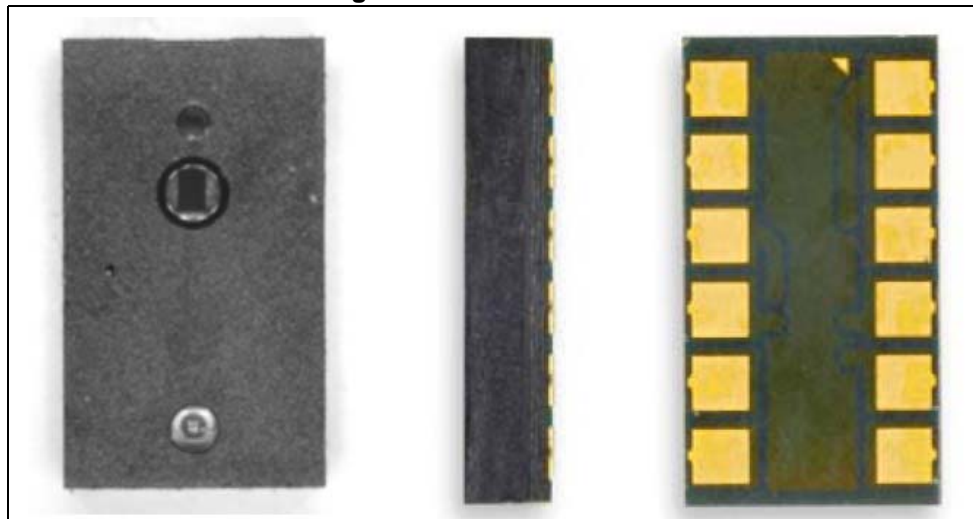

VL6180X distance measurements versus -30 / +85°C extended temperature range

Introduction

The VL6180X module combines a proximity sensor based on ST's patented FlightSense™ technology and an ambient light sensor in one package. The VL6180X interfaces to your micro-controller via the industry standard I2C bus.

This application note describes how VL6180X performs distance measurements versus a temperature range from -30°C to +85°C.

Figure 1. VL6180X module

Set up

All distance measurements are done with below conditions

- VDD = 2.8V (device supply voltage)
- Luminance = 0 lux

Figure 2 to Figure 5 give typical distance measurements on different color targets.

For the purposes of this document all targets are referred to in terms of their photopic (visible spectrum) reflectance. It should be noted that the photopic reflectance of a target is not necessarily the same as the reflectance at 850nm (the wavelength of the VL6180X emitter). Unless otherwise specified, all targets referenced in VL6180X documentation are Munsell neutral color (gray) charts from X-rite (www.xrite.com), filling the entire field of view.

The Munsell notation and reflectance is listed here for each target used.

- N2.00/M 3% 'Black'
- N2.75/M 5% 'Black'
- N4.75/M 17% 'Gray'
- N9.50/M 88% 'White'

Note: /M refers to a mat finish on the target

Measurements

Figure 2. Measurements on a white target (88% reflectance)

