ISL29018IROZ-EVALZ

Using the Intersil ALS Software (v520) With Intersil Ambient and Infrared Light-to-Digital Converter With IR LED Driver ISL29018

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Table of Contents

0.0 Evaluation Package

- Demo Board
- Evaluation CD
- USB 2.0 Cable

1.0 System Requirements

- Windows 98/NT/2000/XP/VISTA
- CD Drive
- Available USB Port

2.0 Hardware Setup

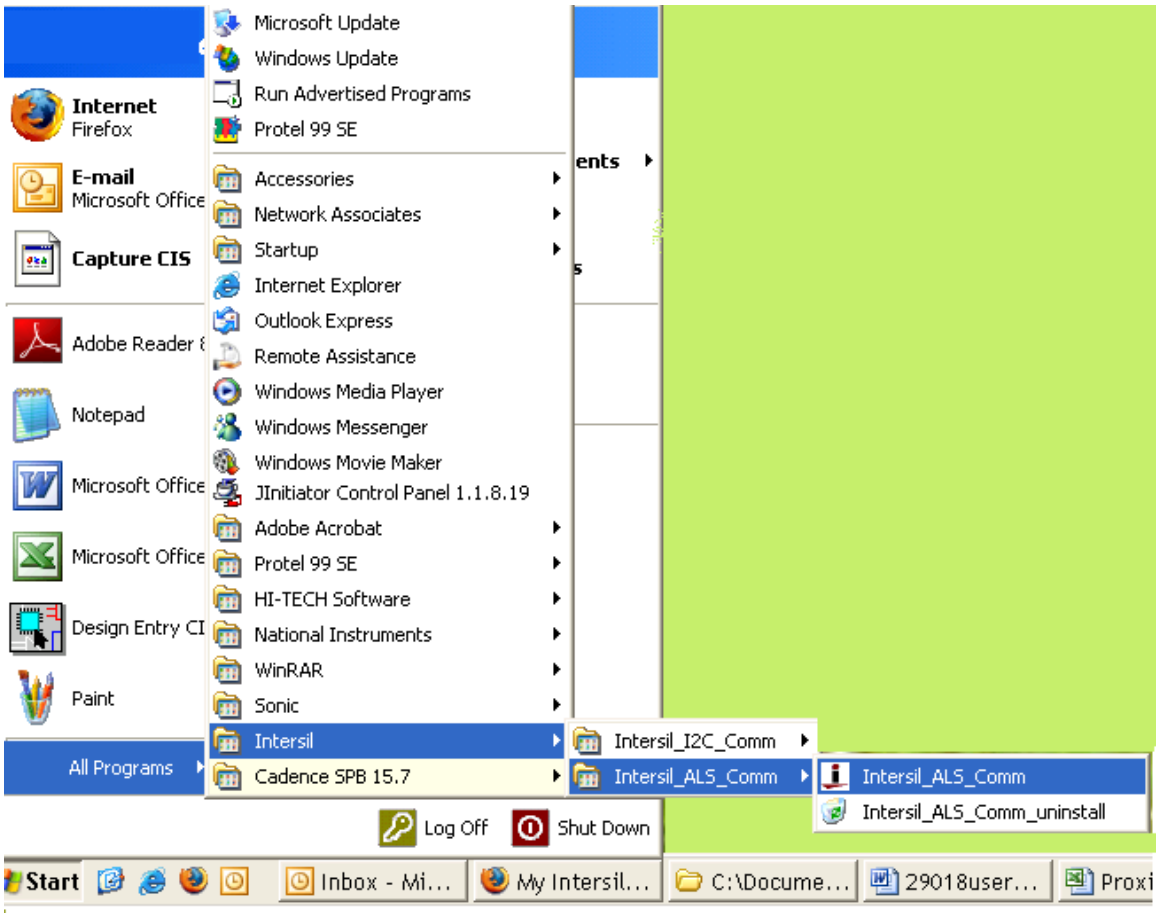
- Connect USB 2.0 Cable to PC first, and then to evaluation board.
- Computer may ask about installing software for new found hardware, select “Yes, this time only”. On the following screen it will ask about how to install hardware. Select the recommended option- Installing from CD- and follow the directions.
- USB is only connector needed.

