GNSS-DEMO-V1.0
User Guide

Issue 1.0

Date 2018-05-11

Neoway Product Document

Notice

This document provides guide for users to use G6/G7.

This document is intended for system engineers (SEs), development engineers, and test engineers.

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About This Document

Scope

This document is applicable to G6 and G7..

It provides readers guide for how to use GNSS-DEMO-V1.0, the EVB of G6 and G7.

Audience

This document is intended for system engineers (SEs), development engineers, and test engineers.

Change History

Issue	Date	Change	Changed By
1.0	2018-05	Initial draft	Zhuo Jianzheng

Conventions

Symbol	Indication
Warning	This warning symbol means danger. You are in a situation that could cause fatal device damage or even bodily damage.
Caution	Means reader be careful. In this situation, you might perform an action that could result in module or product damages.
Note	Means note or tips for readers to use the module

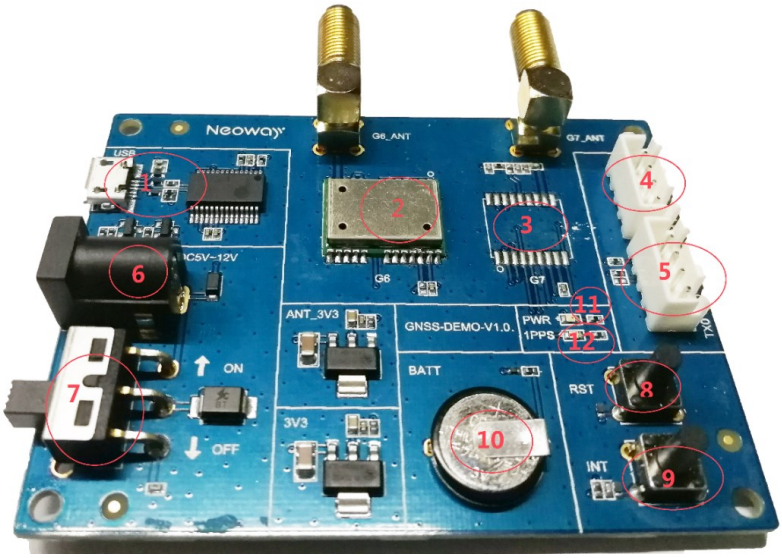
1 Board Functions

G6 and G7 are high-performance and highly-integrated GNSS modules that support dual modes of BDS B1/GPS L1/GLONASS L1. These two modules combine baseband and RF on one chipset, which integrates DC-DC, LDO, power management, POR, RF processor, GNSS digital processor, 32-bit RISC CPU, RAM, FLASH, Watchdog, Timer, RTC, and short circuit protection circuit.

GNSS-DEMO-V1.0 is an EVB that Neoway designed to test G6 and G7 modules. It can help developers set up a test platform conveniently to evaluate G6 and G7 modules.

1.1 Top View

Figure 1-1 Top view of GNSS-DEMO-V1.0



The components marked in red are respectively:

1. USB interface
2. G6 module
3. G7 module
4. II2C interface and UART2 interface
5. UART interface (with hardware flow control)
6. DC input, adapter power supply
7. Switch for main power supply
8. Reset button
9. Interrupt button
10. Backup button cell
11. Power supply indicator
12. PPS indicator

1.2 Interfaces

1.2.1 Power and Communication Interface

The board is supplied 5V DC through Micro USB interface. And the switch controls the power supply to G6 or G7 module. Micro USB interface also works as the communication interface. The UART chipset starts to work once powered up.

Developers need to install PL2303 chipset driver on the computer.

1.2.2 Extended Interfaces

G6 and G7 are two GNSS modules with different package and pin allocation. The following table shows the difference of their interface resources.

1-1Interface resources

	UART1	UART2	I2C interface
G6	Yes	Yes	No
G7	Yes	No	Yes

1.2.3 Antenna Interface

By default, the antenna interface of the board is configured as active. If developers need to install passive antenna, the EVB should be rebuilt.

