

Teseo III

Server-based Assisted GNSS

Quick Testing Guide

Dec. 2018



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Documents & related resources

Teseo III ICs and Modules support three types of Assisted GNSS:

- ST-AGNSS
- Predictive AGNSS
- Real-time AGNSS

Predictive AGNSS and Real-time AGNSS are server-based solutions built on our partnership with [RxNetworks](#).

Predicted

P-AGNSS predicts satellite data based on data downloaded by an assistance server

14-day prediction

Assistance server available for free for Teseo-Modules;

Please contact the ST sales office for more information.

TTFF ~ 1-4s

Real-Time

RT-AGNSS uses real-time satellite data downloaded by an assistance server

Continuous/Real-Time

Assistance server available for free for Teseo-Modules;

Please contact the ST sales office for more information.

TTFF <= 1s

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Documents & related resources

1. Request the Teseo III password

Generate the server password using the command (API-v.8):

```
$PSTMSTAGPS8PASSGEN,<gpsTime>,<vendorId>,<modelId>*<checksum>\n\r
```

	vendorID	modelID
Teseo-LIV3F	ZYDLLXxEH94dEeX2	MYST
TeseoIII-ROM	ZYDLLXxEH94dEeX2	MYST
Standard Binary Image	Contact ST sales office	---

2. Acquire the password

In response of \$PSTMSTAGPS8PASSGEN Teseo III sends a message with deviceID and password:

```
$PSTMSTAGPS8PASSRTN,<deviceID>,<passwd>*<checksum>\r\n
```

DeviceID and Password have to be used to fill the HTTP_POST_Req Header

3 Trigger an HTTP_REQ_POST

Trigger an HTTP POST Request on the RxNetwork server with the required fields based on:

- Selected service (i.e.: Predictive or Real-Time)
- Selected constellation satellite data (i.e.: GPS, Glonass, Galileo, BeiDou, or QZSS)
- Your application needs (see the following slides)

3.a Trigger an HTTP_REQ_POST

- **Predictive Assisted-GNSS**

- **Header:**

```
POST http://stm.api.location.io:80/rxn-api/locationApi HTTP /1.1 Accept:  
application/json Content-Type:application/json Authorization: RXN-SP  
cId=ZYDLLXxEH94dEeX2,mId=MYST,dId=<deviceID>,pw=<passwd>
```

- **Body is a JSON document (for all constellations):**

```
[{ "ee": { "version": 8, "constellations": ["gps", "glonass",  
"beidou", "galileo"], "seedAge": 0} } ]
```

3.b Trigger an HTTP_REQ_POST

- **Real-Time Assisted-GNSS (GPS)**

- **Header:**

```
POST http://stm.api.location.io:80/rxn-api/locationApi HTTP /1.1 Accept:  
application/json Content-Type:application/json Authorization: RXN-SP  
cID=ZYDLLXxEH94dEeX2,mId=MYST,dId=<deviceID>,pw=<passwd>
```

- **Body is a JSON document:**

```
[ { "rtAssistance": { "format": "byte", "msgs": [ "GPS:1NAC", "GPS:1ALM" ] } } ]
```

3.c Trigger an HTTP_REQ_POST

- **Real-Time Assisted-GNSS (Glonass)**

- **Header:**

```
POST http://stm.api.location.io:80/rxn-api/locationApi HTTP /1.1 Accept:  
application/json Content-Type:application/json Authorization: RXN-SP  
cId=ZYDLLXxEH94dEeX2,mId=MYST,dId=<deviceID>,pw=<passwd>
```

- **Body is a JSON document:**

```
[ { "rtAssistance": { "format": "byte", "msgs": [ "GLO:2NAC", "GLO:2NKC",  
"GLO:2ALM" ] } } ]
```

3.d Trigger an HTTP_REQ_POST

- **Real-Time Assisted-GNSS (Galileo)**

- **Header:**

```
POST http://stm.api.location.io:80/rxn-api/locationApi HTTP /1.1 Accept:  
application/json Content-Type:application/json Authorization: RXN-SP  
cId=ZYDLLXxEH94dEeX2,mId=MYST,dId=<deviceID>,pw=<passwd>
```