3.0 Software Installation

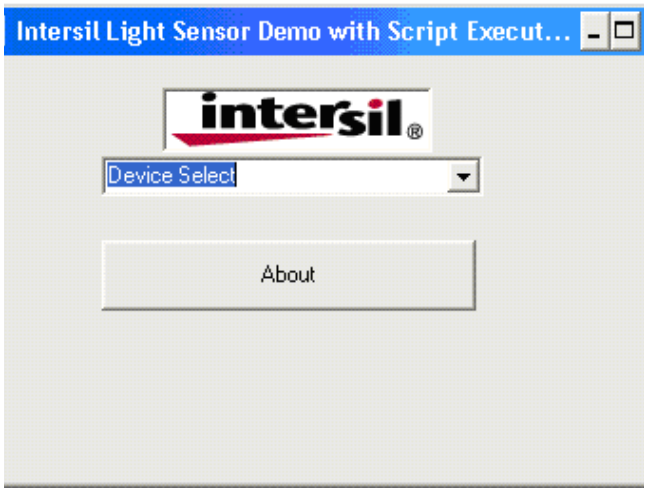
- Insert Intersil CD into CD Drive/player when asked to by the Hardware wizard.
- Install the Intersil software.

4.0 Software Setup

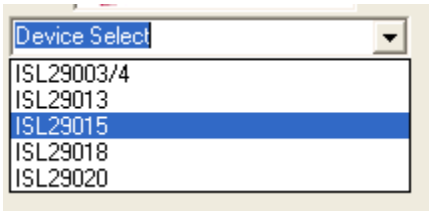
- To open program, go to “Start” menu, Start -> Intersil ->Intersil_ALS_Comm -> Intersil_ALS_Comm



Once you have double clicked the program, the following window will open.



Go to “Device Select” tab and select whichever device you have connected to your computer. For this example, we will use the “ISL29015 Light Sensor”.



One window will open, “ISL29015 Multi-Function Sensor Evaluation Software”. This is the main window in which all demonstrations will be done.

USB Communication - Check to make sure this light is green, if it is not green- check your connection.

Test Communication with IC, click this button; if it shows “good”, then Hardware and Software are properly set up; if it says “fail”, then check your connections. If problem still persists, then you may want to restart the software.

Note: This is common for all devices.

5.0 Multi-Function Sensor Evaluation Software Guide

From menu on left, choose the specific **“Mode”** you want to operate the IC in. A detailed explanation is described in the data sheet. Table 1 on page 4 summarizes the different modes.

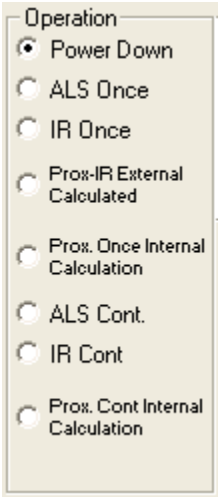
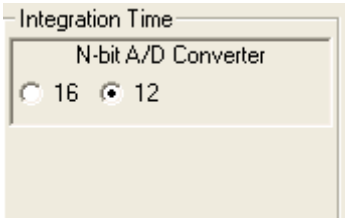


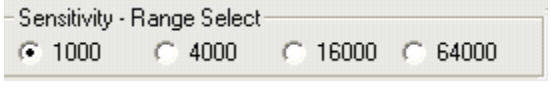
TABLE 1. SUMMARY OF MODES

MODE	EXPLANATION
Power Down	Turn off and keep data in registers
ALS Once	Ambient Light Sense for one conversion then Power-Down
IR Once	Infrared Sense for one conversion then Power-Down
(Prox-IR) External Calculated	Proximity Infrared Sense continuous and continues to refresh registers; Flagging is triggered by algorithm that readjusts self based on external conditions
Prox. Once Internal Calc.	Proximity Infrared Sense for one conversion then Powers Down; Flagging is triggered by Interrupt
ALS Cont.	Ambient Light Sense continuously and continue to refresh registers
IR Cont	Infrared Sense continuous and continues to refresh registers
Prox. Cont Internal	Proximity Infrared Sense continuous and continues to refresh registers; Flagging is triggered by Interrupt

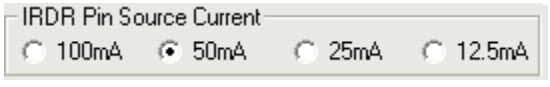
Integration Time - this corresponds to the resolution of the internal ADC, the number of bits allocated to representing Count. Higher resolution (more bits) requires a large number of counts and will need longer acquisition (integration) time.



