- 9600 Baud
- Eight data bits
- No parity bits
- One stop bit

Note: Some Firmware versions may have different default values than those given above.

### 2.2. Telit Proprietary NMEA Messages Format

In addition to the standard NMEA output messages as well as vendor's proprietary NMEA messages, Telit GNSS software supports a set of proprietary NMEA messages, that comply with NMEA 0183, to further enhance the control of GNSS receivers and expose more functionalities.

Telit proprietary NMEA messages start with the "\$" character, which is then followed by the proprietary address field string that uses the Manufacturer's Mnemonic Code registered by Telit with the NMEA, which is "TWS". Thus, the Telit proprietary address field is of the form:

**\$PTWSxxx[x...]**

Where, xxx.. represents an alphanumeric message identifier having a minimum of three characters and being all upper case.

Checksum fields are included in all Telit proprietary NMEA output messages, and letters representing hexadecimal digits are upper-case. Checksum fields are optional for Telit proprietary NMEA input commands.

The messages end with Carriage Return (CR) and Line Feed (LF) characters.

Following is the list of Telit NMEA messages supported with the applicable software.

Proprietary Address Field	Description
\$PTWSVER	Telit software version message
\$PTWSLNA	LNA Gain message
\$PTWSMODE	Operational setting message
\$PTWSRLM	Return Link Message
\$PTWSEPE	Estimated Position Error
\$PTWSANT	Antenna status message
\$PTWSDGPS	DGPS Source message
\$PTWSSBAS	SBAS message
\$PTWSFENCE	Geofence Management message
\$PTWSRESET	Reset message
\$PTWSTSN	Read Telit Serial Number

*Table 2: Telit Proprietary NMEA Messages*

### 2.2.1. Telit Proprietary NMEA Messages Applicability Table

		\$PTWSVER	\$PTWSLNA	\$PTWSMODE	\$PTWSRLM	\$PTWSEPE	\$PTWSANT	\$PTWSDGPS	\$PTWSSBAS	\$PTWSFENCE	\$PTWSRESET	\$PTWSTSN
V13	SL869-V2	✓	✓	✓	✓	✓	✗	✗	✗	✓	✗	✗
	SL869L-V2	✓	✓	✓	✓	✓	✗	✗	✗	✓	✗	✗
	SL871	✓	✓	✓	✓	✓	✓	✗	✗	✓	✗	✗
	SL871L	✓	✓	✓	✓	✓	✓	✗	✗	✓	✗	✗
	SE868-A	✓	✓	✓	✓	✓	✗	✗	✗	✓	✗	✗
	SE868K3-A	✓	✓	✓	✓	✓	✗	✗	✗	✓	✗	✗
	SE868K3-AL	✓	✓	✓	✓	✓	✗	✗	✗	✓	✗	✗
	SE878K3-A	✓	✓	✓	✓	✓	✓	✗	✗	✓	✗	✗
	SC872-A	✓	✓	✓	✓	✓	✗	✗	✗	✓	✗	✗
	SC874-A	✓	✓	✓	✓	✓	✗	✗	✗	✓	✗	✗
V26	SE868-V3	✓	✓	✓	✓	✓	✗	✗	✗	✓	✗	✗
	SE873	✓	✓	✓	✓	✓	✗	✗	✗	✓	✗	✗
	SE873Q5	✓	✓	✓	✓	✓	✗	✗	✗	✓	✗	✗
	SL876Q5-A	✓	✓	✓	✓	✓	✓	✗	✗	✓	✗	✗
V33	SL869-V3	✓	✗	✓	✗	✓	✓	✗	✗	✓	✗	✗
	SL869-ADR	✓	✗	✓	✗	✓	✓	✗	✗	✓	✗	✗
V50	SE868SY-D	✓	✗	✓	✗	✓	✗	✓	✓	✓	✓	✓

✗	Not Supported
✓	Supported

Table 3: Telit Proprietary NMEA Messages Applicability Table

## 3. TELIT NMEA MESSAGES

### 3.1. PTWSVER - Telit Software Version Message

The Telit Software Version can be polled using the input message described in this section.

This command obsoletes \$PTWS,VERSION. Therefore, this latter is still supported but its usage is now deprecated.

#### 3.1.1. Input Message

##### Synopsis:

```
$PTWSVER,action[,param][*CS]<CR><LF>
```

##### Example:

```
$PTWSVER,GET,TELIT*57<CR><LF>
```

Field	Example	Description
<b>Proprietary Address Field</b>	PTWSVER	Telit Software Version Message
<b>Action</b>	GET	Action to be executed: GET action only is supported
<b>Param</b>	TELIT	Optional parameter indicating the specific type of version to be retrieved TELIT = The Telit version is retrieved SDK = The vendor's version string from the underlying SDK is retrieved If no parameter is provided, the Telit version is retrieved.

Table 4: PTWSVER – Telit Software Version Input Message Structure

#### 3.1.2. Output Message

##### Synopsis:

```
$PTWSVER,param,verString*CS<CR><LF>
```

##### Error:

```
$PTWSVER,ERROR[,Action][,Parameter]*CS<CR><LF>
```

```
$PTWSCHECKSUM*0D
```

```
$PTWSINVALID*51
```

**Example:**

```
$PTWSVER,TELIT,V13-2.3.0-STD-5.1.5-N96-000200*78
```

Field	Example	Description
<b>Proprietary Address Field</b>	PTWSVER	Telit SW Version Message
<b>Param</b>	TELIT	Parameter indicating the type of version string being reported TELIT = Telit version string SDK = Vendor's version string from the underlying SDK
<b>VerString</b>	V13-2.3.0-STD-5.1.5-N96-000200	Telit/Vendor's version string

Table 5: PTWSVER – Telit Software Version Output Message Structure

### 3.2. PTWSLNA – LNA Message

LNA related settings can be controlled using the messages described in this section.

This command obsoletes \$PTWS,LNA. Therefore, this latter is still supported but its usage is now deprecated.

#### 3.2.1. Input Message

**Synopsis:**

```
$PTWSLNA,attrib,action[,<value>][*CS]<CR><LF>
```

Field	Example	Description
<b>Proprietary Address Field</b>	PTWSLNA	Telit LNA Gain Message
<b>Attrib</b>	GAIN	Parameter indicating the feature attribute to which the message applies: GAIN attribute only is supported
<b>Action</b>	SET	Action to be executed GET = Poll the current LNA Gain value - The next field of this message must be omitted SET = Configure the LNA Gain to a specific setting to be specified in the next field
<b>Value</b>	HIGH	Optional parameter indicating the specific LNA GAIN setting when the Action is SET HIGH = High gain LOW = Low gain

Table 6: PTWSLNA – Telit LNA Input Message Structure

### 3.2.1.1. Set LNA Gain

This command is used to configure the LNA Gain setting.

#### Synopsis:

```
$PTWSLNA,GAIN,SET,<value>[*CS]<CR><LF>
```

#### Example:

```
$PTWSLNA,GAIN,SET,LOW*78<CR><LF>
```



#### Note: V26 Firmware Family

The module performs a HOT Start after the command execution.

### 3.2.1.2. Query LNA Gain

This command is used to query the current LNA Gain setting.

#### Synopsis:

```
$PTWSLNA,GAIN,GET[*CS]<CR><LF>
```

#### Example:

```
$PTWSLNA,GAIN,GET*14<CR><LF>
```

## 3.2.2. Output Message

### 3.2.2.1. Set LNA Gain Responses

#### Success:

```
$PTWSLNA,OK*6B
```

#### Error:

```
$PTWSLNA,ERROR,GAIN,SET*74
```

```
$PTWSLNA,ERROR,GAIN*1A
```

```
$PTWSLNA,ERROR,SET*4A
```

```
$PTWSLNA,ERROR*37
```

```
$PTWSNOSUPPORT*4E
```

```
$PTWSCHECKSUM*0D
```

```
$PTWSINVALID*51
```

### 3.2.2.2. Query LNA Gain Reponses

#### Success:

```
$PTWSLNA,GAIN,value*CS<CR><LF>
```

#### Example:

```
$PTWSLNA,GAIN,LOW*16<CR><LF>
```

#### Error:

```
$PTWSLNA,ERROR,GAIN*1A
```

```
$PTWSLNA,ERROR*37
```

```
$PTWSNOSUPPORT*4E
```

```
$PTWSCHECKSUM*0D
```

```
$PTWSINVALID*51
```

## 3.3. PTWSMODE – MODE Messages

Telit MODE messages can be used to control various aspects of the operating mode of the GNSS module.

