

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 70cm location
4. Enable power to fixture
 - a. Current @ LRF VCC < 20mA (Propeller unprogrammed)

Programming:

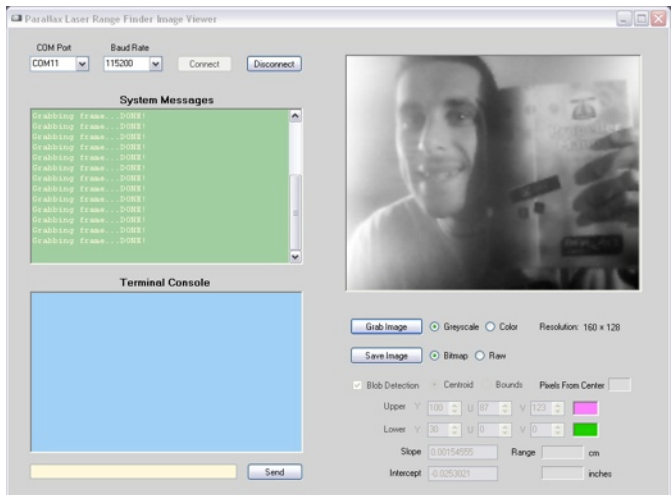
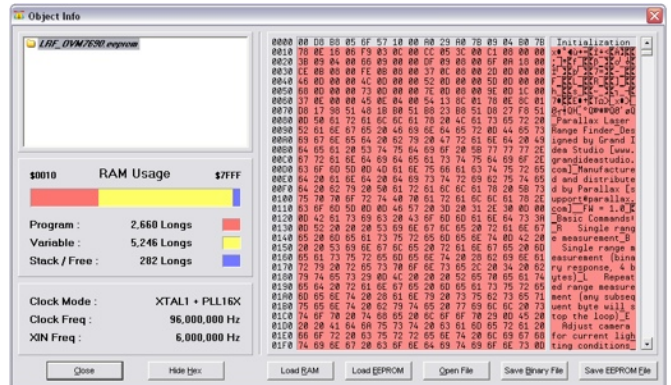
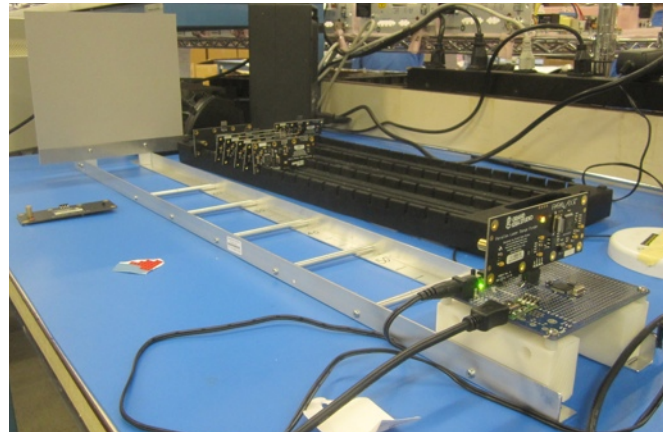
5. Double-click *LRF_OVM7690.eeprom* to load Propeller programming application
6. Attach Prop Clip to test points on the backside, top edge of the LRF PCB
7. Click Load EEPROM button to program firmware into LRF
8. Power cycle the fixture to fully reset LRF

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 Greyscale radio button is selected and press Grab Image button
 - a. LRF LED = RED for ~2 seconds
 - b. A greyscale image should be displayed in the image box
 - c. LRF LED = GREEN



15. In *LRF Image Viewer*, ensure Color radio button is selected, Blob Detection is unchecked, and press Grab Image button
 - a. Laser diode should turn ON for ~1/2 second
 - b. Current @ LRF VCC < 150mA (laser active)
 - c. A color image with laser spot should be displayed in the image box
 - Ensure that the red laser spot is centered vertically within the frame
 - Manually adjust laser diode and repeat Step 15 until properly aligned



16. Glue laser diode and camera into place using Loctite 444 and Loctite 7452 Accelerator
 - a. Take extreme caution 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

18. Insert Laser Range Finder (LRF) module into fixture at 20cm 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: 246 angle: 0.3718561
pfc: 245 angle: 0.3718561
pfc: 244 angle: 0.3718561
pfc: 244 angle: 0.3718561

< intentionally truncated to save space >

Set LRF to D = 70 cm and press spacebar (any other key to abort)
pfc: 66 angle: 0.1109708
pfc: 65 angle: 0.1109708
pfc: 65 angle: 0.1109708
pfc: 67 angle: 0.1109708

SLOPE = +0.001450448 (3ABE1CF8)
INT = +0.01748975 (3C8F46A8)
PFC_MIN = 9

Write new values (Y/N)?Y
:

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21. In text entry box (yellow) of *LRF Image Viewer*, enter “R” character and press Send button (or Return key)
 - a. At 70cm 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