# NEON-2000-JNX Series

AI Smart Camera

**User's Manual**


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**Part No:** 50M-00005-1010

LEADING EDGE COMPUTING

# Revision History

| Revision | Release Date | Description of Change(s) |
|---|---|---|
| 1.0 | 2021-04-07 | Initial release |
| 1.1 | 2021-07-14 | Added NEON-20XA-JNX series |

# Preface



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NOTE:

Additional information, aids, and tips that help users perform tasks.


CAUTION:

Information to prevent ***minor*** physical injury, component damage, data loss, and/or program corruption when trying to complete a task.
*ATTENTION: Informations destinées à prévenir les blessures corporelles mineures, les dommages aux composants, la perte de données et/ou la corruption de programme lors de l'exécution d'une tâche.*


WARNING:

Information to prevent ***serious*** physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.
*AVERTISSEMENT: Informations destinées à prévenir les blessures corporelles graves, les dommages aux composants, la perte de données et/ou la corruption de programme lors de l'exécution d'une tâche spécifique.*

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# 1 Introduction

## 1.1 Overview

The NEON-2000-JNX series is an open camera platform equipped with an NVIDIA® Jetson™ Xavier NX module supporting a series of image sensors providing industrial DI/O capabilities. It is designed for deep learning inference or other vision applications that requires a GPU at the edge. The system has Ubuntu Linux, Jetpack, camera driver and utilities pre-installed to save integration effort and avoid compatibility issues.

The following table describes the current NEON-2000-JNX models with their respective sensor specifications.

| Camera Model | Image Sensor | Sensor Vendor | Sensor Module | Sensor Output | Image Capturing | Note |
|---|---|---|---|---|---|---|
| NEON-201B-JNX | 1/3", 1.2M, Global Shutter, 1280x960, 54fps, Color | ON Semiconductor | AR0134 | USB3 | Basler Pylon | Basler DAA1280-54UC-CS |
| NEON-202B-JNX | 1/1.8", 1.9M, Global Shutter, 1600x1200, 60fps, Color | e2v | EV76C570 | USB3 | Basler Pylon | Basler DAA1600-60UC-CS |
| NEON-203B-JNX | 1/3.7", 2M, Rolling Shutter, 1920x1080, 30fps, Color | ON Semiconductor | MT9P031 | USB3 | Basler Pylon | Basler DAA1920-30UC-CS |
| NEON-204B-JNX | 1/2.5", 5M, Rolling Shutter, 2592x1944, 14fps, Color | ON Semiconductor | MT9P031 | USB3 | Basler Pylon | Basler DAA2500-14UC-CS |
| NEON-201A-JNX | 1/2.6", 2M, Global Shutter, 1920x1200, 60fps, Color | ON Semiconductor | AR0234 | mipi | V4L2/ Gstreamer | |
| NEON-202A-JNX | 1/1.8", 8M, Rolling Shutter, 3840x2160, 60fps, Color | Sony | IMX334 | mipi | V4L2/ Gstreamer | |

**Table 1-1: NEON-2000-JNX Model and Sensor Specifications**

## 1.2 Features

- Provides rich sample code and AI development, quick to start
- NVIDIA Jetson Xavier NX with 6-core NVIDIA Carmel 64-bit ARMv8.2 @ 1400 MHz, 384-core NVIDIA Volta @ 1100 MHz with 48 Tensor Cores, 8 GB 128-bit LPDDR4x @ 1600 MHz and 16 GB eMMC
- USB3 sensor interface compatible with the most machine vision software
- Type-C connector supports DC power, DisplayPort and USB signal, reducing cabling
- Preinstalled Ubuntu and software suite microSD card, plug and play
- Highly integrated and compact system that is easy to deploy

## 1.3 General Specifications

- Lens mount: C-mount
- Total weight: <700g (without lens)
- Operating temperature (tested with YOLOv4)
  - NEON-20XB-JNX series, 0°C to 45°C with 0.6 m/s airflow at 15W mode
  - NEON-20XA-JNX series, 0°C to 55°C with 0.6 m/s airflow at 15W mode
- Power consumption: <40W
- Computing module: NVIDIA Jetson Xavier NX
  - CPU: 6-core NVIDIA Carmel 64-bit ARMv8.2 @ 1400MHz (6MB L2 + 4MB L3)
  - GPU: 384-core NVIDIA Volta @ 1100MHz with 48 Tensor Cores
  - Built-in memory and storage: 8GB 128-bit LPDDR4x @ 1600MHz, 16GB eMMC and 32G microSD card
- Camera I/O and connectors
  - 1x Type-C for power input, DisplayPort and USB signals
  - 1x DC Jack for 12-24V DC input
  - 1x GbE Ethernet port
  - 1x 15-pin D-sub for DI/O and COM which includes:
    - 4x GPI/O, including 1x Camera Trigger In and 1x Trigger Out
    - 1x COM
  - 1x 32G microSD card with preinstalled OS and required software
  - 1x wafer connector and 1x Micro-USB for system flashing and debugging

NOTE:

1. When powering from the DC Jack, the Type-C connector can provide 3W of power to an external device such as a Type-C hub. Devices requiring more than 3W cannot be used.
2. DC power can be from the Type-C connector or DC jack.
3. Use only recommended ADLINK power adapters.
4. The camera boots from the preinstalled microSD card that cannot be removed. To change the microSD card, constant ADLINK.

| Model | NEON-201B-JNX | NEON-202B-JNX | NEON-203B-JNX | NEON-204B-JNX | NEON-201A-JNX | NEON-202A-JNX |
|---|---|---|---|---|---|---|
| **Image Sensor** | | | | | | |
| Resolution (HxV) | 1280x960 | 1600x1200 | 1920x1080 | 2592x1944 | 1920x1200 | 3840x2160 |
| Resolution | 1.2M | 1.9M | 2M | 5M | 2M | 8M |
| Frame Rate (fps) | 54 | 60 | 30 | 14 | 60 | 30 |
| Color/Mono | Color | Color | Color | Color | Color | Color |
| Shutter | Global | Global | Rolling | Rolling | Global | Rolling |
| Sensor Size | 1/3" | 1/1.8" | 1/3.7" | 1/2.5" | 1/2.6" | 1/1.8" |
| Pixel Size (µm) | 3.75 x 3.75 | 4.5 x 4.5 | 2.2 x 2.2 | 2.2 x 2.2 | 3 x 3 | 2.0 x 2.0 |
| Sensor Vendor | ON Semicon-ductor | e2v | ON Semicon-ductor | ON Semicon-ductor | ON Semicon-ductor | Sony |
| Sensor Model | AR0134 | EV76C570 | MT9P031 | MT9P031 | AR0234 | IMX334 |
| Image Capturing Software | Basler Pylon | | | | V4L2 & Gstreamer | |