### 3.3.1. CONST Message Type

PTWSMODE,CONST messages can be used to control (enable, disable) the use of navigational satellite constellations and poll the current configuration. When a constellation is enabled, the module will acquire and track satellites from that constellation and use its measurements to update the navigational solution.

#### 3.3.1.1. Input Message

##### Synopsis:

```
$PTWSMODE,CONST,action[,GPS][,GLO][,BDS][,BDSB1C][,GAL][,QZS][,NAV][,GPSL5][,G  
ALE5][,BDSB2][,QZSL5][*CS]<CR><LF>
```

Field	Example	Description
Proprietary Address Field	PTWSMODE	Telit MODE Messages
Attrib	CONST	Parameter indicating the feature attribute to which the message applies: CONST attribute

Field	Example	Description
Action	SET	Action to be executed GET = Poll the current enabled constellations - The next fields of this message must be omitted SET = Configure the navigational constellations to be used – This configuration must be specified using one or more comma-separated fields of type Parameter specified below
ParameterN	GPS	Optional parameter indicating the specific constellations that must be enabled GPS = Enable GPS constellation GLO = Enable GLONASS constellation GAL = Enable GALILEO constellation BDS = Enable BEIDOU constellation (B1I signal) BDSB1C = Enable BEIDOU constellation (B1C signal) QZS = Enable QZSS constellation NAV = Enable IRNSS/NAVIC (L5 only) constellation GPSL5 = Enable GPS L5 constellation GALE5 = Enable GALILEO E5 constellation BDSB2 = Enable Beidou B2 constellation QZSL5 = Enable QZSS L5 constellation At least one constellation must be present in the command, however QZS-only operation is not supported. Also, GLONASS (GLO) and Beidou (BDS) constellations cannot be enabled at the same time.

Table 7: PTWSMODE,CONST – Telit MODE,CONST Input Message Structure



**Note:** NAV, BDSB1C, GPSL5, GALE5, BDSB2, QZSL5 constellations are supported by V50 firmware family only.

### 3.3.1.1.1. Set Active Constellations

This command is used to enable the active constellations.

#### Synopsis:

```
$PTWSMODE,CONST,SET[,GPS][,GLO][,BDS][,BDSB1C][,GAL][,QZS][,NAV][,GPSL5][,GALE5] [,BDSB2][,QZSL5] [*CS]<CR><LF>
```

#### Example:

```
$PTWSMODE,CONST,SET,GPS,GLO*04<CR><LF>
```

### 3.3.1.1.2. Query Active Constellations

This command is used to query the constellations currently enabled.

#### Synopsis:



```
$PTWSMODE,CONST,GET[*10]<CR><LF>
```

**Example:**

```
$PTWSMODE,CONST,GET*10<CR><LF>
```

### 3.3.1.2. Output Message

#### 3.3.1.2.1. Set Active Constellations Response

**Success:**

```
$PTWSMODE,OK*2B
```

**Error:**

```
$PTWSMODE,ERROR,CONST,SET*70
```

```
$PTWSMODE,ERROR,CONST*1E
```

```
$PTWSMODE,ERROR*77
```

```
$PTWSNOSUPPORT*4E
```

```
$PTWSCHECKSUM*0D
```

#### 3.3.1.2.2. Query Active Constellations Response

**Success:**

```
$PTWSMODE,CONST[,GPS][,GLO][,BDS][,BDSB1C][,GAL][,QZS][,NAV][,GPSL5][,GALE5][,BDSB2][,QZSL5][*CS]<CR><LF>
```

**Example:**

```
$PTWSMODE,CONST,GPS,GLO*6A<CR><LF>
```

**Error:**


```
$PTWSMODE,ERROR,CONST*1E
```

```
$PTWSMODE,ERROR*77
```

```
$PTWSCHECKSUM*0D
```

### Note: V26 Firmware Family


The supported constellation combinations are as follows:



GPS	GLO	BDS	GAL	QZS
ON	OFF	OFF	OFF	OFF
ON	ON	OFF	OFF	OFF
ON	OFF	ON	OFF	OFF
ON	OFF	OFF	ON	OFF
ON	ON	OFF	ON	OFF
ON	OFF	ON	ON	OFF
ON	OFF	OFF	OFF	ON
ON	ON	OFF	OFF	ON
ON	OFF	ON	OFF	ON
ON	OFF	OFF	ON	ON
ON	ON	OFF	ON	ON
ON	OFF	ON	ON	ON
OFF	OFF	OFF	ON	OFF

### Note: V13 Firmware Family

The supported constellation combinations are as follows:



GPS	GLO	BDS	GAL	QZS
ON	OFF	OFF	OFF	N/A
ON	ON	OFF	OFF	N/A
ON	OFF	ON	OFF	N/A
ON	OFF	OFF	ON	N/A
ON	ON	OFF	ON	N/A

QZSS configuration cannot be changed at runtime through \$PTWSMODE,CONST.

### Note: V33 Firmware family

The supported constellation combinations are as follows:

GPS	GLO	BDS	GAL	QZS
ON	OFF	OFF	OFF	OFF
OFF	ON	OFF	OFF	OFF
ON	ON	OFF	OFF	OFF
OFF	OFF	ON	OFF	OFF
ON	OFF	ON	OFF	OFF
OFF	ON	ON	OFF	OFF
OFF	OFF	OFF	ON	OFF
ON	OFF	OFF	ON	OFF
OFF	ON	OFF	ON	OFF
ON	ON	OFF	ON	OFF
OFF	OFF	ON	ON	OFF
ON	OFF	ON	ON	OFF
OFF	OFF	OFF	OFF	ON
ON	OFF	OFF	OFF	ON
OFF	ON	OFF	OFF	ON
ON	ON	OFF	OFF	ON
OFF	OFF	ON	OFF	ON
ON	OFF	ON	OFF	ON
OFF	OFF	OFF	ON	ON
ON	OFF	OFF	ON	ON
OFF	ON	OFF	ON	ON
ON	ON	OFF	ON	ON
OFF	OFF	ON	ON	ON
ON	OFF	ON	ON	ON

### V50 Firmware family

The supported constellation combinations withstand the following limitations:

- Single constellation mode is available only for GPS L1
  - GPS L5 only mode is supported for testing only
- NAVIC and GLONASS constellations cannot be enabled simultaneously
- Maximum four concurrent constellations can be enabled at the same time:
  - Different bands for the same constellation (for example, GPS + GPS L5) are considered as a single constellation
  - GPS and QZSS are considered as one constellation
  - GPS and QZSS constellations must use the same band (for example, both L1, both L5 or both L1+L5)

- QZSS only operation is not supported.



**Note:** In case of wrong constellation combination, the module's response is:

```
$PTWSNOSUPPORT*4E
```

and the current configuration is maintained.

### 3.3.2. NAVRATE Message Type

PTWSMODE,NAVRATE messages can be used to control the Navigation Update Rate (i.e. the position fix interval).

#### 3.3.2.1. Input Message

##### Synopsis:

```
$PTWSMODE,NAVRATE,action[,rate][*CS]<CR><LF>
```

Field	Example	Description
<b>Proprietary Address Field</b>	PTWSMODE	Telit MODE Messages
<b>Attrib</b>	NAVRATE	Parameter indicating the feature attribute to which the message applies: NAVRATE attribute
<b>Action</b>	SET	Action to be executed GET = Poll the current navigation update rate - The next fields of this message must be omitted SET = Configure the navigation update rate to be used – This configuration must be specified using one integer fields as specified below
<b>Rate</b>	5	Optional parameter indicating the update rate that must be configured in Hertz: 1 = 1 Hz (1 PVT dataset per second) 2 = 2 Hz 5 = 5 Hz 10 = 10 Hz 25 = 25 Hz

Table 8: PTWSMODE,NAVRATE – Telit MODE,NAVRATE Input Message Structure



**Note:** 25Hz navigation update rate is supported by V50 firmware family only.

Navigation Update Rates higher than 1Hz cause an automatic adjustment of CPU clock that results in an increase of power consumption.

