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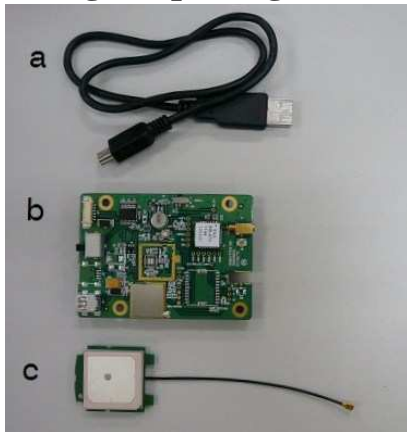
1. Introduction

EB-870A evaluation kit is an user friendly tool for your evaluation of TSI's EB-870A GPS engine board. With its miniature size, low power consumption and superior performance, EB-870A is your ultimate choice for all embedded applications such as :

- Handheld devices (PDA, Smart phone...)
- Automotive and Marine Navigation
- Automotive Navigator Tracking
- Emergency Locator
- Geographic Surveying
- Personal Position
- Sporting and Recreation

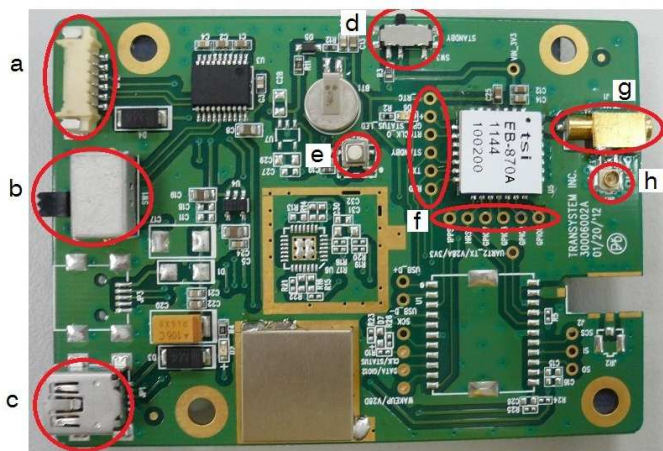
2. When you open it

2.1. Checking the package content



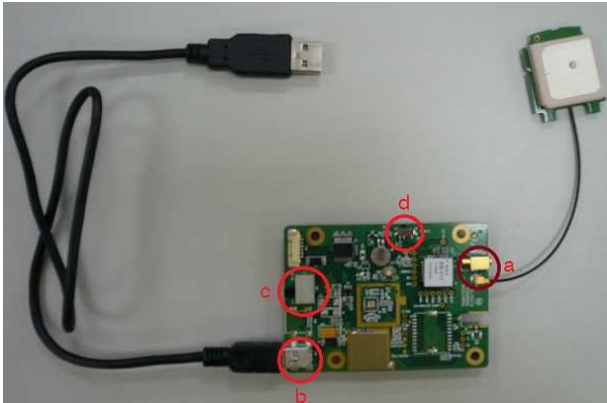
- a. USB cable *1
- b. EB-870A evaluation board *1
- c. GA-723A active antenna *1

2.2. Evaluation Board Picture



- a. RS-232 port
- b. USB & RS232 select switch
- c. Mini USB port
- d. Standby switch
- e. Hardware reset button
- f. Test point
- g. Aux RF port1 (MMCX)
- h. RF port2 (IPEX)

2.3. USB Setup



- a. Plug active antenna into the RF port2 (IPEX)
- b. Connect USB cable between EB-870A evaluation board and PC
- c. Turn USB & RS232 select switch to “USB” position
- d. Turn GPS on/off switch to “GPS on” position

3. EB View Software

Open EB View software and select correct COM port and Baud Rate and then click “On” button to establish the communication between EB-870A evaluation board and PC. If the connection is successful, the NMEA stream will keep showing.

