

Sierra Radio Systems

Digital Compass

Reference Manual

Version 1.0

Contents

- Digital compass board
- RS485 power injector

For more information, go to the Sierra Radio Systems web site at www.sierraradio.net or www.hamstack.com

Digital Compass System Installation

Step 1 – Wiring

The Digital Compass unit takes power over a CAT5 standard ethernet cable. 2 wires supply +12VDC power and 2 are ground. The remaining wires are used for control when not using the RF data radio modules. Power is inserted into the CAT5 cable using a power injector.

Typically the Digital Compass unit is mounted to the boom of the antenna. A CAT5 cable is routed to the source of +12VDC. At the 12V source, connect the +12V to the power injectors DC coaxial connector. This is 2.1mm standard connector with positive tip. The CAT5 ethernet cable plugs into either one of the RJ45 connectors. The power injector has two RJ45 connectors and all pins are passed through from connector to connector to allow daisy chaining devices.

Step 2 – Calibration

Place the Digital Compass on a flat surface. Power the unit. Press the small button on the CPU board labeled “Mode” The status LED will change the blink rate. At this point rotate the compass two full turns. Complete the turns within 30 seconds. The compass setup mode will time out automatically and your compass is calibrated.

Step 3 – Software installation and use

Install the SRS Station Control Panel software and set the com port to communicate with the data radio base station.

The Digital Compass will continuously stream the compass heading.

Using the Station Control Panel program, connect to the data radio's base station and select the compass display panel. You should see the compass heading and pointer.

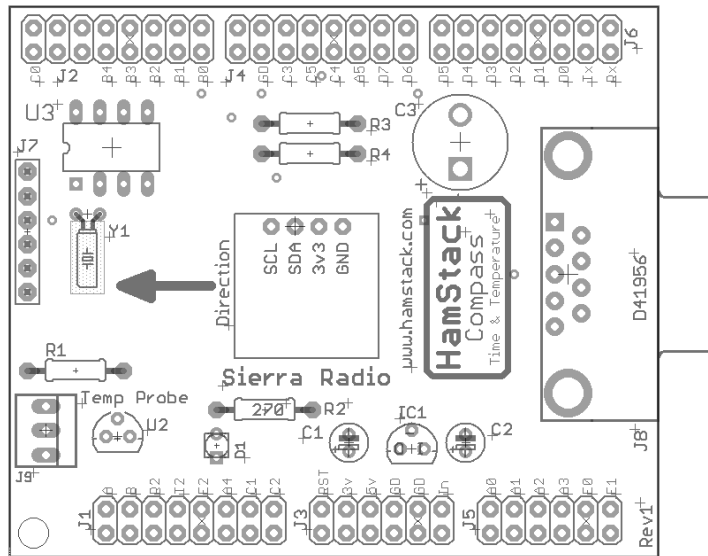
Assembly

The HamStack and StationStack boards are easy to assemble. There is no particular assembly sequence required. Follow the parts placement diagram and insert the components and solder them in place. If there are special assembly instructions or configuration steps required, they are included in each section.

The HamStack Getting Started guide book provides more detailed suggestions for board assembly. While the instructions are written for the HamStack CPU board in particular, the sequence of assembly and tips to make the whole process go faster and smoother are generally applicable to all boards. Start with IC sockets, then resistors, then capacitors, etc...

The Getting Started guide can be downloaded from the HamStack web site.

Digital Compass Board



Overview

The digital compass board is designed to integrate a Honeywell 2-axis magnetometer with built-in controller to a HamStack CPU board. In addition to the compass, the board features additional convenient devices and connections.