Higher navigation update rates require baud rate to be adjusted to accommodate the increase of NMEA data throughput. For instance, 921600 baud per second is suggested for 25Hz navigation update rate.

### 3.3.2.1.1. Set Navigation Update Rate

This command is used to set the navigation update rate.

**Synopsis:**

```
$PTWSMODE,NAVRATE,SET,<RATE>[*CS]<CR><LF>
```

**Example:**

```
$PTWSMODE,NAVRATE,SET,5*03<CR><LF>
```

### 3.3.2.1.2. Query Navigation Update Rate

This command is used to query the navigation update rate.

**Synopsis:**

```
$PTWSMODE,NAVRATE,GET[*0E]<CR><LF>
```

**Example:**

```
$PTWSMODE,NAVRATE,GET*0E<CR><LF>
```

## 3.3.2.2. Output Message

### 3.3.2.2.1. Set Navigation Update Rate

**Success:**

```
$PTWSMODE,OK*2B
```

**Error:**

```
$PTWSMODE,ERROR,NAVRATE,SET*6E
```

```
$PTWSMODE,ERROR,NAVRATE*00
```

```
$PTWSMODE,ERROR*77
```

```
$PTWSNOSUPPORT*4E
```

```
$PTWSCHECKSUM*0D
```

### 3.3.2.2.2. Query Navigation Update Rate

#### Success:

```
$PTWSMODE,NAVRATE,<rate>[*CS]<CR><LF>
```

#### Example:

```
$PTWSMODE,NAVRATE,10*59<CR><LF>
```

#### Error:

```
$PTWSMODE,ERROR,NAVRATE*00
```

```
$PTWSMODE,ERROR*77
```

```
$PTWSCHECKSUM*0D
```

## 3.4. PTWSRLM – RLM Messages

PTWSRLM messages are used to control the reporting of the RLM (Return Link Service Message) output message defined in the NMEA-0183 standard.

### 3.4.1. Input Message

#### 3.4.1.1. Configure RLM Message

The reporting of the RLM NMEA output message can be configured using the message described in this section.

#### Synopsis:

```
$PTWSRLM,action[,<value>][*CS]<CR><LF>
```

#### Examples:

```
$PTWSRLM,ENABLE*7E<CR><LF>
```

```
$PTWSRLM,REGISTER,0A0A0A0A0A0A0A0*1B<CR><LF>
```

Field	Example	Description
Proprietary Address Field	PTWSRLM	Telit RLM Message
Action	ENABLE	Action to be executed Allowed values to enable/disable the reporting of the RLM message ENABLE = Enable RLM NMEA output message DISABLE = Disable RLM NMEA output message Allowed values to register/unregister a specific Beacon ID for which the reporting of the RLM message is to be enabled REGISTER = Register a Beacon ID UNREGISTER = Unregister a Beacon ID
Value		Optional parameter, in form of 15 hex digits, indicating the specific Beacon ID for which the reporting of the RLM message is to be enabled – mandatory when the Action field is REGISTER

Table 9: PTWSRLM – Telit RLM Message Structure

**Note:** The reporting of the RLM NMEA output message is disabled by default at each module restart. \$PTWSRLM,ENABLE command has then to be sent to enable the RLM reporting again.

### V26 Firmware Family

The Beacon ID, for which the reporting of the RLM message is to be enabled, must be specified through the \$PTWSRLM,REGISTER,<beaconID> command. This latter command is therefore available on V26 firmware family only.

The SAR search/decode process ends if one of the following conditions is met:

- On demand via \$PTWSRLM,UNREGISTER,<beaconID>
- Valid RLM message received
- 30-min timeout exceeded



**Warning:** \$PTWSRLM message structure may be subjected to change to accommodate future enhancements needed to manage SAR/RLM messaging.

### 3.4.1.2. Query RLM Message Configuration

The current configuration for the reporting of the RLM NMEA output message can be queried using the command described in this section.

**Synopsis:**

```
$PTWSRLM,attrib,action[*CS]<CR><LF>
```

**Example:**

```
$PTWSRLM,STATUS,GET*11<CR><LF>
```

Field	Example	Description
<b>Proprietary Address Field</b>	PTWSRLM	Telit RLM Message
<b>Attrib</b>	STATUS	Parameter indicating the feature attribute to which the message applies: STATUS attribute only is supported
<b>Action</b>	GET	Action to be executed GET = Poll the current configuration for the RLM output message.

Table 10: PTWSRLM – Telit RLM Query Message Structure

### 3.4.2. Output Message

#### 3.4.2.1. Configure RLM Message Response

**Success:**

```
$PTWSRLM,OK*7B
```

**Error:**

```
$PTWSRLM,ERROR,REGISTER*02
```

```
$PTWSRLM,ERROR*27
```

```
$PTWSCHECKSUM*0D
```

#### 3.4.2.2. Query RLM Message Configuration Response

**Success:**

```
$PTWSRLM,STATUS,1*76<CR><LF> - If RLM reporting is enabled
```

```
$PTWSRLM,STATUS,0*77<CR><LF> - If RLM reporting is disabled
```

**Error:**

```
$PTWSRLM ERROR,STATUS*13
```

```
$PTWSRLM,ERROR*27
```

```
$PTWSCHECKSUM*0D
```



### 3.5. PTWSEPE – EPE Messages

PTWSEPE messages are used to control the reporting of the EPE (Estimate Positioning Error) output message.

#### 3.5.1. Input Message

The reporting of the PTWSEPE output message can be enabled or disabled using the message described in this section.

##### Synopsis:

```
$PTWSEPE,action,<value>[*CS]<CR><LF>
```

##### Example:

```
$PTWSEPE,SET,ON*13<CR><LF>
```

Field	Example	Description
Proprietary Address Field	PTWSEPE	Telit EPE Message
Action	SET	Action to be executed SET = Configure the EPE message reporting according to the value to be specified in the next field
Value	ON	Parameter to enable/disable the reporting of the EPE message ON = Enable PTWSEPE output message OFF = Disable PTWSEPE output message

Table 11: PTWSEPE – Telit EPE Input Message Structure



**Note:** The reporting of the EPE output message is disabled by default at each module restart. \$PTWSEPE,SET,ON command has then to be sent to enable the EPE reporting again.

### Warning: V13 Firmware Family

The allowed values for the <action> field are:

- ENABLE = Enable PTWSEPE output message
- DISABLE = Disable PTWSEPE output message



The <value> field is not used.

Example:

```
$PTWSEPE,ENABLE*7D<CR><LF>
```

```
$PTWSEPE,DISABLE*28<CR><LF>
```

## 3.5.2. Output Message

### 3.5.2.1. Input Message Response

#### Success:

```
$PTWSEPE,OK*78
```

#### Error:

```
$PTWSEPE,ERROR,SET*4A
```

```
$PTWSEPE,ERROR*24
```

```
$PTWSCHECKSUM*0D
```

```
$PTWSINVALID*51
```

### 3.5.2.2. EPE Reporting Message

The EPE (Estimate Positioning Error) is reported using the PTWSEPE output message described in this section.

#### Synopsis:

```
$PTWSEPE,<timestamp>,<EHPE>,<EVPE>*CS <CR><LF>
```

#### Example:

```
$PTWSEPE,132517.000,5.35,16.74*56<CR><LF>
```

Field	Example	Description
Proprietary Address Field	PTWSEPE	Telit EPE Message
Timestamp	132517.000	UTC time of the position error data hhmmss.sss (hours,minutes,seconds)
EHPE	5.35	Expected Horizontal Position Error One-sigma estimate of the horizontal error expressed in meters as a floating-point number with two digits of precision
EVPE	16.74	Expected Vertical Position Error One-sigma estimate of the vertical error, expressed in meters as a floating-point number with two digits of precision

Table 12: PTWSEPE – Telit EPE Reporting Output Message Structure



#### Note: V33 Firmware Family

The EPE reporting message reports the <EHPE> value only.