The screenshot shows the EB View software interface with the following components:

- Status Bar:** Status | Setup | Command
- Configuration:** Please choose: 115200 (Baud Rate), Com20 (COM Port), and an On button.
- NMEA Stream:**

```

$GNRMC,102724.000,A,2446.3056,N,12101.0514,E,0.10,190.53,
$GPVTG,190.53,T,M,0.10,N,0.18,K,A*3B
$GPGGA,102725.000,2446.3056,N,12101.0514,E,1,12,0.77,148.0,0.0,0.0,0.0,0.0
$GNGSA,A,3,02,26,05,15,,,,,,,,,1.13,0.77,0.82*12
$GNGSA,A,3,74,88,87,81,66,72,75,65,,,,,,,,,1.13,0.77,0.82*14
$GPGSV,3,1,11,15,70,286,49,26,56,023,49,21,56,282,,05,42,052
$GPGSV,3,2,11,02,36,138,49,193,,43,41,,29,,46*78
$GPGSV,3,3,11,18,,37,09,,48,08,,39*73
$GLGSV,2,1,08,88,48,272,49,65,39,345,47,75,37,112,44,87,33,21
$GLGSV,2,2,08,72,26,048,44,74,23,051,43,81,15,325,43,66,14,21
$GNRMC,102725.000,A,2446.3056,N,12101.0514,E,0.15,190.53,

```
- Satellite Constellation:** A circular diagram showing satellite positions with numbers 02, 05, 06, 08, 15, 18, 21, 26, 29, 41, 46, 47, 44, 44, 43, 43, 48, 49, 50, 66, 67, 75, 77a, 77b, 81, 87, and 88. To the right are buttons for 'hot', 'warm', and 'cold'.
- Data Summary:**

Date	Latitude	Fix SBAS Mode
2012/11/08	N 24°46'18.33"	3D NO Fix
Time	Longitude	Speed
18:27:25	E 121°01'03.08"	0.277 km/h
<input checked="" type="checkbox"/> GGA	<input checked="" type="checkbox"/> GSA	<input checked="" type="checkbox"/> GSV
<input checked="" type="checkbox"/> RMC	<input type="checkbox"/> GLL	<input checked="" type="checkbox"/> VTG
<input type="checkbox"/> ZDA	<input type="checkbox"/> MCHN	
	PDOP	Altitude
	1.13	148.3
	Fix Time	
	0	
- Signal Strength Chart:** A bar chart showing signal strength for various satellites. The y-axis ranges from 0 to 80. The x-axis lists satellite IDs. Values are: 02 (49), 05 (50), 06 (39), 08 (48), 15 (49), 18 (37), 21 (0), 26 (49), 29 (46), 41 (47), 46 (44), 47 (44), 44 (43), 43 (43), 48 (49), 50 (49).

3.1. Configuration

In Setup and Command Page, Output frequency of each NMEA can be changed from 1second to 5 seconds and Fix update-Rate can be changed from 1 time to 5 times per second. DGPS like WASS, EGNOS, MSAS can be enable or disable. Here also allow users to update the AGPS and record the NMEA sentence.

EB View
Status | **Setup** | Command

Datum: [0]wGS1984"International" [Query] [Set]

DGPS
Current Status: Enable Disable [Query]
Setting: Enable Disable [Set]

Device Name: [] [Read] [Write]

Send Command: [\$PMTK] [Send]

Satellite Channel

Channel	SVid	SNR	Status
1	02	47	
2	05	50	
3	08	44	
4	09	49	
5	15	50	
6	18	40	
7	21	0	
8	26	51	
9	29	46	
10	42	40	
11	65	46	
12	66	44	
13	72	41	
14	74	43	

EB View
Version 1.0.6 Oct. 12th 2012
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EB View
Status | **Setup** | Command

Datum: [0]wGS1984"International" [Query] [Set]

DGPS
Current Status: Enable Disable [Query]
Setting: Enable Disable [Set]

Device Name: [] [Read] [Write]

Send Command: [\$PMTK] [Send]

Satellite Channel

Channel	SVid	SNR	Status
1	02	47	
2	05	50	
3	08	44	
4	09	49	
5	15	50	
6	18	40	
7	21	0	
8	26	51	
9	29	46	
10	42	40	
11	65	46	
12	66	44	
13	72	41	
14	74	43	

EB View
Version 1.0.6 Oct. 12th 2012
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For example:

NMEA output setting	+	Fix update-rate	=	Real NMEA output
GGA(1), GSA(1), GSV(1), RMC(1)	+	1	=	GGA(1), GSA(1), GSV(1), RMC(1)
GGA(1), GSA(1), GSV(1), RMC(1)	+	2	=	GGA(1/2), GSA(1/2), GSV(1/2), RMC(1/2)
GGA(1), GSA(1), GSV(1), RMC(1)	+	3	=	GGA(1/3), GSA(1/3), GSV(1/3), RMC(1/3)
GGA(1), GSA(1), GSV(1), RMC(1)	+	4	=	GGA(1/3), GSA(1/3), GSV(1/3), RMC(1/3)
GGA(1), GSA(1), GSV(1), RMC(1)	+	5	=	GGA(1/5), GSA(1/5), GSV(1/5), RMC(1/5)

Note:

1. GGA(1) means GGA sentence output every 1 second, GGA(2) output every 2 seconds.
2. GGA(1/2) means GGA sentence output 2 times per second, (1/5) output 5 times per second.

