



**NC-860  
PC/104 GPS Module**

Reference Manual

Revised March 2004



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# Introduction

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## 1.1 Specifications

- COM ports: Two RS-232 asynchronous communication ports. 16550 UART supported with 16-bit FIFO. Baud rate up to 115,000 bps. The GPS data is available on COM2.
- Parallel Port : One parallel port for LPT1, LPT2, or LPT3, selectable. Supports SPP, EPP, and ECP modes.
- IDE Port: IDE port (Secondary - 2 Drive - uses IRQ 15)

### GPS Engine Specifications

- Chipset: SiRF Star 2 chipset, 12-channel "All-In-View" tracking, L1 frequency 1575.42 Mhz C/A code, clock generator: 5 to 25 MHz
- Cold Start Acquisition: 50 seconds typical TTFF (Time To First Fix)
- Warm Start Acquisition: 38 seconds typical TTFF
- Hot Start Acquisition: 8 seconds typical TTFF
- Reacquisition: 0.1 seconds (up to 30 second blockage)
- Position Accuracy: 5 to 20 meters, 2DRMS, without SA imposed (95%)
- Velocity: Up to 1,854 km/h (515 m/sec)
- Acceleration: Up to 4 g
- Altitude: Up to 18,000 meters
- Operating Temperature: 0 to 60 degrees C
- Relative Humidity: 5 to 95% non-condensing
- Output Port: RS-232
- Serial port: (DB-9)
- Baud Rate: 4,800 to 19,200 bps (factory default is 9,600)
- Input Messages: NMEA-0183/SiRF Binary Set Altitude and position, date and time, almanac, selection of output messages and baud rate.
- Output Messages: NMEA-0183 V2.2 GGA, GSV, RMC, VTG, GLL, GSA (factory default is GGA, GSV, RMC, GSA)
- Power Requirement: +5VDC +/- 0.25VDC, 1.5W



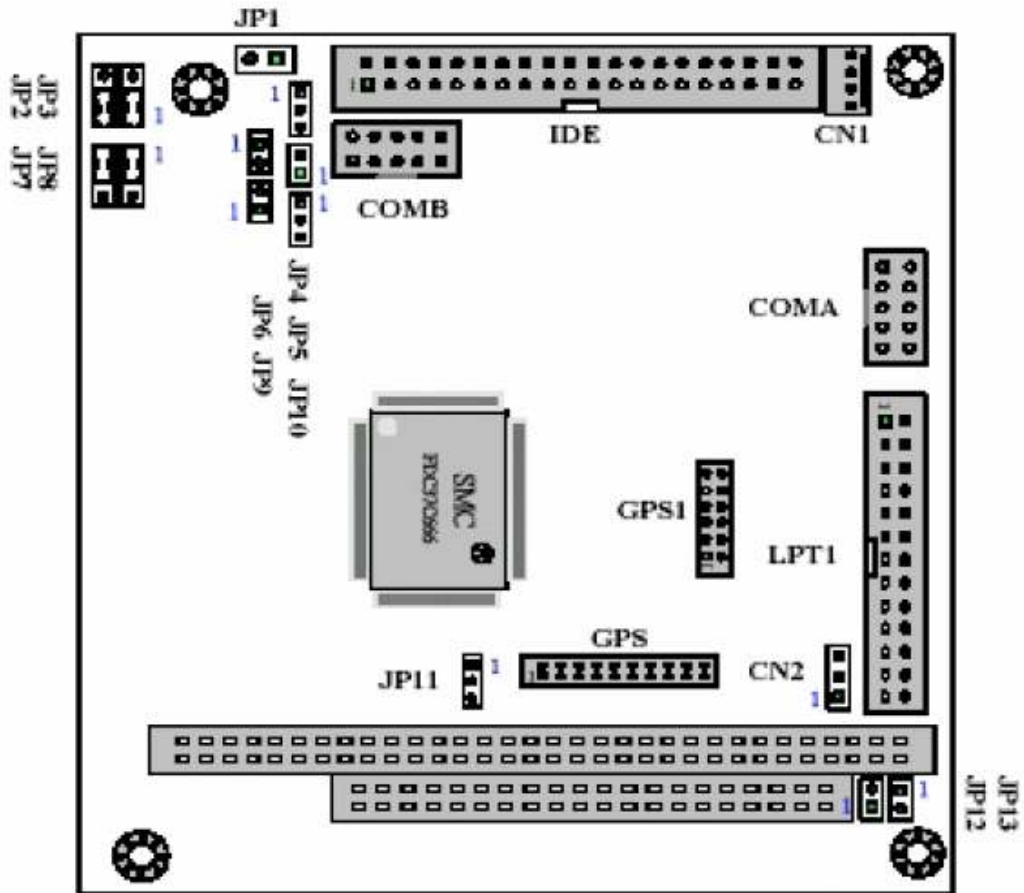
- Battery Backup: Built-in Gold Capacitor
- Antenna Frequency: 1.575 GHz
- Antenna: VSWR 2.0 maximum
- Antenna Bandwidth: 10 Mhz
- Antenna Impedance: 50 ohms
- Antenna Peak Gain: 4 dBic minimum
- Antenna Gain Coverage: 4 dBic at -90 degrees C to +90 degrees C
- Antenna Polarization: RHCP
- Antenna Power Handling: 1 Watt
- Amplifier Gain: 27 dB typical
- Amplifier Noise Figure: 1.5 dB typical
- Amplifier Output VSWR: 2.0 maximum
- Amplifier Power Requirements: 22 mA maximum at +5VDC
- Antenna Weight: 110 grams
- Antenna Dimensions: 50 x 50 x 17 mm