### 3.6. PTWSANT – Antenna Status Messages

PTWSANT messages are used to monitor the Antenna Status by performing antenna detection (in case of antenna modules only) and antenna sensing.

This command obsoletes \$PTWS,ANT. Therefore, this latter is still supported but its usage is now deprecated.



**Note:** Antenna detection and antenna sensing features may require a specific external circuitry to be performed.

Please contact Telit Technical Support for further information.

#### 3.6.1. Input Message

PTWSANT input messages are used to query the antenna status and configure specific reporting modes.

##### Synopsis:

```
$PTWSANT,attrib,action[,mode][*CS]<CR><LF>
```

##### Examples:

```
$PTWSANT,STATUS,GET*19<CR><LF>
```

```
$PTWSANT,OUTPUT,SET,EVENT*66<CR><LF>
```

Field	Example	Description
<b>Proprietary Address Field</b>	PTWSANT	Telit Antenna Status Message
<b>Attrib</b>	STATUS	Parameter indicating the feature attribute to which the message applies: STATUS = Query the Antenna Status - Action field can be GET only OUTPUT = Configure a specific reporting mode for the Antenna Status - when the Action field is SET Poll the current reporting mode configuration - when the Action field is GET
<b>Action</b>	GET	GET = Query the Antenna Status - When the Attrib field is STATUS Poll the current reporting mode configuration - When the Attrib field is OUTPUT SET = Configure a specific reporting mode for the Antenna Status - When the Attrib field is OUTPUT.
<b>Mode</b>		Optional parameter indicating the specific reporting mode to be set - When the Attrib field is OUTPUT and the Action field is SET NONE = Polling Mode PERIODIC = Periodic Mode EVENT = Event Mode

Table 13: PTWSANT – Telit Antenna Status Input Message Structure

### Note: Antenna Status Reporting Modes



- NONE: Polling mode - The output is provided only after a \$PTWSANT,STATUS,GET command
- PERIODIC: The output is provided along with the other NMEA sentences, once a second
- EVENT: The output is provided only if an antenna status change has been detected

## 3.6.2. Output Message

### 3.6.2.1. Antenna Status Reporting Message

The Antenna Status is reported through the message described in this section.

In case of antenna modules, antenna detection is performed first, to understand which, between the embedded internal antenna and an external active one, is used. In latter case, antenna sensing is performed to check the working status of the external antenna itself.

**Synopsis:**

```
$PTWSANT,STATUS,AntStatus*CS<CR><LF>
```

**Examples:**

```
$PTWSANT,STATUS,NORMAL*5C<CR><LF>
```

Field	Example	Description
<b>Proprietary Address Field</b>	PTWSANT	Telit Antenna Status Message
<b>Attrib</b>	STATUS	Parameter indicating the feature attribute to which the message applies: STATUS = Antenna Status Reporting
<b>AntStatus</b>	NORMAL	Antenna Status SHORT = Antenna Sense – Shorted NORMAL = Antenna Sense – Normal OPEN = Antenna Sense – Open/Detached INTERNAL = Antenna Detection – Internal Antenna UNKNOWN = Unknown status

Table 14: PTWSANT – Telit Antenna Status Reporting Message Structure

### 3.6.2.2. Antenna Status Reporting Mode Configuration Response

The current reporting mode configuration for Antenna Status is reported in the message described in this section.

**Synopsis:**

```
$PTWSANT,OUTPUT,mode*CS
```

**Examples:**


```
$PTWSANT,OUTPUT,EVENT*08
```

Field	Example	Description
<b>Proprietary Address Field</b>	PTWSANT	Telit Antenna Status Message
<b>Attrib</b>	OUTPUT	Parameter indicating the feature attribute to which the message applies: OUTPUT = Antenna Status Reporting Mode Configuration
<b>Mode</b>	EVENT	NONE = Polling Mode PERIODIC = Periodic Mode EVENT = Event Mode

Table 15: PTWSANT – Telit Antenna Status Reporting Mode Configuration Message Structure

**Note:****V26 Firmware Family**

Polling mode only is supported.



PTWSANT supports the antenna detection only – The supported statuses are INTERNAL and NORMAL. In this latter case, the NORMAL status is used just to indicate that an external antenna is being used, i.e. no antenna sensing is performed.

**V33 Firmware Family**

PTWSANT supports the antenna sensing only – The only supported statuses are SHORT, NORMAL and OPEN.

### 3.6.3. Antenna Status Error and Acknowledge Responses

The messages described in this section are reported to respond to an unsuccessful command or to respond to a configuration modification command.

**Success**

The following response applies only to \$PTSANT,OUTPUT,SET commands:

\$PTWSANT,OK\*2B

**Error**

The following response applies only to \$PTWSANT,STATUS commands:

\$PTWSANT,ERROR,STATUS\*17

The following responses apply only to \$PTWSANT,OUTPUT commands:

\$PTWSANT,ERROR,OUTPUT,SET\*72

\$PTWSANT,ERROR,OUTPUT\*1C

The following are responses for generic errors:

\$PTWSANT,ERROR\*2F

\$PTWSNOSUPPORT\*4E

\$PTWSCHECKSUM\*0D

### 3.7. PTWSDGPS – DGPS Messages

The DGPS messages can be used to control various aspects of the DGPS section of the GNSS module.

#### 3.7.1. SOURCE Message Type

PTWSDGPS,SOURCE messages can be used to control (select, query) the source of corrections used by the DGPS section of the GNSS module. When a SOURCE is selected, the module will enable the usage of that source and use its corrections to enhance the navigation solution.

##### 3.7.1.1. Input Message

###### Synopsis:

```
$PTWSDGPS,SOURCE,action[,SOURCE][*CS]<CR><LF>
```

Field	Example	Description
<b>Proprietary Address Field</b>	PTWSDGPS	Telit DGPS Messages
<b>Attrib</b>	SOURCE	Parameter indicating the feature attribute to which the message applies: SOURCE attribute only is supported
<b>Action</b>	SET	Action to be executed GET = Poll the current selected source - The next fields of this message must be omitted SET = Configure the DGPS source to be used – This configuration must be specified using one source specified below
<b>SOURCE</b>	SBAS	Optional parameter indicating the specific constellations that must be enabled NONE = Disable DGPS section AUTO = Automatic selection between SBAS and RTCM with priority/preemption on RTCM. SBAS = Selects SBAS as source of corrections RTCM = Selects RTCM as source of corrections

Table 16: PTWSDGPS,SOURCE – Telit DGPS,SOURCE Input Message Structure



**Note:** SBAS only is supported as DGPS source in V50 firmware family.

#### 3.7.1.1.1. Select DGPS Source

This command is used to select the DGPS source.

**Synopsis:**

```
$PTWSDGPS,SOURCE,SET,<SOURCE>[*CS]<CR><LF>
```

**Example:**

```
$PTWSDGPS,SOURCE,SET,SBAS*70<CR><LF>
```

#### 3.7.1.1.2. Query DGPS Source

This command is used to query the DGPS source.

**Synopsis:**

```
$PTWSDGPS,SOURCE,GET[*4B]<CR><LF>
```

**Example:**

```
$PTWSDGPS,SOURCE,GET*4B<CR><LF>
```

### 3.7.1.2. Output Message

#### 3.7.1.2.1. Select DGPS Source Response

**Success:**

```
$PTWSDGPS,OK*28
```

**Error:**

```
$PTWSDGPS,ERROR,SOURCE,SET*2B
```

```
$PTWSDGPS,ERROR,SOURCE*45
```

```
$PTWSDGPS,ERROR*74
```

```
$PTWSNOSUPPORT*4E
```

```
$PTWSCHECKSUM*0D
```

#### 3.7.1.2.2. Query DGPS Source Response

**Success:**

```
$PTWSDGPS,SOURCE,<SOURCE>[*CS]<CR><LF>
```



**Example:**

```
$PTWSDGPS,SOURCE,SBAS*1E<CR><LF>
```

**Error:**

```
$PTWSDGPS,ERROR,SOURCE*45
```

```
$PTWSDGPS,ERROR*74
```

```
$PTWSCHECKSUM*0D
```

### 3.8. PTWSSBAS – SBAS Messages

Telit SBAS messages can be used to control various aspects of the Satellite Based Augmentation System usage and reception.

