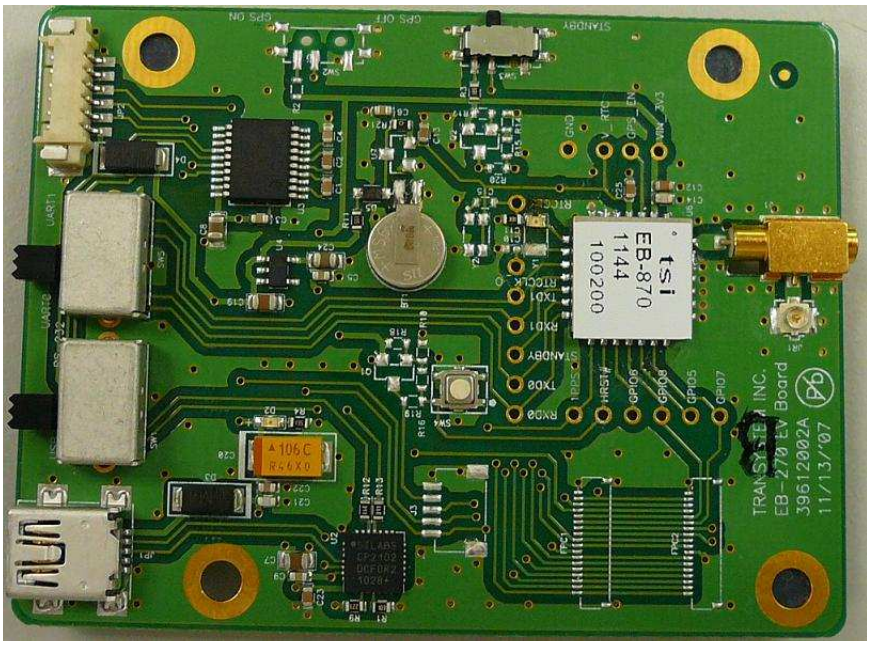
EB-870 GPS Engine Board
Evaluation Kit User’s Manual

AN-01



TRANSYSTEM INC.

No. 1-2 Li-Hsin Rd. I, Science-Based
Industrial Park, Hsinchu, Taiwan
T : +886-3-5780393 / F : +886-3-5784111
www.transystem.com.tw
sales@transystem.com.tw

Rev.1.0

Table of Contents

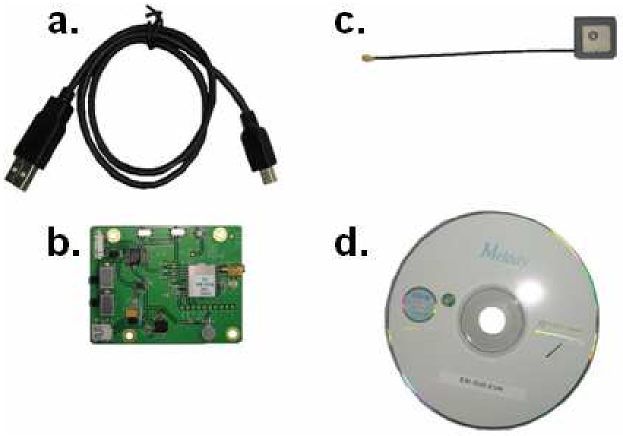
1. Introduction

EB-870 evaluation kit is an user friendly tool for your evaluation of TSI's EB-870 GPS engine board. With its miniature size, low power consumption and superior performance, EB-870 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

