Teseo III
Server-based Assisted GNSS

Quick Testing Guide

May 2020

Server-based Assisted GNSS - Contents

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Introduction

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Introduction

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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Management over proprietary NMEA commands
Subject to agreement on service-level

Nmea - API

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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	---

<gpsTime> is the current time expressed in the number of seconds since midnight 06-Jan-1980

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} } ]
```

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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_RESPOSE

- **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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Curl

- 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

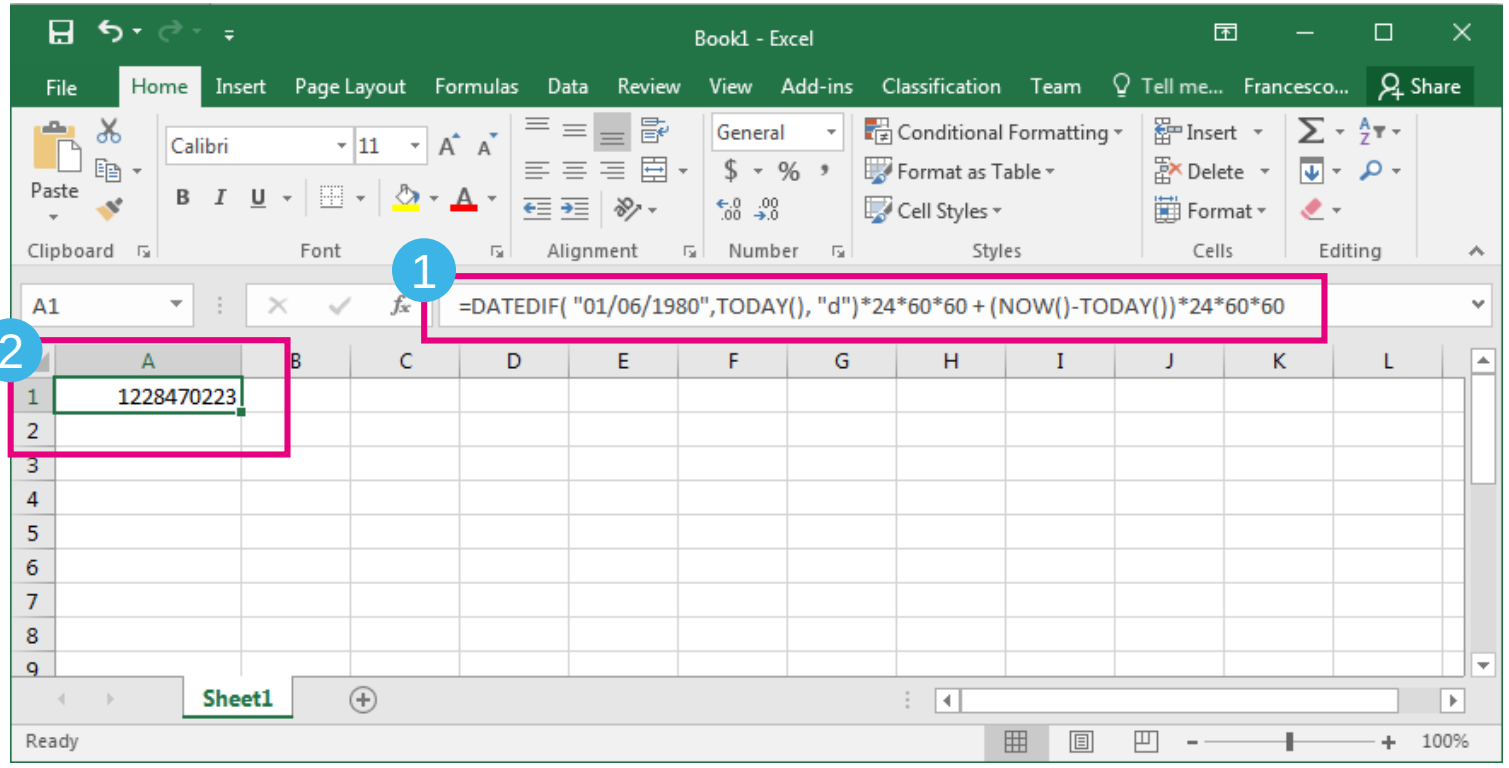
- Let's start with:

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

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



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

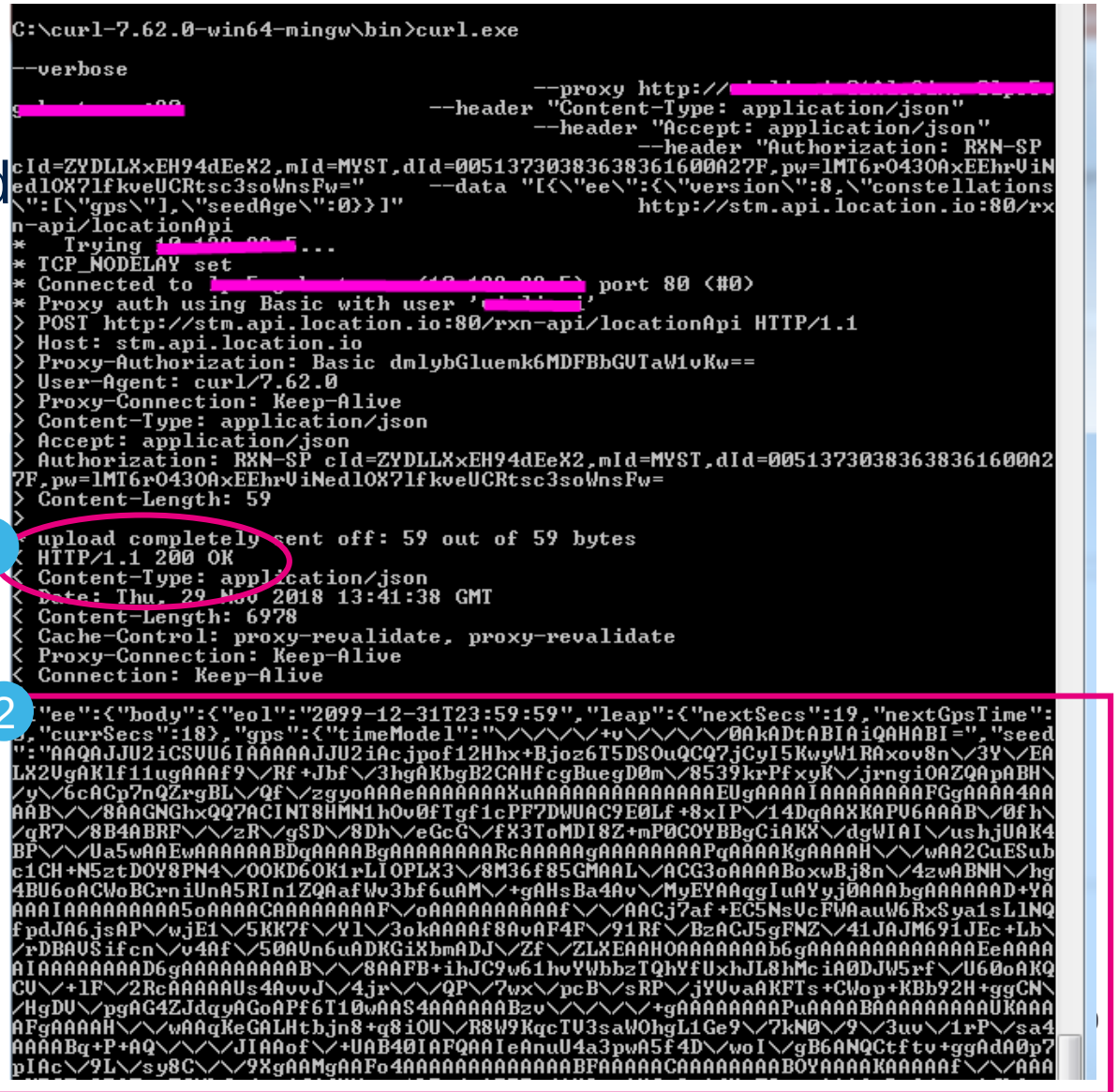
1. Trigger the HTTP_POST command using CURL with all the parameters:

```
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



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

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Documents & related resources

All documents are available on:
www.st.com

- Teseo III: Webpage
  - Datasheet of all PNs;
- Teseo Modules: Webpage
  - Datasheet of all PNs;
- Teseo-Suite: Webpage
  - Datasheet
  - Install program