1.3 Recommended Antenna Indicators

		Active Antenna	Passive Antenna
Frequency Range	BDS	1561.098±2.046MHz	1561.098±2.046 MHz
	GPS	1575.42±1.023 MHz	1575.42±1.023 MHz
	GLONASS	1602.0±4 MHz	1602.0±4 MHz
Input impedance		50Ω	50Ω
Gain		≤30dB	-
Inband gain flatness		≤1.5dB	-
Noise reduction coefficient		≤1.5dB	-

Input VSWR	≤1.5	≤1.5
Output VSWR	≤2	≤2
Outband rejection: 1568±30MHz	≤30dB	-
Recommended operating voltage	3.0V±0.3	-
Temperature range	-40~85℃	-40~85℃

2 Commissioning

2.1 Power Supply

This EVB supports different types of power supply:

- 5V/12V Adapter
- USB

2.1.1 5V/12V Adapter

If an adapter is used to supply power for the board, insert it into the DC power supply interface and pull the switch to the DC side. The adapter supplies voltage ranging from 5 to 12 V.

Figure 2-1 Adapter

2.1.2 Micro-USB Cable

The following figure shows a micro-USB cable, used to supply power for the module, and communicate with a computer through USB and UART. Insert the USB cable into the interface and pull the switch to the USB side.

Figure 2-2 USB cable

Note

If the USB connection is used only for communication, pull the switch to DC.

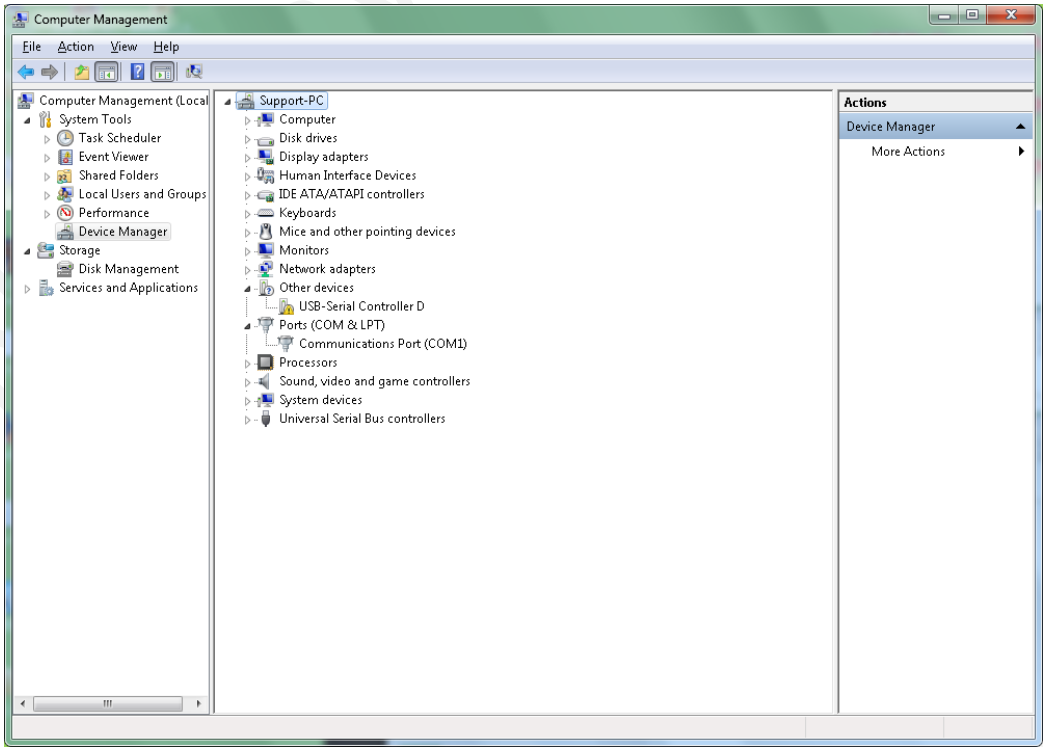
2.2 Installing USB Driver

Before the commissioning, developers should install PL2303 driver. Perform the following steps to install it on a Windows 7 (64-bit) OS:

Step 1: Check if the PL2303 driver is installed properly.