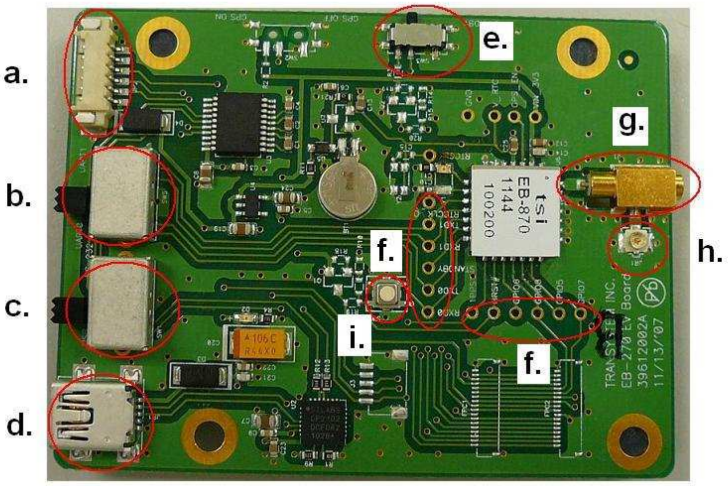
2. When you open it

2.1. Checking the package content



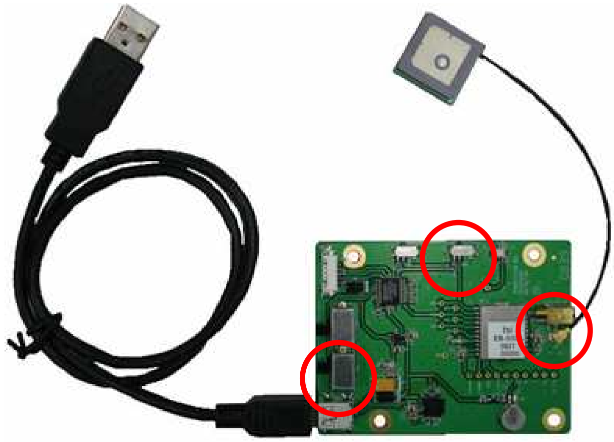
a. USB cable *1
b. EB-870 evaluation board *1
c. GA-110 active antenna *1
d. CD-ROM *1 (with technical documents and testing software.)

2.2. Evaluation Board Picture



a. RS-232 port
b. UART0 & UART1 select switch
c. USB & RS232 select switch
d. Mini USB port
e. Standby switch
f. Test point
g. Aux RF port1 (MMCX)
h. RF port2 (IPEX)
i. Hardware reset button