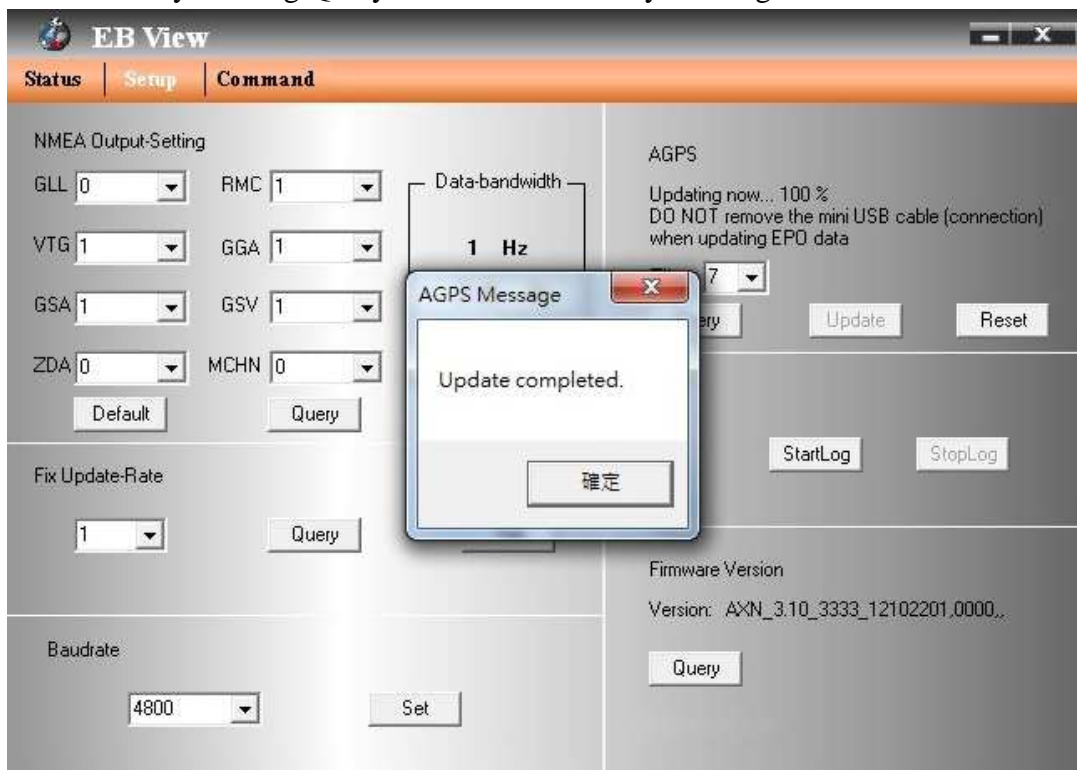
3.2. Update AGPS

Step1. Make sure you have network available for accessing the internet.

Step2. Connect EB-870A evaluation board to PC and then open EB View to establish the communication.

Step3. Go to “Setup” page

Step4. Click “Update” button under AGPS to update the AGPS data. The program will connect to the AGPS server and download the data automatically. You can also check the valid time of AGPS by clicking Query. Clear AGPS data by clicking Reset.



Note: AGPS has 7 or 14 days time limited it was depend by your select file.

4. Connector Definition

Pin#	Signal Name	Type	Description
1	GND	P	Ground
2	VIN_3V3	P	Power Supply 2.8~4.2V DC
3	NC	NC	NC
4	VRTC_3V3	P	RTC power 2.0~4.2V, 40uA @ 3.3V typical
5	GND	P	Ground
6	GND	P	Ground
7	GND	P	Ground
8	GNSS Status	O	GNSS status, blink when GPS or GLONASS has position fix
9	NC	NC	NC
10	TX1	O	UART port 1 output, leave open if not used
11	RX1	I	UART port 1 input (RTCM only), leave open if not used
12	STANDBY#	I	Falling edge trigger. Back to High for normal operation. Leave open if not used
13	TX0	O	UART port 0 for NMEA output
14	RX0	I	UART port 0 input
15	PPS	O	PPS
16	HRST#	I	Reset input, active low. Internal pull high, leave open if not used
17	GPIO3 / SO	I/O*	General input / output ; SPI serial output, leave open if not used
18	GPIO4 / SCK	I/O*	General input / output ; SPI clock output, leave open if not used
19	GPIO5 / SCS#	I/O*	General input / output ; SPI select, active low, leave open if not used
20	GPIO2 / SI	I/O*	General input / output ; SPI serial input, leave open if not used
21	GND	P	Ground
22	GND	P	Ground
23	GND	P	Ground
24	GND	P	Ground
25	GND	P	Ground
26	GND	P	Ground
27	GND	P	Ground