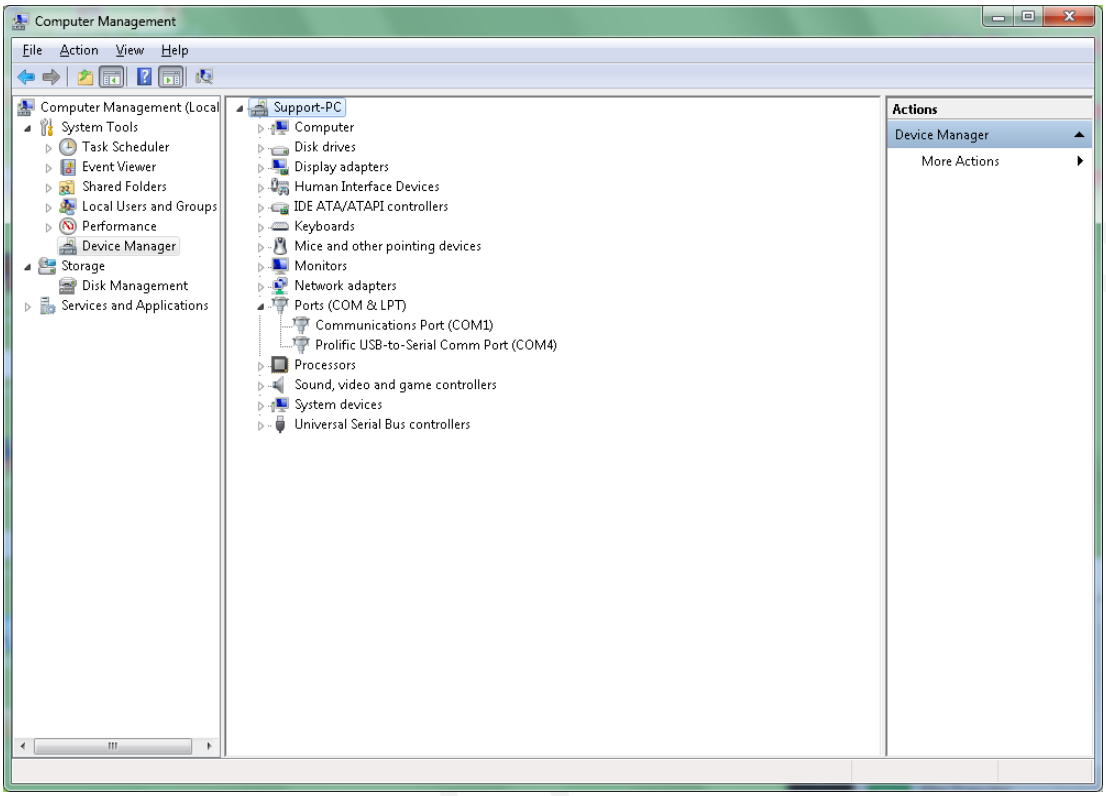
1. Right-click **Computer** and choose **Properties** from the menu.
2. Click Device Manager and check if the driver is installed properly.

   If the driver has not been installed properly, the device is displayed as shown in the following figure.



Step 2: Double-click PL2303_x64.exe to install the driver.

Step 3: After installing the driver, check if the device is identified.