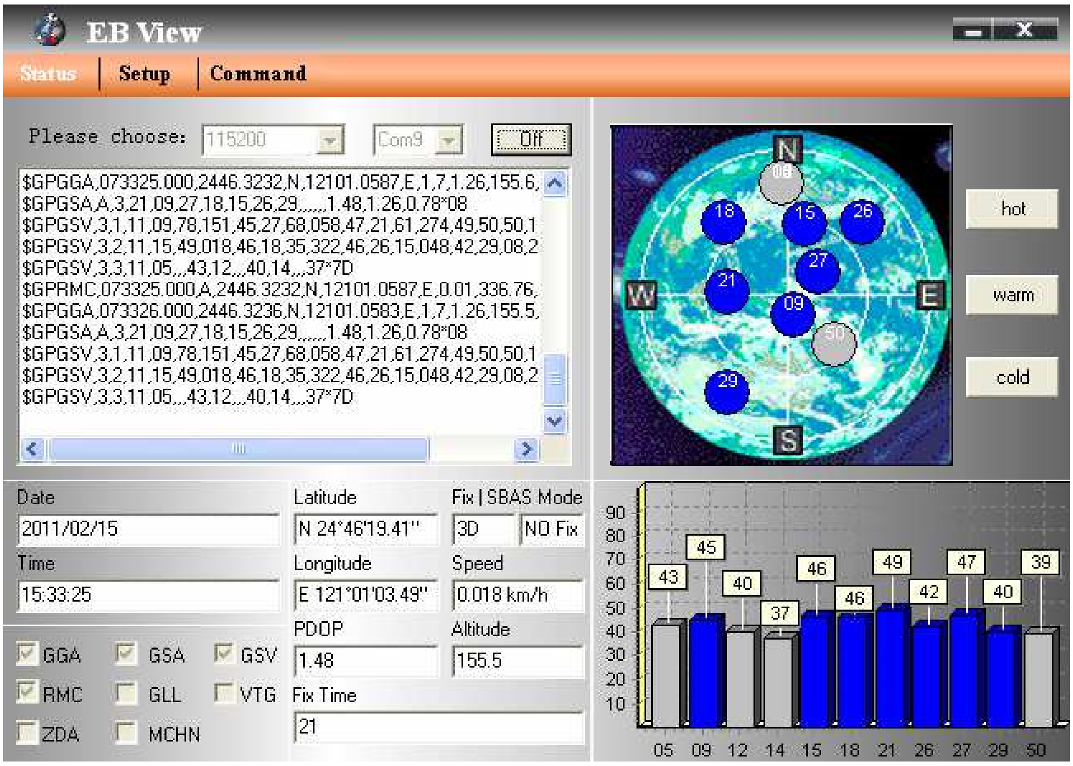
2.3. USB Setup



a. Plug active antenna into the RF port2 (IPEX)
b. Connect USB cable between EB-870 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-870 evaluation board and PC. If the connection is successful, the NMEA stream will keep showing.



Please choose: 115200 Com9 Off

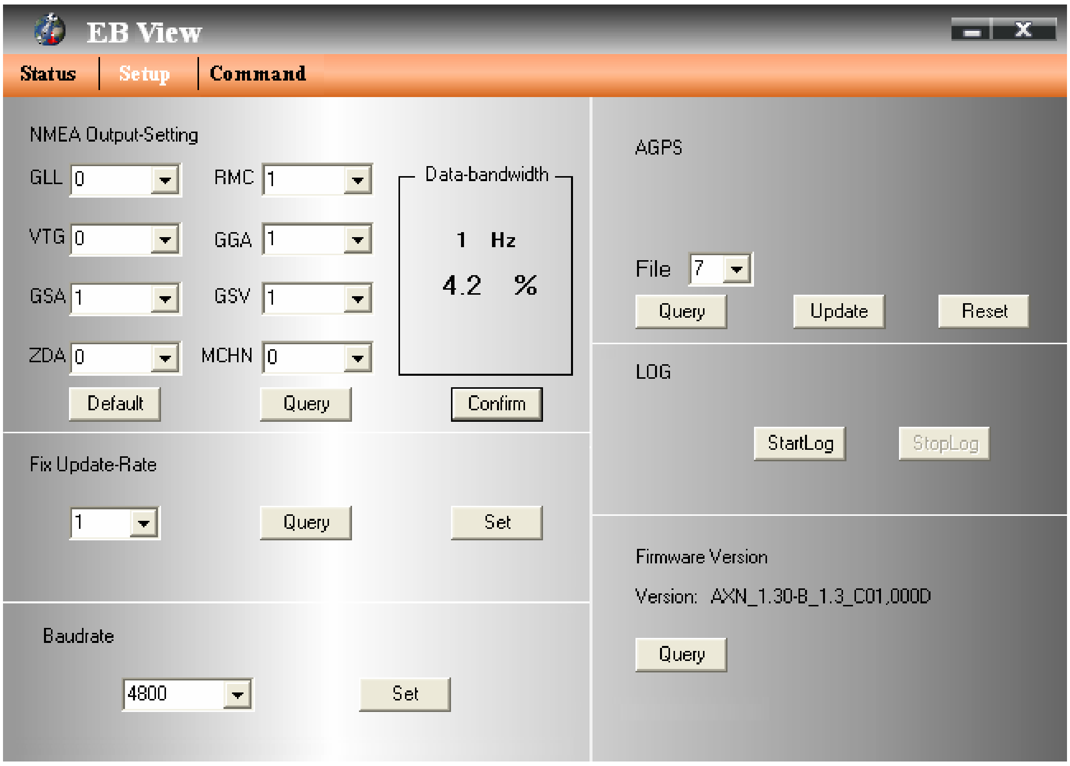
```
$GPGGA,073325.000,2446.3232,N,12101.0587,E,1,7,1.26,155.6,
$GPGSA,A,3,21,09,27,18,15,26,29,,,,,,1.48,1.26,0.78*08
$GPGSV,3,1,11,09,78,151,45,27,68,058,47,21,61,274,49,50,50,1
$GPGSV,3,2,11,15,49,018,46,18,35,322,46,26,15,048,42,29,08,2
$GPGSV,3,3,11,05,,,43,12,,,40,14,,,37*7D
$GPRMC,073325.000,A,2446.3232,N,12101.0587,E,0.01,336.76,
$GPGGA,073326.000,2446.3236,N,12101.0583,E,1,7,1.26,155.5,
$GPGSA,A,3,21,09,27,18,15,26,29,,,,,,1.48,1.26,0.78*08
$GPGSV,3,1,11,09,78,151,45,27,68,058,47,21,61,274,49,50,50,1
$GPGSV,3,2,11,15,49,018,46,18,35,322,46,26,15,048,42,29,08,2
$GPGSV,3,3,11,05,,,43,12,,,40,14,,,37*7D
```

