



Simplify The Complexity

SkyNav EVB10

GPS Modules Eval. Board

User Manual

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General Description

This document provides a description of the hardware features and usage of EVB10. It contains RF connector applied active antenna input and RS232 serial port and USB port to connect with PC, there is a MCU and two digital “8” LED display on board so that can work in stand-alone mode. It will allow GPS end user to evaluate and test Skylab GPS modules for navigation and positioning performance as well as to update the firmware of modules.

Key Features

The EVB10 Evaluation board serves as evaluation platform, design example, and programmer to update firmware of GM10 and GB10 modules, the following summarizes the board features:

- Operating voltage: DC9~15V
- Selectable RS232 serial port and USB port to PC
- Built in MCU for working stand alone mode
- Two digital “8” LED display the working status of GB10 and GM10
- Multi-LED lights indicate the status of power up and system working
- Multi-Jumpers for configulating working mode
- Reset button for reset the GM10 or GB10 modules
- SMA RF connector
- Operating temperature: -10~+70° C

Functional Description

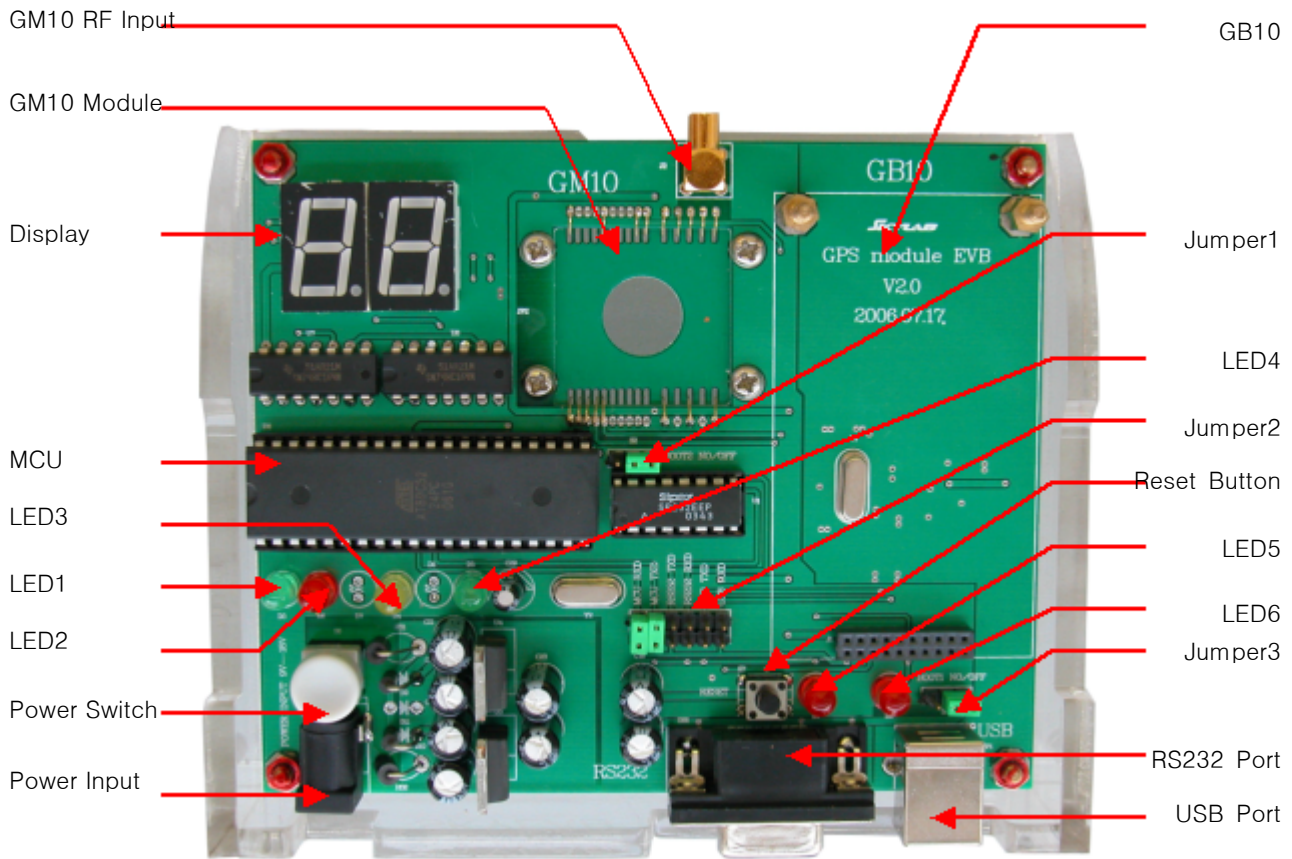
The EVB10 can be connected with PC through RS232 serial port or USB port and linked with uNav Orion Analyzer software through NMEA or UBP protocol, it can be used to evaluate and test Skylab’s GB10 and GM10 products for navigation and positioning performance based on this software. About the usage and introduction of this software, pls. refer to the user manual of uNav Orion Analyzer. About the format and usage of NMEA and UBP protocol pls. refer to NMEA and UBP protocol user manual.

