EVBUM2292/D

KAE Family Evaluation Kit Quick Start Guide

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EVAL BOARD USER'S MANUAL

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.

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.

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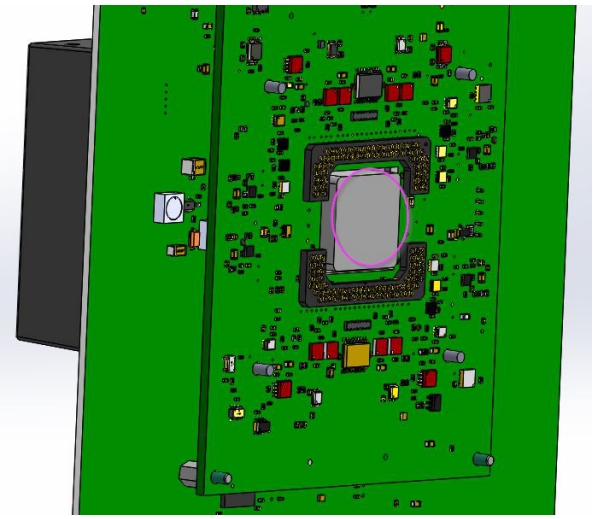

Figure 1. Thermal Grease

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:

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

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