Date: 2011/02/15
Time: 15:33:25
Latitude: N 24°46'19.41"
Longitude: E 121°01'03.49"
Fix | SBAS Mode: 3D | NO Fix
Speed: 0.018 km/h
PDOP: 1.48
Altitude: 155.5
Fix Time: 21

☑ GGA ☑ GSA ☑ GSV
☑ RMC ☐ GLL ☐ VTG
☐ ZDA ☐ MCHN

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.



NMEA Output-Setting

GLL 0
RMC 1
VTG 0
GGA 1
GSA 1
GSV 1
ZDA 0
MCHN 0

Data-bandwidth
1 Hz
4.2 %

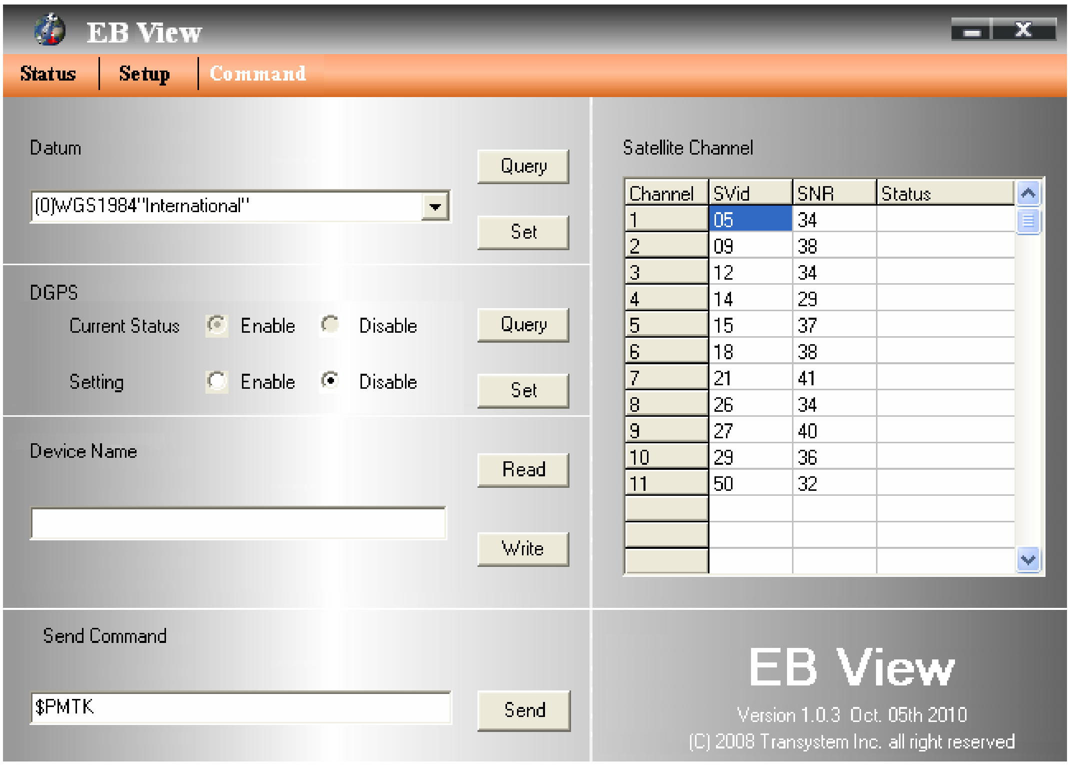
Fix Update-Rate 1

Baudrate 4800

AGPS
File 7

LOG

Firmware Version
Version: AXN_1.30-B_1.3_C01,000D



Datum
(0)WGS1984"International"

DGPS