- **Body is a JSON document :**

```
[ { "rtAssistance": { "format": "byte", "msgs": [ "GAL:2NAC", "GAL:2ALM" ] } } ]
```

3.e Trigger an HTTP_REQ_POST

- **Real-Time Assisted-GNSS (Beidou)**

- **Header:**

```
POST http://stm.api.location.io:80/rxn-api/locationApi HTTP /1.1 Accept:  
application/json Content-Type:application/json Authorization: RXN-SP  
cId=ZYDLLXxEH94dEeX2,mId=MYST,dId=<deviceID>,pw=<passwd>
```

- **Body is a JSON document:**

```
[ { "rtAssistance": { "format": "byte", "msgs": [ "BDS:2NAC", "BDS:2ALM" ] } } ]
```

4. Parse HTTP_RESPONSE

- **Status** equal '200' means OK
- **Body is a JSON document:** (see [AN5160](#) pag. 45)
- **Description under NDA**

An example with CURL and Teseo-LIV3F

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- HTTP POST **cannot** be raised with Google Chrome or Microsoft Internet Explorer
- In this example, CURL (command line tool and library for transferring data with URLs) is used as an HTTP program in command line mode
- Let's start with:
 - ① Download and install CURL in your machine
 - ② Connect your Teseo-LIV3F platform to the Teseo-Suite on PC

Generate the password 1/2

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1 Evaluate GPS_Time: in Microsoft Excel

In Excel, you can evaluate *GPS_Time* using the following the formula:

```
"=DATEDIF( "01/06/1980",TODAY(), "d")*24*60*60 + (NOW()-TODAY())*24*60*60"
```

2 Use the value as *GPS_time*

The screenshot shows the Microsoft Excel interface. The formula bar at the top displays the formula: `=DATEDIF("01/06/1980",TODAY(), "d")*24*60*60 + (NOW()-TODAY())*24*60*60`. A blue circle with the number '1' is placed over the formula bar. In the spreadsheet grid, cell A1 contains the formula, and cell A2 contains the result, 1228470223. A blue circle with the number '2' is placed over cell A2. The Excel ribbon shows the 'Home' tab selected, with various options like Font, Alignment, Number, and Styles visible.

Generate the password 2/2

3 In the Teseo-Suite: Send to Teseo-LIV3F the command:

```
$PSTMSTAGPS8PASSGEN,<value_point_2>,ZYDLLXxEH94dEeX2,MYST
```

4 Acquire the DeviceID and Password from message:

```
$PSTMSTAGPS8PASSRTN,<deviceID>,<passwd>
```

Trigger the HTTP POST with CURL

- 1 Trigger the HTTP_POST command using CURL with all the parameters:

```
curl.exe --verbose --proxy http://<usr>:<psw>@<proxy_adr>:80  
  
--header "Content-Type: application/json" --header "Accept: application/json"  
  
--header "Authorization: RXN-SP cId=ZYDLLXxEH94dEeX2,mId=MYST,dId=<devID>,pw=<pass_wd>"  
  
--data "[{\\"ee\\":{\\"version\\":8,\\"constellations\\":[\\"gps\\"],\\"seedAge\\":0}}]"  
  
http://stm.api.location.io:80/rxn-api/locationApi
```