#### 3.8.1. CONFIG Message Type

PTWSSBAS,CONFIG message can be used to configure the tracking of SBAS system. When a SBAS system is tracked, the module will acquire its navigation message and use the augmentation data to refine the navigational solution.

##### 3.8.1.1. Input Message

**Synopsis:**

```
$PTWSSBAS,CONFIG,action[,SYSTEM][*CS]<CR><LF>
```

Field	Example	Description
<b>Proprietary Address Field</b>	PTWSSBAS	Telit SBAS Messages
<b>Attrib</b>	CONFIG	Parameter indicating the feature attribute to which the message applies: CONFIG attribute only is supported
<b>Action</b>	SET	Action to be executed GET = Poll the current SBAS configuration - The next fields of this message must be omitted SET = Modify the SBAS configuration
<b>System</b>	EGNOS	Optional parameter indicating the system to be tracked for SBAS augmentation: AUTO = Automatic selection based on availability WAAS EGNOS MSAS GAGAN SDCM BDSSBAS

*Table 17: PTWSSBAS,CONFIG – Telit SBAS,CONFIG Input Message Structure*

**Note:** Automatic selection is not supported by V50 firmware family.

#### 3.8.1.1.1. Set SBAS Configuration

This command is used to set the SBAS configuration.

**Synopsis:**

```
$PTWSSBAS,CONFIG,SET,<SYSTEM>[*CS]<CR><LF>
```

**Example:**

```
$PTWSSBAS,CONFIG,SET,EGNOS*37<CR><LF>
```

#### 3.8.1.1.2. Query SBAS Configuration

This command is used to query the SBAS configuration.

**Synopsis:**

```
$PTWSSBAS,CONFIG,GET[*5F]<CR><LF>
```

**Example:**

```
$PTWSSBAS,CONFIG,GET*5F<CR><LF>
```

### 3.8.1.2. Output Message

#### 3.8.1.2.1. Set SBAS Configuration Response

**Success:**

```
$PTWSSBAS,OK*2B
```

**Error:**

```
$PTWSSBAS,ERROR,CONFIG,SET*3F
```

```
$PTWSSBAS,ERROR,CONFIG*51
```

```
$PTWSSBAS,ERROR*77
```

```
$PTWSNOSUPPORT*4E
```

A network diagram in the top-left corner shows a complex web of interconnected nodes and lines, with some nodes highlighted in yellow and blue.

\$PTWSCHECKSUM\*0D

### 3.8.1.2.2. Query SBAS Configuration Response

#### Success:

```
$PTWSSBAS,CONFIG,<SYSTEM>,,,[*CS]<CR><LF>
```

#### Example:

```
$PTWSSBAS,CONFIG,EGNOS,,,*75<CR><LF>
```

#### Error:

```
$PTWSSBAS,ERROR,CONFIG*51
```

```
$PTWSSBAS,ERROR*77
```

```
$PTWSCHECKSUM*0D
```

### 3.9. PTWSFENCE – Geofencing Messages

PTWSFENCE messages are used to control various aspects of Telit Geofencing feature.



#### Note: V26 Firmware Family

PTWSFENCE messages are available on V26-1.0.1-STD-5.7.12P1.1 and subsequent versions.

#### 3.9.1. CONFIG Message Type

\$PTWSFENCE,CONFIG messages can be used to configure the fence regions to be used by the Geofencing feature.

##### 3.9.1.1. Input Messages

##### 3.9.1.1.1. Set Fence Parameters

#### Synopsis:

```
$PTWSFENCE,CONFIG,SET,<id>,<tolerance>,<shape>,<lat>,<long>,<rad>[*CS]<CR><LF>
>
```

#### Example:

```
$PTWSFENCE,CONFIG,SET,1,1,CIRC,31.248672,121.589105,50*00<CR><LF>
```

Field	Example	Description
<b>Proprietary Address Field</b>	PTWSFENCE	Telit Geofencing Messages
<b>Attrib</b>	CONFIG	Parameter indicating the feature attribute to which the message applies
<b>Action</b>	SET	Action to be executed SET = Configure settings for a specific fence ID
<b>ID</b>	1	ID of the fence region to be configured 1 to 6
<b>Tolerance</b>	1	Confidence level to be taken into account for geofence status calculation 0 = No confidence required 1 = 68% 2 = 95%, 3 = 99.7%

Field	Example	Description
Shape	CIRC	Shape of the fence – CIRC, circular fences supported only
Lat	31.248672	Latitude in form of ±31.248672 (plus sign can be omitted)
Long	121.589105	Longitude in form of ±121.589105 (plus sign can be omitted)
Rad	50	Radius in meters Min value = 10 m Max value = 100000 m

Table 18: *PTWSFENCE,CONFIG,SET* – Set Fence Parameters

### 3.9.1.1.2. Query Fence Parameters

#### Synopsis:

`$PTWSFENCE,CONFIG,GET[,<id>][*CS]<CR><LF>`

#### Example:

`$PTWSFENCE,CONFIG,GET,1*0A<CR><LF>`

Field	Example	Description
Proprietary Address Field	PTWSFENCE	Telit Geofencing Messages
Attrib	CONFIG	Parameter indicating the feature attribute to which the message applies
Action	GET	Action to be executed GET = Query the current settings for a specific fence ID
ID	1	Optional Parameter indicating the ID of the fence whose configuration needs to be polled 1 to 6 If no fence ID is specified, multiple responses are relayed, one for each configured fence

Table 19: *PTWSFENCE,CONFIG,GET* – Query Fence Parameters



**Note:** When a query is performed for an unconfigured fence ID, a `$PTWSFENCE,ERROR` response is returned.

### 3.9.1.2. Output Messages

#### 3.9.1.2.1. Set Fence Parameters Response

**Success:**

```
$PTWSFENCE,OK*63
```

**Error:**

```
$PTWSFENCE,ERROR,CONFIG,SET*77
```

```
$PTWSFENCE,ERROR,CONFIG*19
```

```
$PTWSFENCE,ERROR*3F
```

```
$PTWSNOSUPPORT*4E
```

```
$PTWSCHECKSUM*0D
```

```
$PTWSINVALID*51
```

#### 3.9.1.2.2. Query Fence Parameters Response

**Success:**

- a. Case I – Fence ID is specified in the query message

```
$PTWSFENCE,CONFIG,<id>,<tolerance>,CIRC,<lat>,<long>,<rad>[*CS] <CR><LF>
```

**Example:**

```
$PTWSFENCE,CONFIG,1,1,CIRC,31.248672,121.589105,50*6E<CR><LF>
```

- b. Case II – No Fence ID is specified in the query message

```
$PTWSFENCE,CONFIG,<n>,<id>,<tolerance>,CIRC,<lat>,<long>,<rad>[*CS]<CR><LF>
```

Where, **n** is the number of configured fences

**Example:**

```
$PTWSFENCE,CONFIG,3,1,1,CIRC,31.248672,121.589105,50*51<CR><LF>
```

```
$PTWSFENCE,CONFIG,3,2,0,CIRC,31.248672,-10.589105,16*4F<CR><LF>
```

```
$PTWSFENCE,CONFIG,3,3,2,CIRC,31.248672,112.589105,66*55<CR><LF>
```

**Error:**

```
$PTWSFENCE,ERROR,CONFIG,GET*63
```

```
$PTWSFENCE,ERROR,CONFIG*19
```

```
$PTWSFENCE,ERROR*3F
```

```
$PTWSNOSUPPORT*4E
```

```
$PTWSCHECKSUM*0D
```

```
$PTWSINVALID*51
```

### 3.9.2. STATUS Message Type

\$PTWSFENCE,STATUS messages can be used to enable/disable the fence regions to be used by the Geofencing feature and poll the status for each configured area.