Current Status ● Enable ○ Disable
Setting ○ Enable ● Disable

Device Name

Send Command
$PMTK

Satellite Channel

Channel	SVid	SNR	Status
1	05	34	
2	09	38	
3	12	34	
4	14	29	
5	15	37	
6	18	38	
7	21	41	
8	26	34	
9	27	40	
10	29	36	
11	50	32	

EB View
Version 1.0.3 Oct. 05th 2010
(C) 2008 Transystem Inc. all right reserved

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.			

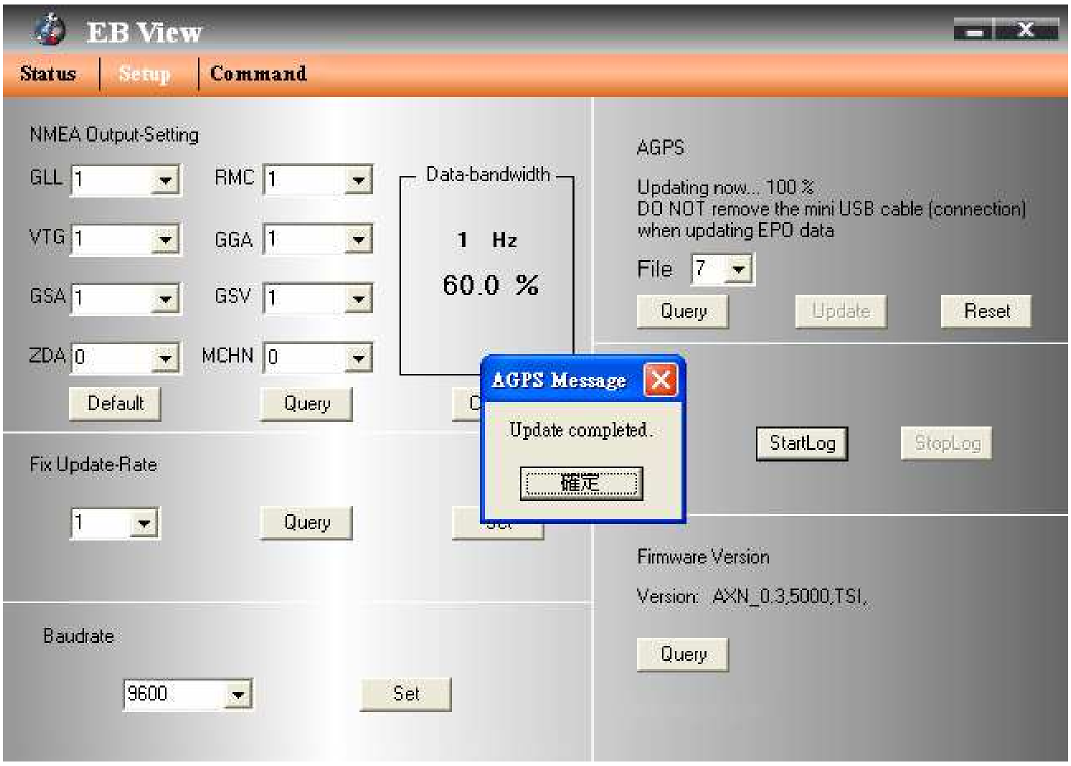
3.2. Update AGPS

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

Step2. Connect EB-870 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.