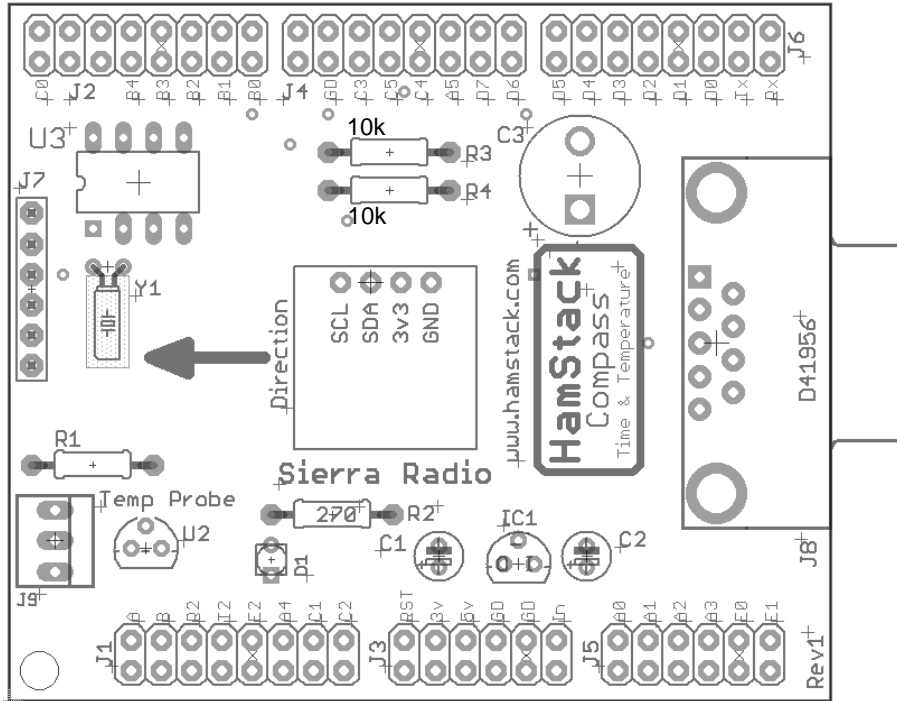
Features

- Digital compass module with a 2-axis magnetometer, built-in controller and I2C interface
- Optional DS1307 real time clock / calendar chip
- Optional A OneWire temperature probe jack with pull up resistor and power
- Optional DB9 connector RS232 signals routed from the HamStack CPU

When building this board, you can choose to assemble all or part of the board to customize it for your specific project.

Digital Compass Board

Parts Placement



Assembly Tip

Install components that are necessary for sub-circuits for your project needs as follows...

Basic components required for any configuration

- C1 10 UF electrolytic capacitor
- C2 10 UF electrolytic capacitor
- D1 LED
- IC1 78L05
- J1 2x8 Stacking header or male header pointing down
- J2 2x8 Stacking header or male header pointing down
- J3 2x6 Stacking header or male header pointing down
- J4 2x8 Stacking header or male header pointing down
- J5 2x7 Stacking header or male header pointing down
- J6 2x8 Stacking header or male header pointing down
- J7 2x6 Stacking header
- R2 270

Components required for RS232 interface

- J8 DB9 Female connector

Components required for digital compass

- R3 10k
- R4 10k
- U1 Digital compass module

Components required for clock / calendar

- R3 10k
- R4 10k
- SOC 8 pin DIP socket
- U3 DS1307
- Y1 32 kHz crystal

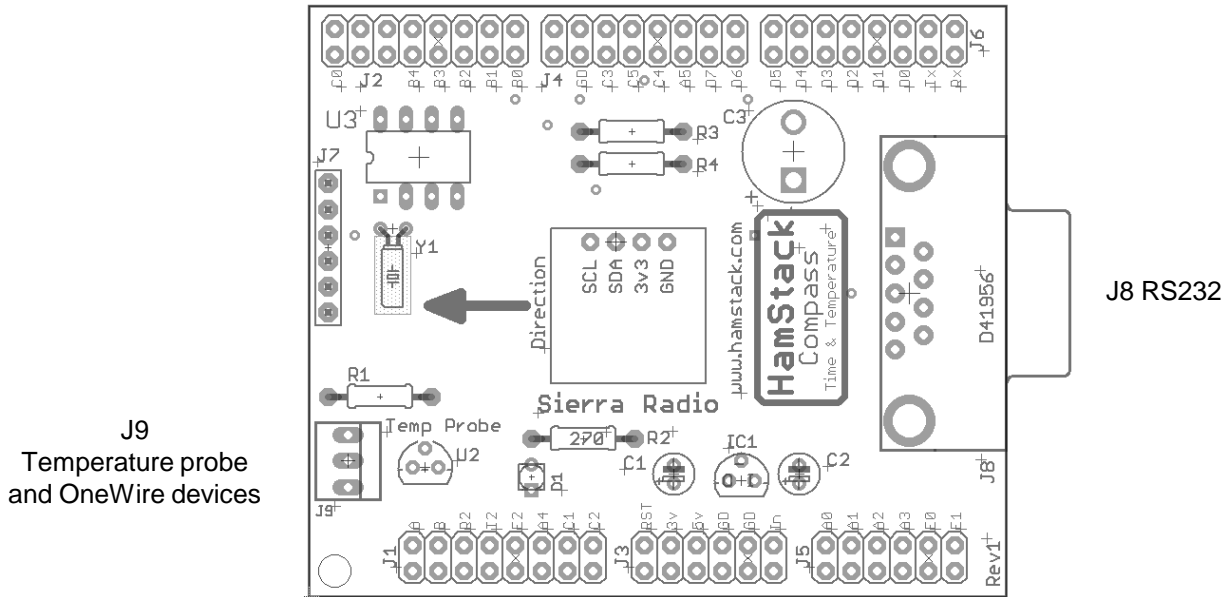
Components required for temperature probe and other OneWire devices

