

KAE Family Evaluation Kit Quick Start Guide

This guide will help you get up and running using the KAE family of sensors with the ON Semiconductor G3 hardware and SensorStudio software.

Before You Start

- **Evaluation Hardware and Supported Image Sensor**
The Evaluation Hardware consists of an Imager board with cooling, FPGA processor board and a lens mount.
- **Optional TE Cooler Controller**
The KAE Evaluation kits have a TE cooler. To operate the cooler (recommended) a controller is required.
The TE cooler/controller have special power supply requirements. See TE Cooler section.
- **Optional Camera Link Interface**
Camera Link is supported (except KAE-01093) by the installing the (optional) Microtronix A6287 HSMC interface card and using the (optional) Imperx FrameLink Express frame grabber. See Camera Link section.
- **SensorStudio Software**
The most recent version can be downloaded at www.onsemi.com.
- **USB**
USB 3.0 is supported.
- **Computer**
Windows 7 and Windows 10 64 bit, 2+ GHz processor, 8 GB RAM, USB connection.
- **Power Supply**
12 V DC, 2 A, with 2.1 mm center positive DC power jack.
- **Cables**
2 meter USB 3.0 cable is included with the kit.
- **Lens Mount and Lens**
A C/CS lens mount is provided with the full KAE-01093 and KAE-0215X kits. An F mount is provided for the full KAE-0447X and KAE-0815X kits. No lens is provided. For KAE-0215X and KAE-0447X imager board only products there is no sensor or lens mount provided. For the KAE-01093 imager board only product there is no sensor provided but a C type lens mount is provided.



ON Semiconductor®

www.onsemi.com

EVAl BOARD USER'S MANUAL

Install SensorStudio Software

Install the software by running the “setup.exe” file, and check the boxes for installing the USB 3.0 drivers if they have never been installed. The 64-bit USB3 driver is not digitally signed. Read *First_InstallerInstructions.pdf* document, which is part of the SensorStudio installer, for information on driver installation.

Camera Link Hardware and Software

Camera link is a supported option with the KAE0215X and KAE0447X plugins. It is not supported in the KAE01093 plugin.

Use of Camera Link can double the display rate and is useful with the larger KAE devices. To use Camera Link you will need 2 SDR-SDR cables to support medium format.

Camera Link is only used for image transfer. You will always need a USB connection for control.

If you are planning on using Camera Link, you will need the Imperx frame grabber. For a laptop, use the VCE-CLEX01, which needs an ExpressCard54 interface. For a desktop use VCE-CLPCIE01, which needs a PCIe X1 slot. Consult the instructions in the SDK you download from Imperx for installing the hardware and software.

Assemble Evaluation Hardware

• Sensor, Lens Mount

The full KAE Evaluation Kit for KAE-0215X and KAE-01093 comes with a C type lens mount installed and a lens cover. The full KAE Evaluation Kit for KAE-0447X and KAE-0815X come with an F mount. All imager board only products (not the full kit) need to have the sensor installed. You will need to apply thermal grease to the cooling system cold finger prior to installing the sensor.

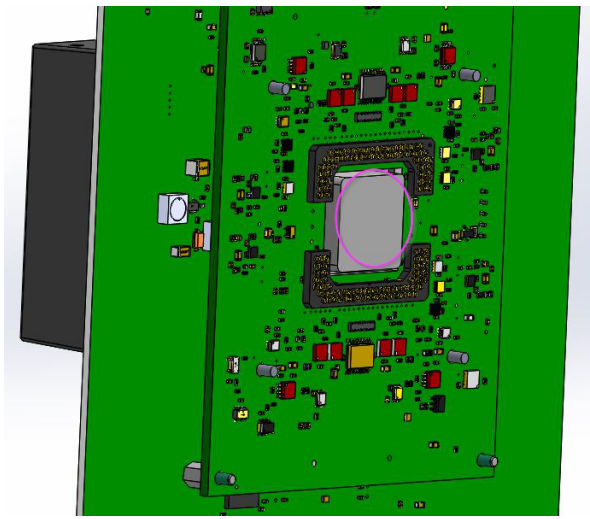


Figure 1. Thermal Grease

When installing the sensor be sure to notice the pins are keyed so it can only be installed one way.

After the sensor is installed you will need to install the lens mount. All lens mounts are designed to counteract the force from the cold finger spring which will try to push the sensor out of the socket.

The KAE-01093 imager board has a more complex lens mount because it is part of a passive cooling system. Make sure to use all 8 of the M2 screws you remove when you disassemble the lens mount from the imager board. When you reinstall them tighten each a little at a time so you are always applying even pressure against the front of the sensor.

• **Plug in Power and Communication Cables**

With the Evaluation Kit powered off, insert the USB cable into your PC. Insert the power plug into the receptacle on the Imager/FPGA board. Turn on the Power. Use DeviceManager to verify “Truesense USB3” seen by the system.