NMEA Output-Setting
GLL 1
RMC 1
VTG 1
GGA 1
GSA 1
GSV 1
ZDA 0
MCHN 0

Data-bandwidth
1 Hz
60.0 %

AGPS
Updating now... 100 %
DO NOT remove the mini USB cable (connection) when updating EPO data
File 7

AGPS Message
Update completed.

Fix Update-Rate
1

Baudrate
9600

Firmware Version
Version: AXN_0.3.5000,TSI,

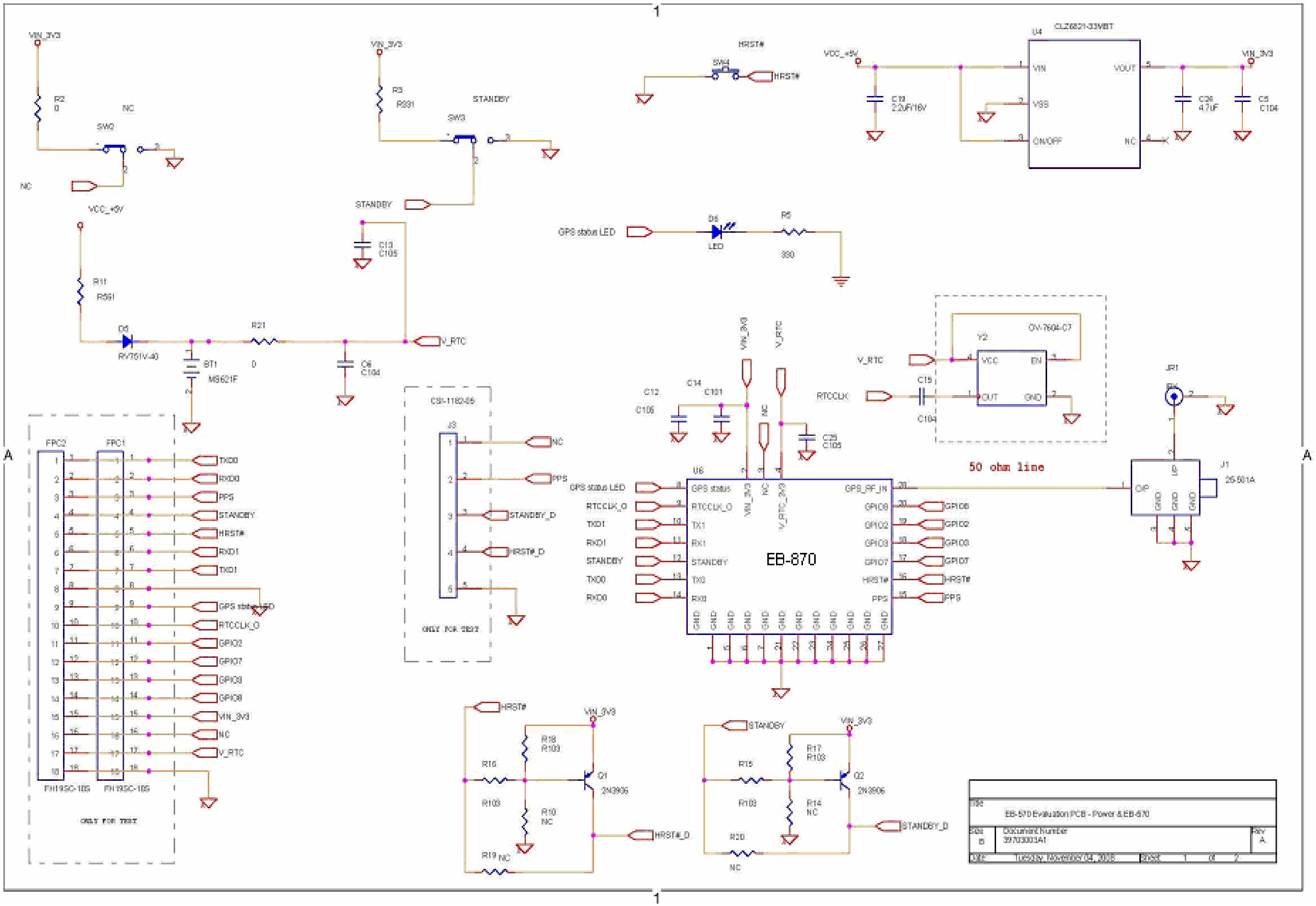
Note: AGPS has 7 or 14 days time limited it was depend by your select file.

