SF01/A
Laser rangefinder

White paper

lightware
optoelectronics

SF01/A

SF01/A - Evaluation

Objective

To determine the limits and operating performance of the SF01/A laser rangefinder module in real world situations against varying target surfaces.

Method

USB cable

Visible laser pointer
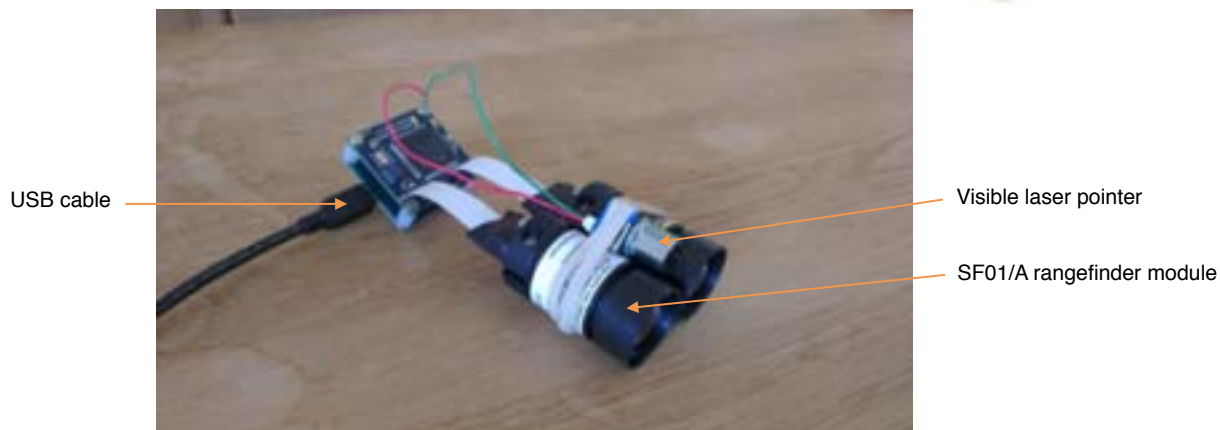
SF01/A rangefinder module

Figure 1 :: Test setup

1. Connected SF01/A to laptop via USB cable.
2. Attached the SF01/A to a tripod.
3. Fastened a laser pointer to the SF01/A for rough aim indication.
3. Used the LightWare Terminal application to gather and evaluate data.
4. Performed an accuracy test in direct sunlight on a matt black and white target over a range of 30 m.
5. Documented measurements on various surfaces and objects.

Accuracy evaluation

Target distance (m)	Target colour	Measured distance	Error (cm)	Variance (cm)
5	white	5.00 - 5.01	0.5	±0.5
5	black	5.02 - 5.03	2.5	±0.5
10	white	9.99 - 10.00	-0.5	±0.5
10	black	9.97 - 10.01	-1.0	±2.0
15	white	15.00 - 15.01	0.5	±0.5
15	black	14.99 - 15.00	-0.5	±0.5
20	white	19.99 - 20.00	-0.5	±0.5
20	black	20.00 - 20.02	1.0	±1.0
25	white	25.01 - 25.02	1.5	±0.5
25	black	25.00 - 25.03	1.5	±1.5
30	white	30.00 - 30.01	0.5	±0.5
30	black	29.99 - 30.02	0.5	±1.0

The accuracy, even in direct sunlight, was very consistent over the tested range. The matt black target did show a slightly higher variance than the white target.

Maximum distance was consistently 60 m with low signal strength. The SF01/A peaked at ~63 m where the signal was lost completely.

Figure 2 :: Matt black & white targets used for accuracy testing

Target surface evaluation

The SF01/A was then tested on surfaces more commonly found in the environment. This is more challenging than testing the unit in the controlled environment of the production facility where conditions are more ideal.

These tests were completed in full sunlight, on a clear day without any noticeable wind.

Photos are included below to give an idea of the types of target surfaces the SF01/A was aimed at.

Target description	Target colour	Target distance (m)	Notes
Foliage - Leafy bush	Green	22	Consistent, high signal strength
Foliage - Tree leaves	Green	36	Consistent, high signal strength
Foliage - Pine tree	Green	40	Consistent, medium / high signal strength
Foliage - Tree leaves	Green	50	Consistent, medium signal strength
Foliage - Tall grass	Brown	45	Consistent, but limited to ~45 m because it was hard to hit a further target at such a shallow angle
Wall - Rough	Grey	54	Consistent, medium signal strength
Wall - Brick	Beige	15	Consistent, high signal strength
Fence - Palisade	White	20	Occasional readings to the grass beyond, high signal strength

Figure 3 :: Foliage - tall grass

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Figure 4 :: Foliage, miscellaneous

Conclusion

The SF01/A was consistently able to measure over a 60 m range with varying target surfaces. The typical accuracy was ±1 cm with a worst case variability of ±2 cm.

Document revision history

Amendment description	Rev.	Date	Page	Author
Initial release of document	0	2014-05-13	All	RJG