

Using the Intersil ALS Software (v 541) with Intersil Ambient and Infrared Light to Digital Converter with IR LED Driver ISL29011



FIGURE 1.

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Evaluation Package

- Demo Board
- Evaluation CD
- USB 2.0 Cable

System Requirements

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

Hardware Setup

1. Connect the USB 2.0 Cable to the PC first, and then to the Evaluation Board.

2. The Computer may ask about installing software for new found hardware; select "Yes, this time only."
3. On the following screen, it will ask about how to install hardware. Select the recommended option (Installing from CD) and follow the directions.
4. The USB is the only connector needed.

Software Installation

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

Software Setup

To open the program, go to the "Start" menu, Start -> Intersil -> Intersil_ALS_Comm -> Intersil_ALS_Comm. (see Figure 2).

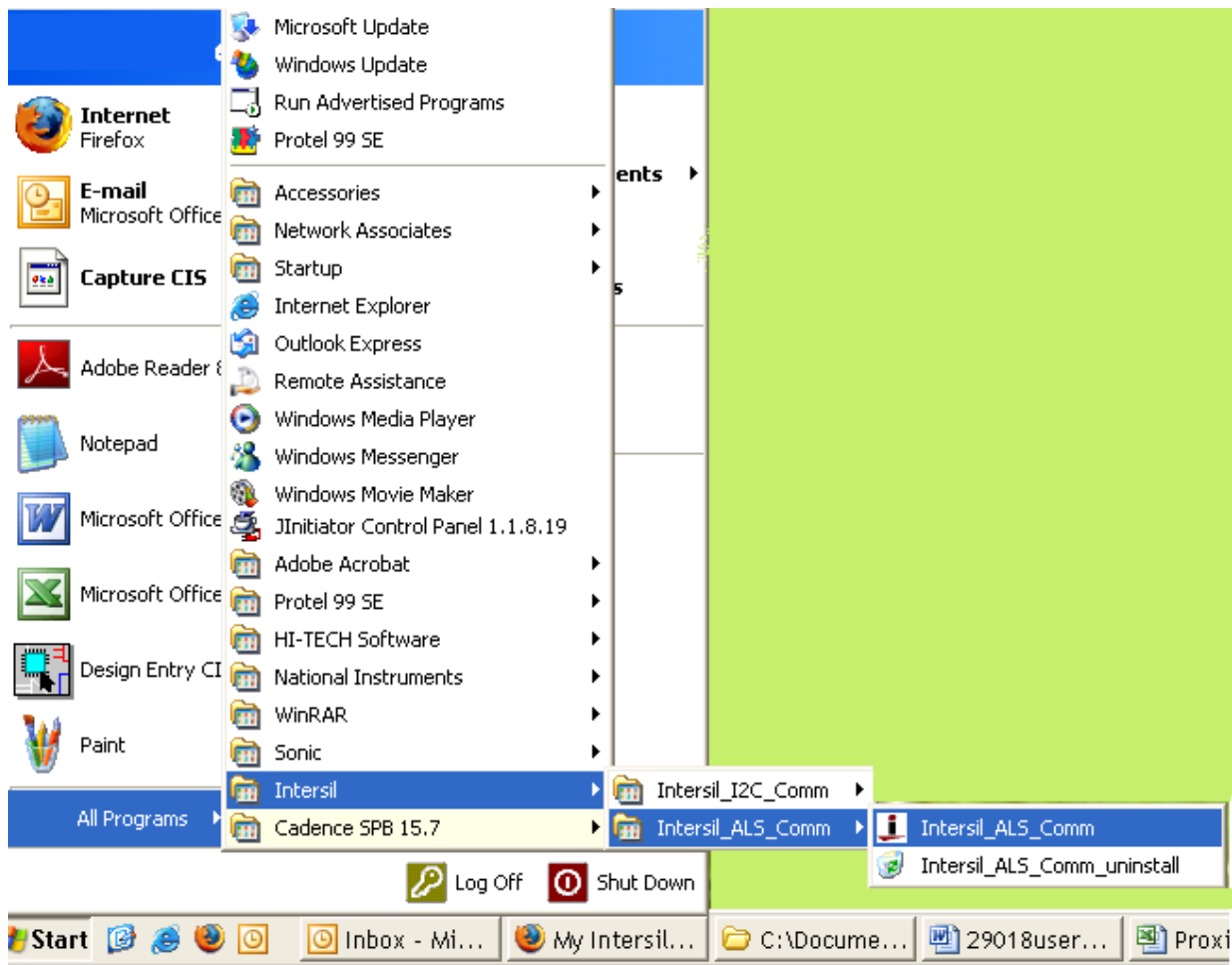


FIGURE 2.

Application Note 1529

Once you have double clicked the program, the following window will open (see Figure 3).