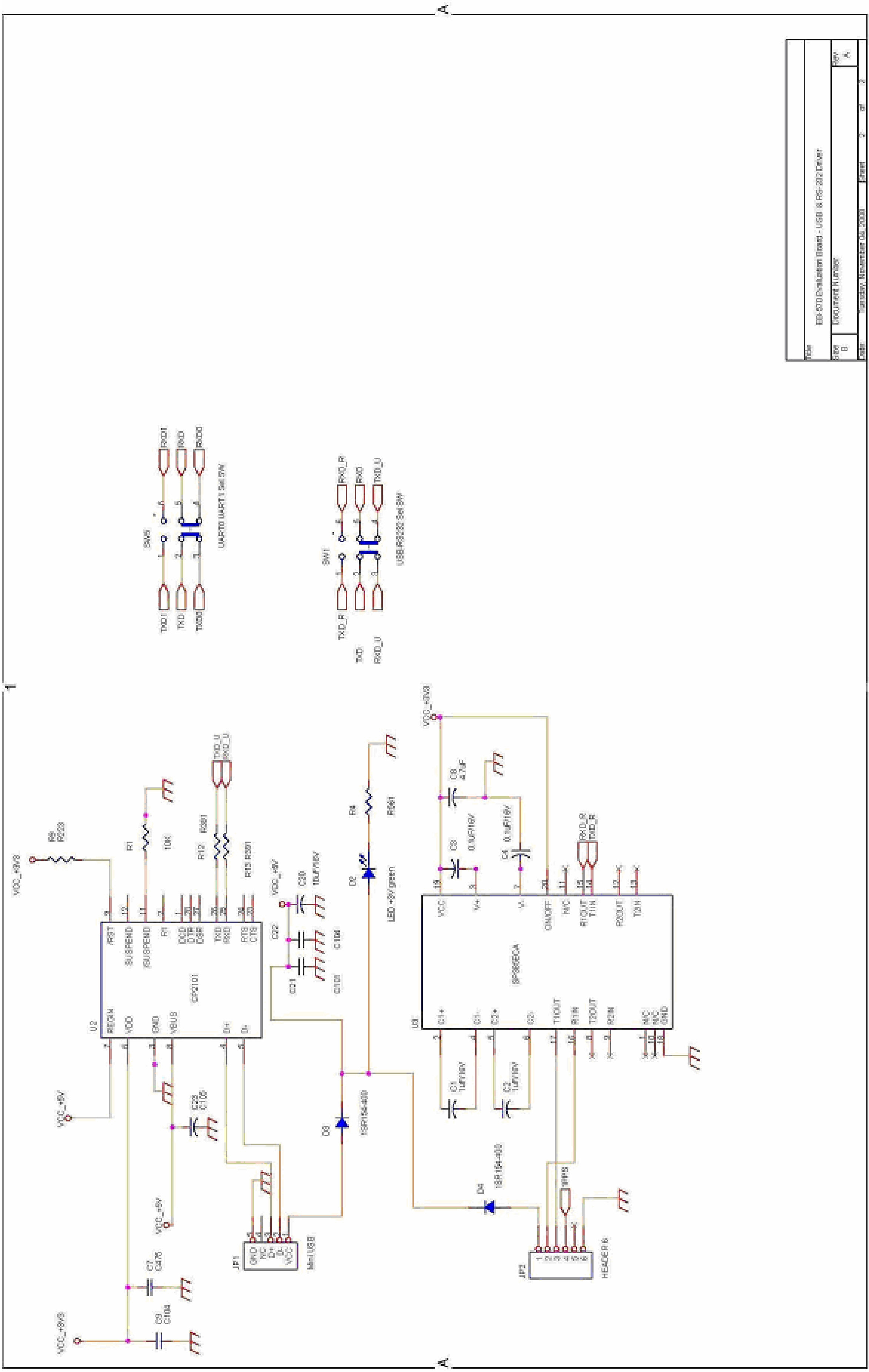
4. Connector Definition

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, 20uA @ 3.3V typical
5	GND	P	Ground
6	GND	P	Ground
7	GND	P	Ground
8	GPS Status	O	GPS status, blink when GPS has position fix
9	NC	NC	NC
10	TX1	O	UART port 1 output
11	RX1	I	UART port 1 input (RTCM only)
12	STANDBY#	I	Falling edge trigger
13	TX0	O	UART port 0 for NMEA output
14	RX0	I	UART port 0 input
15	PPS	O	PPS
16	HRST#	I	GPS reset, active low. Internal pull high
17	GPIO3 / SO	I/O*	General input / output ; SPI serial output
18	GPIO4 / SCK	I/O*	General input / output ; SPI clock output
19	GPIO5 / SCS#	I/O*	General input / output ; SPI select, active low
20	GPIO2 / SI	I/O*	General input / output ; SPI serial input
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, 1575.42MHz, 50 ohm DC O/P: 2.8V Current ≦ 25mA

Note : 1) P: Power, I: Input, O: Output, I/O: Input or Output
2) GPIO current output default：4mA, Max ：16mA

5. Evaluation Board Schematics