**Table 1-2: NEON-2000-JNX General Specifications**

| Model | NEON-201B-JNX | NEON-202B-JNX | NEON-203B-JNX | NEON-204B-JNX | NEON-201A-JNX | NEON-202A-JNX |
|---|---|---|---|---|---|---|
| Image Sensor Trigger Mode | External H/W trigger (see note below), S/W trigger, free run | | | | | S/W trigger, free run |
| Lens Mount | C Mount | | | | | |
| **System** | | | | | | |
| Computing Platform | NVIDIA Jetson Xavier NX | | | | | |
| CPU | 6-core NVIDIA Carmel ARM®v8.2 64-bit CPU 6 MB L2 + 4 MB L3 | | | | | |
| Supported OS | Ubuntu 18.04 | | | | | |
| GPU | NVIDIA Volta architecture with 384 NVIDIA CUDA® cores and 48 Tensor cores | | | | | |
| Storage | 16G eMMC (built-in NX module) and pre-installed 32G microSD card | | | | | |
| Memory | 8 GB 128-bit LPDDR4/16G eMMC (built-in NX module) | | | | | |
| **Connectors and Functions** | | | | | | |
| Ethernet | Supports 10/100/1000 Mb | | | | | |
| USB Type C | Video output(Display Port), 1920x1080 @ 30fps | | | | | |
| | 1x USB3 and 1xUSB2 | | | | | |
| | Power supply for the camera (when connected to Type C charger or adaptor) | | | | | |
| | Power supply (5 W) for external Type C Hub (when connected to Type C hub) | | | | | |
| D-Sub | 4x DI and 4x DO | | | | | |
| | 1x UART (TXD, RXD, GND) | | | | | |
| Micro USB | USB OTG (for system flash) | | | | | |
| Wafer connector | For system flash | | | | | |
| **Mechanical & Power** | | | | | | |
| Dimensions | 123.3 x 77.5 x 66.81 mm | | | | | |
| Weight | 700g | | | | | |
| Power Input | DC Jack (DC12~24V) or Type C (DC15V) | | | | | |
| Power Consumption | <40W (camera only) | | | | | |

**Table 1-2: NEON-2000-JNX General Specifications**

| Model | NEON-201B-JNX | NEON-202B-JNX | NEON-203B-JNX | NEON-204B-JNX | NEON-201A-JNX | NEON-202A-JNX |
|---|---|---|---|---|---|---|
| **Environmental & Certification** | | | | | | |
| Operating Temperature | 0°C to 45°C | | | | 0°C to 55°C | |
| Storage Temperature | -20°C to 70°C | | | | | |
| Humidity | 40% to 75% (non-condensing) | | | | | |
| Vibration | Operating, 5 ~ 500 Hz, 5 Grms, 3 axes | | | | | |
| Shock | Operating, 11ms duration, 30G, half sine, 3 axes | | | | | |
| ESD | Contact +/- 4kV, Air +/- 8kV | | | | | |
| EMC | CE and FCC Class A (EN61000-4/-2) | | | | | |
| Safety | UL and cB | | | | | |

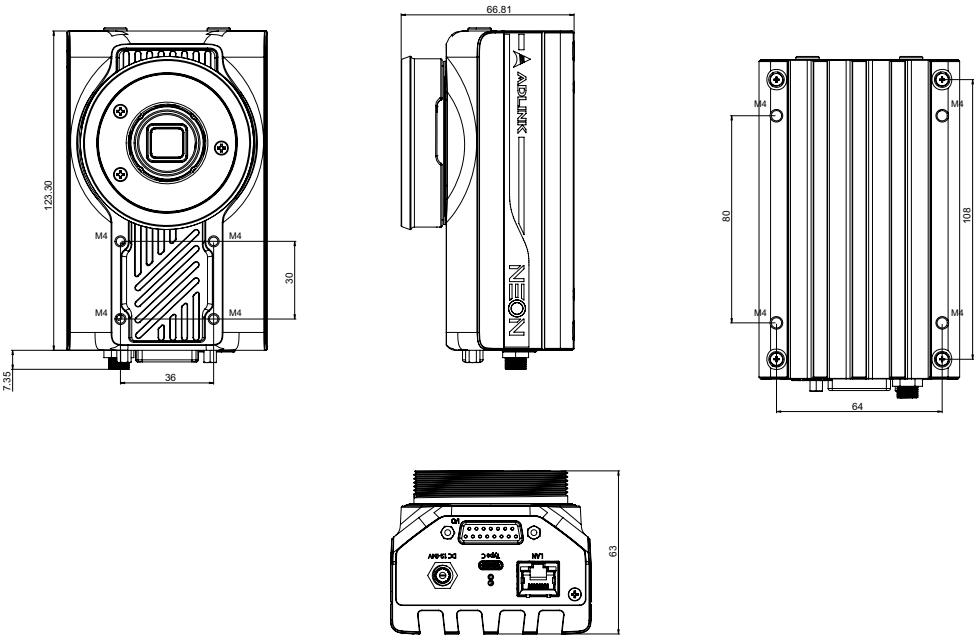
**Table 1-2: NEON-2000-JNX General Specifications**


For NEON-20XB-JNX series, if the camera is in External Trigger Mode, the sensor exposure time can be based on the preset time in Pylon.

## 1.4 Mechanical Dimensions

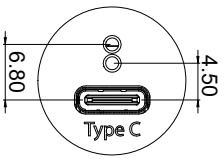
This section provides dimensions and related mechanical information for the NEON-2000-JNX.

### 1.4.1 Camera Dimensions



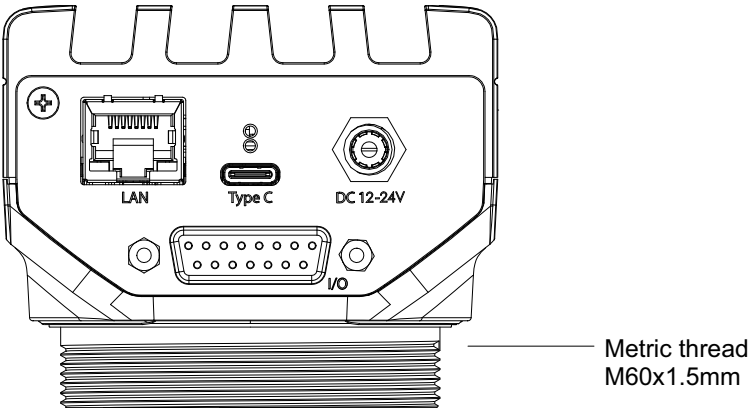

Dimensions: mm

### 1.4.2 USB Type-C Screw Lock Location and Dimensions




Dimensions: mm

### 1.4.3 LED Light Mounting Thread



## 1.5 Accessories

Use ADLINK recommended accessories for optimum system performance. The table below includes ADLINK verified accessories.

| Accessory | Part Number | Description |
|---|---|---|
| USB Type-C cable | 30-01284-0030-A0 | USB Type-C (M) to USB Type-C (M), length 1.8M, with screw lock |
| USB Type-C Hub & Adapter | 92-99090-1010 | AC 100-240V, USB – C PD2.0, DC 15V/2.3A |
| DI/O cable | 30-01332-0010-A0 | DB15P (M) to DB37P (M), length 3M, connected to DIN-37D-01 |
| DIN-37D-01 DI/O extension board | 91-14025-1020 | DI/O extension board with one 37-pin D-sub connector and DIN-rail mount |
| 8mm lens | 92-15731-0010 | Focal length 8mm, F1.4, 2/3”, 3MP |
| AC/DC adaptor | 31-62156-1000-A0 | AC 100-240V DC, 12V/5A, DC jack |

# 2 Connectors and I/O

This chapter includes the locations and descriptions of the connectors and I/O found on the NEON-2000-JNX.