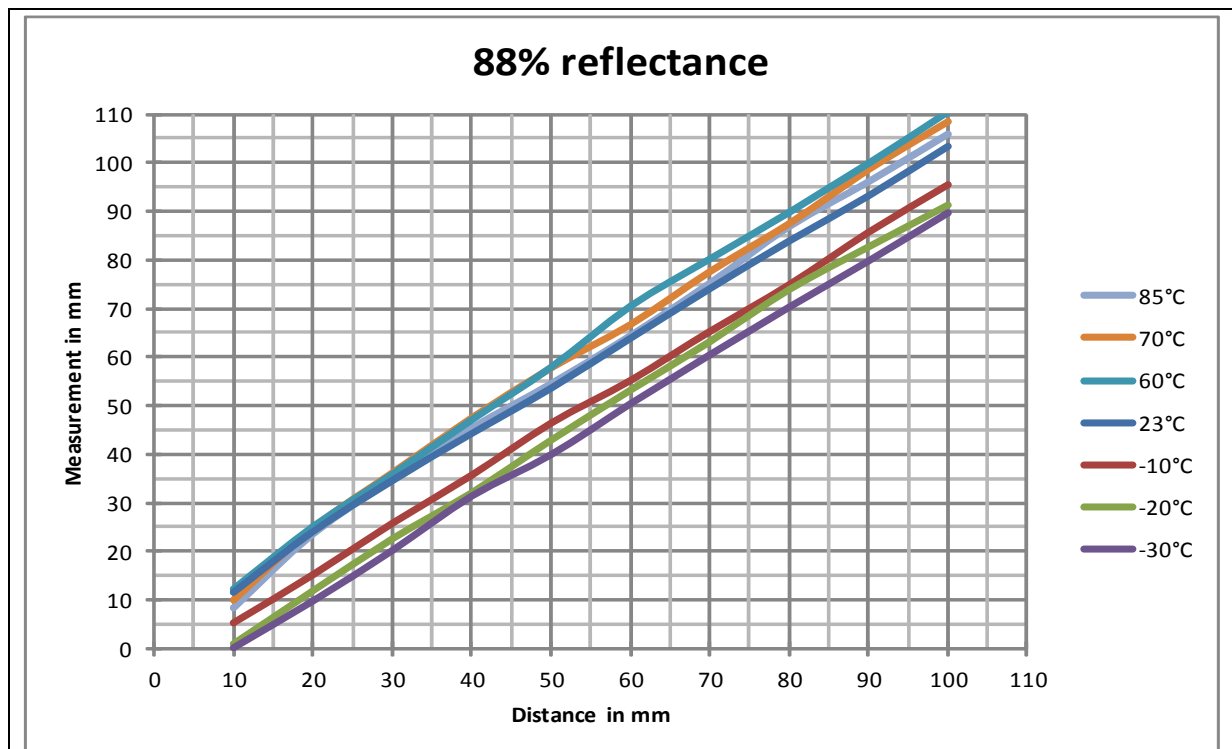


Figure 3. Measurement on a gray target (17% reflectance)

