VENTUS HD 6 CORE– USER GUIDE

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1 SAFETY CONDITIONS

Read all instructions prior to use.

Observe electrostatic discharge (ESD) precautions when handling.

The camera requires reasonable thermal sinking when operating. Use stirred air and conduction to outside environment when installed in an enclosure.

The camera must be operated within its environmental limits.

Repairs and service are to be completed only by Sierra Olympia Technologies. Please refer any issues to your sales representative.

2 EXPORT NOTICE

Product Export Classification Control Number (ECCN): 6A003.b.4.a. This document is provided for operation purposes only and does not contain export-controlled technology.

3 REFERENCE DOCUMENTS

Document Number	Document Title
20-70009	Mechanical ICD, Ventus HD 6 Core
20-70008	Mechanical ICD, Ventus HD 6 Core No Lens
20-70006	Electrical ICD, Ventus HD 6 Core
1043862	Customer Electrical Interface Control Document (ICD) For the HexaBlu Baseline OEM Camera Core
Nanomotion S600458002	Nanomotion RS08 Rotary Shutter User Manual

4 INTRODUCTION

The Ventus HD6 Core is ready to operate out of the box. This guide will provide a walkthrough of the minimum setup to begin imaging.

The Ventus HD 6 is an MWIR imager designed to be integrated into end-user products by integrators and OEMs. This user guide will cover basic usage and limits of the product. More detailed technical information (including software protocol, connector locations and pinouts, etc.) may be found in the referenced ICDs (interface control documents).

The main elements of the Ventus HD 6 camera are the DRS HexaBlu sensor, calibration shutter, lens, chassis, and the interface board.

The Ventus HD 6 may be installed in an enclosure that protects the camera from the elements and provides field-friendly connectors using patch cables to the camera's interfaces as defined by the electrical ICD.

5 INCLUDED ITEMS

The packaging contains:

- Ventus HD 6 Core 30mm or No Lens
- USB Delivery drive
  - ICDs and documentation
  - YAT configuration with predefined Commands
  - Pleora eBus SDK Runtime installation
  - Pleora eBus configuration

5.1 Recommended Equipment

Optional cables are available. See 20-70006 Electrical ICD, Ventus HD6 CORE for additional connection information:

Item Name	SOTI PN	Manufacturer PN
Input Power Cable	S-A07-10237	NA
USB to TTL Serial 3.3V Cable	NA	FTDI TTL-232R-3V3
Camera Link Cable	NA	3M 1SF26-*
Pleora Technologies iPORT CL-GIGE	NA	900-6010

See 20-70006 Electrical ICD, Ventus HD 6 Core for additional connection information.

6 QUCK START GUIDE

6.1 Install Software

The recommended demonstration software is included on the USB Delivery drive: Pleora eBus Player (contained within the eBus SDK), YAT (Yet Another Terminal serial terminal software). The instructions in this document use this software to image with the Ventus HD 6 Core. Any GigEVision receiver and serial communication method may be used with the Ventus HD 6 Core.

The software installation files are on the USB Delivery drive.

6.2 Video

Connect power cable to J3.

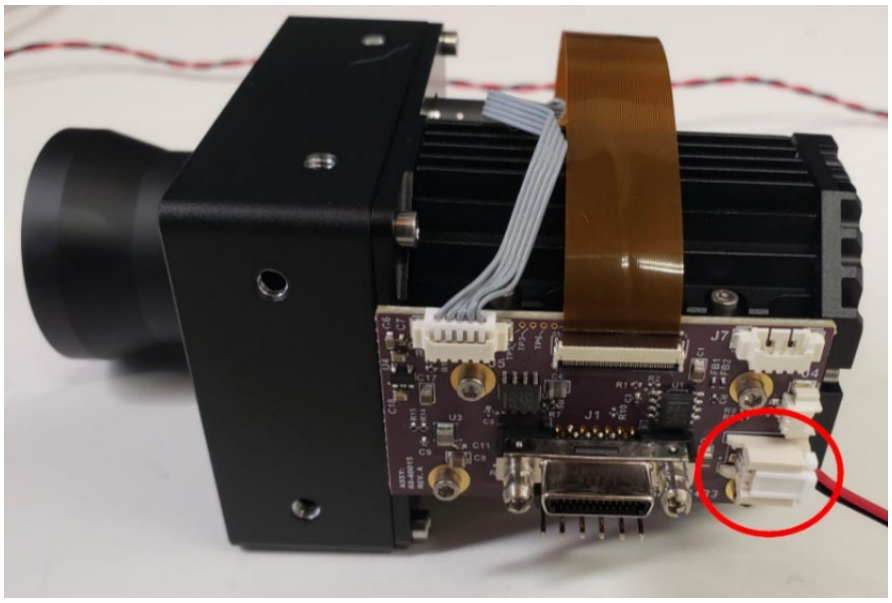

Figure 1 Power Connection

Connect the camera link cable to J1 and the Pleora frame grabber. Ensure the frame grabber is powered through PoE and connected to a client network.