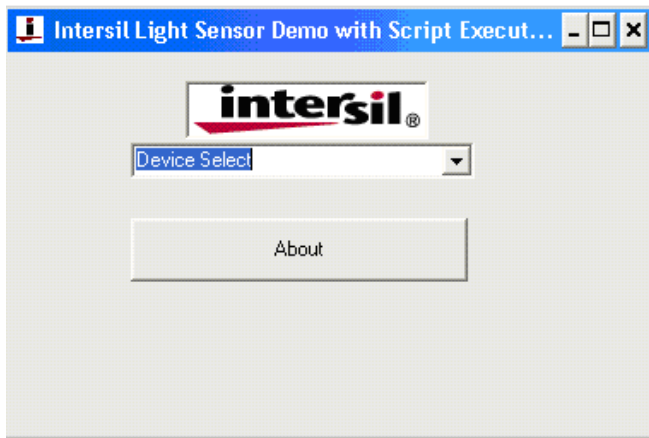


FIGURE 3.

Go to the "Device Select" tab and select which ever Device you have connected to your computer (see Figure 4) For this example, we will use the "ISL29011 Light Sensor."

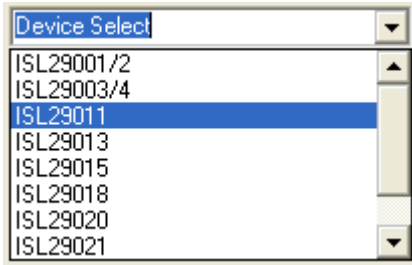


FIGURE 4.

One window will open; "ISL29011 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.



FIGURE 5.

Testing Communication- To test communication with the IC, click the button shown in Figure 6; if it shows "good", then the Hardware and Software are properly set up; if it says "fail", then check your connections. If the problem still persists then you may want to restart the software.



FIGURE 6.

Note: This is common for all devices

Multi-Function Sensor Evaluation Software Guide

From the menu on the left, choose the specific "Mode" in which you want to operate the IC. A detailed explanation

is described in the data sheet ([FN6467](#)). Table 1 summarizes the different modes.

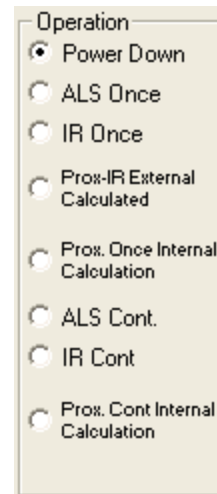


FIGURE 7.

TABLE 1.

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. Once Internal Calc.	Proximity Infrared Sense for one conversion then Power-down; Flagging is triggered by Interrupt.
ALS Cont.	Ambient Light Sense continuously and continue to refresh registers.
IR Cont	Infrared Sense continuously and continue to refresh registers.
Prox. Cont Internal	Proximity Infrared Sense continuously and continue 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.

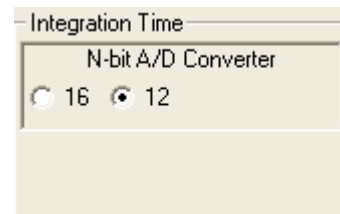


FIGURE 8.

Application Note 1529

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), versus a dark object, which will require a low Range (i.e. 1000). Higher range reduces photo detector sensitivity.

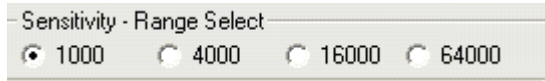


FIGURE 9.

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

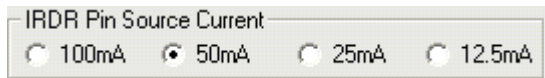


FIGURE 10.

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

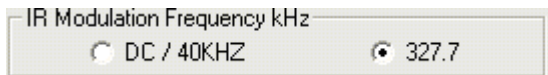


FIGURE 11.

This section 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.

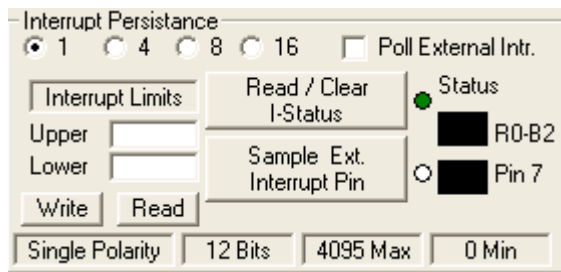


FIGURE 12.

The Interrupt function will work for both ALS and Prox modes.

To use:

1. Choose Interrupt Persistence value (we recommend 8)
2. Enter a decimal number for the Upper Limit. Enter a decimal number for the Lower Limit.
3. The Upper Limit must be greater than the 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 the same values in the field box after clicking on "Read"). If not, repeat steps 2-3.
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. Collecting data is within the Upper Limit and the Lower Limit; the black box means unflagged status. On the other hand, either collecting data is above the Upper Limit or the lower of the Lower Limit, then the black block will be red, which means a flag has been triggered.