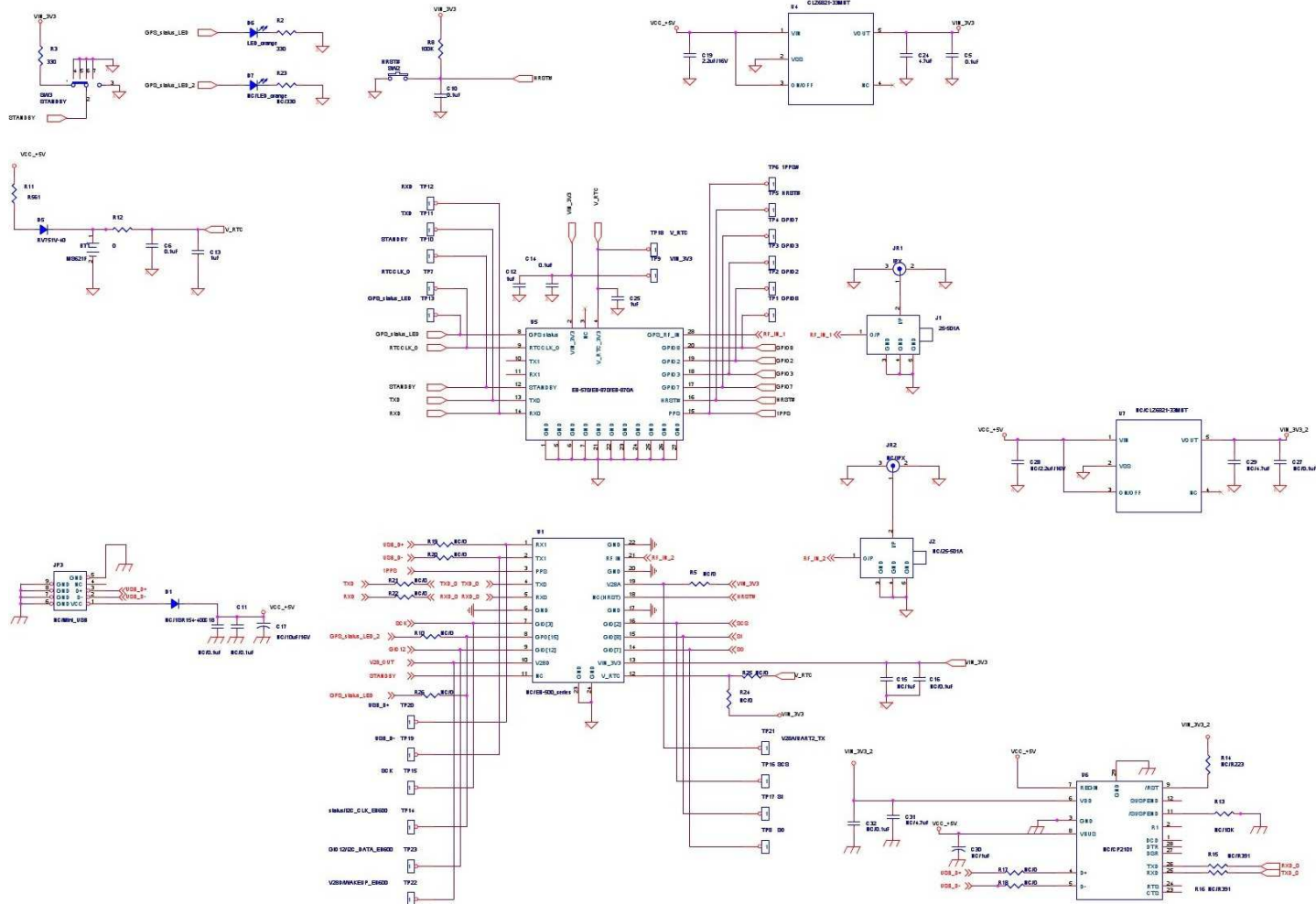
28	RF_IN	I	Antenna port, L1 band 1573MHz ~1610MHz DC O/P: 2.8V Current \leq 25mA
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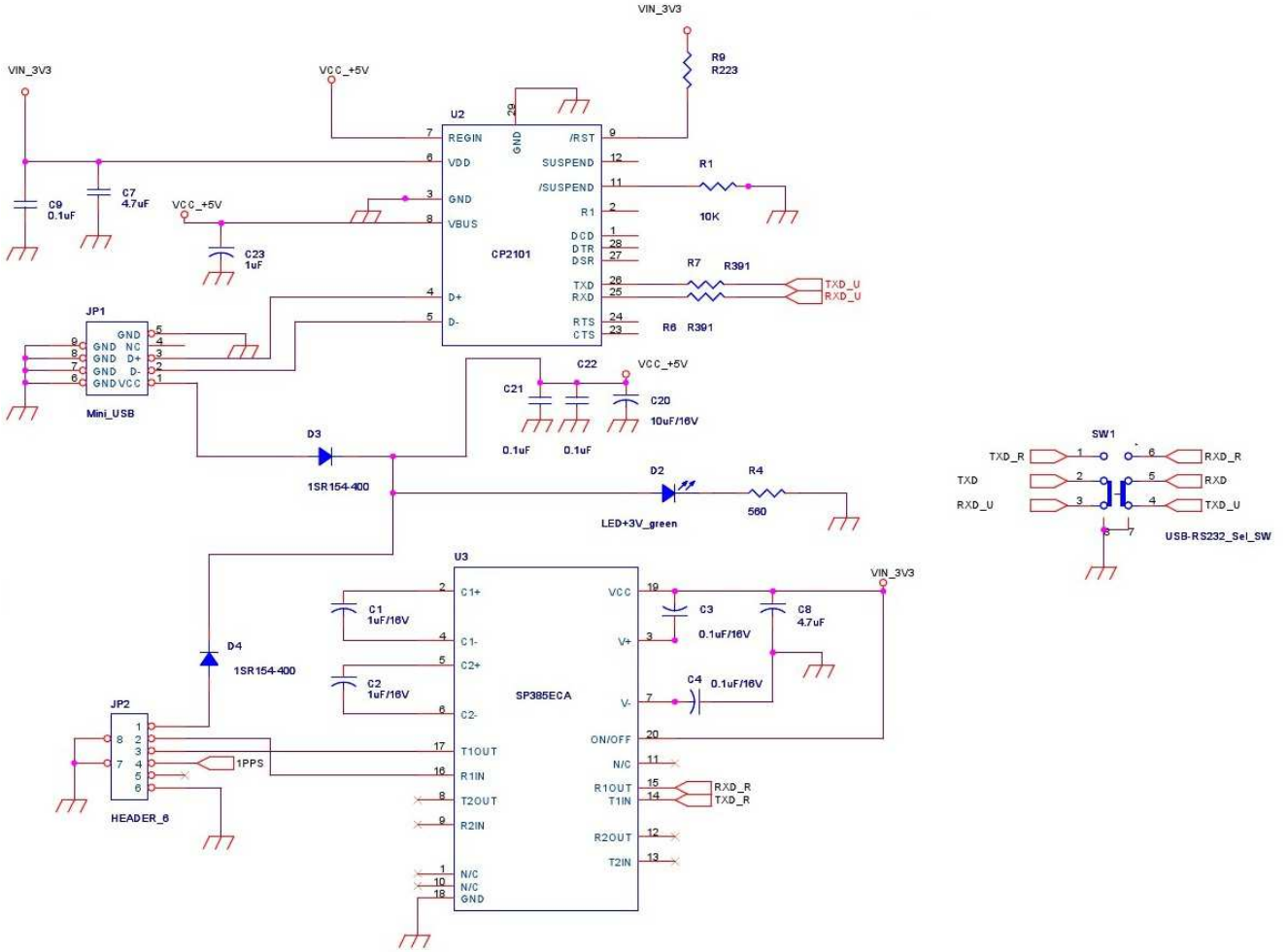
Note : 1) P: Power, I: Input, O: Output, I/O: Input or Output
 2) GPIO current output default : 4mA, Max : 16mA

EB-870A GPS Engine Board Evaluation Kit User's Manual

AN-01

5. Evaluation Board Schematics





EB-870A GPS Engine Board **Evaluation Kit User's Manual**

AN-01

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