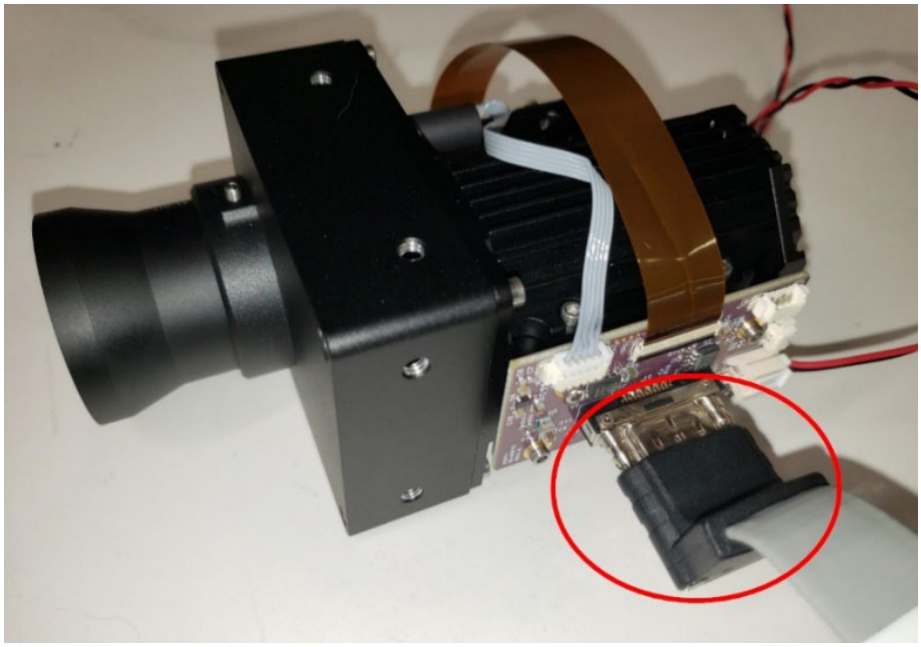

Figure 2 Camera Link Connection

Open eBUS player and connect to the frame grabber.

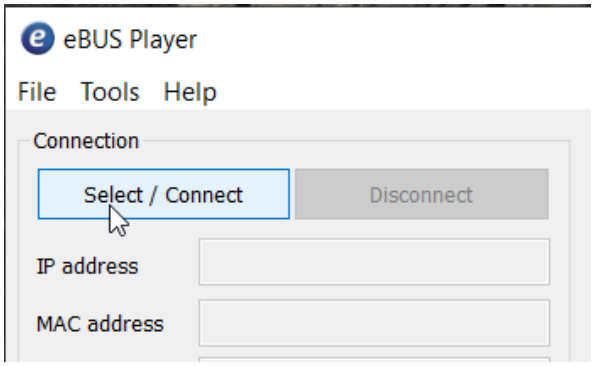

Figure 3 eBus Player Select/Connect

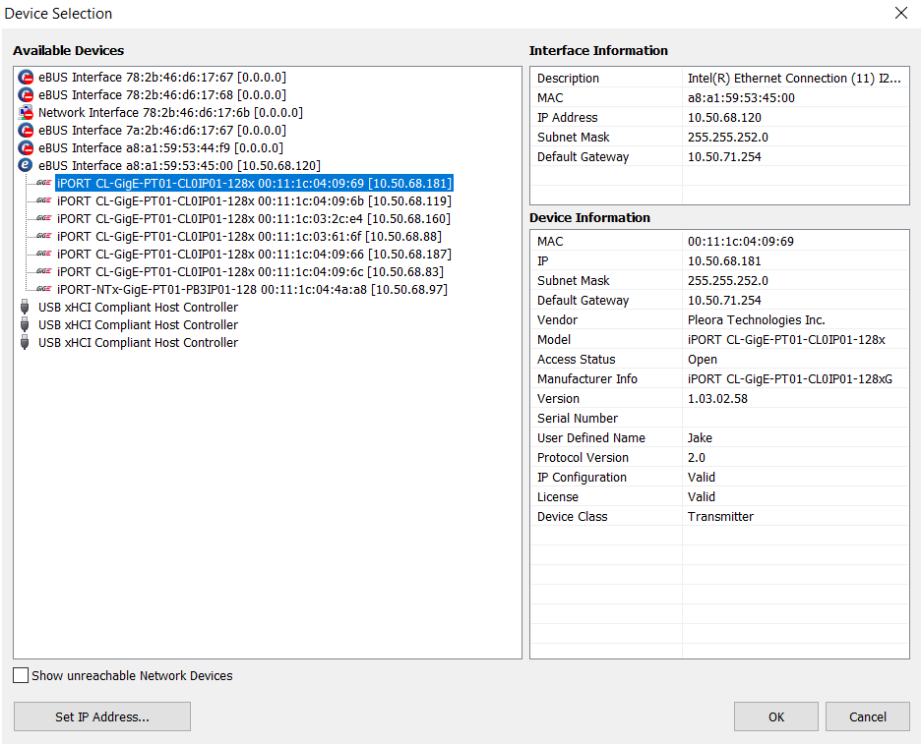

Figure 4 eBus Player Connections List

Use **File>Open...** to browse to the delivery disk and select the ebus_USB_Hexablu_1280x960.pvcfg file.

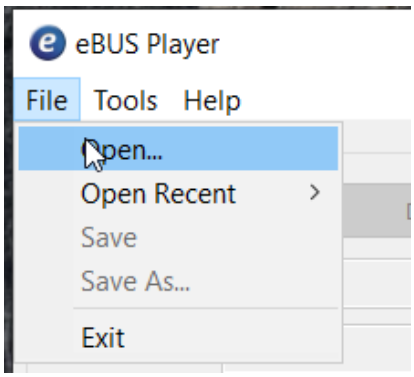

Figure 5 eBus Player Configuration File Selection

Click **Play** to begin acquisition – this can be done before the camera is powered.

Apply 14V input power to the Ventus HD 6 module. After a few seconds, it will begin cooldown and display the following test pattern over Camera Link. Note that eBus Player may display error/warnings for dropped frames/lines during initial acquisition.

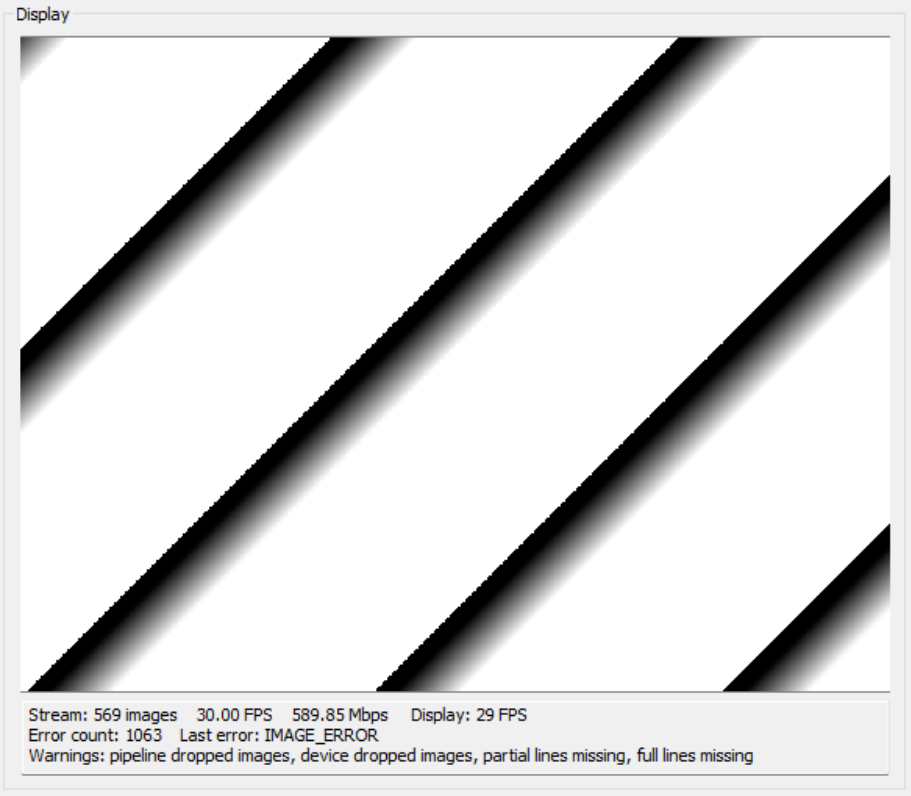

Figure 6 eBus Player During Cooldown

Cooldown can take up to 5 minutes at room temperature (typical <3 minutes), after which a live image is displayed. In eBus Player, the image may appear flat with very little contrast as

the complete 16bit dynamic range of the sensor is displayed. eBus Player has a histogram windowing function available in **Tools>Image Filtering…** Select **Enabled** in the histogram section, and click **Auto Configure** for automatic image scaling.

6.3 Serial Command Access

Connect a serial communication device (such as the recommended USB/serial cable) to the J6 connector and computer.

Figure 7 Serial Connection

YAT (Yet Another Terminal) is recommended to send Hexablu protocol messages. The provided configuration file contains predefined commands: Mode (NUC table) switch, enable/disable NUC, frame rate selection, flat field correction (FFC).

The configuration file (Hexablu_Serial.yat) can be opened itself, or can be opened in the YAT software with **File>Open**. After opening the configuration file, the terminal must be configured.

Click terminal settings.

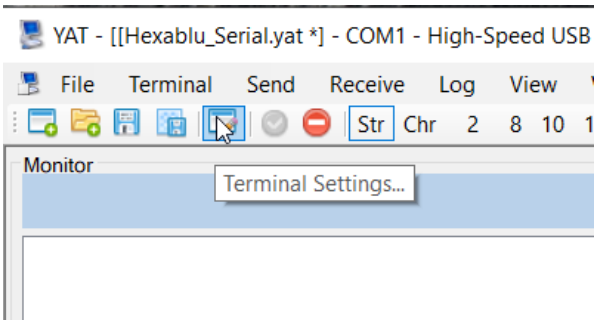

Figure 8 YAT Terminal Settings

Select the correct serial port (can be checked in device manager). Baud = 115200/8/N/1. Click **OK**.

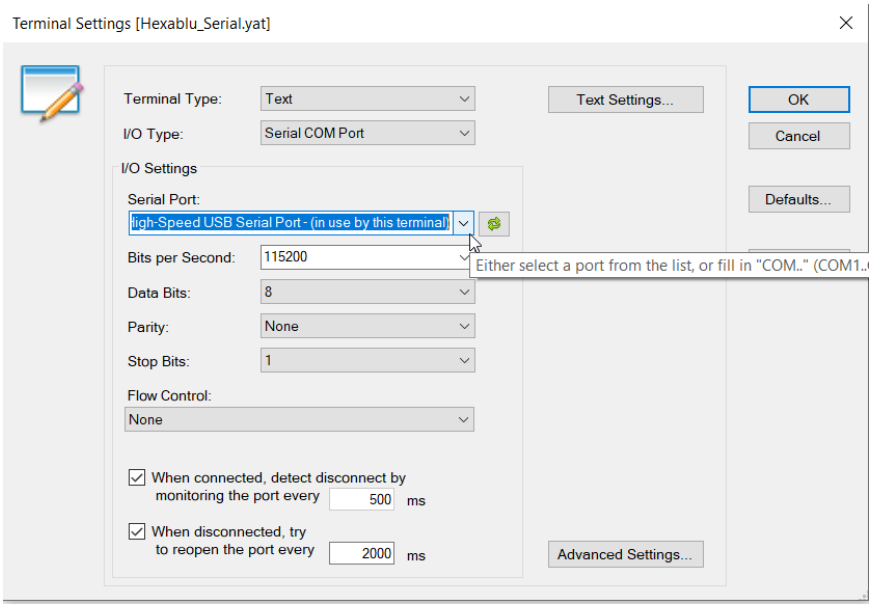

Figure 9 YAT Terminal Settings Continued

Click "open/start terminal" (green checkmark). Use the commands predefined with the buttons on the right of the YAT GUI. Use the **Send Text** dialog box to send other commands according to the DRS HexaBlu Customer ICD.

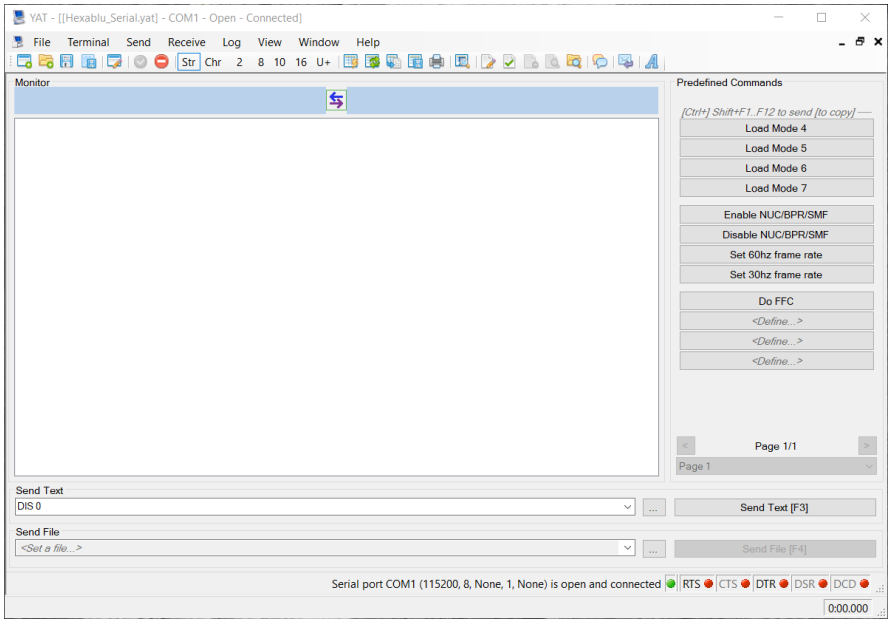

Figure 10 YAT Terminal

7 FOCUS

If the Ventus HD 6 Core comes with a fixed focus lens:

The Ventus HD 6 cameras are pre-focused at the Sierra Olympia factory at infinity which is suitable for most applications. The camera may be manually refocused by loosening the set screw and rotating the lens until the desired focus is achieved, then tightening the set screw.

8 NONUNIFORMITY CORRECTION

8.1 NUC

The Hexablu contains several Modes that each correspond to a 2-point (gain + offset) NUC table and FPA settings, including integration time. The Ventus HD 6 is calibrated with a through-lens NUC at the integration times listed below. It is recommended to change modes based on scene temperature. See the Hexablu Electrical ICD, doc number 1043862 section 5.19 for how to change the mode.

Calibration temperatures were determined from room temperature radiometry data. The image will have the least residual-spatial non-uniformity imaging scenes within and near these calibration temperature ranges.

The scene temperature ranges that look best for each Mode will vary depending on weather (rain, humidity etc) and range (atmospheric attenuation and turbulence). Wetter weather and increasing range tends to attenuate the signal. This can be compensated for by switching to a larger integration time (ie 32ms), to collect more light per frame.

Mode	Integration Time	Frame Rate	Calibration Temperature
4	10ms	60Hz	50 to 90C
5	16ms	60Hz	30 to 70C
6	32ms	30Hz	10 to 40C

8.2 Shutter

The Ventus HD6 is equipped with a shutter to perform Flat Field Corrections (FFCs). A FFC can be used to correct changes in the nonuniformity over time. The included shutter can be used (with external control) for internal FFC – in this case, shutter/sensor operation must be coordinated. For example: a control device will command the shutter to close, command the sensor to perform an FFC, and then command the shutter to open. Control of the shutter is realized through the I2C pass-through interface (J7) and the protocol defined in the Nanomotion RS08 User Manual.

8.3 Shutter Positioning

NOTE: The shutter is installed opposite the manufacturer's specification, so when the shutter is in the "closed" position (per Nanomotion specification) it is *optically* "open". To obstruct the sensor with the shutter, move the shutter to the "open" (as defined by the Nanomotion specification) position. Please reference the Nanomotion RS08 User Manual for more details.

9 COOLING

The Ventus HD 6 Core requires approximately 7W of cooling, please see 20-70009 Mechanical ICD, Ventus HD 6 Core or 20-70008 Mechanical ICD, Ventus HD 6 Core No Lens for heatsinking surfaces.

10 ADDITIONAL INFORMATION

For integrators, please reference the HexaBlu Electrical ICD document number 1043862 for HexaBlu sensor commands.

11 REVISION HISTORY

Revision	Date	Description	ECO
Rev A	2023-05-11	Initial Release	1308
Rev B	2024-07-11	Update Section 8.1 and 5.1	1773