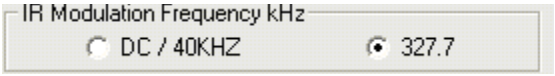
Sensitivity-Range Select - allows you to choose the sensitivity of the sensor based on external conditions/object detection. For example, a really bright object would require a higher range (i.e. 64000), vs a dark object which will require a low range (i.e. 1000). A higher range reduces photo detector sensitivity.



Source current - allows you to adjust the IR LED driving current. A greater current allows for detection of objects at farther distances.



IR Modulation Frequency - allows you to modulate the IR LED driving current. Increasing the frequency parameter allows for better noise immunity.



Interrupt Persistence - allows you to set the interrupt trip-point, and acts as an alarm/monitoring function to determine whether the ADC count exceeds the upper limit. Refer to Table 2.

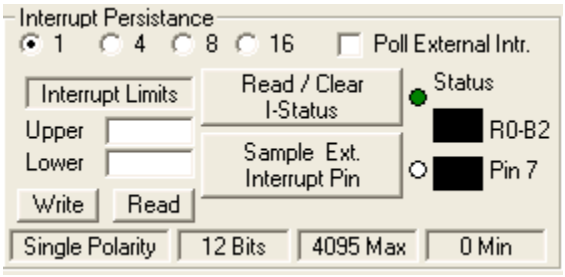


TABLE 2. FUNCTIONS

INTERRUPT PERSISTENCE	Sets the number of times the upper limit need be exceeded or lower limit need be subceded, once the allotted number of times is achieved in consecutive the number of clock cycles (determined by persistence number chosen) then an alarm/interrupt will flag
INTERRUPT LIMITS	Type the upper threshold for the interrupt in the top box (Max = 65535 for Int. Time = 16; Max = 4095 for Int. time = 12). Type the lower threshold for the interrupt in the bottom box (Min = 0, for either Int. Time)
WRITE	Stores value to memory in Registers 4 through 7.
READ	Read limit values stored in Registers 4 through 7.
READ/CLEAR I-STATUS	Checks the 2nd bit of Register 0 to determine Interrupt status, whether interrupt thresholds have been triggered or not. It then displays the results in the “Status” section. The R0-B2 box displays the status of the interrupt. To clear the interrupt status, click 2 times on “Read/Clear” button. Green light means button is on and value from bit 2 from R0 has been read. Square light displays status. If black, then interrupt is off/not triggered yet if red, then interrupt has been triggered.
SAMPLE EXT. INTERRUPT PIN	Samples the external Pin 7 on package of the IC Green light means, button is on and is displaying output of Interrupt pin (7th pin). Square light displays the status. Black means trigger hasn’t been triggered yet and Red means interrupt has just been triggered.
POLL EXTERNAL INTR.	Allows for checking of External Interrupt Status while sampling data.

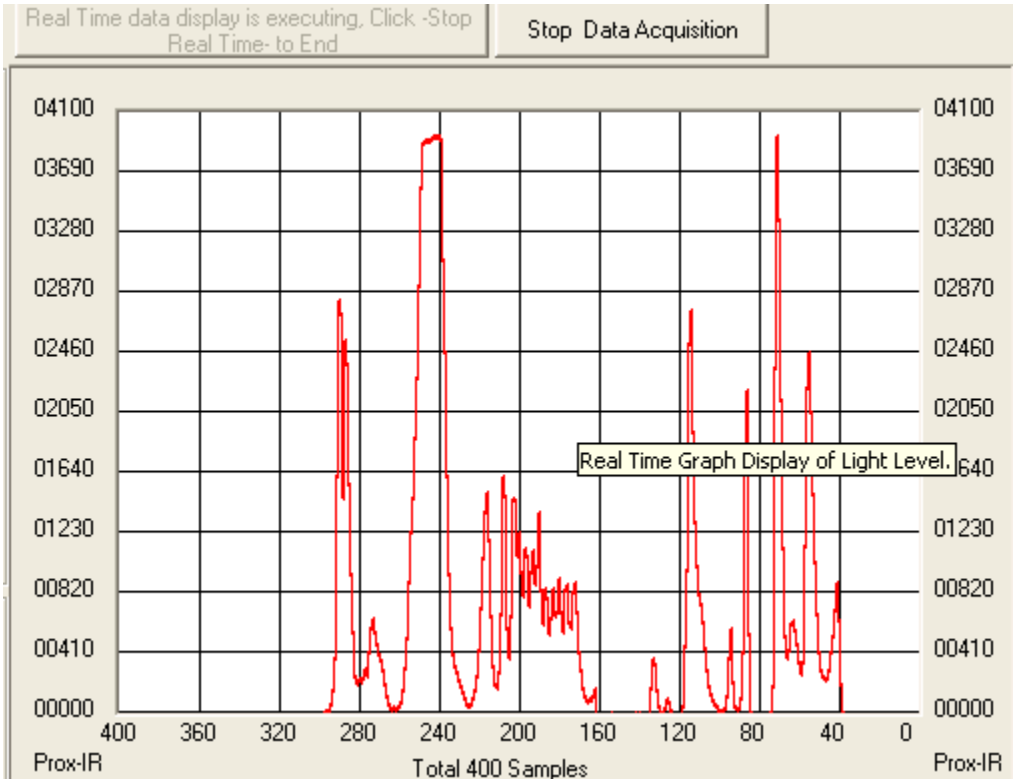
To Use:

