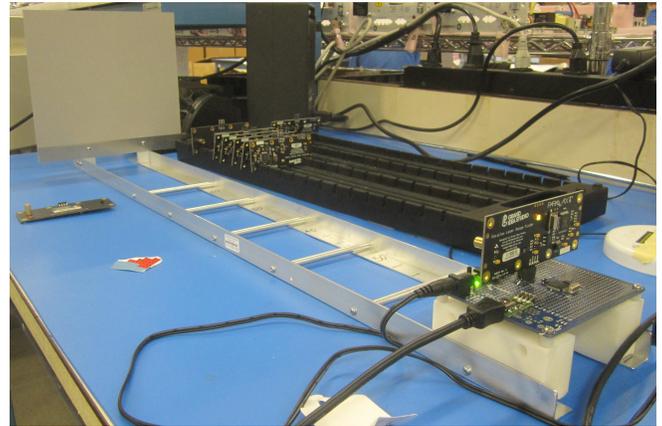


### Setup:

1. Connect LRF Text Fixture mini-USB port to PC
2. Load *LRF Image Viewer* application on PC
3. Insert Laser Range Finder (LRF) module into fixture at 70 cm location
4. Enable power to fixture
  - a. Current @ LRF VCC < 20mA (Propeller unprogrammed)



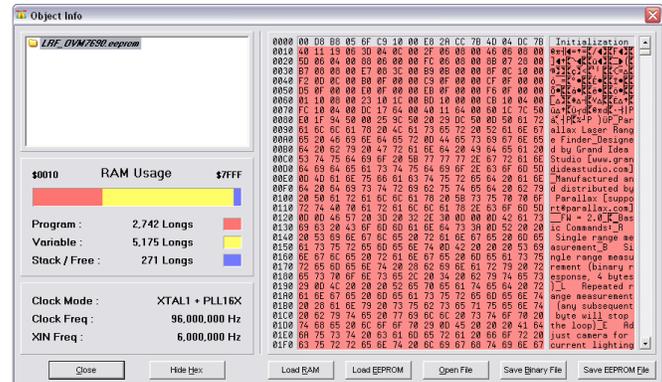
### Programming:

5. Double-click *LRF\_OVM7690.eeprom* to load Propeller programming application
6. Attach Prop Clip to test points on the backside, top edge of the LRF PCB
7. Click Load EEPROM button to program firmware into LRF
8. Power cycle the fixture to fully reset LRF



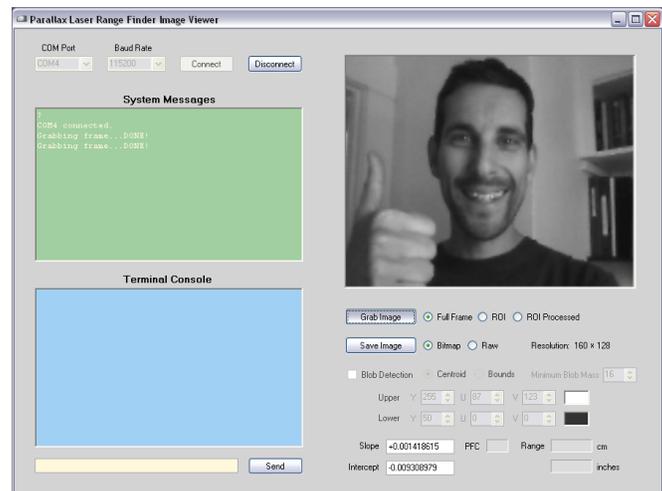
### System Test:

9. Current @ LRF VCC < 50mA (Propeller programmed)
10. LRF LED = ORANGE
11. 3V3 bus = 3.3V +/- 1% = 3.26V to 3.34V (measure @ C15)
12. 2V8 bus = 2.8V +/- 3% = 2.71V to 2.89V (measure @ C18)
13. In *LRF Image Viewer*, select COM Port, set Baud Rate to 115200, and press Connect button
  - a. LRF LED = GREEN
  - b. If LRF LED = ORANGE BLINK, then error. Observe Terminal Console window for error message.



### Camera Test and Laser Alignment:

14. In *LRF Image Viewer*, ensure Full Frame radio button is selected and press Grab Image button
  - a. LRF LED = RED for ~2 seconds
  - b. A grayscale image should be displayed in the image box
  - c. LRF LED = GREEN



15. In *LRF Image Viewer*, ensure ROI radio button is selected and press Grab Image button

- a. Laser diode should turn ON for ~1/4 second
- b. Current @ LRF VCC < 150mA (laser active)
- c. A grayscale image with laser spot should be displayed in the image box
  - Ensure that the laser spot (light gray or white) is centered vertically within the frame
  - Manually adjust laser diode and repeat Step 15 until properly aligned



YES



NO

16. Glue laser diode and camera into place using Loctite 444 and Loctite 7452 Accelerator

- a. Take extreme care to not move laser diode

17. Once glue has hardened, re-check laser diode alignment using Step 15

### Calibration:

Refer to the example video demonstrating the calibration sequence at [www.youtube.com/watch?v=1gk\\_tRbJO84](http://www.youtube.com/watch?v=1gk_tRbJO84)

18. Insert Laser Range Finder (LRF) module into fixture at 20 cm location

19. In text entry box (yellow) of *LRF Image Viewer*, enter “X” character and press Send button (or Return key)

20. Follow prompts returned by the LRF in the Terminal Console

- a. Example output should be as follows:

```
:X
Are you sure you want to calibrate (Y/N)?Y
Set LRF to D = 20 cm and press spacebar (any other key to abort)
pfc: 289 angle: 0.3718561
pfc: 289 angle: 0.3718561
pfc: 290 angle: 0.3718561
pfc: 289 angle: 0.3718561
```

< intentionally truncated to save space >

```
Set LRF to D = 70 cm and press spacebar (any other key to abort)
pfc: 105 angle: 0.1109708
pfc: 105 angle: 0.1109708
pfc: 105 angle: 0.1109708
pfc: 105 angle: 0.1109708
```

```
SLOPE = +0.001420366 (3ABA2B96)
INT = -0.03679396 (BD16B544)
PFC_MIN = 48
LOWER_BOUND = 50
UPPER_BOUND = 255
BLOB_MASS_THRESHOLD = 16
```

```
Write new values (Y/N)?Y
:
```

21. In text entry box (yellow) of *LRF Image Viewer*, enter “R” character and press Send button (or Return key)
  - a. At 70 cm location on fixture, result should be  $D = 700 \text{ mm} \pm 3\% = 679 \text{ mm to } 721 \text{ mm}$
  - b. If result out of bounds, repeat Calibration process one time
22. System Test & Calibration Procedure complete

**END OF TEST**