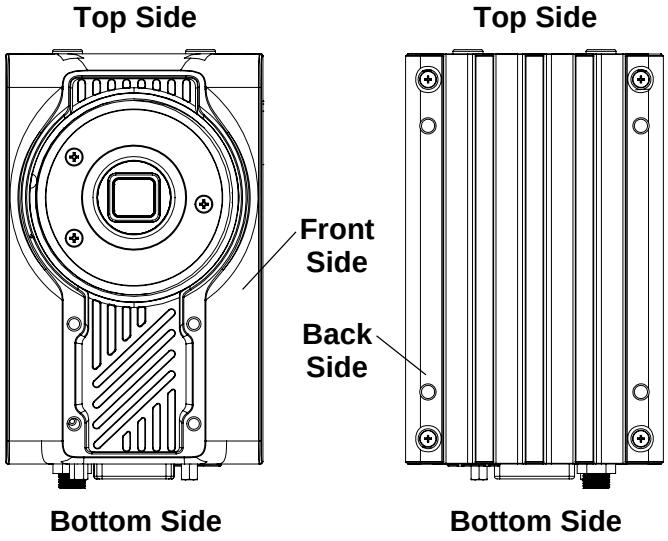



**Figure 2-1: NEON-2000-JNX Orientation**

## 2.1 Bottom Side I/O and Connector Description

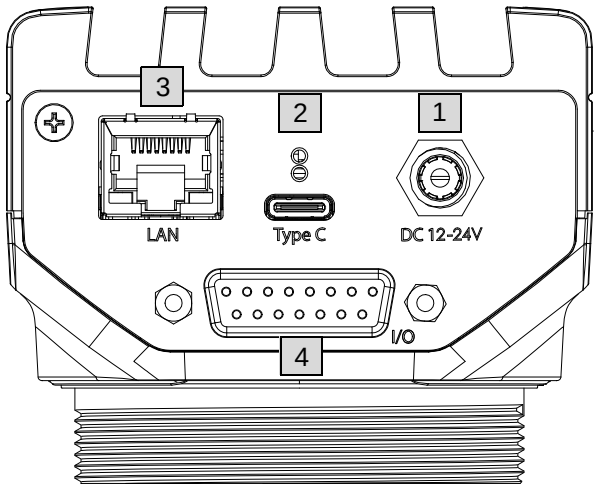



**Figure 2-2: Bottom Side I/O and Connectors**

| Item | Description |
|---|---|
| 1 | • DC Jack for DC input with included ADLINK AC/DC adaptor (P/N 31-62156-1000-A0)<br>• Power input: 12-24V DC at >30 W |
| 2 | • USB Type-C connector w/ screw lock<br>• Supports DisplayPort (up to 1080P @ 30 fps)<br>• The NEON-2000-JNX can be powered via this port or the DC jack |
| 3 | 1 GbE LAN at 10/100/1000 Mbit/s |
| 4 | 15-pin D-sub I/O connector for the digital I/O and UART. Use to connect external I/O devices such as sensors, COM and LED/strobe controllers. |

**Table 2-1: Bottom Side I/O and Connectors**

### 2.1.1 D-sub I/O Connector

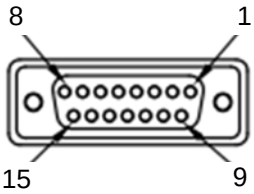



**Figure 2-3: D-sub I/O Connector**

| Pin | Function | Pin | Function |
|---|---|---|---|
| 1 | UART - TX | 2 | DI/O GND |
| 3 | Digital output 0/Strobe output 0 (see note 2) | 4 | Digital output 1 |
| 5 | Digital output 2 | 6 | Digital output 3 |
| 7 | UART GND | 8 | Reserved |
| 9 | UART – RX | 10 | DI/O GND |
| 11 | Digital input 0/Trigger input 0 (see note 1) | 12 | Digital Input 1 |
| 13 | Digital Input 2 | 14 | Digital Input 3 |
| 15 | Reserved | | |

**Table 2-2: D-sub I/O Connector Pin Definitions**

NOTE:

1. Pin 11 (Digital input 0/Trigger input 0) is programmable. When configured for trigger input, it is used for hardware triggering of the image sensor. Connect an external sensor signal to pin 11 and set the camera to hardware trigger mode to enable realtime or hardware triggered image capture.

2. Pin 3 (Digital output 0/Strobe output 0) is programmable. When configured for strobe output, it can be connected to an LED light/strobe controller to adjust the timing latency/delay according to the camera connected to pin 11.

| I/O Category | Maximum Throughput | Specification | | |
|---|---|---|---|---|
| UART | - | Baud rate: 9600bps @ 8N1 | | |
| Digital Input | 10 KHz | Common sharing: | 1 common for sharing ground | |
| | | Input range: | 0-5 VDC | |
| | | High level threshold: | 2-5 VDC | |
| | | Low level threshold: | 0-0.8 VDC | |
| Digital Output | 10KHz | Open-collector | Input voltage range: | 3.3-30 VDC |
| | | | Maximum sink current | 100 mA |

**Table 2-3: D-sub I/O Connector Specification**

### 2.1.2 DC Jack

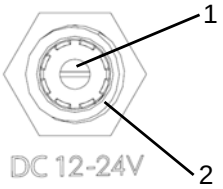



**Figure 2-4: DC Jack Connector**

| Pin | Function | Description |
|---|---|---|
| 1 | Power | Power input |
| 2 | Ground | Reference ground |

**Table 2-4: DC Jack Pin Definitions**

## 2.2 Top Side I/O and Connector Description

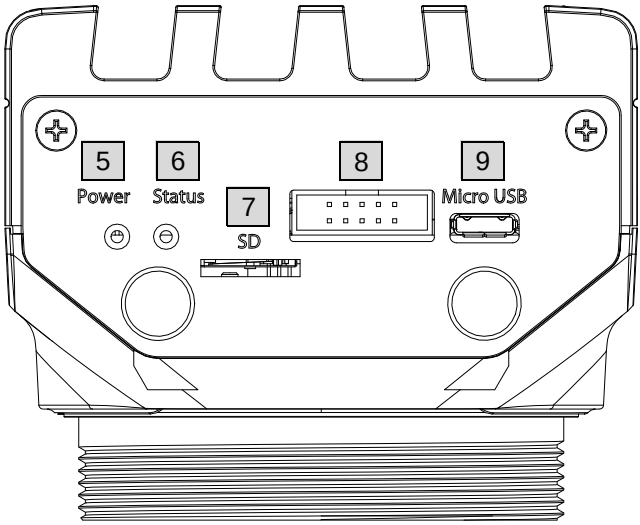



**Figure 2-5: Top Side I/O and Connectors**

| Item | Description |
|---|---|
| 5 | Power status LED. Lights green when power is connected. |
| 6 | Operating system status LED. Flashes orange when the system is booting, and lights when the system has booted successfully. |
| 7 | microSD card slot, with 32G microSD card pre-installed with Ubuntu and required software. The camera boots from this microSD card. |
| 8 | Wafer connector. This connector is used to update the NEON-2000-JNX. |
| 9 | Micro-USB port. This connector is used to update the NEON-2000-JNX. |

**Table 2-5: Top Side I/O and Connectors**

### 2.2.1 Wafer Connector

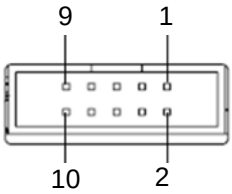



**Figure 2-6: Wafer Connector**

| Pin | Function | Pin | Function |
|---|---|---|---|
| 1 | Reserved | 2 | Reserved |
| 3 | System Reset | 4 | GND |
| 5 | RECOVERY | 6 | GND |
| 7 | Reserved | 8 | GND |
| 9 | Reserved | 10 | GND |

