VL6180X range status error codes explanation

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Main components	
VL6180X	Proximity and ambient light sensing (ALS) module

Purpose and benefits

The purpose of this document is explain in a little more detail what the range status error codes are in the VL6180X device.

It is assumed that customers who use this document can communicate with the VL6180X through I^2C and are now looking for more information on the range status error codes.
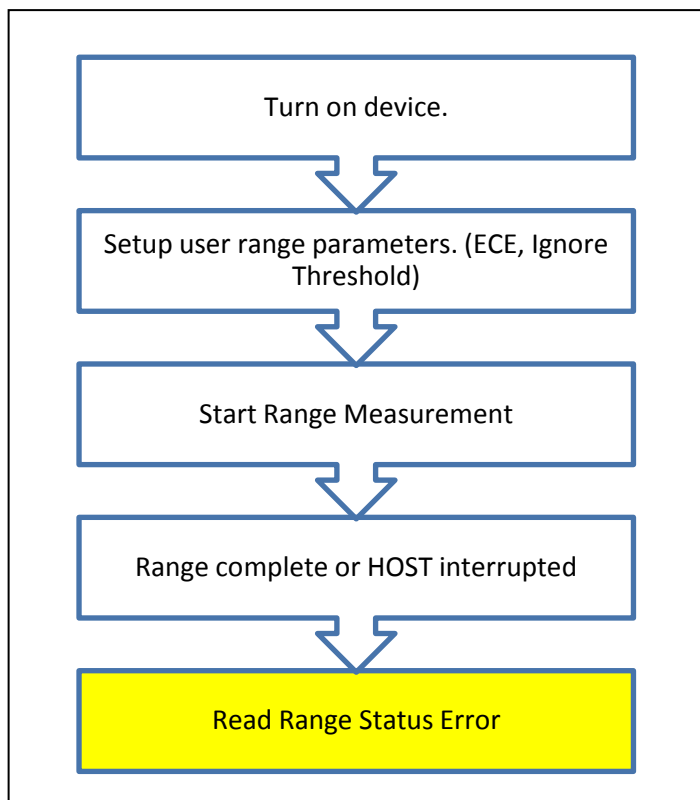
Figure 1. VL6180X device

Description

The range status error codes have been developed for this device to allow the user to read back status codes if there is no measurement received.

Figure 2 below shows under what conditions you would read these error codes.

Figure 2. Range status error code flow

Turn on device.

Setup user range parameters. (ECE, Ignore Threshold)

Start Range Measurement

Range complete or HOST interrupted

Read Range Status Error

Range Status Error Codes:

Table 1 below gives a summary of each range status error code and their meaning. The error codes can be read from register 0x04D.

Table 1: 400mm register settings

Error Code	Error Name	Description
0000	No Error	System is ranging normally with no error reported.
0001	VCSEL Continuity Test	This error along with codes 0010 and 0011 are related to the VCSEL health checks. If there is an error with any one of these, the device should be reset. If there error persists then the device should not be used.
0010	VCSEL Watchdog Test	See above.
0011	VCSEL Watchdog	See above.
0100	PLL1 Lock	Error with internal PLL1 with synchronization. Device should be reset if this error is seen.
0101	PLL2 Lock	Error with internal PLL2 with synchronization. Device should be reset if this error is seen.

0110	Early Convergence Estimate	With the ECE function turned on, if there is no target in front of the VL6180X, this error means there is no target detected and ECE has timed out.
0111	Max Convergence	If there is no target in front of the sensor then a max convergence error may be reported. This means the system has gone to the maximum set time to find a target and has not found one.
1000	No Target Ignore	If ignore target threshold is used then this error may be reported if there is no target in front of the sensor.
1011	Max Signal To Noise Ratio	The system checks ambient signal rate every measurement. If there is more ambient (noise) than signal detected for a given measurement then this error will be reported.
1100	Raw Ranging Algo Underflow	This error may be reported if the target is very close.
1101	Raw Ranging Algo Overflow	This error may be reported if the target is above 200mm.
1110	Ranging Algo Underflow	This error may be reported if the target is very close.
1111	Ranging Algo Overflow	This error may be reported if the target is above 200mm.

These range error codes are to be used to give the HOST an idea of what type of measurement is being read from the VL6180X.

Support material

Related design support material		
MOB-EK2-180-01/1 Product/ system evaluation board		
Documentation		
Datasheet: VL6180X - Proximity and ambient light sensing (ALS) module		

Revision history

Date	Version	Changes
May 29, 2014	1	Initial release

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