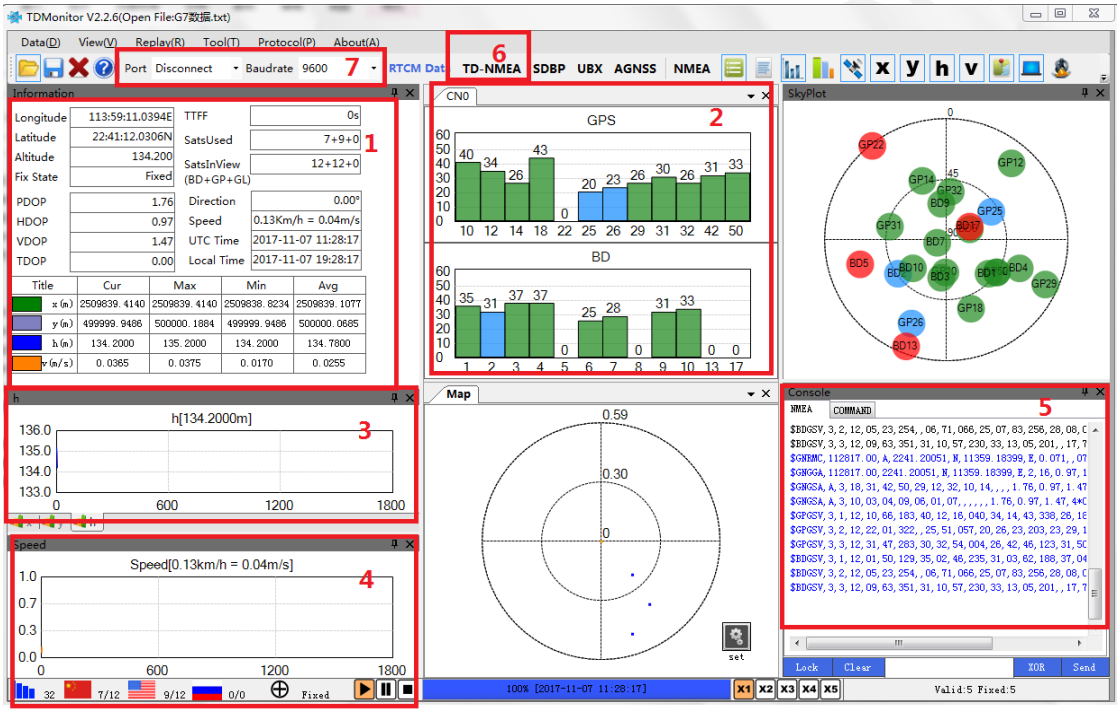
Step 4: Start the UART tool and select baud rate (9600 by default) and COM port. The tool will print the positioning packets.

3 TD Monitor

3.1 Overview

TD Monitor is a packet parsing tool. It can display the detailed positioning information obtained by the module, such as longitude, latitude, positioning time, satellites in view and their CN0, speed, altitude, etc.

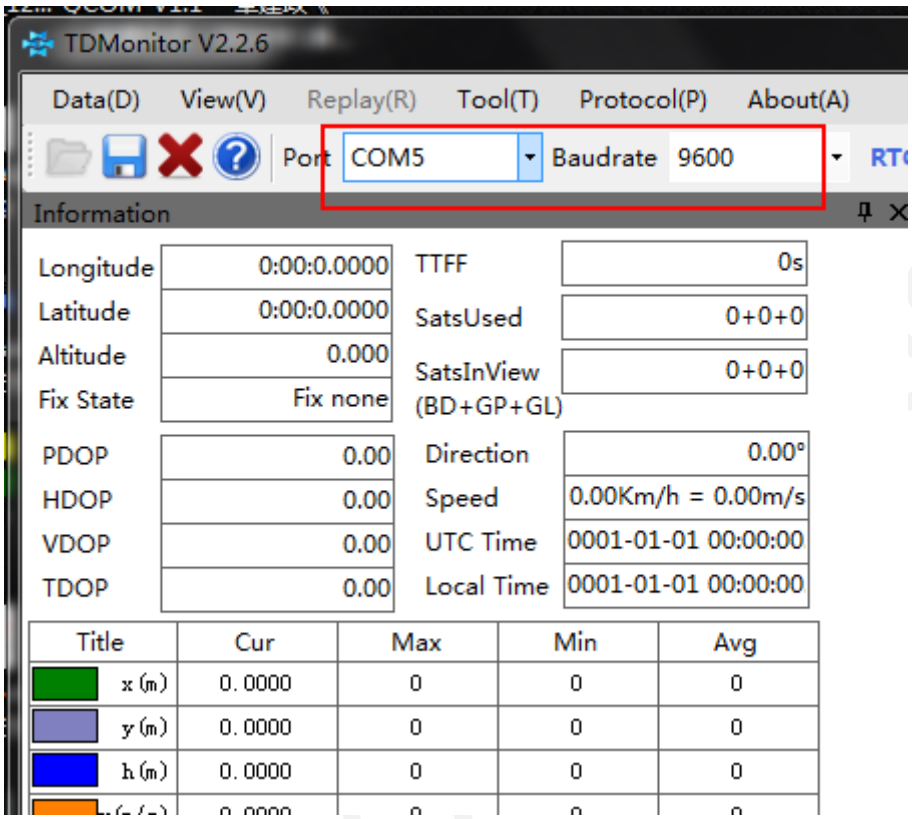
Figure 3-1 TD Monitor GUI



1. Basic positioning information
2. CN0 of satellites in view
3. Height
4. Speed
5. Packets
6. Status configuration
7. UART and baudrate