VCC_+3V3
R9
R223
VCC_+3V3
VCC_+5V
U2
REGIN
VDD
GND
VBUS
D+
D-
/RST
SUSPEND
/SUSPEND
RI
DCD
DTR
DSR
TXD
RXD
RTS
CTS
CP2101
R1
10K
R12 R391
R13 R391
TXD_U
RXD_U
C9
C104
C7
C475
VCC_+5V
C23
C105
JP1
GND
NC
D+
D-
VCC
Mini USB
C21
C22
VCC_+5V
C20
10uF/16V
C101
C104
D3
1SR154-400
D2
LED +3V green
R4
R561
U3
C1+
C1-
C2+
C2-
T1OUT
R1IN
T2OUT
R2IN
N/C
N/C
GND
VCC
V+
V-
ON/OFF
N/C
R1OUT
T1IN
R2OUT
T2IN
SP385ECA
VCC_+3V3
C3
0.1uF/16V
C8
4.7uF
C4
0.1uF/16V
C1
1uF/16V
C2
1uF/16V
RXD_R
TXD_R
D4
1SR154-400
JP2
HEADER 6
1PPS
SW6
TXD1
TXD
TXD0
RXD1
RXD
RXD0
UART0 UART1 Sel SW
SW1
TXD_R
TXD
RXD_U
RXD_R
RXD
TXD_U
USB-RS232 Sel SW
Title
EB-570 Evaluation Board - USB & RS-232 Driver
Size
B
Document Number
Rev
A
Date
Tuesday, November 04, 2008
Sheet
2
of
2
1
4
A
A

Contact Information

Transystem Inc.
No.1-2 Li-Hsin Rd. 1,
Science-Based Industrial Park,
Hsinchu 300, Taiwan, R.O.C.
Tel: +886.3.578.0393 / Fax: +886.3.578.4111
www.transystem.com.tw/
sales@transystem.com.tw