**Table 2-6: Wafer Connector Pin Definitions**

## 2.3 Front Side I/O and Connector Description

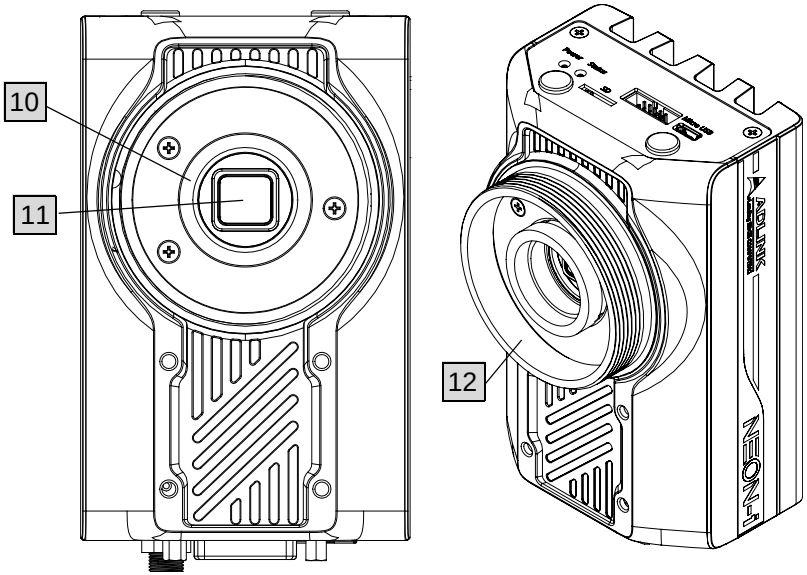



**Figure 2-7: Front Side I/O and Connectors**

| Item | Description |
|---|---|
| 10 | C-type lens mount |
| 11 | Image sensor |
| 12 | Strobe/LED light mounting thread. See “LED Light Mounting Thread” on page 9. |

**Table 2-7: Front Side I/O and Connectors**

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# 3 Getting Started

## 3.1 Mounting

The NEON-2000-JNX can be mounted using the mounting screw holes on either the front (A) or back (B) sides.

*Le NEON-2000-JNX peut être monté à l'aide des trous de vis de montage sur les côtés avant (A) ou arrière (B).*

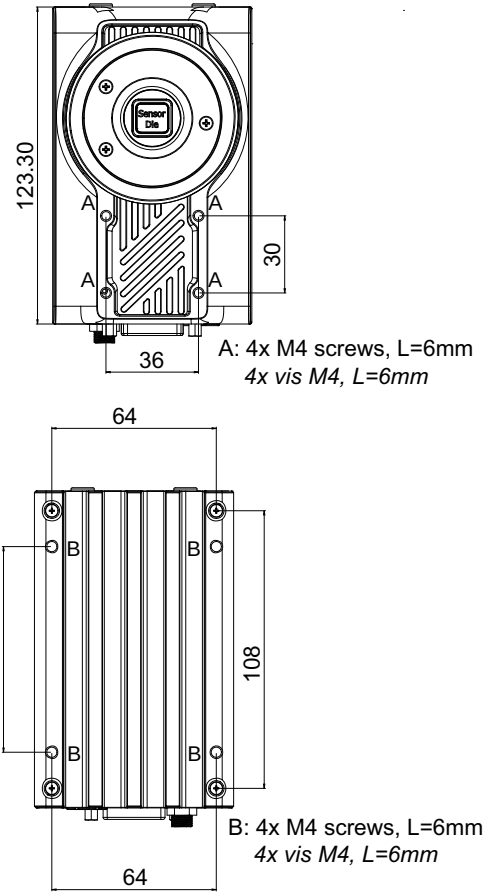



**Figure 3-1: NEON-2000-JNX Mounting Holes**

## 3.2 Digital I/O Connection Example

External devices such as trigger sensors, LED light controllers or relays can be connected to the NEON-2000-JNX to implement different applications. This section shows an example of how to connect such devices.

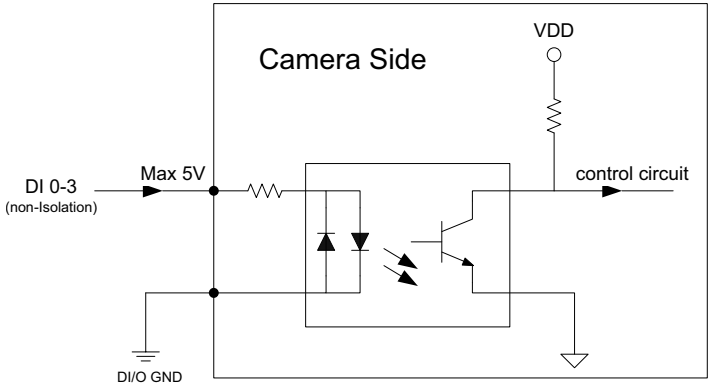



**Figure 3-2: Digital Input Schematic Diagram**

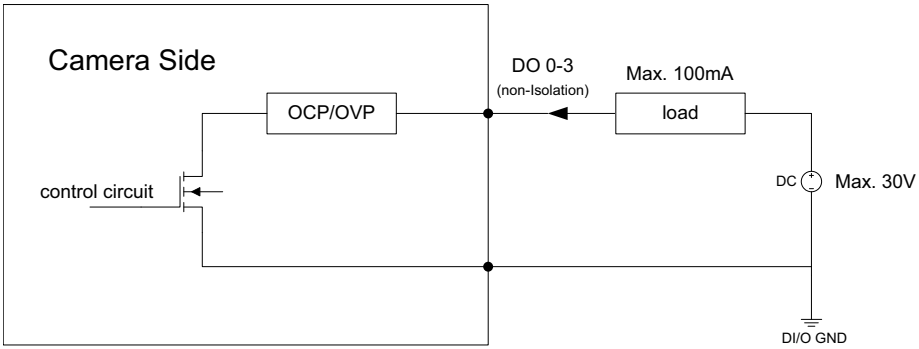



**Figure 3-3: Digital Output Schematic Diagram**

## 3.3 Attaching a Lens

The NEON-2000-JNX is compatible with C-mount type lenses.

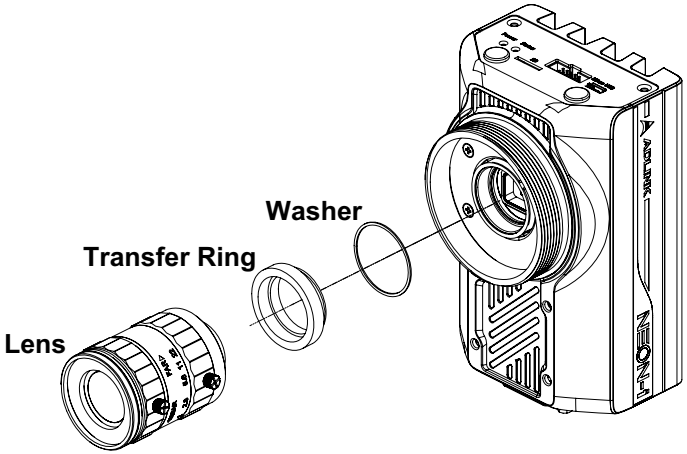


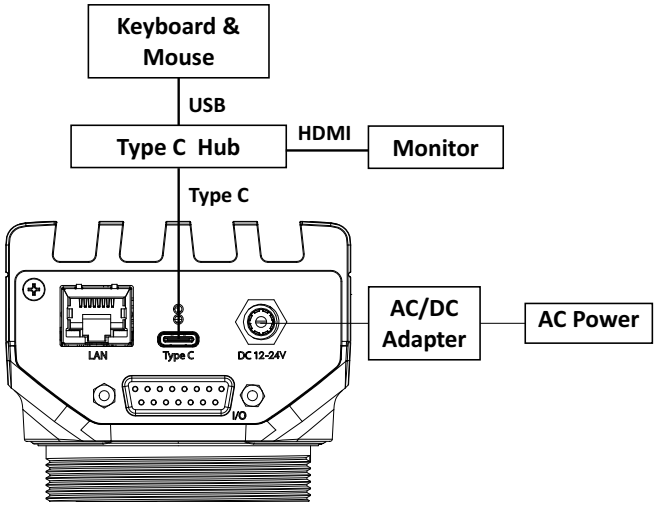

**Figure 3-4: Lens Attachment Assembly**

NOTE:

The transfer ring is installed before shipping. The washer is used only with the NEON-202B-JNX.