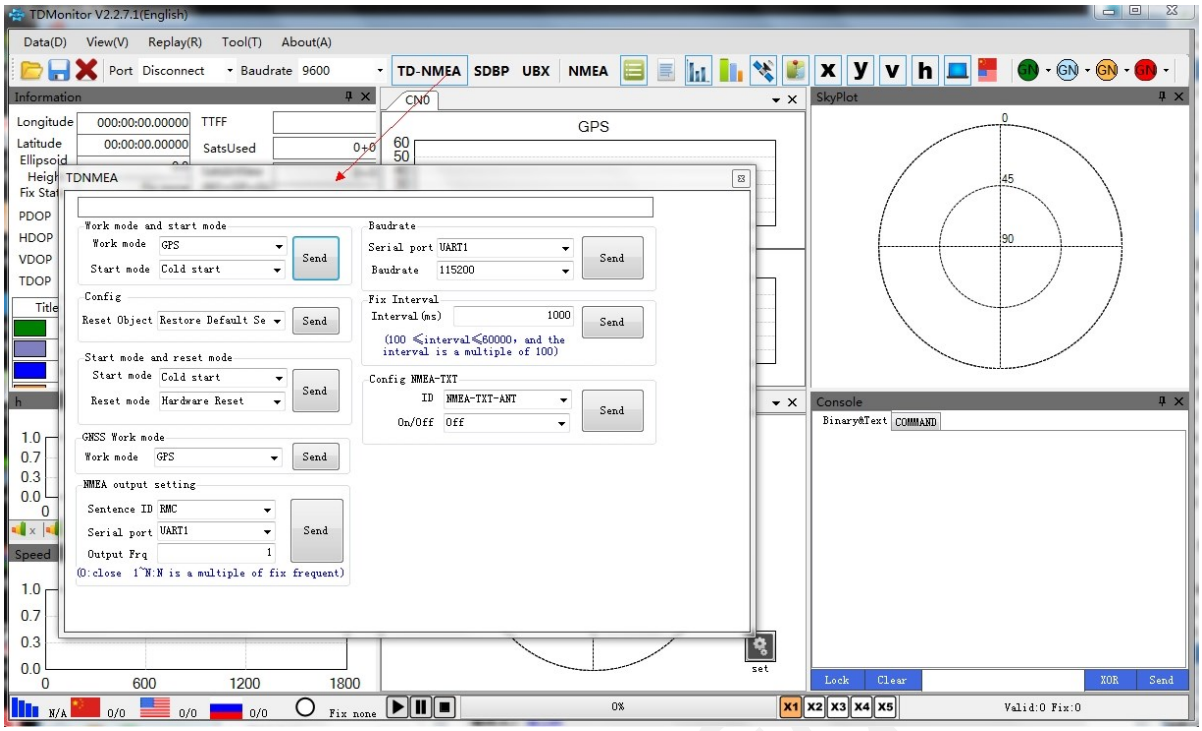
3.2 How to Use TD Monitor

Step 1: Start the software, select COM port and set baudrate. The default baud rate is 9600.



Step 2: Click the TD-NMEA button. In the dialog box that is displayed, select the work mode and start control of the GNSS module.

The settings will not be saved after the module is reset or restarted.



Step 3: Developers can also set the work mode and status of the module by sending AT commands through UART.