- J9 3 pin connector
- R1 4.7k
- U2 DS18B20 *Optional

A DS18B20 can be installed on the PCB or left off the board and connected by wire through the 3 pin J9 connector.

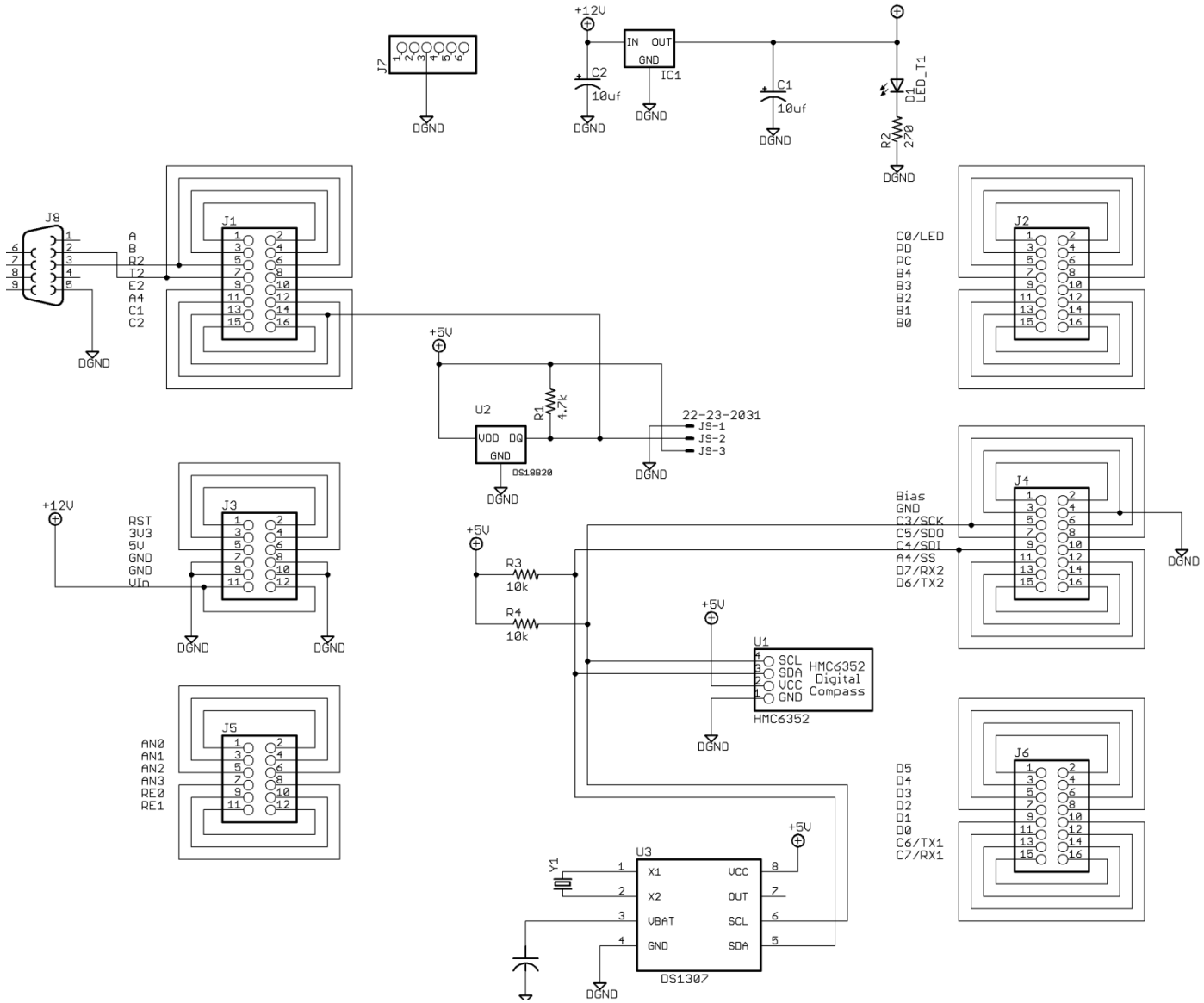
Digital Compass Board

Connections

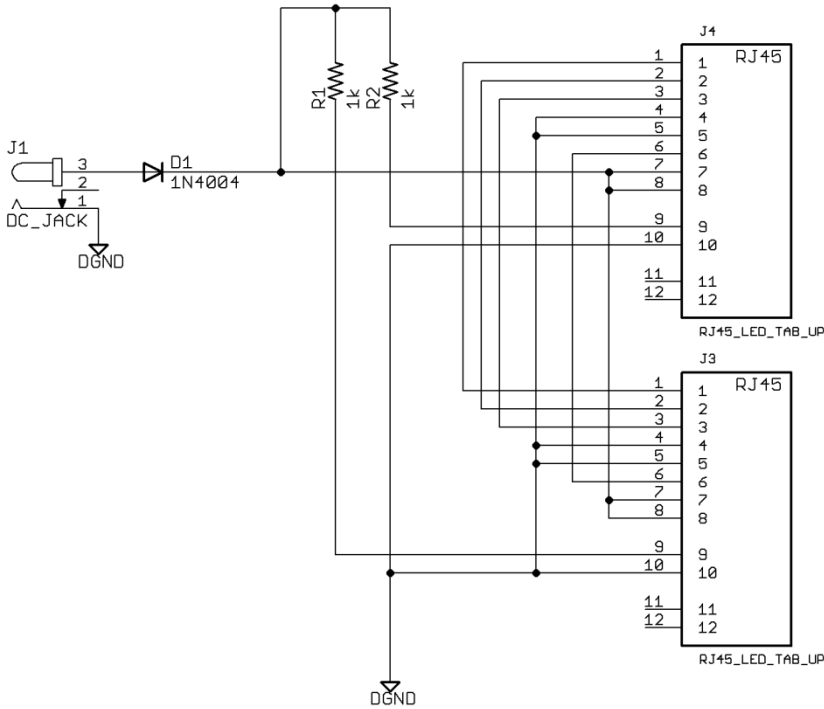


J8	DB9 Female	RS232 IO. Pin 2 data out, pin 3 data in, pin 5 ground Requires MAX232 RS232 chip to be installed on the CPU board