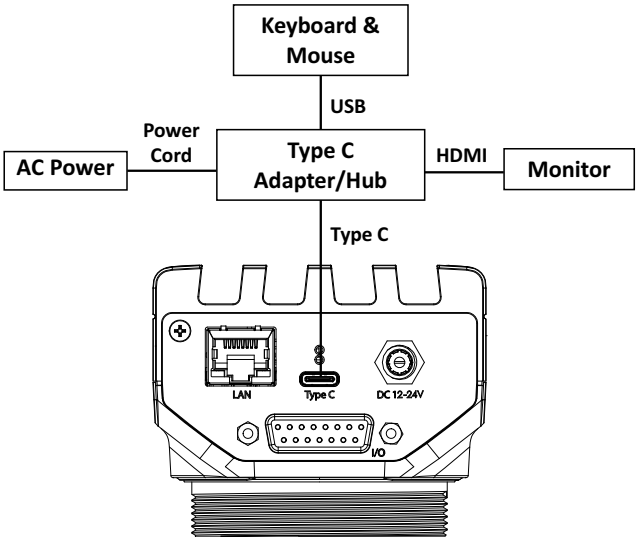
## 3.4 Power and Peripheral Connections

The NEON-2000-JNX DC power source can be either from a USB Type-C adaptor or DC jack. The USB Type-C connector also supports a DisplayPort video signal and USB3, which can be used to connect a keyboard and mouse. The following figures show examples of possible power and peripheral connection configurations.




NOTE: This configuration requires an ADLINK AC/DC power adapter (P/N 31-62156-1000-A0). Ensure that the power adapter cord of the device connects to a socket outlet with a ground/earth connection.

**Figure 3-5: Separate Power and Peripheral Connections**




NOTE:

This configuration requires an ADLINK USB Type-C hub/adapter (P/N 92-99090-1010).

**Figure 3-6: Combined Power and Peripheral Connections**

## 3.5 Log In

Log in to the NEON-2000-JNX with the following credentials:

- Default account: adlink
- Default password: adlink

## 3.6 Image Capture and Inference

ADLINK provide sample files for testing the NEON-2000-JNX image capturing and inference functions and are located the **Samples** folder on the Desktop.


To get the latest sample code, go to https://github.com/AIoT-IST/Samples

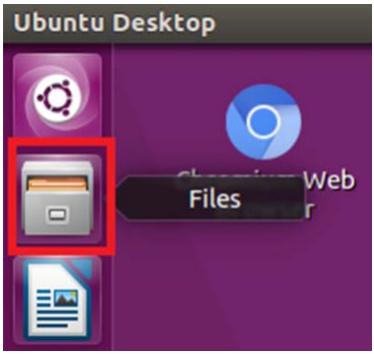
## 3.7 NEON-20XB-JNX Series Capture and Adjustment

This section describes how to use the Basler Pylon utility to capture an image, set the sensor, and load/save sensor settings for the NEON-20XB-JNX series. For the NEON-20XA-JNX series, to the **Sample** folder on the desktop.

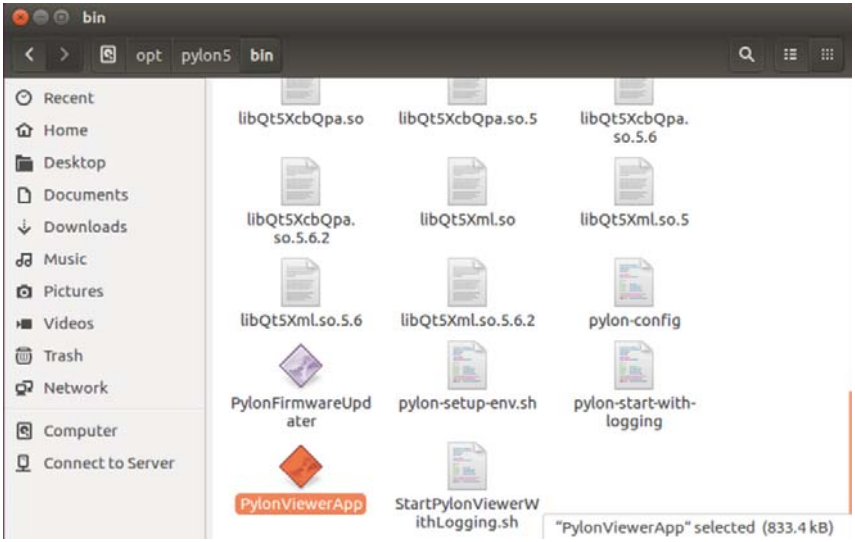
### 3.7.1 Capture an Image via Pylon

The following steps illustrate how to capture images using the Basler PylonViewerApp.

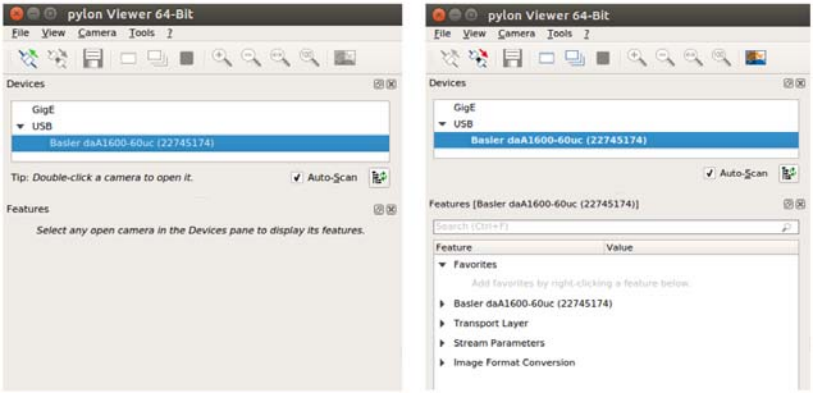
**Step 1**: Click **Files**.



**Step 2**: Go to **/opt/pylon5/bin** and double-click **PylonViewerApp,** or, select the PylonViewerApp in the launcher.



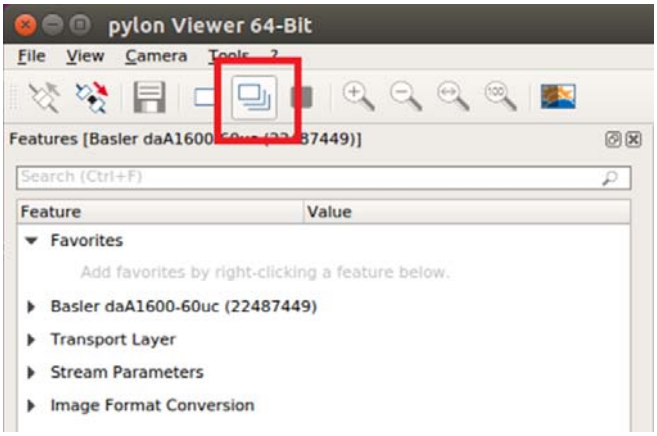
**Step 3**: Double-click **Basler daA1600-60c** to open the camera.