#### 3.9.2.1. Input Messages

##### 3.9.2.1.1. Enable/Disable Fence

###### Synopsis:

```
$PTWSFENCE,STATUS,SET,<id>,<ON|OFF|1|0>[*CS]<CR><LF>
```

###### Example:

```
$PTWSFENCE,STATUS,SET,1,1*1D<CR><LF>
```

Field	Example	Description
<b>Proprietary Address Field</b>	PTWSFENCE	Telit Geofencing Messages
<b>Attrib</b>	STATUS	Parameter indicating the feature attribute to which the message applies
<b>Action</b>	SET	Action to be executed SET = Configure settings for a specific fence ID
<b>ID</b>	1	ID of the fence region to be enabled/disabled 1 to 6
<b>Activation</b>	1	Activation state for the specified ID 0/OFF = Disabled 1/ON = Enabled

Table 20: PTWSFENCE,STATUS,SET – Enable/Disable Fence

##### 3.9.2.1.2. Poll Fence Status

###### Synopsis:

```
$PTWSFENCE,STATUS,GET[,<id>][*CS]<CR><LF>
```

**Example:**

```
$PTWSFENCE,STATUS,GET,1*14<CR><LF>
```

Field	Example	Description
<b>Proprietary Address Field</b>	PTWSFENCE	Telit Geofencing Messages
<b>Attrib</b>	STATUS	Parameter indicating the feature attribute to which the message applies
<b>Action</b>	GET	Action to be executed GET = Poll the current status for a specific fence ID
<b>ID</b>	1	Optional Parameter indicating the ID of the fence whose status needs to be polled 1 to 6 If no fence ID is specified, a single, variable length message is relayed where only the status of enabled geofences is reported

Table 21: PTWSFENCE,STATUS,GET – Poll Fence Status



**Note:** When a query is performed for an unconfigured fence ID, a \$PTWSFENCE,ERROR response is returned.

### 3.9.2.2. Output Messages

#### 3.9.2.2.1. Enable/Disable Fence Response

**Success:**

```
$PTWSFENCE,OK*63
```

**Error:**

```
$PTWSFENCE,ERROR,STATUS,SET*69
```

```
$PTWSFENCE,ERROR,STATUS*07
```

```
$PTWSFENCE,ERROR*3F
```

```
$PTWSCHECKSUM*0D
```

```
$PTWSINVALID*51
```



### 3.9.2.2.2. Poll Fence Status Response

#### Success:

- a. Case I – Fence ID is specified in the query message

```
$PTWSFENCE,STATUS,<timestamp>,<date>,<id>,<1|0>,<status>[*CS] <CR><LF>
```

#### Example:

```
$PTWSFENCE,STATUS,110415.000,300718,1,1,IN*4B<CR><LF>
```

Field	Example	Description
<b>Proprietary Address Field</b>	PTWSFENCE	Telit Geofencing Messages
<b>Attrib</b>	STATUS	Parameter indicating the feature attribute to which the message applies
<b>Timestamp</b>	110415.000	UTC Time of the position that was used to determine the status – hhmmss.sss format
<b>Date</b>	300718	Date – DDMMYY format
<b>ID</b>	1	ID of the fence region being polled 1 to 6
<b>Activation</b>	1	Activation state for the specified ID 0 = Disabled 1 = Enabled
<b>Status</b>	IN	Current Position Status IN = The position and its uncertainty circle are completely inside the geofence OUT = The position and its uncertainty circle are completely outside the geofence ON = The position and its uncertainty circle intersect the geofence boundary UNK = The fence is turned off, or the position is invalid (module is not navigating)

Table 22: PTWSFENCE,STATUS – Poll Fence Status Response

- b. Case II – No Fence ID is specified in the query message

```
$PTWSFENCE,STATUS,<hhmmss.sss>,<date>,<n>,<summary>,<id1>,<status1>,<id2>,<status2>,...<idN>,<statusN>[*CS]
```

#### Where:

n is the number of enabled fences

summary is the OR'ed value of the status of all active/enabled geofences

#### Example:

```
$PTWSFENCE,STATUS,110415.000,300718,2,IN,1,IN,4,OUT*19
```

**Error:**

```
$PTWSFENCE,ERROR,STATUS,GET*7D
```

```
$PTWSFENCE,ERROR,STATUS*07
```

```
$PTWSFENCE,ERROR*3F
```

```
$PTWSCHECKSUM*0D
```

```
$PTWSINVALID*51
```

### 3.10. PTWSRESET - Reset Message

PTWSRESET message enables the reset of the GNSS receiver.

#### 3.10.1. Input Message

**Synopsis:**

```
$PTWSRESET,<type>[*CS]<CR><LF>
```

**Example:**

```
$PTWSRESET,HOT*2A<CR><LF>
```

Field	Example	Description
Proprietary Address Field	PTWSRESET	Telit Reset Message
Type	HOT	HOT = Hot reset WARM = Warm reset COLD = Cold reset FACTORY = Factory reset

Table 23: PTWSRESET - Reset Message Structure



**Note:** Factory reset, as compared to Cold reset, adds TCXO offset information deletion.

Also, Factory reset is not intended to restore receiver's settings to factory defaults.

#### 3.10.2. Output Message

**Success:**

```
$PTWSRESET,OK*7D
```



**Error:**

\$PTWSRESET,ERROR\*21

### 3.11. PTWSTSN – TSN Read Message

PTWSTSN Telit NMEA command can be used to read the module's Telit Serial Number (TSN).

#### 3.11.1. Input Message

##### Synopsis:

```
$PTWSTSN,action[*CS]<CR><LF>
```

##### Example:

```
$PTWSTSN,READ*77
```

Field	Example	Description
Proprietary Address Field	PTWSTSN	TSN Read Message
Action	READ	Action to be executed: READ is the only supported action

Table 24: PTWSTSN – TSN Read Message

#### 3.11.2. Output Message

##### Synopsis:

```
$PTWSTSN,<TSN>*CS<CR><LF>
```

##### Example:

```
$PTWSTSN,1016090000K*21
```

Field	Example	Description
Proprietary Address Field	PTWSTSN	TSN Read Message
TSN	1016090000K	Telit Serial Number - 11 alpha-numerical digits

Table 25: PTWSTSN – TSN Read Message Output Message Structure

##### Error:

```
$PTWSTSN,ERROR*3D
```

```
$PTWSTSN,ERROR,READ*03
```

```
$PTWSCHECKSUM*0D
```

```
$PTWSINVALID*51
```



---

**Note:** if a TSN has never been written, the related TSN field will be empty, i.e. PTWSTSN output message will be:

\$PTWSTSN,\*65

---

## 4. APPENDIX A – TELIT LEGACY NMEA MESSAGES

### 4.1. Telit Legacy NMEA Messages Format

This appendix documents Telit legacy NMEA commands that were supported by Telit V13 firmware family (up to version V13-2.2.3-STD-3.8.16), that comply with NMEA 0183, to further enhance the control of GNSS receivers and expose more functionalities.

Telit legacy proprietary NMEA messages start with the “\$” character, which is then followed by the proprietary address field string that uses the Manufacturer’s Mnemonic Code registered by Telit with the NMEA, which is “TWS”. Thus; the Telit proprietary address field is of the form:

**\$PTWS,xxx[x...]**

Where *xxx..* represents an alphanumeric message identifier having a minimum of three characters and being all uppercase.

Checksum fields are included in all Telit proprietary NMEA output messages, and letters representing hexadecimal digits are uppercase. Checksum fields are optional for Telit proprietary NMEA input commands.

The messages end with Carriage Return (CR) and Line Feed (LF) characters.

Telit Legacy NMEA Messages are now superseded by the new Telit NMEA message set and are no longer maintained.