J9	OneWire	Pin 1 Ground Pin 2 Data, connects to PORTC.1 Pin 3 +5v out

Digital Compass Board Schematic

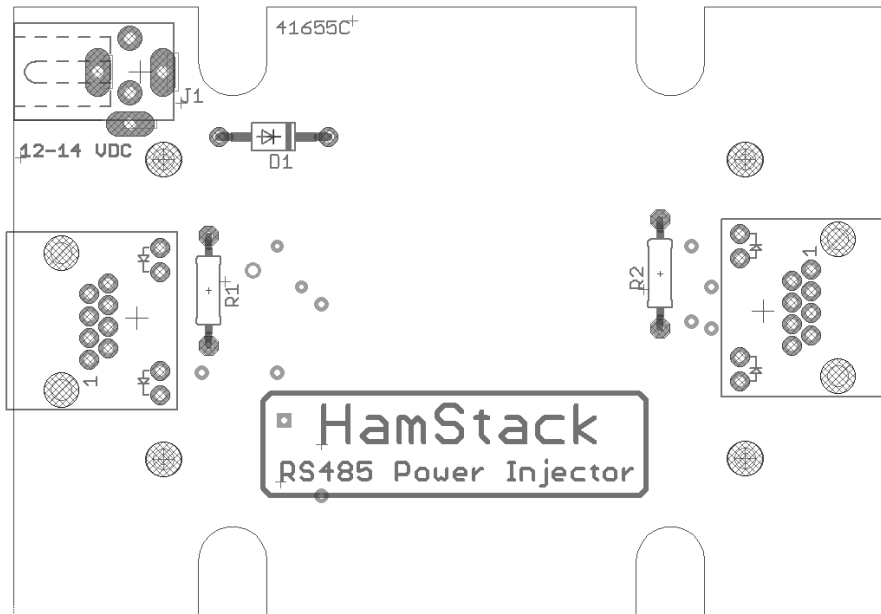


RS485 Power Injector



RJ45 Network Connector

Pin	Signal
1	RS485-A
2	RS485-B
3	Reserved
4	Ground
5	Ground
6	Reserved
7	+12 VDC
8	+12 VDC



- D1 1N4004
- J1 2.1mm DC coaxial connector, positive center pin
- J2, J3 RJ45
- R1, R2 1k resistor