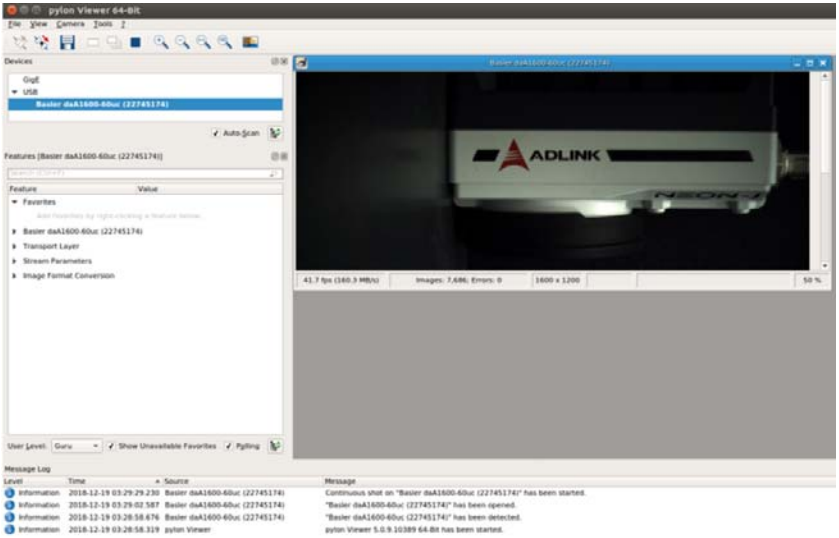



NOTE:

Basler daA1600-60c is the specific sensor for the NEON-202B-JNX used in this example. As sensor names are model-specific, be sure to select the correct sensor based on the specific NEON-20XB-JNX used.

**Step 4**: Click **Continuous Shot** to begin capturing images.



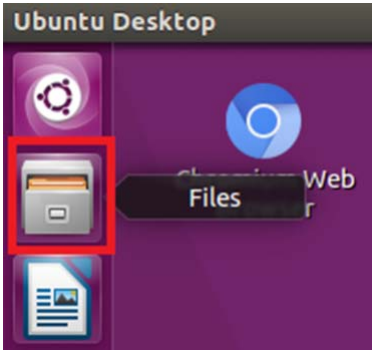



### 3.7.2 Image Sensor Adjustment via Pylon

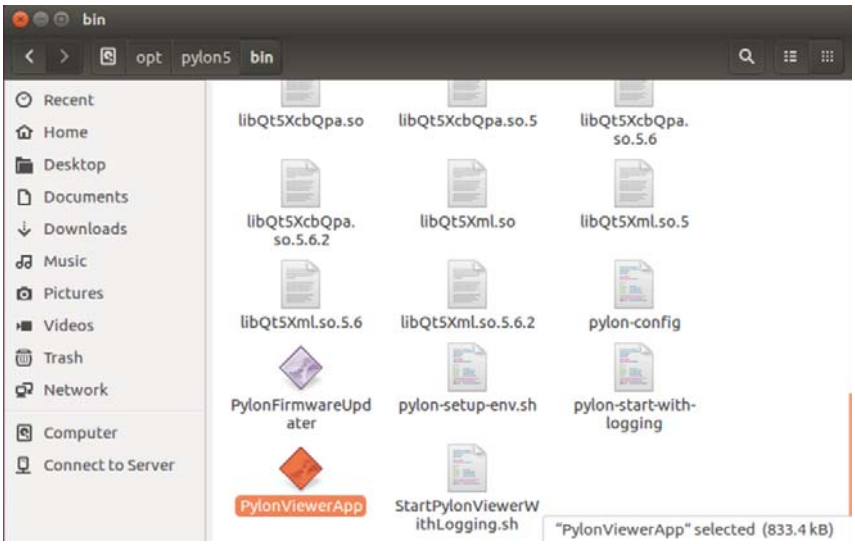
The default NEON-20XB-JNX sensor settings may not be suitable for all applications. This section illustrates how to customize the sensor settings.

#### 3.7.2.1 Use Pylon utility to load saved sensor configuration files

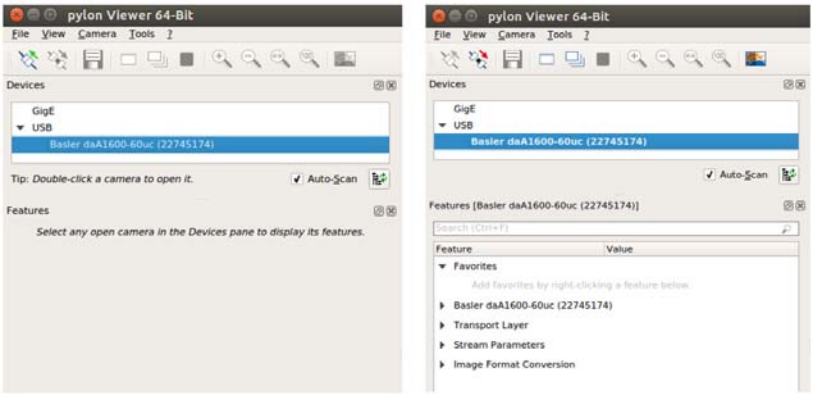
**Step 1**: Click **Files**.




**Step 2**: Go to **/opt/pylon5/bin** and double-click **PylonViewerApp,** or, select the PylonViewerApp in the launcher.



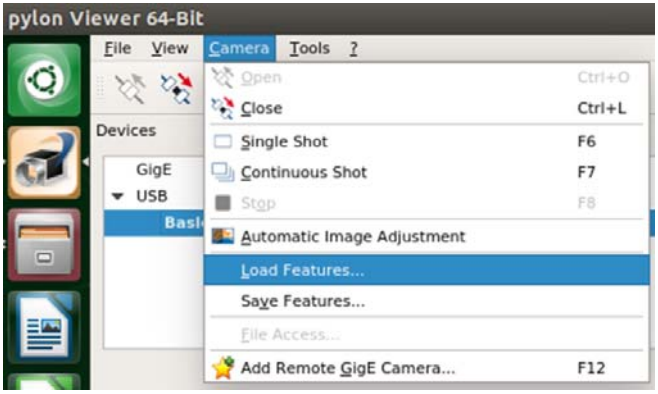
**Step 3**: Double-click **Basler daA1600-60c** to open the camera.

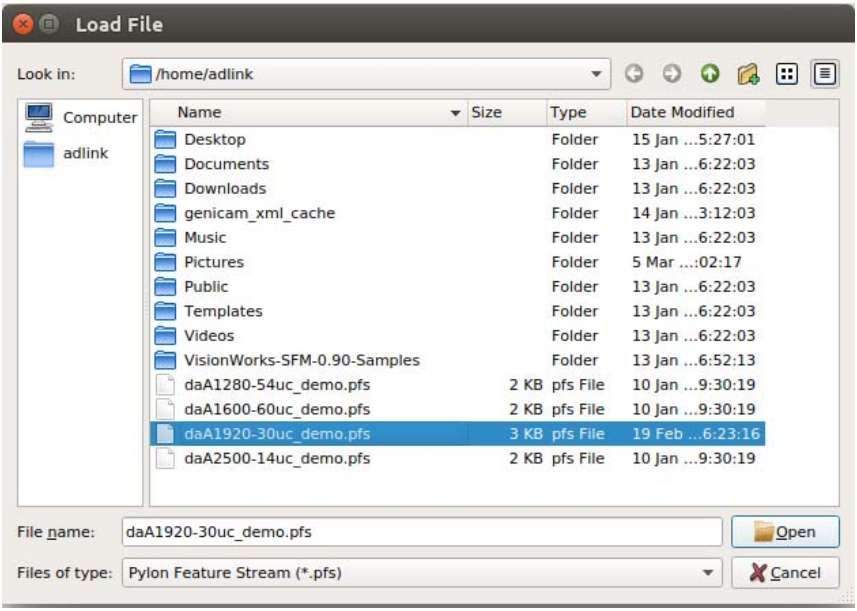



NOTE:

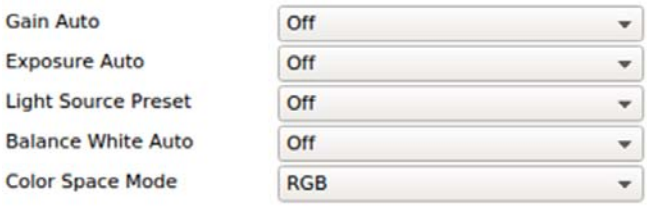
Basler daA1600-60c is the specific sensor for the NEON-202B-JNX used in this example. As sensor names are model-specific, be sure to select the correct sensor based on the specific NEON-20XB-JNX used.