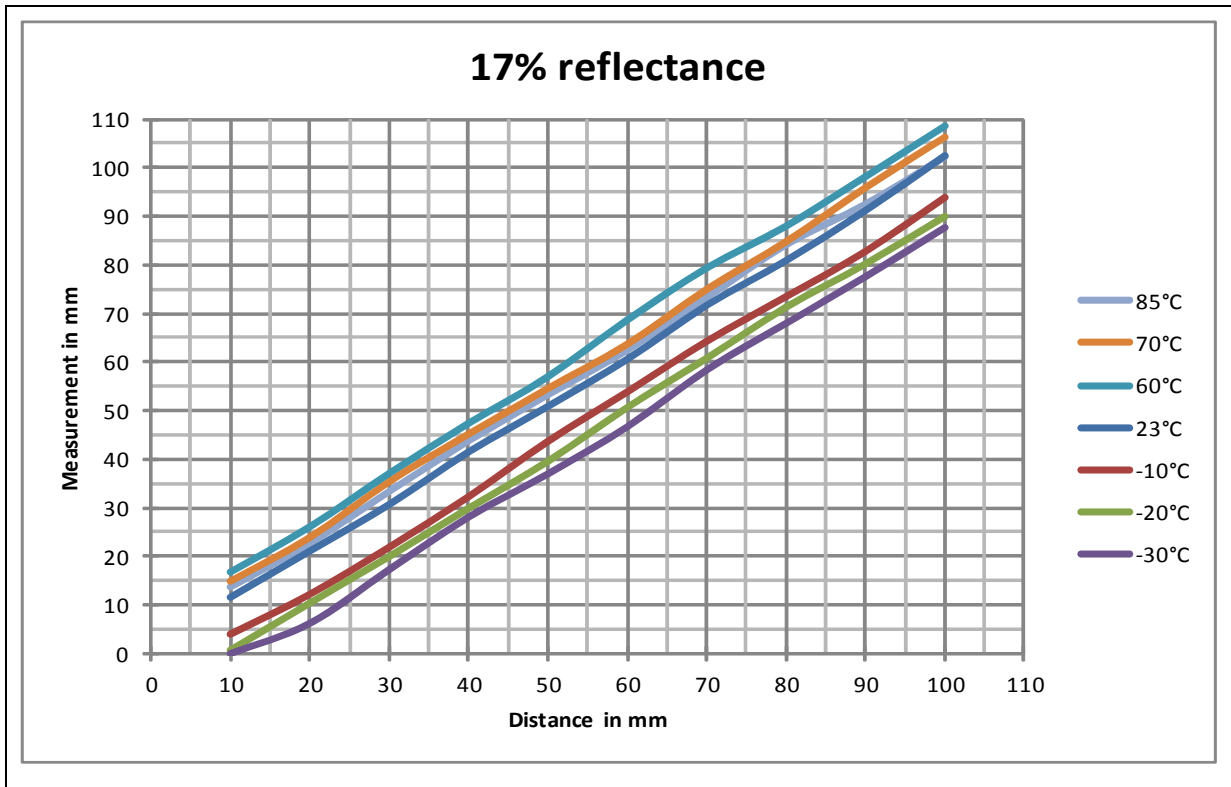


Figure 4. Measurement on a black target (5% reflectance)