• **TE Cooler Controller (Recommended)**

Connect the controller to the TE cooler interface connector using the supplied pigtail (wires, contacts and 5 pin housing). The internally cooled kits have the interface connector on the imager board. The externally cooled kit has a short cable going to the thermistor and TEC. Pinout for the cooler and thermistor is shown below:

Pin Number	Connection
1	Thermistor red
2	Thermistor black
3	No Connection
4	TE Cooler Red (pos)
5	TE Cooler Black (neg)

The external TE Cooler is a 2 stage TE Technologies TE-2-127-127-1.3. The thermistor is a 15K TE Technology MP-2444 15. Use of the TE Technology TC-48-20 controller is recommended. Recommend cooling to +5°C for the KAE-0215X externally cooled kit and to 0°C for the KAE-01093, KAE-0215X, KAE-0447X and KAE-0815X internally cooled kits. If frosting or condensation occur raise the operating temperature of the TE controller 2-3 degrees. TC-48-2 controller has a DC power supply input range of 0 to 50 V. Whatever input you supply is the output it will use to drive the TEC. **Do not violate the voltage levels below:**

Kit:	Voltage:	Current:
KAE-01093 Internal TEC	11.2 V	1.1 A
KAE-0215X internal TEC	11.2 V	1.1 A
KAE-0447X and KAE-0815X internal TEC	14 V	1.4 A

TE CONTROLLER POWER SUPPLY:

Use an adjustable power supply. DO NOT run the 11.2 V TEC devices with a 12 V supply. This reduces efficiency of TEC and sends too much current through it. Recommend adjustable power brick such as Ellway 4-24 V, 2.5 A, 2.1 x 5.5 connector, part number HGJL-1509T.

VERY IMPORTANT:

Do not drive the TEC cooler with the TEC controller unless the fan in the cooling tower is running. You can damage to TEC cooler.

Run SensorStudio

• **Shortcut**

To properly configure the shortcut icon for SensorStudio, right click, choose properties and then select the compatibility tab. Set the OS for your OS and enable “run as admin”. The latter is needed if you install SensorStudio in the standard Program Files area which is owned by admin.

• **Launch Program**

Double click the SensorStudio desktop icon to launch the software.

• **Load Plugin**

The plugin can be loaded by clicking the G3 button in the toolbar.



The KAE-01093 sensor will use the KAE1093 plugin. The KAE-0215X uncooled sensor will use the KAE plugin. The KAE-0215X cooled sensor will use the

KAE0215X plugin. The KAE-0447X and KAE-0815X sensors will use the KAE0447X plugin.

• Connect to Hardware

- ◆ Select the “Connection” tab within the control GUI
- ◆ Select Camera Link or USB
- ◆ Click the Connect button
- ◆ The yellow indicator will change to green indicating that a connection has been established

Launch Scripts

The plugin requires you to run scripts to set up the imaging hardware:

- ◆ Go to the Setup tab
- ◆ Select script set from the dropdown box:
 - KAE-0215X uncooled uses KAE_0XXXX
 - KAE-01093, Internally cooled KAE-0215X and all KAE-0447X and KAE-0815X parts use G3_AFE_SETUP
- ◆ Hit initialize
- ◆ You should see a progress bar pop up
- ◆ When done the imager should be running

Next Steps

SensorStudio provides a number of controls to evaluate the operation of the sensor including image capture, processing, and characterization.

Additional information on these controls is included in the SensorStudio help system, which is available from the HELP menu by selecting “SS2 and Python Help”. There is also help on the plugin and GUI panels. For additional help, please contact ON Semiconductor at:

www.onsemi.com/imagesensors

by e-mail: is-support@onsemi.com.

ON Semiconductor and the ON Semiconductor logo are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor 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 as such not available for sale to consumers. The board is only intended for research, development, demonstration and evaluation purposes and should as such 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 delivered "AS IS" and without warranty of any kind including, but not limited to, that the board is production-worthy, that the functions contained in the board will meet your requirements, or that the operation of the board will be uninterrupted or error free. ON Semiconductor expressly disclaims all warranties, express, implied or otherwise, including without limitation, warranties of fitness for a particular purpose and non-infringement of intellectual property rights.

ON Semiconductor 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 ON Semiconductor shall not constitute any representation or warranty by ON Semiconductor, and no additional obligations or liabilities shall arise from ON Semiconductor having provided such information or services.

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. Should you purchase or use the board for any such unintended or unauthorized application, you shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of 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 ON Semiconductor 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.

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

LIMITATIONS OF LIABILITY: ON Semiconductor 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 ON Semiconductor is advised of the possibility of such damages. In no event shall ON Semiconductor'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.

For more information and documentation, please visit www.onsemi.com.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Email Requests to: orderlit@onsemi.com

ON Semiconductor Website: www.onsemi.com

TECHNICAL SUPPORT

North American Technical Support:

Voice Mail: 1 800-282-9855 Toll Free USA/Canada

Phone: 011 421 33 790 2910

Europe, Middle East and Africa Technical Support:

Phone: 00421 33 790 2910

For additional information, please contact your local Sales Representative