1. Choose Interrupt Persistence value (we recommend 8)
2. Enter a decimal number for Upper Limit. Enter a decimal number for Lower Limit.
3. Upper Limit must be greater than Lower Limit. The values for the limits depend on the application, configuration of other options, and distance for which you choose to flag at.
4. Click on “Write” and then click on “Read” and verify that desired limit values are correct (verify that values in entered for intended Limits are same values in field box after clicking on “Read”). If not, repeat steps 2 and 3.

5. Double click “Read/Clear I-Status” to clear status.
6. Now you may choose to manually poll the Interrupt pin (pin 7 on package), or for it to happen automatically. To manually do it-simply click on “Sample Ext. Interrupt Pin” when desired. To do it automatically, ensure “Poll External Intr.” box is selected.
7. Interrupt is set up now, you may begin collecting data. In the status section, the black box means unflagged status, and red means flag has been triggered.

Collect Data Graphical Real Time Data - allows you to sample data (whether ALS, IR, or Prox-IR). Samples are now being taken and are being plotted, and appropriate values are displayed on the right in the corresponding box.

Stop Data Acquisition - To stop sampling of data.

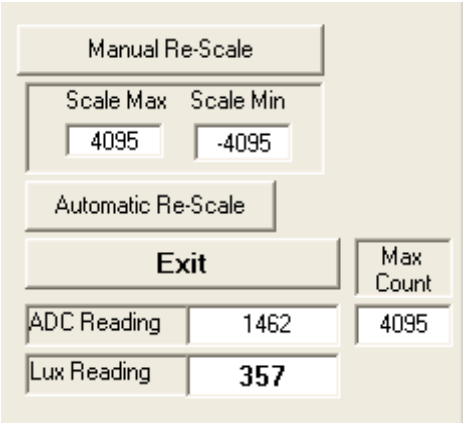


Here, the scale can be adjusted to meet your sampling needs. “**Manual Re-Scale**” allows you to type in the Maximum and Minimum values for the scale (vertical axis) in the appropriate boxes. The “**Automatic Re-Scale**” button is useful if sampled data is out of range of graph or need to zoom-in on data. It will rescale the vertical axis to an appropriate field of view.

Exit - this button closes the entire program

The value in the “**ADC Reading**” and/or “**Lux Reading**” fields are the appropriate output coming out of the sensor according to which Mode is engaged.

Max Count - This is the maximum value that can be measured based on the resolution chosen (Integration Time). Max count increases with more Integration Time.



6.0 Troubleshooting

- If suffering from poor USB connection; USB port may need to change.
- If Proximity sensor is unable to measure anything within a certain distance, the sensor has saturated and the Selectivity parameter needs to be increased.
- If the program says connection fail and instantly the sensor stops working, then simply unplug it from the computer and plug it back in. If problem still persists then unplug, close program, plug it back in and reopen program.
- If during a measurement, program crashes or instantly the Evaluation board is no longer detected as being connected, then unplug and plug back in.
- If too much noise is being picked up, then increase the Frequency parameter.
- If you require better detection of far distances, then increasing the current parameter will help.

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