Proprietary Address Field	Message Identifier	Description
<b>\$PTWS</b>	VERSION	Telit software version message
	ANT	Antenna status message
	JAM	Jamming detection status
	LNA	LNA Gain message
	ODO	Odometer message

Table 26: Telit Legacy NMEA Messages

## 4.1.1. Telit Legacy NMEA Messages Applicability Table

		LEGACY				
		\$PTWS,VERSION	\$PTWS,ANT	\$PTWS,JAM	\$PTWS,LNA	\$PTWS,ODO
V13	SL869-V2	✓	✓	✓	✓	✓
	SL869L-V2	✓	✓	✓	✓	✓
	SL871	✓	✓	✓	✓	✓
	SL871L	✓	✓	✓	✓	✓
	SE868-A	✓	✓	✓	✓	✓
	SE868K3-A	✓	✓	✓	✓	✓
	SE868K3-AL	✓	✓	✓	✓	✓
	SE878K3-A	✓	✓	✓	✓	✓
	SC872-A	✓	✓	✓	✓	✓
	SC874-A	✓	✓	✓	✓	✓
V26	SE868-V3	*	*	*	*	*
	SE873	*	*	*	*	*
	SE873Q5	*	*	*	*	*
	SL876Q5-A	*	*	*	*	*
V33	SL869-V3	*	*	*	*	*
	SL869-ADR	*	*	*	*	*

*	Not Supported
✓	Supported

Table 27: Telit Legacy NMEA Messages Applicability Table

## 4.2. PTWS,VERSION – Telit Software Version Message

The Telit Software Version can be obtained using the input message described in this section.

This message is now obsolete by the new PTWSVER message.

### 4.2.1. Input Message

Query Telit software version: This message polls the version string of Telit software.

#### Synopsis:

```
$PTWS,VERSION,GET
```

#### Example:

```
$PTWS,VERSION,GET*0C<CR><LF>
```

### 4.2.2. Output Message

Telit Software Version string output: This message outputs the version string of Telit software.

#### Synopsis:

```
$PTWS,VERSION,VAL,VerString
```

#### Example:

```
$PTWS,VERSION,VAL,v13-2.2.0-STD-3.8.13-N96-B2*3F<CR><LF>
```

Field	Example	Description
Proprietary Address Field	PTWS	Telit NMEA Talker ID
Message ID	VERSION	Software Version Message
Tag1	VAL	VAL = Version string value reported in the next field
VerString	v13-2.2.0-STD-3.8.13-N96-B2	Telit FW version string

Table 28: PTWS,VERSION – Telit Software Version Output Message Structure

## 4.3. PTWS,ANT – Antenna Status Message

Antenna Status can be obtained using the input message described in this section.

This message is now obsolete by the new PTWSANT message.



### 4.3.1. Input Message

Query Antenna Status: This message queries the status of the antenna circuit on a module.

**Synopsis:**

```
$PTWS,ANT,STATUS
```

**Example:**

```
$PTWS,ANT,STATUS*4F<CR><LF>
```

### 4.3.2. Output Message

Antenna Status output message: This message outputs the current antenna status.

**Synopsis:**

```
$PTWS,ANT,STATUS,VAL,AntStatus,AntStatusCode
```

**Example:**

```
$PTWS,ANT,STATUS,VAL,OK,1*0D<CR><LF>
```

Field	Example	Description
Proprietary Address Field	PTWS	Telit NMEA Talker ID
Message ID	ANT	Antenna Status Message
Tag1	STATUS	STATUS = Antenna Status reported in this message
Tag2	VAL	VAL = Antenna Status value reported in the next field
AntennaStatus	OK	SHORT = Antenna is Shorted OK = Antenna Status is Normal OPEN = Antenna is Detached UNKNOWN = Unknown status
AntennaStatusCode	1	0 = Antenna Sense → SHORT 1 = Antenna Sense → OK 2 = Antenna Sense → OPEN 3 – 255 = Any value returned by the Antenna sense function other than 0, 1, and 2

Table 29: PTWS,ANT – Antenna Status Output Message Structure

## 4.4. PTWS,JAM – Jamming Detection Status Message

Jamming detection status can be obtained using the input message described in this section.

#### 4.4.1. Input Message

Query Jamming detection status: This message queries the status of the Jamming detection.

**Synopsis:**

\$PTWS,JAM,STATUS

**Example:**

\$PTWS,JAM,STATUS\*52<CR><LF>

#### 4.4.2. Output Message

Jamming Detection Message: This message outputs the Jamming detection results.

**Synopsis:**

\$PTWS,JAM,SIGNAL,VAL,INDEX,JamIndex,FREQ,JamFreq

**Examples:**

1. Jamming Detected

\$PTWS,JAM,SIGNAL,VAL,INDEX,8,FREQ,1574.996338\*6E<CR><LF>

2. No Jamming Detected

\$PTWS,JAM,SIGNAL,NONE\*7E<CR><LF>

Field	Example	Description
Proprietary Address Field	PTWS	Telit NMEA Talker ID
Message ID	JAM	Jamming Detection Status Message
Tag1	SIGNAL	SIGNAL = Jamming signal information reported in the next field
Tag2	VAL	NONE = No jamming frequency is detected If this field = NONE, the rest field of this message will be voided. VAL = One or more jamming signal frequency detected
Tag3	INDEX	INDEX = Index of the jamming frequencies reported in the next field
JamFreq	1574.996338	The corresponding jamming frequency that was detected (at the JamIndex slot). Unit: MHz Precision: six decimal positions that gives a resolution of 1 Hz

Table 30: PTWS,JAM – Jamming Detection Status Output Message Structure

## 4.5. PTWS,LNA – LNA Gain Message

LNA Gain settings can be controlled using the messages described in this section.

This message is now obsolete by the new PTWSLNA message.

### 4.5.1. Input Messages

#### Synopsis:

```
$PTWS,LNA,Tag1,Tag2[,LNAUserValue]
```

Field	Example	Description
Proprietary Address Field	PTWS	Telit NMEA Talker ID
Message ID	LNA	LNA Gain Message
Tag1	GAIN	GAIN = LNA Gain specific message
Tag 2	SET	GET = Poll the current LNA Gain value - The next field of this message must be omitted SET = Configure the LNA Gain to a specific setting to be specified in the next field
LNAUserValue	1	Only applicable if Tag2 = "SET" 1 = LNA Gain High 0 = LNA Gain Low

Table 31: PTWS,LNA – LNA Gain Input Message Structure

#### 4.5.1.1. Set LNA Gain

This command is used to configure the LNA Gain setting.

#### Synopsis:

```
$PTWS,LNA,GAIN,SET,LNAUserValue
```

#### Example:

```
$PTWS,LNA,GAIN,SET,1*31<CR><LF>
```

#### 4.5.1.2. Query LNA Gain

This command is used to query the current LNA Gain setting.

#### Synopsis:

```
$PTWS,LNA,GAIN,GET
```

#### Example:

```
$PTWS,LNA,GAIN,GET*38<CR><LF>
```

## 4.5.2. Output Message

The LNA Gain output message is used to report the current the LNA gain setting.

### Synopsis:

```
$PTWS,LNA,GAIN,VAL,DEF,LNADefault,USR,LNAUser
```

### Example:

```
$PTWS,LNA,GAIN,VAL,DEF,1,USR,0*27<CR><LF>
```

Field	Example	Description
Proprietary Address Field	PTWS	Telit NMEA Talker ID
Message ID	LNA	LNA Gain Message
Tag1	GAIN	GAIN = LNA Gain specific message
Tag 2	VAL	VAL = This message reports LNA Gain setting information
Tag 3	DEF	DEF = Default LNA Gain setting reported in the next field
LNADefault	1	1 = Default LNA gain value HIGH 0 = Default LNA gain value LOW
Tag 4	USR	USR = LNA Gain setting configured by the User and reported in the next field
LNAUser	0	1 = Default LNA gain value HIGH 0 = Default LNA gain value LOW 1 = Not specified (the default gain value is used)

Table 32: PTWS,LNA – LNA Gain Output Message Structure

## 4.6. PTWS,ODO – ODO Messages

Odometer specific messages can be controlled through the input messages described in this section.

### 4.6.1. Input Messages

#### 4.6.1.1. Start ODO Count

This command is used to reset the ODO count value to zero and restart the odometer count.