TABLE 2.

Interrupt Persistence	Sets the number of times the upper limit need be exceeded or lower limit need be sub ceded- once the allotted number of times is achieved- 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 4-7
Read	Read limit values stored in Registers 4-7
Read/Clear I-Status	Checks the 2 nd 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 (7 th pin) - Square light displays the status, black means trigger hasn't been triggered yet - Red means interrupt has just been triggered
Poll External Intr.	Allows for checking of External Interrupt Status while sampling data.

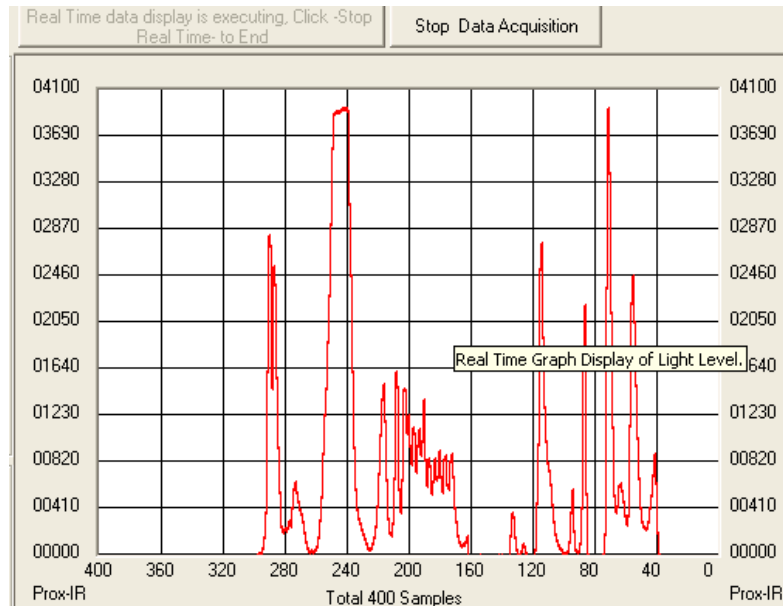


FIGURE 13.

Collect Data Graphical Real Time Data - Allows you to sample data (whether ALScont, IRcont, or Proxcont). 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 the 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 the graph or you need to zoom-in on data. It will rescale the vertical axis to an appropriate field of view.

- The **Exit** button closes the entire program
- The value in the **"ADC Reading"** and/or **"Lux Reading"** fields are the appropriate outputs 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.

"AD Maximum", **"AD Minimum"** displays max ADC reading out and min ADC reading out at certain lighting conditions. Those options help for setting upper and lower interrupt limits. **"Every 25 Rdgs"** means update display readings in Dec and Hex every 25 ADC Readings.

- **"Clear button"** will refresh AD Maximum, AD Minimum and Every 25 Rdgs readings for next condition of light source.

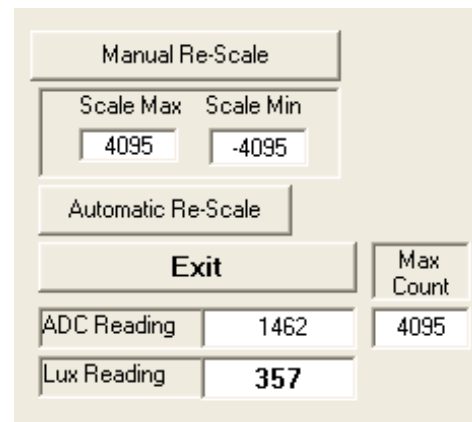


FIGURE 14.

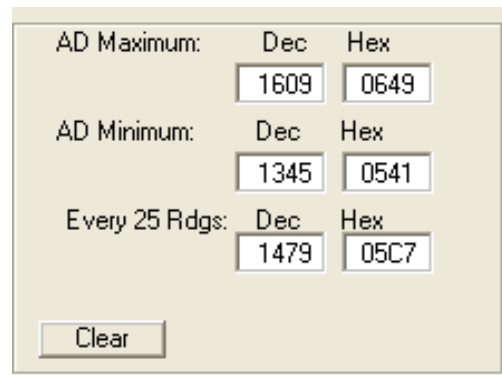


FIGURE 15.

Trouble Shooting

If suffering from poor USB connection; the USB port may need to be changed.

If the Proximity sensor is unable to measure anything within a certain distance, the sensor is saturated and the Selectivity parameter needs to be increased.

If the program says connection fail and the sensor instantly stops working, then simply unplug it from the computer and plug it back in. If the problem still persists then unplug, close the program, plug it back in, and reopen the program.

If during a measurement, the 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.

Intersil Corporation reserves the right to make changes in circuit design, software and/or specifications at any time without notice. Accordingly, the reader is cautioned to verify that the Application Note or Technical Brief is current before proceeding.

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