Note: Enter the entire command on a single line

Acquire the JSON document

- 1 Status equals 200 means OK
- 2 The body is the JSON document requested

```
C:\curl-7.62.0-win64-mingw\bin>curl.exe
--verbose
--proxy http://[redacted]
--header "Content-Type: application/json"
--header "Accept: application/json"
--header "Authorization: RXN-SP
cId=ZYDLLXxEH94dEeX2,mId=MYST,dId=00513730383638361600A27F,pw=1MT6r0430AxEEhrUiNed10X7lfkveUCRtsc3soWnsFw="
--data "[{"ee":"<"version":8,"constellations":["gps"],"seedAge":0}]"
http://stm.api.location.io:80/rxn-api/locationApi
* Trying [redacted]...
* TCP_NODELAY set
* Connected to [redacted] port 80 (#0)
* Proxy auth using Basic with user [redacted]
> POST http://stm.api.location.io:80/rxn-api/locationApi HTTP/1.1
> Host: stm.api.location.io
> Proxy-Authorization: Basic dmlybGluemk6MDFBbGVUaW1vKw==
> User-Agent: curl/7.62.0
> Proxy-Connection: Keep-Alive
> Content-Type: application/json
> Accept: application/json
> Authorization: RXN-SP cId=ZYDLLXxEH94dEeX2,mId=MYST,dId=00513730383638361600A27F,pw=1MT6r0430AxEEhrUiNed10X7lfkveUCRtsc3soWnsFw=
> Content-Length: 59
upload completely sent off: 59 out of 59 bytes
HTTP/1.1 200 OK
Content-Type: application/json
Date: Thu, 29 Nov 2018 13:41:38 GMT
Content-Length: 6978
Cache-Control: proxy-revalidate, proxy-revalidate
Proxy-Connection: Keep-Alive
Connection: Keep-Alive
"ee":"<"body":{"eol":"2099-12-31T23:59:59","leap":{"nextSecs":19,"nextGpsTime":
"currSecs":18},"gps":{"timeModel":
"AAQAJJU2iCSUU6IAAAAAJJU2iAcjppof12Hhx+Bjoz6T5DSOuQCQ7jCy15KwyW1RAxov8n\3Y\EA
LX2UgAKl1f1ugAAaf9\RF+Jbf\3hgAKkgB2CAHfcgBuegD0m\8539krPfxyk\jrgiOAZQAABH\
/y\6cACp7nQZrgBL\Qf\zgyoAAeAAAAAAAAAAxAAAAAAAAAAAAAAAAEUgAAAAIAAAAAAFGgAAAA4AA
AAB\8AAGNGhxQQ7ACINT8HMNIh0v0fTgf1cPF7DWUAC9E0Lf+8xIP\14DgAAxKAPU6AAAB\0fh\
/gR7\8B4ABRF\zR\gSD\8Dh\veGcG\fx3ToMD18Z+mP0COYBBgCiAKK\dgWIAI\usjhJUAk4
BF\Ua5wAAEwAAAAAABDgAAAAABgAAAAAARcAAAAAARgAAAAAARqAAAAAKgAAAAH\wAA2CuESub
c1CH+N5ztDOY8PN4\0OKD6OK1rL1OPLX3\8M36f85GMAAL\ACG3oAAAABoxwBj8n\4zwABNH\hg
4BU6oACW0BCrn iUnA5R1n1ZQAafWu3bf6uAM\+gAHSBa4Av\MvEYAAqgLuAYy.j0AAAAbgAAAAAAD+YA
AAAAIAAAAAA5oAAAAACAAAAAFAF\oAAAAAFAF\AACj7af+EC5NsUcFWAAuW6RxsYalSL1NQ
fpdJA6jsAP\wJE1\5KK7f\Yl\3okAAAAf8AvAF4F\91Rf\BzACJ5gFNZ\41JAJM691JEc+Lb\
rDBAUSifcn\04af\50AUn6uADKGIxhMADJ\Zf\ZLXEAAHOAAAAAAb6gAAAAAFAAAAAAEEAAAA
AIAAAAAAAD6gAAAAAAB\8AABF+ihJC9w61huYUbbzTQhYfUxhJL8hMc iA0DJW5rf\U60oAKQ
CU\+1F\2RcAAAAAUs4AvvJ\4jr\QP\7wx\pcB\sRP\jYUvAAKFTs+Cwop+KBb92H+ggCN\
/HgDU\pgAG4ZJdqyAGoAPf6T10wAAS4AAAAABZv\+gAAAAAABPuAAAAAABAAAAAUAUAAA
AFgAAAAH\wAAgKeGALHthjn8+g8iOU\R8W9KqcTU3sawOHg1LGe9\7kN0\9\3uv\1rP\sa4
AAAAABq+P+AQ\JIAAof\UAB40IAFQAAIeAnuU4a3pwA5f4D\woI\gB6ANQCftv+ggAdA0p7
oIac\9L\sy8C\9XgAAMgAAFo4AAAAAFAAAAAAABFAAAAAAFAAAAAAABOYAAAAAFAAAAAAFAAAAA
```