## 1.2 Safety Precautions

Follow the warnings below to protect your system from damage and yourself from injury:

1. Avoid exposing your system to static electricity at any time.
2. Protect yourself from electric shock. Do not touch any components of this card when the power is ON. Always disconnect power when the system is not in use.
3. Disconnect power when you change any hardware devices.

# NC-860 Board Layout





# NC-860 Jumper Settings

JP1: HDD LED                      Pin 1: VCC                      Pin 2: SIGNAL

JP2 and JP8: Printer Output

	ECP + EPP	ECP	EPP	OUTPUT ONLY
JP2	1-2 ON	1-2 ON	2-3 ON	2-3 ON
JP8	1-2 ON	2-3 ON	1-2 ON	2-3 ON

JP3 and JP7: Printer Address Setting

	3BCH(LPT1)	378H(LPT2)	278H(LPT3)	DISABLE
JP3	2-3 ON	1-2 ON	1-2 ON	2-3 ON
JP7	1-2 ON	2-3 ON	1-2 ON	2-3 ON

JP4 and JP9: Serial Output Select

Both OFF to select RS-422 Full Duplex Function  
Both ON to select RS-485 Half Duplex Function

JP5 and JP10: Serial Port Flow Control

JP5: RTS Control                      Software Control RTS: 1-2 ON    Hardware Control RTS: 2-3 ON  
JP10: DTR Control    Software Control DTR: 1-2 ON    Hardware Control DTR: 2-3 ON

JP6: Work Station Termination Jumper

Factory default is OFF  
Jumper JP6 ON for last node

JP11: Antenna DC Voltage

GPS +5V: 1-2 ON  
VCC 12V Selection: 2-3 ON

JP12: ROM Default Select

Factory default is OFF (See GPS Data Sheet)

JP13: NMEA PROTOCOL SELECT

Factory default is OFF (See GPS Data Sheet)



CN1: Touch Panel Connector

Pin	Assignment	Pin	Assignment
1	X+	2	X-
3	Y+	4	Y-

CN2: GPS Clock Output

1 PPS Pin 1  
Ground Ref Pin 2  
10KHz Pin 3

COM A: Serial Port 1 (COM1) RS-232

Pin	Assignment	Pin	Assignment
1	DCD1	2	RXD1
3	TXD1	4	DTR1
5	GND	6	DSR1
7	RTS1	8	CTS1
9	RI1		

COMB: Serial Port 2 (COM2) when GPS engine is not installed

IDE: Secondary IDE port (IRQ 15)