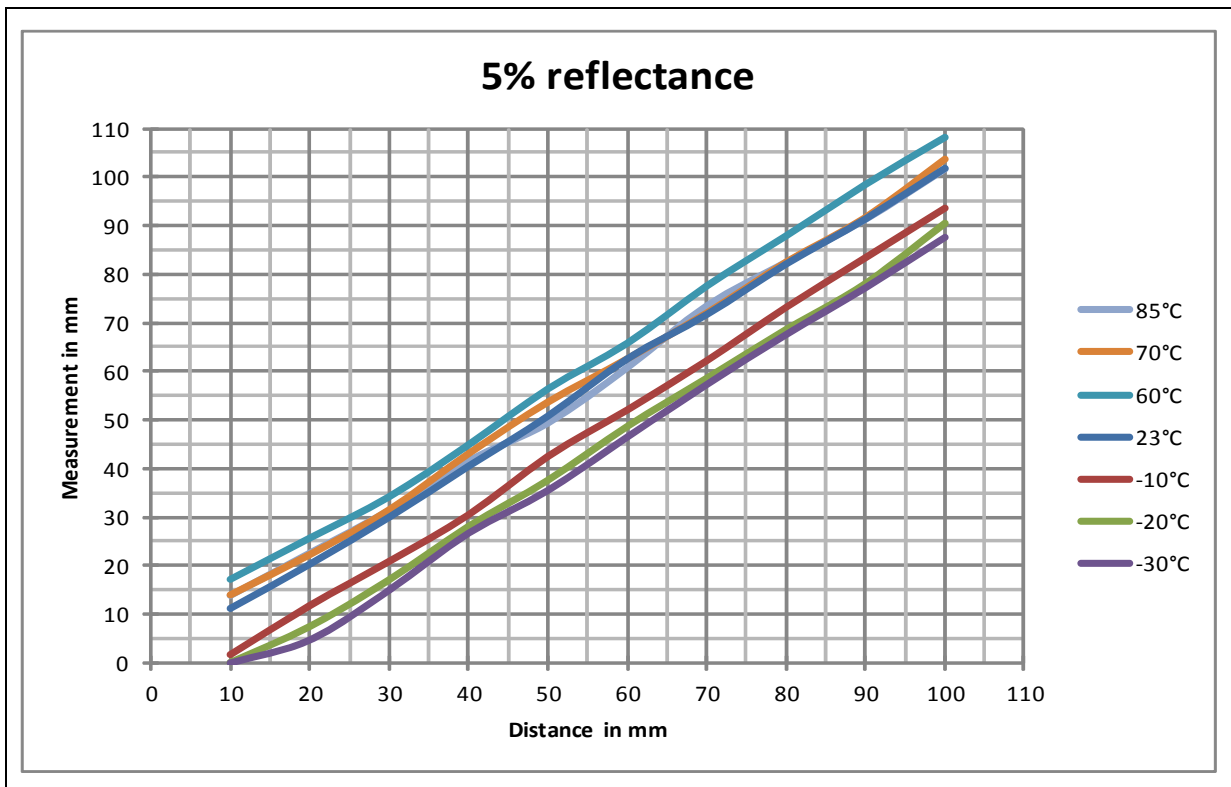
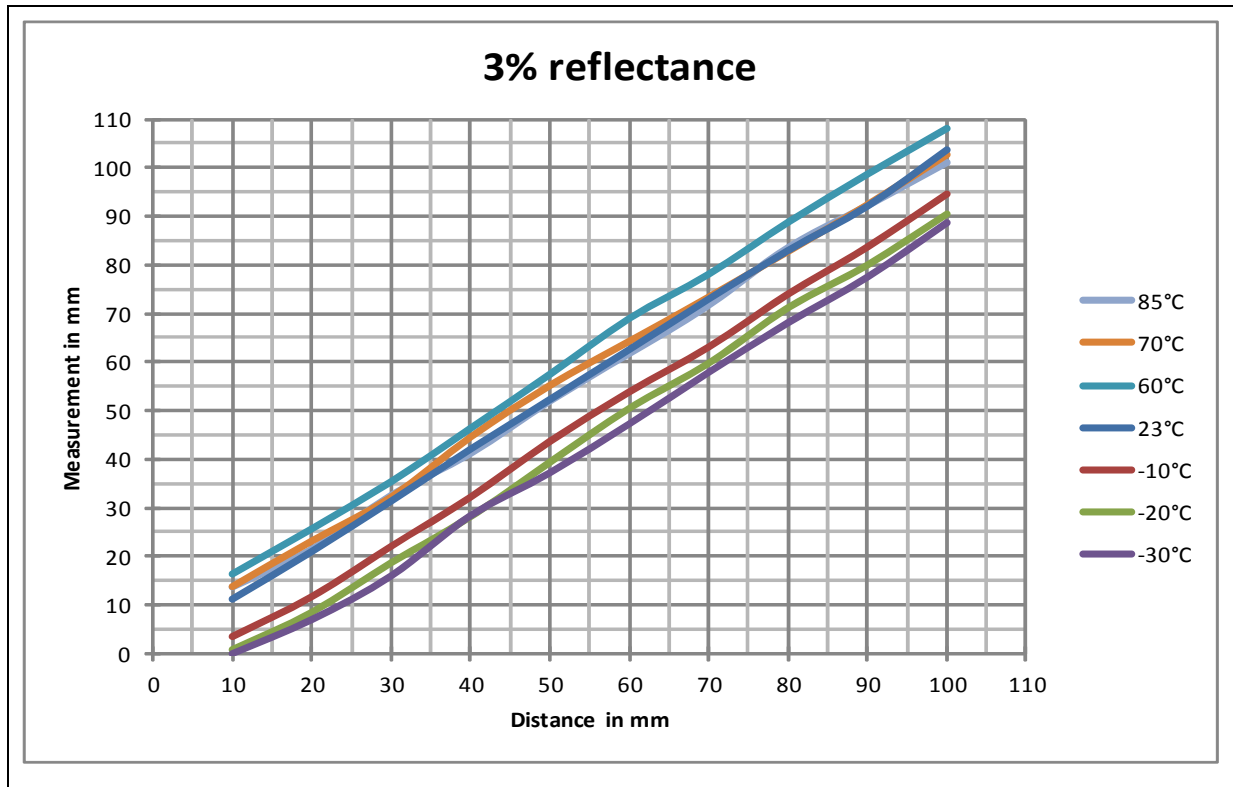


Figure 5. Measurement on a black target (3% reflectance)



Conclusion

Over the temperature range -30°C to +85°C, VL6180X reports a distance measurement varying linearly with the temperature and with a constant offset.

In a system submitted to a large variation of temperature and having the temperature information, the VL6180X behavior allows the user to develop a simple algorithm to compensate this offset in temperature..

1 Revision history

Table 1. Document revision history

Date	Revision	Changes
28-Nov-2014	1	Initial release.

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