**Step 4**: Files with image sensor settings can be loaded by selecting **Load Features…** and choosing the appropriate .pfs file.

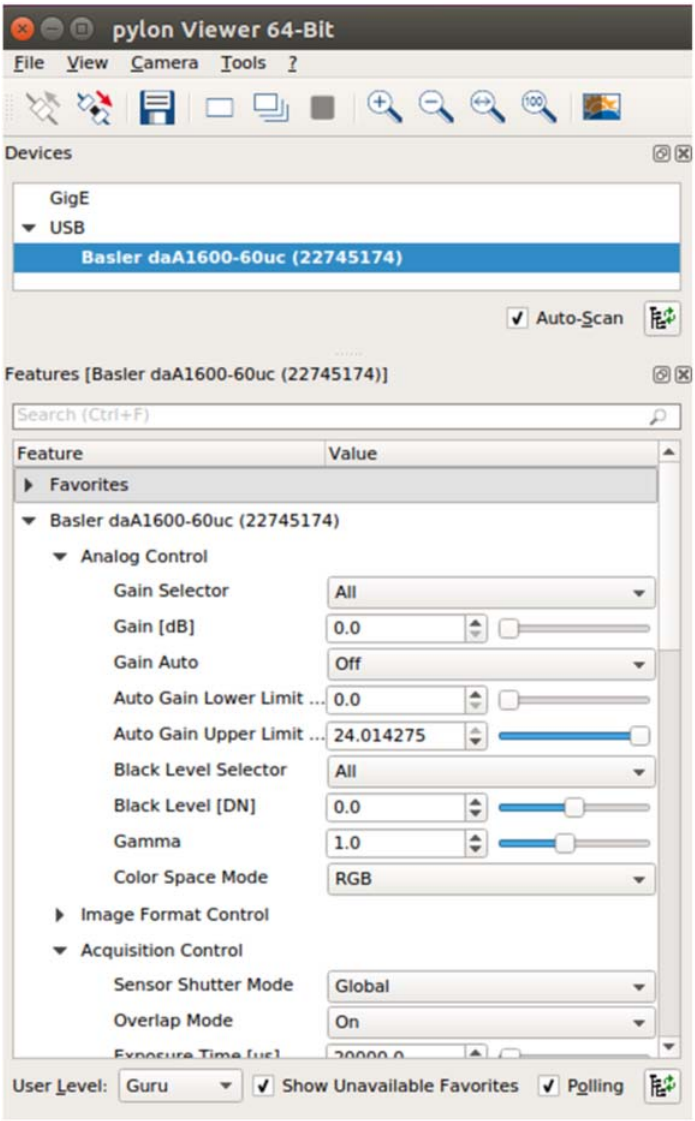




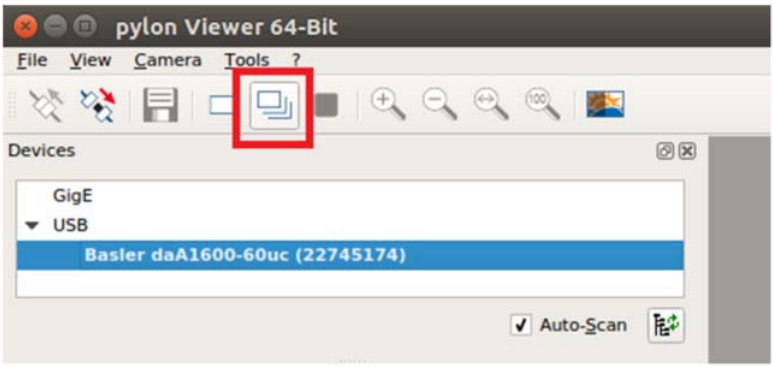

**Step 5**: If the file loads successfully, the sensor's settings should be modified. For example:



The modified settings can also be viewed under **Features** in pylon Viewer.

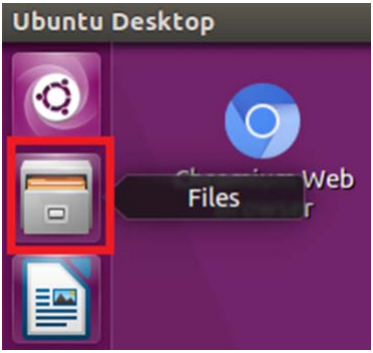


**Step 6**: Click **Continuous Shot** to have the camera capture images with the loaded sensor settings.

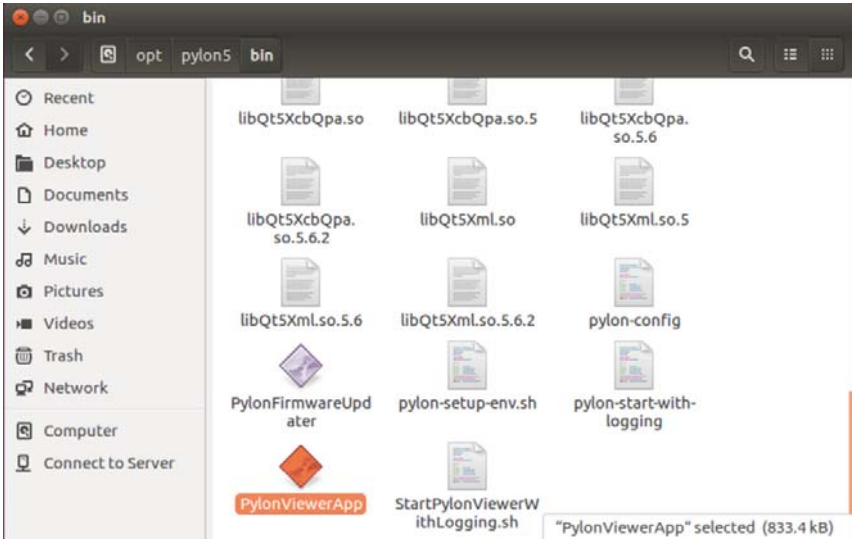



### 3.7.2.2 Use Pylon to adjust the sensor

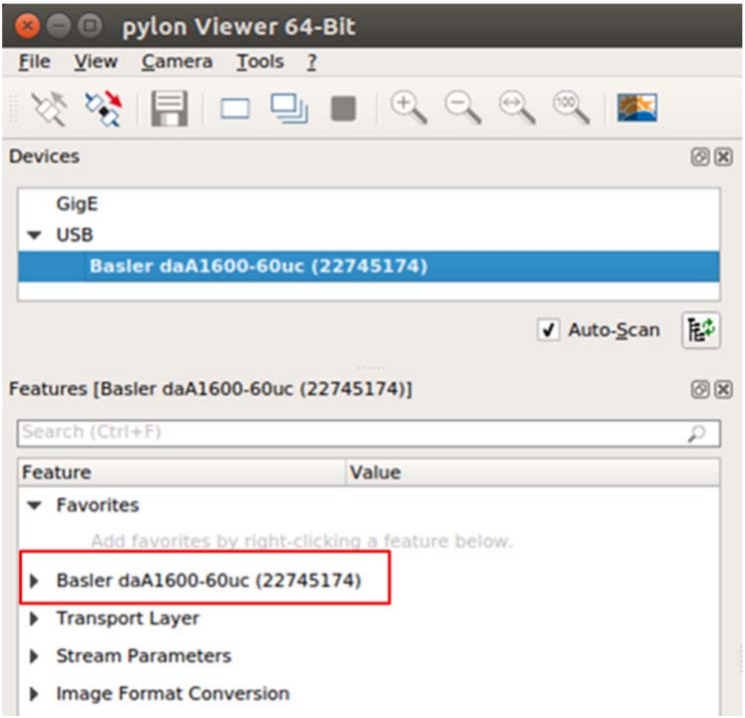
**Step 1**: Click **Files**.