The end user can update the firmware of GB10 or GM10 with uNav Orion Analyzer so that keep the newest version released by Skylab and perform more advanced features meet various requirements. With regarding to how to update pls. Refer to the user manual of uNav Orion Analyzer.

Also, The EVB10 can work in stand-alone mode with MCU built in board. The MCU controller can monitor the data of GPS modules output, analyze the NMEA or UBP protocol, and display the GB10 or GM10 working status, this will be in favor of end user to check and test the module’s “good” or “failure” quickly before solder these modules on system board.

The EVB10 is strictly an evaluation board. It can be used for other purposes also, but it should not be interpreted as a production worthy design. Instead, the EVB10 provides a design example, which demonstrates typical achievable performance with the GB10 or GM10 in a variety configuration.

EVB10 Picture



Power Supply

The width input range from DC 9V to DC 15V

Power Switch

A self-locking switch. Press the button to power on the EVB10.

Reset Button

Push in briefly to restart the GM10 or GB10.

Antenna Input

The EVB10 is designed for supporting the active antenna. The gain of active antenna should be no less than 15dB. The maximum noise figure should be no more than 2.5dB.

GM10 Socket

Place GM10 module in this socket, pls. Ensure that spring pin connect with posthole of GM10 well. And noted the position of first pin.

GB10 Connector

Insert GB10 Module in this connector, pls. Noted the position of first pin of GB10

RS232 and USB Interface

Selectable interface to connect EVB10 with PC, pls. Install the USB driver before use the USB port.

Display and Indicators

The EVB10 have two digital “8” display and multi-LED lights to display the various working status of EVB10 and GB10 or GM10, the following items describer these status:

- LED1 (Green): light up when power switch turn on
- LED2 (Red): Flicker when MCU receive or transfer data to GPS modules
- LED3 (Yellow): Flicker when GPS module don't find the available satellites or don't positioning
- LED4 (Green): Flicker when GPS modules find the available satellites and start positioning
- LED5 (Red): Flicker when update the firmware of GPS modules
- LED6 (Red): Flicker when GPS modules transfer the data out
- Two digital “8”: Display the numbers of available satellites

Note: The LED2~LED5 and the two digital “8” display are available in the case of MCU monitor the output data of GPS module (JP2 MCU RXD and TXD in “connected” position), otherwise. Only the LED1 and LED6 are available (JP2 MCU RXD and TXD in “open” position).

Jumper and Setting

The EVB10 can be configured for various purposes through jumpers; the following table identifies these jumpers and their normal setting:

Jumper ID	Setting	Description	Default
JP1	Left Connected	GM10 Boot from UART	Open
	Right Connected	GM10 Boot from Flash (Normal Mode)	Connected
JP2	MCU RXD	Connect MCU with Module UART	Connected
	MCU TXD	Connect MCU with Module UART	Connected
	RS232 TXD	Connect PC with Module UART Through RS232	Open
	RS232 RXD	Connect PC with Module UART Through RS232	Open
	USB TXD	Connect PC with Module UART Through USB	Open
	USB RXD	Connect PC with Module UART Through USB	Open
JP3	Left Connected	GM10 Boot from UART	Open
	Right Connected	GM10 Boot from Flash	Connected

EVB10 Usage

Note: The EVB10 can just evaluate and test a type GPS module at the same time, pls. Don't fix GB10 and GM10 on board at the same time.

Stand-alone Mode: To check and test GB10 or GM10 “good” and “failure”

Step 1: Insert the GB10 or GM10 in respective socket and connect active antenna to module's RF input.

Step 2: Set up JP2 to connect MCU RXD and TXD with GPS module

Step 3: Press power switch

Here, The two digital “8” display will display two “--” before the GPS module transfer the data out, stay a while, it will display “00” when GPS module start to seek and capture satellites, after several or tens seconds depended on various start mode, it will display the numbers of available satellites, and indicate that the GPS module has found the position of itself.

PC-based Mode: To evaluate and test GPS modules.

Step 1: Insert the GB10 or GM10 in respective socket and connect active antenna to module's RF input.

Step 2: Set up JP1 in “OFF” position for GM10 test; set up JP3 in “OFF” position for GB10 test.

Step 3: Set up JP2 to connect RS232 RXD and TXD with GPS module and connect RS232 cable to PC.

Alternatively set up JP2 to connect USB RXD and TXD with GPS module and connect USB cable to PC (need to install the driver of USB device on PC when use USB port for the first time).

Step 4: Press power switch of EVB10 and run Orion Analyzer software on PC.

Step 5: Configure Orion analyzer COM port and other test items, Pls. refer to the user manual of Orion analyzer for its usage.

PC-based Mode: To update the firmware of GPS modules

Only change the setting of JP1 and JP3 in “ON”, the others steps is same as above.

Note: When the EVB10 work in PC-based mode, you can also keep the connection between MCU RXD and TXD to GPS module to monitor the working status of EVB10 with LED indicators on board.