### Synopsis:

```
$PTWS,ODO,START
```

**Example:**

```
$PTWS,ODO,START*04<CR><LF>
```

#### 4.6.1.2. Stop ODO Count

This command is used to stop the ODO count.

**Synopsis:**

```
$PTWS,ODO,STOP
```

**Example:**

```
$PTWS,ODO,STOP*5C<CR><LF>
```

#### 4.6.1.3. Query ODO Count

This command queries the current ODO value.

Use this command to poll ODO value if the ODO output has been turned off.

**Synopsis:**

```
$PTWS,ODO,GET
```

**Example:**

```
$PTWS,ODO,GET*12<CR><LF>
```

#### 4.6.1.4. Turn ODO Output Messages On

This command turns the ODO output message on. The receiver will output the current ODO count through the \$PTWS,ODO,VALUE output message.

**Synopsis:**

```
$PTWS,ODO,OUTPUT,ON
```

**Example:**

```
$PTWS,ODO,OUTPUT,ON*76<CR><LF>
```

#### 4.6.1.5. Turn ODO Output Messages Off

This command turns the ODO output message off. The receiver will stop reporting the current ODO count.

**Synopsis:**

```
$PTWS,ODO,OUTPUT,OFF
```

**Example:**

```
$PTWS,ODO,OUTPUT,OFF*38<CR><LF>
```

#### 4.6.2. Output Message

ODO Output message: This message outputs the current ODO count at the output rate of position fix.

**Synopsis:**

```
$PTWS,ODO,VALUE,dddd.dd
```

**Examples:**

```
$PTWS,ODO,VALUE,9281.30*0C<CR><LF>
```

Field	Example	Description
Proprietary Address Field	PTWS	Telit NMEA Talker ID
Message ID	ODO	ODO Message
Tag1	VALUE	VALUE = Current ODO value reported in the next field
ODO Count Value	9281.30	dddd.dd (meters) Current ODO count value

Table 33: PTWS,ODO – ODO Output Message Structure



**Note:** The ODO output is turned OFF by default at each reset. The ODO output can be enabled again using the “\$PTWS,ODO,OUTPUT,ON” command.

Since after each restart the ODO value is undefined, the “\$PTWS,ODO,START” command must be sent to reset the ODO count value.

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The system integrator is responsible for the functioning of the final product. Therefore, the external components of the module, as well as any project or installation issue, have to be handled with care. Any interference may cause the risk of disturbing the GSM network or external devices or having an impact on the security system. Should there be any doubt, please refer to the technical documentation and the regulations in force. Every module has to be equipped with a proper antenna with specific characteristics. The antenna has to be installed carefully in order to avoid any interference with other electronic devices and has to guarantee a minimum distance from the body (20 cm). In case this requirement cannot be satisfied, the system integrator has to assess the final product against the SAR regulation.

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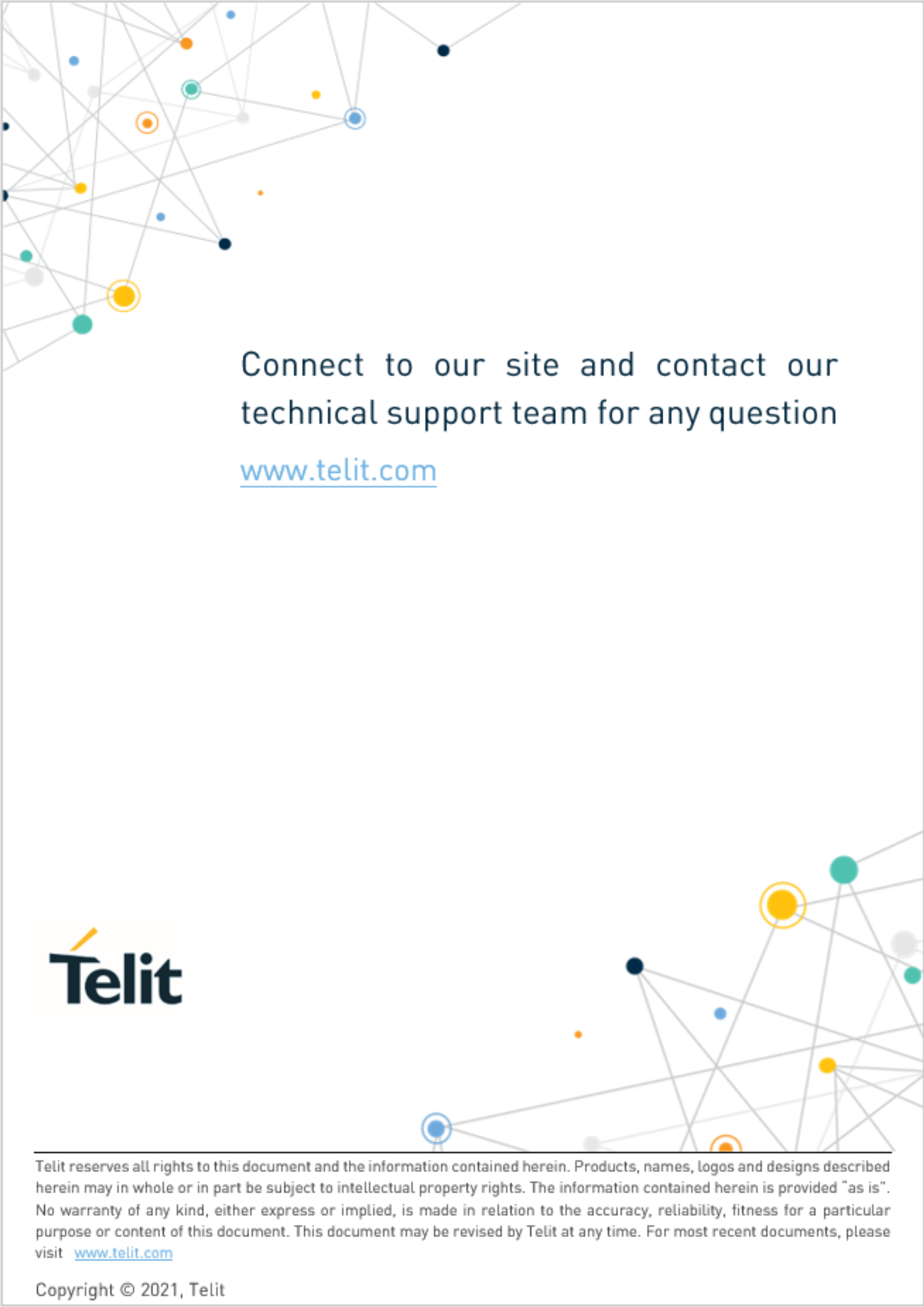
## 6. GLOSSARY

ASCII	American Standard Code for Information Interchange
BE	Broadcast Ephemeris
DGPS	Differential Global Positioning System
DOP	Dilution of Precision
NMEA	National Marine Electronics Association
PRN	Pseudo-Random Noise
SRAM	Static Random-Access Memory
UTC	Co-ordinated Universal Time

## 7. DOCUMENT HISTORY

Revision	Date	Changes
7	2021-10-05	Updated Telit Proprietary NMEA Messages Applicability Table Added notes in sections 3.3.2.1, 3.7.1.1 and 3.10.1 Added section 3.11
6	2021-08-12	Added PTWSDGPS, PTWSSABS and NAVRATE attribute for PTWSMODE message
5	2021-07-26	Removed PTWSCPU Messages Updated document to new Telit standard template
4	2021-05-11	Updated PTWSMODE Messages
3	2020-06-26	Added Telit Legacy NMEA appendix Added support to V50 Firmware Family and new supported PTWS Messages
2	2019-11-13	Added PTWSFENCE support for V13 Firmware Family Updated Telit Technical Support access link
1	2019-08-08	Added support to V33 Firmware Family Added PTWSFENCE Commands and Messages Added PTWSRLM support on V26 FW family
0	2018-04-12	First issue

From Mod.0809 rev.3

A network diagram consisting of various colored nodes (blue, orange, yellow, green, black, grey) connected by thin grey lines, forming a complex web. The nodes are scattered across the page, with a higher density in the top-left and bottom-right corners.

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