

IT-CCD G2 Evaluation Hardware Quick Start Guide



ON Semiconductor®

www.onsemi.com

Eval Board User's Manual

Before You Begin

Confirm that all of the required components are available:

- Evaluation Hardware and Supported Image Sensor.
The Evaluation Hardware consists of an Imager board, an FPGA board, and a Lens Mount kit. A list of image sensors supported by the Evaluation Hardware can be found at www.onsemi.com. Note that different image sensors require the use of separate Imager Boards – please consult the information at the web page above to confirm that the appropriate imager board is matched to the sensor being evaluated.
- Sensor Studio Software.
The most recent version can be downloaded at www.onsemi.com.
- Frame Grabber (optional).
Evaluation kit supports USB2 but data rate is very slow and only single channel sensor operation is supported. For faster speed and multichannel operation two Camera Link Frame Grabbers are currently supported:
 1. Imperx FrameLink Express (Expresscard54), and
 2. Bitflow NOEN CLB (PCI Express 4x).
- Computer.
Windows 7 and Windows 10 64 bit, 2+ GHz processor, 8 GB RAM, USB connection, available ExpressCard 54 (Laptop) or PCI Express slot (desktop).
- Power Supply.
12 V DC, 2 A, with 2.1 mm center positive DC power jack.
- Cables.
For Imperx Frame Grabber: Camera Link SDR to SDR cable. For Bitflow Frame Grabber: Camera Link SDR to MDR cable. 2 meter cable length is recommended.
- Lens.
The Lens Mount kit is compatible with C, CS, and F mount lenses.
- Table-top Tripod. (Optional)

Install SensorStudio

Install Sensor Studio software by running the “setup.exe” file. During the installation process, software drivers can be selected. All installations should select the G2 USB2 driver for use with this Eval kit. USB is mandatory for firmware updates.

Install Frame Grabber (Optional)

Obtain frame grabber software from vendor and install per instructions from them. With the computer turned off, install the Frame Grabber hardware. When the computer is turned on, the new hardware will be detected. Since software drivers were loaded by vendor installers, the “default recommended location” can be used to complete the installation.

If using an Imperx frame grabber, run the file “FLExDvrManager.exe”, and disable CameraLink status check for both CameraLink channels.

Assemble Evaluation Hardware

- Install Sensor onto Imager Board.
Be careful to ensure that the sensor is correctly inserted into the socket. While the sensor (and socket) are keyed, it is still possible to shift placement laterally. More information on the proper handling of image sensors can be found in the application note ‘Image Sensor Handling and Best Practices’, available at www.onsemi.com.
- Assemble Optics.
Follow the assembly instructions included with the Lens Mount Kit to secure the appropriate mount to the Imager Board, and then attach the lens.
- Assemble Boards.
The FPGA and Imager boards connect via board-to-board style connectors located on the back of each board. Orient the boards so that the silkscreen or printing on both is right side up (readable), and then connect together. The entire assembly can now be secured to a tripod using the included tripod mount.
- Plug in power and camera link cables.
With the Evaluation Kit powered off, insert the Camera Link cable into the frame grabber and into the base connector on the FPGA board. Insert the power plug into the receptacle on the FPGA board. Turn on the Power.

Run Sensor Studio

- **Launch Program.**
Double click the Sensor Studio II desktop icon (Figure 1) to launch the software. Once the interface loads, click the ‘G2’ button (Figure 2) at the top of the screen. An image display window and the control GUI will appear on the screen.



Figure 1.



Figure 2.

- **Connect to Frame Grabber.**
Go to the control GUI and select the “Connection” tab. Select Camera Link or USB. If Camera Link then choose either the ImperxG2 or BitflowG2 option, depending on the Frame Grabber being used. Click the Connect to Hardware button. The red light will change to green indicating that a connection has been established. (Figure 3) If no connection can be established, confirm that the Frame Grabber has been properly recognized and installed by the system (as viewed in Device Manager), and then refer to the installation guide for the frame grabber.

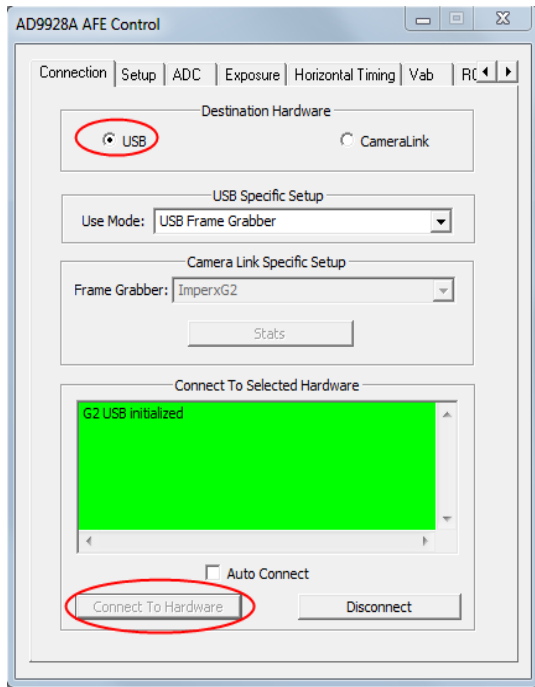


Figure 3.