JSON specification is under NDA

- The internal JSON file description is under NDA
- For further information, please contact the ST Sales Office

Teseo-LIV3F's STM32 driver ([X-CUBE-GNSS1](#)) provides a precompiled library to support a server-based Assisted-GNSS ready for use on the customer's STM32 application.

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Documents & related resources



All documents are available on: www.st.com

- **Teseo III: Webpage**
 - Datasheet of all PNs;
- **Teseo-LIV3F: Webpage**
 - Datasheet
 - User Manuals
- **Teseo-Suite: Webpage**
 - Datasheet
 - Install program

GNSS ICs

ST's Teseo family of Global Navigation Satellite System ICs combines high positioning accuracy and indoor sensitivity with powerful processing capabilities, to simultaneously support multiple global navigation systems (BeiDou, Galileo, GLONASS, GPS, and QZSS).

Teseo III is the latest generation of GNSS ICs, and compared to Teseo II offers reduced power consumption, carrier-phase tracking for higher accuracy, and support for Ready-only Memory (ROM).

Our product offering includes standalone positioning chips (SAL) and configurable system-on-chips (SOCs). The standalone devices are offered with GNSS firmware embedded, to perform all positioning operations including tracking, acquisition, navigation and data output. The SoCs offer power processing and spare memory to enable customers and partners to easily and efficiently merge their code or specific IPs with ST's GNSS library to create a highly optimized platform.

Both solutions come with different package options and memory size, and are compatible with the TESEO-DRAW sensor fusion firmware for dead-reckoning and assisted navigation.

Teseo devices address e-call and telematics systems, personal navigation in PNDs and handheld devices, as well as marine and in-car navigation systems.

TESEO-SUITE

PC software tool to manage, configure and evaluate the performance of Teseo GNSS solutions in parallel.

Download Databrief

QUICK VIEW | RESOURCES

ST TESEO-SUITE is a powerful PC Tool able to manage all the capabilities of ST GNSS solutions in parallel:

On each ST TESEO GNSS solution the Teseo Suite is able to read, modify and NMEA sentences logging and analysis supported. NMEA message-list configuration.

Key Features

- Multiple GNSS tracer
- Multiple protocol support
- GNSS firmware configuration tool
- GNSS flashing tool
- Dead reckoning panel
- NMEA diagnostic tool
- Satellites signal monitoring viewer
- Map viewer
- Log viewer

RESOURCES

Quick Links

Technical Documentation

Product Specifications		
Description	Version	
DB3224 PC GUI software to control, configure and performance analyze of Teseo GNSS family	1.0	

Legal

License Agreement		
Description	Version	
SLA0056 Software license agreement	1.0	

EVb-T3

TESEO III evaluation board

Download Databrief

QUICK VIEW | RESOURCES | TOOLS AND SOFTWARE | SAMPLE & BUY | QUALITY & RELIABILITY

Teseo EVB board is a complete standalone evaluation platform for Teseo III GNSS ST solution.

Teseo III embeds the high performance ARM946 microprocessor with dedicated SRAM and several serial communication interfaces, including USB, SPI, PC, UART and CAN.

Performance and configuration can be analyzed using the ST TESEO-SUITE PC Tool2.

Key Features

- ST Teseo III GNSS platform
- Multiconstellation GNSS: GPS, Galileo, Glonass, BeiDou, QZSS are supported;
- USB Power Supply and battery charge;
- Internal battery for standalone usage;
- ON/OFF and Reset buttons available;
- NMEA over;

RESOURCES

Technical Documentation

Product Specifications			
Description	Version	Size	
DB3223 Teseo III GNSS evaluation board	1.0	137 KB	