

Verdex Pro Series Design and Production Technical Reference

[Fasteners and Spacers](#)

[Other Vendors](#)

[Antennae](#)

[Antennae for GPSstix](#)

[Other Sources for GPS Antenna](#)

[Passive versus Active Antenna](#)

[Through-hole Headers for Expansion Boards](#)

Fasteners and Spacers

Gumstix sells [a pack of screws and spacers](#) for the assembly of basix, connex, verdex and verdex pro boards together with expansion boards.

For the 2 holes near the 60-pin connector:

- 0-80 x 1/2" machine screws (slotted pan-head)
- #0 hex nuts
- #0 nylon washers

For the third hole that's got tight space between the SDRAM chips:

- M1.0 x 6mm machine screws (slotted cheesehead)
- alternately, 00-90 Fillister head 1/4" screws and hex nuts
- M1.0 hex nuts

For spacing the boards:

- 2mm black nylon spacers (connex-side daughtercards)
- 3mm black nylon spacers (basix-side daughtercards)

Other Vendors

<http://www.mdmetric.com>

Antennae

Antennae for GPSstix

The GPSstix expansion board uses an SMA connector to connect the antenna, which is compatible with an ANN SMA Antenna as can be [found here](#) .

Which GPS antennas work with the GPSstix expansion board ?

GPSstix 1678 and later

GPSstix version R1286 (and later) is designed for use with an active antenna that accepts 3.3VDC - the u-blox LEA-4H GPS receiver module will supply power of up to 50mA to the antenna.

GPSstix version R791 (the original design)

GPSstix version R791 (the original design) is designed for use "out of the box" with a passive antenna. If you have an active antenna that will work with a 3.3VDC supply, follow these instructions to modify the GPSstix board to supply antenna bias voltage:

- # Disconnect the LEA-4H GPS module's pin 19 from ground by cutting the trace.
- # Solder a 10 Ohm resistor between pins 18 and 19 on the LEA-4H GPS module.

Other Sources for GPS Antenna

When shopping for a GPS antenna, the most important characteristics are:

1. Connector (passive or active antennas): SMA, or you will need a SMA-to-something adapter.
2. Voltage/Current (active antennas only): 3.3VDC @ < 50mA, much lower current preferred.
3. Noise Figure (active antennas only): the lower the better, as adding amplified noise to the amplified GPS signal won't help high-sensitivity/weak-signal performance.
4. Gain (active antennas only): < 50dB (the max the LEA-4H can handle), but you really only need enough gain to make up for antenna cable loss, and not much more (especially if the noise figure is a little high).

[Synergy Systems, LLC](#) carries GPS passive and active antennas, as well as a good selection of GPS and GPS-related accessories.

Spark Fun Electronics carries GPS active antennas, available via [this link](#).

[Gilsson Technologies](#) carries high-performance active antennas designed to work with a range of Garmin, Magellan and Navman receivers, and some are good matches for use with a modified original R791 GPSstix or an un-modified R1286+ revision GPSstix. In particular, they have models designed to work with a bias supply from 2.5-12VDC at only 10-18mA, and can equip them with cables up to 16 feet in length.

Passive versus Active Antenna

There are 2 kinds of GPS antennas.

1. Active - An active antenna is a passive antenna with a Low Noise Amplifier (LNA) co-located with the antenna. The LNA provides additional gain (usually necessary/desirable for long cable runs, particularly for thin coax cable), and thus requires that power be supplied to the LNA (usually on the center conductor of the coax cable between the GPSstix and the antenna). Active GPS antennas are usually more widely/easily available at retail, compared to passive antennas. Make sure that you buy

an antenna that is specified to operate at the voltage and current supplied by the GPSstix (see below).

2. Passive - A passive antenna is just an antenna (with no additional electronics as in an active antenna). The GPSstix receiver operates at the GPS L1 frequency of 1575.42 MHz (1.57542 GHz) only. Passive GPS antenna elements should be Right-Hand Circular Polarized (RHCP) and are usually available in "patch" format (most common) or as quadrifilar helix modules (e.g., from [Sarantel](#), generally only useful if you're designing your own GPS board).

From February 2007 to July, 2007, Gumstix sold the GPSstix version R1286 at gumstix.com. This version of the GPSstix was designed to be easily modifiable for a passive antenna with the following changes:

Un-solder the "TEN OHM ACTIVE" resistor which is located in a white silkscreened box next to the SMA antenna connector.

Solder a wire to the "ZERO OHM PASSIVE" pads.

"WARNING": "Do NOT connect a passive antenna to a GPSstix configured for an active antenna (a modified original R791 GPSstix or an un-modified R1286+ revision GPSstix)". Passive antennas may present a near-short-circuit to the GPSstix antenna power section, and the resulting over-current might damage the antenna, GPS receiver module, and/or the antenna bias resistor (not a "good idea"! ;). As long as an appropriately-sized antenna bias resistor is in place, the u-blox LEA-4H should detect the short-circuit and turn off the antenna supply, but you're still pushing your luck!

Through-hole Headers for Expansion Boards

Pinouts for the Through-Hole headers:

Notes:

- A through-hole header, not populated, is available on several expansion boards for the Verdex Pro series
- All logic levels are 1.8V.
- Signals available on 0.100" through-holes.

Last revision: December 14, 2009.

The signal and pinout information can be derived from the schematic posted in pubs.gumstix.com for each expansion board of the verdex pro series, [starting here](#).

e.g. for the console boards of the verdex pro series, each schematic is posted [here](#) .