

This is the Revision A version of the Sense3 Module. The status of this project is work in progress.

Sense3 Module (Revision A)

Table of Contents

This document is also available in PDF format.

- 1. Introduction
- 2. Programming
- 3. Hardware
 - ◆ 3.1 Circuit Schematic
 - ◆ 3.2 Printed Circuit Board
 - ◆ 3.3 Construction Instructions
- 4. Software
- 5. Issues

1. Introduction

The Sense3 module has three sensors — an infrared (IR) distance sensor, a sonar distance sensor, and a laser bearing finder. The IR and sonar sensors need no external support, whereas the laser bearing finder needs pieces of reflective tape placed at the correct height at known locations in the environment. The Sense3 module is intended to be placed on top of a common hobby server to provide approximately 180 degrees of sensor sweeping.

This module uses a number of helper modules to accomplish its task. These modules are:

ScanBase

This module is used to electrically connect to the Sense3 module. This module is connected to the robot base and does not sweep back and forth. The hobby servo is electrically connected to this module.

ScanPanel

This module is mechanically mounted directly to the top of a hobby servo horn. This module provides electrical connections between ScanBase and Sense3 modules. In addition, one of the LaserHolder1 modules is plugged into this module to provide power for the Laser pointer.

LaserHolder1

This module is used to mechanically mount and align the small laser pointer so that its laser beam comes out of the appropriate hole of the Sense3 module. Two of these modules are required plus the Sense3 form a single unit that slips right into the appropriate female connectors on the ScanPanel.

Servo Adaptor 0.4

A couple of these modules provide a way to mechanically attach the hobby servo to the robot base.

2. Programming

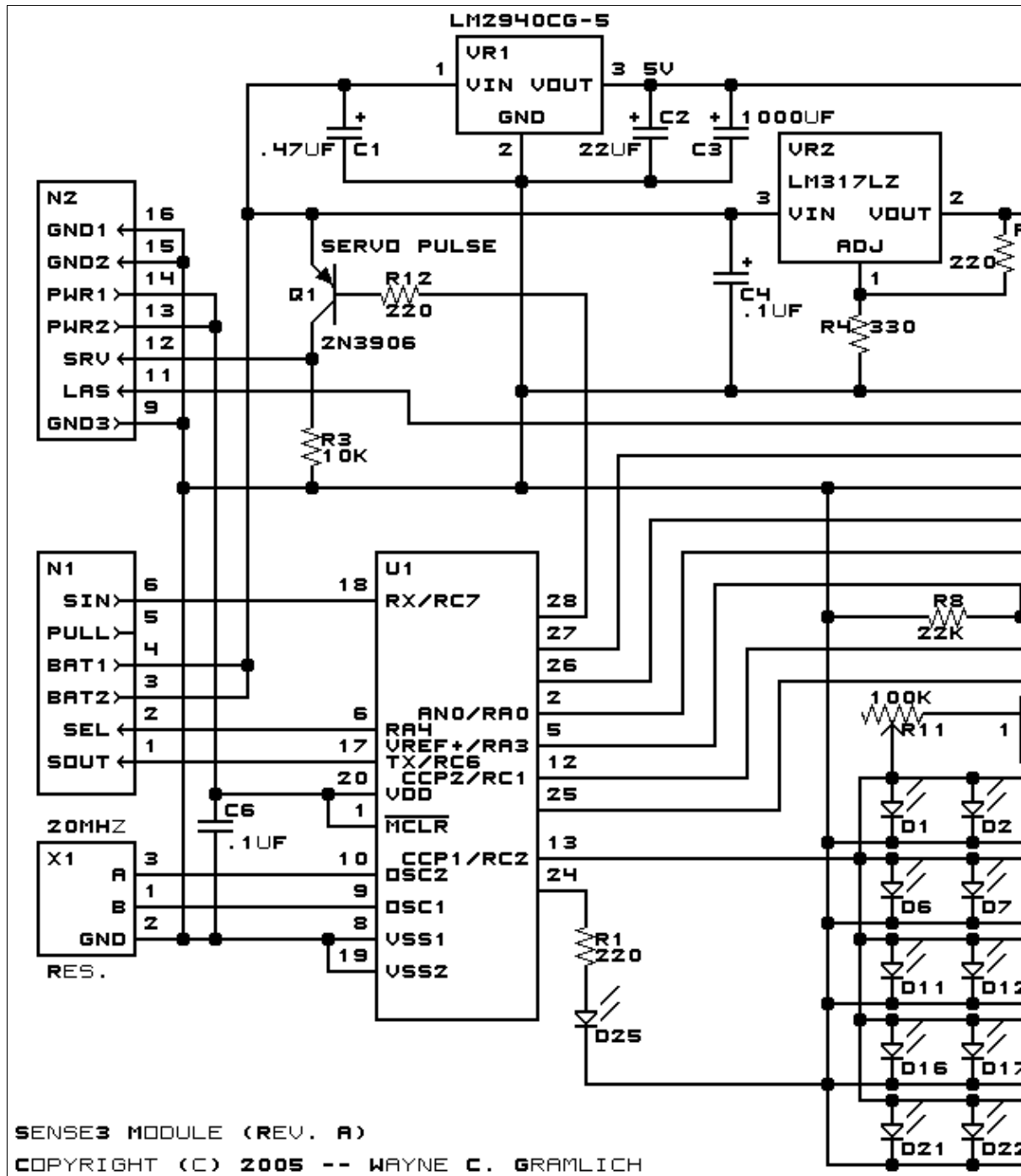
There is no programming yet.

3. Hardware

The hardware consists of a circuit schematic and a printed circuit board.

3.1 Circuit Schematic

The schematic for the Sense3 Module is shown below:



The parts list kept in a separate file --- [sense3.ptl](#).

- ◆ Ground
- ◆ Regulated 5 Volts
- ◆ Unregulated +6 Volts
- ◆ Serial In
- ◆ Serial Out
- ◆ Debug Port(2)

3.2 Printed Circuit Board

The printed circuit board files are listed below:

[sense3_back.png](#)

The solder side layer.

[sense3_front.png](#)

The component side layer.

[sense3_artwork.png](#)

The artwork layer.

[sense3.gbl](#)

The RS-274X "Gerber" back (solder side) layer.

[sense3.gtl](#)

The RS-274X "Gerber" top (component side) layer.

[sense3.gal](#)

The RS-274X "Gerber" artwork layer.

[sense3.drl](#)

The "Excellon" NC drill file.

[sense3.tol](#)

The "Excellon" tool rack file.

4. Software

There is no software yet.

5. Issues

The following issues need to be addressed:

- ◆ C3 is mis-labeled in the artwork layer.
 - ◆ The hole for the laser beam is too small.
 - ◆ The alignment holes are too small for any reasonable hardware.
 - ◆ The alignment holes are too close, move further out.
 - ◆ R10 is too close to Q3.
 - ◆ Contemplate putting VR1 down flat
 - ◆ C2 and C1 are too close to VR1.
 - ◆ C2 and C1 are too close to VR1.
 - ◆ C4 would be better if the leads were .2".
 - ◆ Move GP2D120 up to better center it.
 - ◆ Label the wire colors for the GP2D120 connection to N4.
 - ◆ Make lead space for C6 be .2".
 - ◆ Think about using polypropylene [sp?] tubing for sensor shade. Reposition holes to fit tubing snugly.
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