Table 3-1 Work mode commands

	$CCSIR,x,y*hh	
Sentence Function	Set work mode and start control	
Field	Symbol	Field Description
1	$CCSIR	
2	x	x indicates work mode. The value can be 1: BDS 2: GPS 3: BDS+GPS 4: GLONASS 5: BDS +GLONASS 6: GPS +GLONASS
3	y	0: set to 0 if users cannot determine start mode (cold, hot, or warm). The software will determine start mode automatically based on working mode. Start mode: 1: cold start

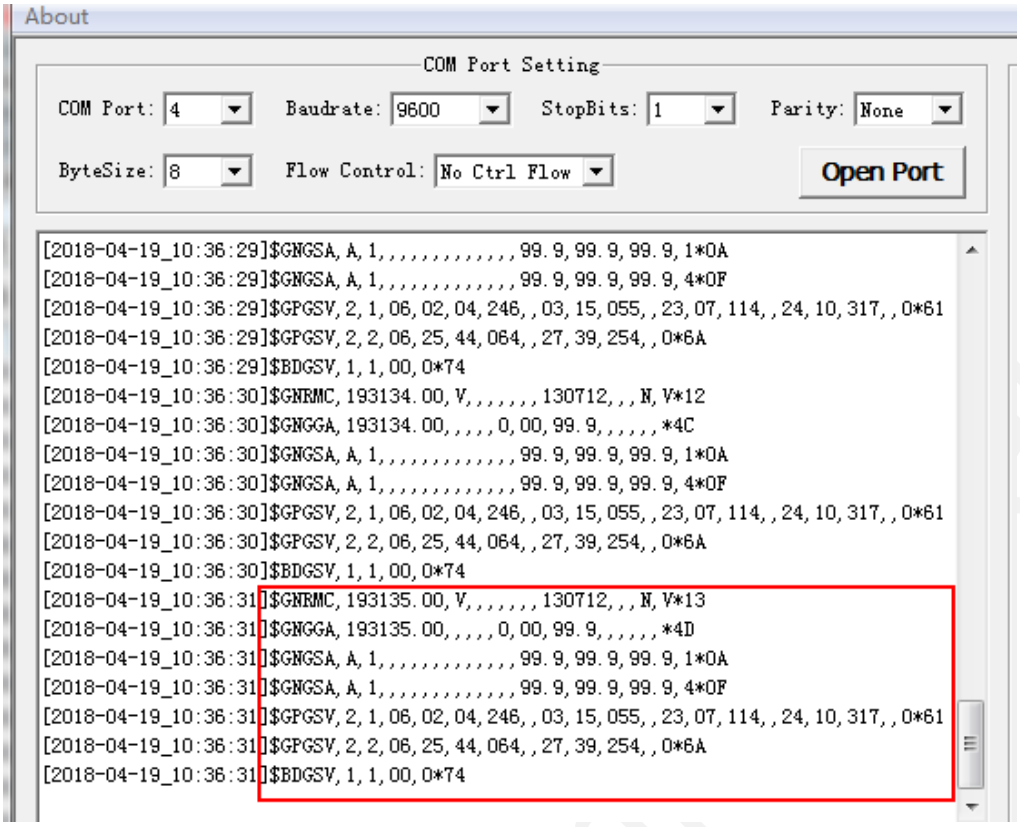
		2: warm start 3: hot start
4	hh	Checksum

Work Mode	Command
GPS cold start	$CCSIR,2,1*4B
GPS warm start	$CCSIR,2,2*48
GPS hot start	$CCSIR,2,3*49
BDS cold start	$CCSIR,1,1*48
BDS warm start	$CCSIR,1,2*4B
BDS hot start	$CCSIR,1,3*4A
GLO cold start	$CCSIR,4,1*4D
GLO warm start	$CCSIR,4,2*4E
GLO hot start	$CCSIR,4,3*4F
BDS+GPS cold start	$CCSIR,3,1*4A
BDS+GPS warm start	$CCSIR,3,2*49
BDS+GPS hot start	$CCSIR,3,3*48
BDS+GLO cold start	$CCSIR,5,1*4C
BDS+GLO warm start	$CCSIR,5,2*4F
BDS+GLO hot start	$CCSIR,5,3*4E
GPS+GLO cold start	$CCSIR,6,1*4F
GPS+GLO warm start	$CCSIR,6,2*4C
GPS+GLO hot start	$CCSIR,6,3*4D

3.3 Check Work Mode

Developers can determine the work mode based on the GSV sentence type in packets.

The packet contains GPGSV and BDGSV, indicating BDS plus GPS mode.



The packet contains GPGSV and GLGSV, indicating GLONASS plus GPS mode.