- **Initialize System.**
Select the “Setup” tab from the control GUI. Press the Initialize button to begin running the configuration script which will initialize the system. (Note that system initialization can take as long as 30 seconds depending on computer hardware.) See Figure 4. When initialization is complete, the system will default to live capture mode, and a live image will appear in the display window. Note that errors during initialization typically occur as a result of a bad Camera Link cable connection – be sure that connectors are screwed in at both ends of the cable.

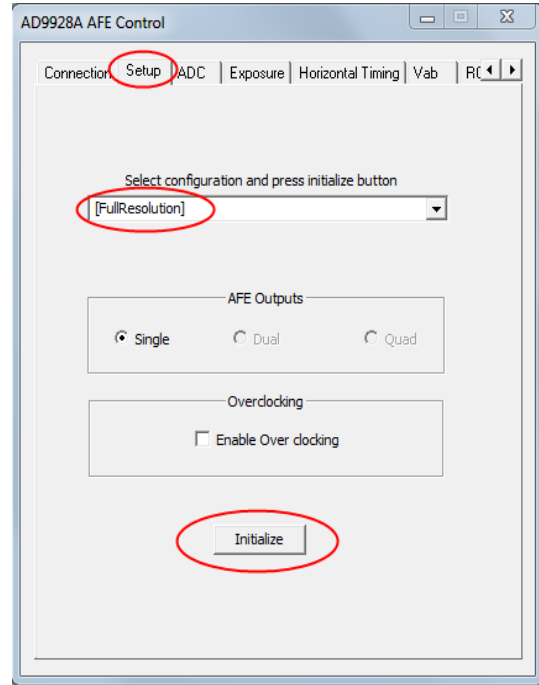


Figure 4.

Next Steps

Sensor Studio provides a number of controls to evaluate operation of the sensor, including image capture, processing, and characterization. Additional information on these controls is included in the Sensor Studio help system, which is available from the HELP menu by selecting “SS and Python Help”.

For additional help in system setup, please contact ON Semiconductor at www.onsemi.com/imagesensors or by e-mail at is-support@onsemi.com.

onsemi, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

The evaluation board/kit (research and development board/kit) (hereinafter the "board") is not a finished product and is not available for sale to consumers. The board is only intended for research, development, demonstration and evaluation purposes and will only be used in laboratory/development areas by persons with an engineering/technical training and familiar with the risks associated with handling electrical/mechanical components, systems and subsystems. This person assumes full responsibility/liability for proper and safe handling. Any other use, resale or redistribution for any other purpose is strictly prohibited.

THE BOARD IS PROVIDED BY ONSEMI TO YOU "AS IS" AND WITHOUT ANY REPRESENTATIONS OR WARRANTIES WHATSOEVER. WITHOUT LIMITING THE FOREGOING, ONSEMI (AND ITS LICENSORS/SUPPLIERS) HEREBY DISCLAIMS ANY AND ALL REPRESENTATIONS AND WARRANTIES IN RELATION TO THE BOARD, ANY MODIFICATIONS, OR THIS AGREEMENT, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION ANY AND ALL REPRESENTATIONS AND WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, NON-INFRINGEMENT, AND THOSE ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE CUSTOM OR TRADE PRACTICE.

onsemi reserves the right to make changes without further notice to any board.

You are responsible for determining whether the board will be suitable for your intended use or application or will achieve your intended results. Prior to using or distributing any systems that have been evaluated, designed or tested using the board, you agree to test and validate your design to confirm the functionality for your application. Any technical, applications or design information or advice, quality characterization, reliability data or other services provided by **onsemi** shall not constitute any representation or warranty by **onsemi**, and no additional obligations or liabilities shall arise from **onsemi** having provided such information or services.

onsemi products including the boards are not designed, intended, or authorized for use in life support systems, or any FDA Class 3 medical devices or medical devices with a similar or equivalent classification in a foreign jurisdiction, or any devices intended for implantation in the human body. You agree to indemnify, defend and hold harmless **onsemi**, its directors, officers, employees, representatives, agents, subsidiaries, affiliates, distributors, and assigns, against any and all liabilities, losses, costs, damages, judgments, and expenses, arising out of any claim, demand, investigation, lawsuit, regulatory action or cause of action arising out of or associated with any unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of any products and/or the board.

This evaluation board/kit does not fall within the scope of the European Union directives regarding electromagnetic compatibility, restricted substances (RoHS), recycling (WEEE), FCC, CE or UL, and may not meet the technical requirements of these or other related directives.

FCC WARNING – This evaluation board/kit is intended for use for engineering development, demonstration, or evaluation purposes only and is not considered by **onsemi** to be a finished end product fit for general consumer use. It may generate, use, or radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to part 15 of FCC rules, which are designed to provide reasonable protection against radio frequency interference. Operation of this equipment may cause interference with radio communications, in which case the user shall be responsible, at its expense, to take whatever measures may be required to correct this interference.

onsemi does not convey any license under its patent rights nor the rights of others.

LIMITATIONS OF LIABILITY: **onsemi** shall not be liable for any special, consequential, incidental, indirect or punitive damages, including, but not limited to the costs of requalification, delay, loss of profits or goodwill, arising out of or in connection with the board, even if **onsemi** is advised of the possibility of such damages. In no event shall **onsemi**'s aggregate liability from any obligation arising out of or in connection with the board, under any theory of liability, exceed the purchase price paid for the board, if any.

The board is provided to you subject to the license and other terms per **onsemi**'s standard terms and conditions of sale. For more information and documentation, please visit www.onsemi.com.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:

Technical Library: www.onsemi.com/design/resources/technical-documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales