SIERRA-OLYMPIA TECHNOLOGIES INC.

USER GUIDE
VENTUS OGI

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1 SAFETY CONDITIONS

Read all instructions prior to use.

Observe ESD (electrostatic discharge) 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 the environmental limits.

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

2 EXPORT NOTICE

This document may contain technology information whose export, transfer, and/or disclosure may be controlled by the US EAR (Export Administration Regulations). Diversion contrary to US law is prohibited.

3 REFERENCE DOCUMENTS

Document Number	Document Title
S-D07-10496	WIND Viewer User Guide
S-D03-10577	Electrical ICD Ventus OGI
S-D11568	Mechanical ICD Ventus OGI
S-D11584	Mechanical ICD Ventus OGI 50mm

4 INTRODUCTION

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

This document applies to WIND Viewer Version 3.1.y and above. More detailed information on WIND Viewer is available in the WIND Viewer User Guide.

The Ventus OGI is an MWIR optical gas 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 included ICDs (interface control documents).

The main elements of the Ventus OGI camera are the cryocooler, sensor cold finger, calibration shutter, lens, chassis, and a video processing engine which is referred to as the SightLine processor, or SLA. The SLA serves as the central processor for the camera and performs video render/processing, IP encoding, and control of the sensor subsystem. Control commands are sent to the SLA and may be passed through to subsystems in a fashion further described the software ICD.

WARNING! Do not update Sightline firmware without consulting Sierra-Olympia Technical Support. Update with an unqualified firmware version can interrupt camera functionality.

A sample user interface, WIND Viewer, is included to demonstrate functionality of video encoding and control command structure. It is also useful as benchtop evaluation software and can control most functionality of the camera immediately out of the box. More detailed operational instructions can be found in the WIND Viewer User Guide.

It is common for the Ventus OGI to 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. The command interface and protocol are suitable to build camera functionality into end-user applications. The camera may also be operated to its full potential as delivered by using the sample interfaces provided.

4.1 Theory of Operation

Optical gas imaging using the Ventus OGI relies on the MWIR (mid wave infrared) energy absorption of certain gasses. The sensor incorporates a special bandpass filter to increase sensitivity of energy in the 3.2 µm – 3.47 µm wavelength range. Gasses exhibiting reduced optical transmission in this energy range appear in contrast to the background, making them visually detectable but not quantifiable.

Applicable gasses include, but are not limited to, butane, methane, and propane. For inquiry about specific gasses, please contact Sierra-Olympia Technologies, Inc.

5 INCLUDED ITEMS

The packaging contains:

- Ventus OGI camera
- Integration cable kit (If ordered)
- USB delivery/documentation package
- Lens wrench

5.1 Recommended Equipment

Optional cables are available. See S-D03-10577 Electrical ICD, Ventus OGI for additional connection information.

Table 1: Ventus OGI Cables

Item Name	SOTI PN	Manufacturer PN
Input Power Cable	S-A07-10237 or S-A07-10497	NA
Serial camera control	S-A07-10236	NA
Ethernet	S-A07-10240	NA
Analog Video Cable	S-A07-10502	NA

6 SETUP PROCEDURE

6.1 Connect the Ethernet cable.

6.1.1 Connect the provided PicoBlade-terminated Ethernet cable to J12.

6.1.2 Connect the camera to a managed network or directly to your computer.

6.2 If applicable, connect the analog video cable.

6.2.1 A BNC terminated analog video cable has been provided for your convenience.

6.2.2 Connect the BNC terminated analog video cable to J14 for NTSC analog video.

6.3 Connect the power cable.

6.3.1 Connect the provided Sherlock-terminated power cable to J15. The nominal input voltage is 12 VDC (max 14 V) with a minimum 2.5 A supply.

6.3.2 The analog video line will be active after initialization and sensor cooldown without any additional configuration.

6.4 Use WIND Viewer to establish an IP connection.

6.4.1 Install WIND Viewer from the USB delivery drive and launch the program.

NOTE: All available SLA equipped cameras on the network will appear in this list, identified by IP address and camera serial number.

The camera has been preconfigured to obtain an IP address automatically from a DHCP server or from link-local addressing.

6.4.2 When the camera has initialized (approximately 30 seconds after it is powered ON), it will become available to the WIND Viewer for connection.

6.4.3 Locate the camera in the Connection drop-down list in the Control tab.

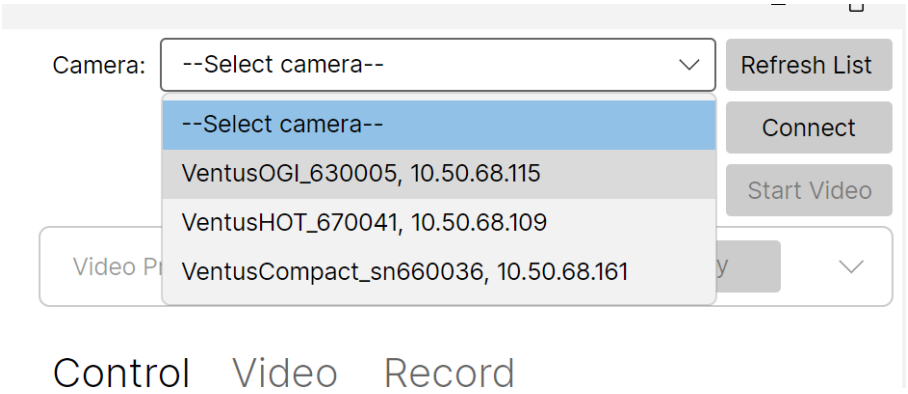

Figure 1: Connection Dropdown List

6.4.4 If your camera does not appear in the list, verify that the camera is initialized.

6.4.5 Click **Refresh List** after approximately one minute. The camera should be initialized after approximately one minute.

6.4.6 If the camera still does not appear in the list, make sure that the computer is on the same subnet as the camera.

6.4.7 Select the camera from the drop-down and click **Connect**.

6.4.8 When the Connect button changes to Disconnect, the connection has been successfully established.

NOTE: While direct camera-to-computer connection (link local addressing) is possible, troubleshooting of networking issues is often more easily done by connecting the camera and computer to a typical local network infrastructure via a switch.

7 STREAM VIDEO

7.1 Make sure that the steps in Section *6* are completed.

7.2 H.264 begins streaming immediately over UDP to the local computer's IP address on port 15004. Live video should appear in the WIND Viewer main window.

7.3 Video streaming may be more intricately configured through the full communication protocol.

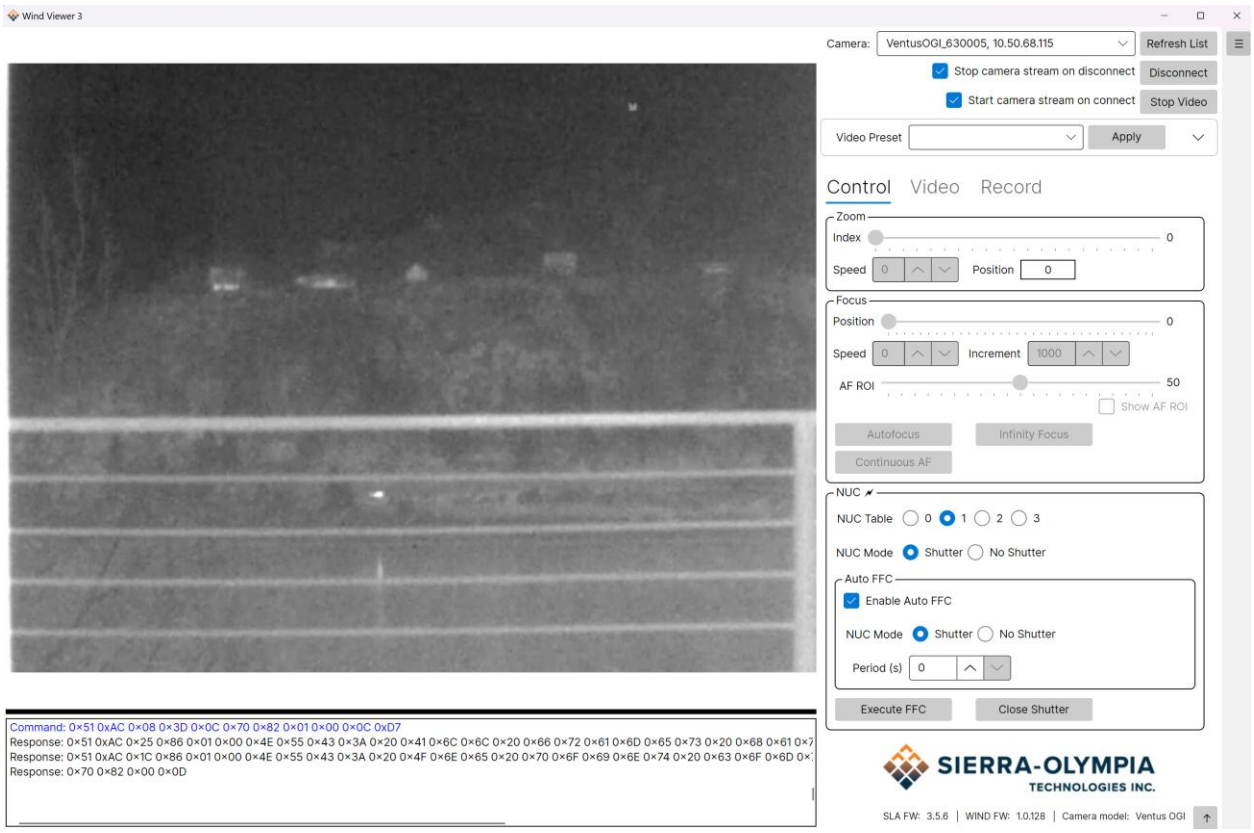

Figure 2: WIND Viewer GUI

NOTE: It takes approximately 10 minutes for the camera's cryocooler to reach stable operating temperature. The camera is unable to image during this time and may display a cool-down pattern.

7.4 Explore all camera functions in the WIND Viewer. There is nothing in this application that can damage the camera or is irreversible.

8 CALIBRATION

The Ventus OGI offers 1-point FFC (flat field offset correction) using an internal shutter and two 2-point NUC (gain) tables. An FFC should be performed to remove spatial noise and nonuniformities. Nonuniformities may develop as the camera and optics reach stable operating temperature.

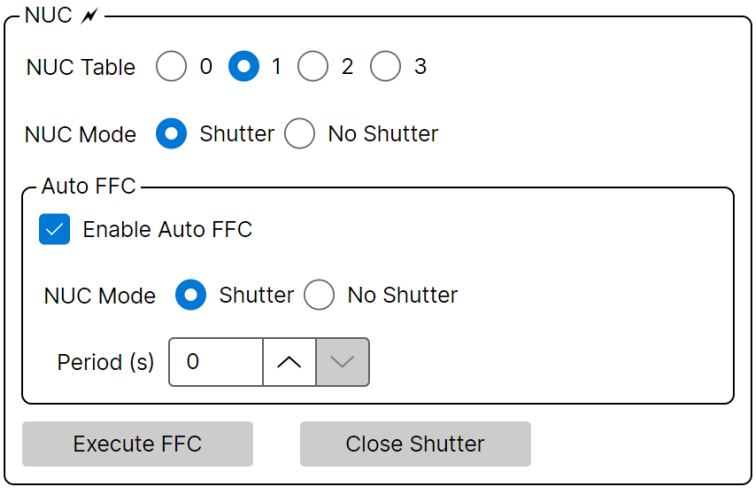

Figure 3: Sensor FFC Mode

8.1 Perform an FFC

8.1.1 Click the **Execute FFC** button in WIND viewer.

NOTE: The Shutter option actuates the internal shutter between the sensor and lens, providing a thermally uniform target to the sensor.

The No Shutter option does not actuate the shutter and assumes that the sensor has otherwise been exposed to a uniform target.

This calibration option with a uniform target in front of the lens may yield better performance in marginal or rapidly changing ambient temperatures. The Shutter option is recommended for most use cases.

8.2 NUC Tables

The OGI has two NUC tables that provide optimum performance for different scene temperature ranges. You may switch between them at any time using the NUC Table radio buttons in WIND Viewer. In the overlapping range 25°C – 40°C (where either table is applicable) it is recommended to use a shorter integration time (***Error! Reference source not found.***).

Table 2: Ventus OGI NUC

NUC Table	Temperature Range	Integration Time
0	10 – 40°C	20 ms
1	25 – 55°C	10 ms

9 SL-VG63-025-050 LENS INTERCHANGE PROCEDURE

To change between the 50 mm and 25 mm lens, loosen the lock ring on the lens with one of the included lens wrenches. When the lens is loosened it can be unscrewed by hand. Check the lens for FOD and use canned air, or 99% isopropyl alcohol with low scratch swabs to remove FOD. Put lens caps on the removed lens and remove lens cap for the lens you are installing, also check this lens for FOD before installing on the camera body.

Install the second lens to desired focus (refer to section *10* for focus procedure) and then tighten the lock ring with one of the included lens wrenches and torque to 125 in-lbs.

10 LENS FOCUS PROCEDURE

The Ventus OGI cameras are pre-focused at the Sierra-Olympia factory to a distance and depth of field suitable for most applications. The camera may be manually refocused by loosening the lock ring with the provided lens wrench and rotating the lens until the desired focus is achieved, then tightening the lock ring. Factory focus distances and depth of field at that focus distance are summarized below in ***Error! Reference source not found.***.

Table 3: Camera Focus Data

Camera	Focus Distance	Minimum depth of field	Maximum depth of field
Ventus OGI 25mm	7.5 m (25 ft)	5 m (16 ft)	16 m (52 ft)
Ventus OGI 50mm	Infinity	25 m (75 ft)	Infinity

11 GAS ENHANCEMENT MODE

The Ventus OGI offers a GEM (gas enhancement mode) to significantly improve gas detectability. It is demonstrable in the WIND Viewer Video tab and is disabled by default.

Select the **Enable GEM** checkbox to begin GEM. Use the sliders to experiment with Sensitivity and Blend. Sensitivity more greatly increases contrast of smaller movements, and the blend control alpha-blends the contrast-enhanced detected image with the original image.

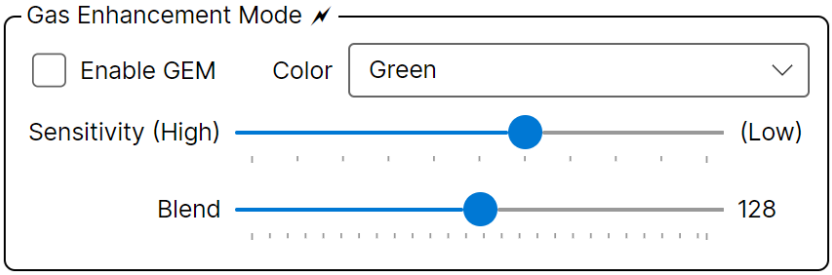

Figure 4: Gas Enhancement Mode

GEM works using a frame-to-frame difference detection algorithm, incorporating advanced image registration and enhancement to increase contrast of interframe spatial changes. It is designed to highlight movement in the image frame and intended for stationary camera installations. GEM is not designed for handheld, aerial, or moving camera applications where

GEM will highlight all movement of the camera, rather than movement of the gas alone. However, performance may differ from application to application, and you may find that GEM mode is useful in non-stationary applications.

12 REVISION HISTORY

Revision	Date	Description	ECO
B	2022/01/07	Updated for PN: SL-VG63-025-050 and SL-VG63-050-10	1146
C	2022/06/20	Updated to include Sightline warning	1268
D	2023/12/15	Updated Export warning and Company Name, Updated with Wind Viewer 3.1.0 images	1651
E	2026/02/26	Include torque specification, Added section 5.1, Spelling corrections	1959