**Step 2**: Go to **/opt/pylon5/bin** and double-click **PylonViewerApp,** or, select the PylonViewerApp in the launcher.



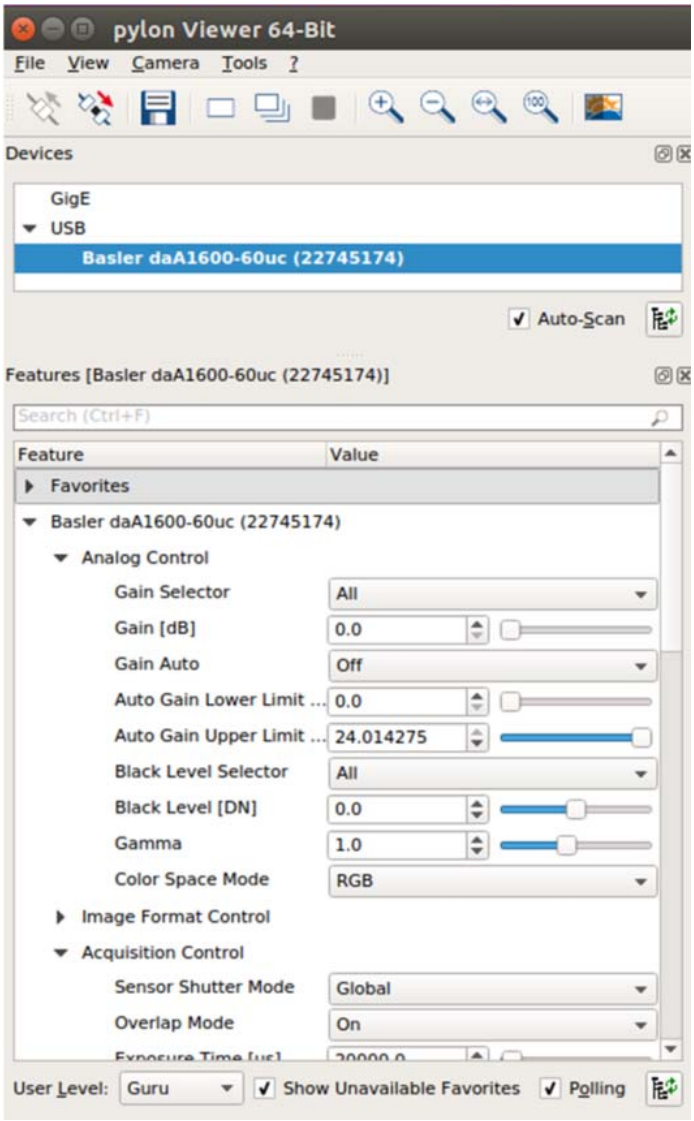
**Step 3**: Double-click **Basler daA1600-60c** to open the camera.




NOTE:

Basler daA1600-60c is the specific sensor for the NEON-202B-JNX used in this example. As sensor names are model-specific, be sure to select the correct sensor based on the specific NEON-20XB-JNX used.

**Step 4**: To save the modified settings to a file, select **Camera > Save Features...** from the main menu.



### 3.7.3 Use APIs to adjust the image sensor

After opening the device, add the **PylonFeaturePersistenceLoad** function to load features that will adjust the image accordingly.

For example:

```
PylonDeviceOpen( hDev, PYLONC_ACCESS_MODE_CONTROL
     | PYLONC_ACCESS_MODE_STREAM );
PylonDeviceGetNodeMap( hDev, &hMap);
PylonFeaturePersistenceLoad( hMap , “daA1600-
     60uc_adjust image quality.pfs”, 1 );
```

```
GENAPIC_RESULT PylonFeaturePersistenceLoad ( NODEMAP_HANDLE hMap,
                                             const char *   pFileName,
                                             _Bool          verify
                                           )
```

Loads the features from a file and stores it to the node tree.

**Parameters**

| | | |
|---|---|---|
| [in] | **hMap** | Node map handle. |
| [in] | **pFileName** | Name of the file containing the node map values. |
| [in] | **verify** | If verify==true (default) all node values will be validated. |

**Returns**

If the function succeeds, the return value is GENAPI_E_OK.
If the function fails, the return value will be any of error codes described in the section Error Codes.

Loads the features from a file and stores it to the node tree.

```
GENAPIC_RESULT PylonDeviceOpen ( PYLON_DEVICE_HANDLE hDev,
                                 int                 accessMode
                               )
```

Open a device.

**Parameters**

[in] **hDev** Device handle

[in] **accessMode** Intended access mode. You can pass one or more of the flags specified below.

**Returns**

If the function succeeds, the return value is GENAPI_E_OK.
If the function fails, the return value will be any of error codes described in the section Error Codes.

This function opens a device. A device must be opened before any operations can be performed on it. The *accessMode* argument can be used to restrict the type of access allowed by the device. The following access modes are available:

- `PYLONC_ACCESS_MODE_CONTROL` - Allows to read or write camera parameters to configure the camera.
- `PYLONC_ACCESS_MODE_STREAM` - Allows to read image data from the camera's stream grabber object.
- `PYLONC_ACCESS_MODE_EVENT` - Allows to read event data from the camera's stream grabber object.
- `PYLONC_ACCESS_MODE_EXCLUSIVE` - Allows exclusive access. When this flag is specified no other application may access the camera.
- `PYLONC_ACCESS_MODE_MONITOR` - Allows only read access. This flag cannot be combined with any other flags. It is typically used in Multicast/Broadcast applications with GigE cameras.

You can pass one or more flags. If you pass more than one flag you can combine them using the 'or' operator.

```
GENAPIC_RESULT PylonDeviceGetNodeMap ( PYLON_DEVICE_HANDLE hDev,
                                       NODEMAP_HANDLE *    phMap
                                     )
```

Return the parameter node map for a device.

**Parameters**

[in] **hDev** Device handle

[out] **phMap** Result pointer

**Returns**

If the function succeeds, the return value is GENAPI_E_OK.
If the function fails, the return value will be any of error codes described in the section Error Codes.

This function returns a handle for the node map of a device. If the device does not support a node map an invalid handle is returned.

## 3.8 Neon-20XA Trigger Control

### 3.8.1 Trigger API Function

You can adjust image features or control a lens by using the v4l2-ctl command as follows:

```
v4l2-ctl --set-ctrl=<ctrl>=<val>
```

To list the all the options, enter:

```
v4l2-ctl --all
```

The following table list all the Trigger API Function options and their descriptions.

| **<ctrl>** | **<ctrl> description** | **<val> type** | **<val> description** |
|---|---|---|---|
| trigger_mode | enable/disable the trigger mode | Menu<br>0: OFF<br>1: PULSED<br>2: AUTOMATIC SOFTWARE<br>3: AUTOMATIC EXTERNAL | min=0<br>max=3<br>default=0 |
| trigger_gain | set the gain at trigger mode | int | min=10000<br>max=1280000<br>step=1000<br>default=10000 |
| trigger_wb_mode | choose the white balance mode at trigger mode | Menu<br>0: Manual Gain<br>1: Manual Color Temperature<br>2: Sunny<br>3: Shadow<br>4: Indoor<br>5: Lamp | min=0<br>max=5<br>default=1 |

**Figure 3-7: Neon-20XA Trigger API Function Options**

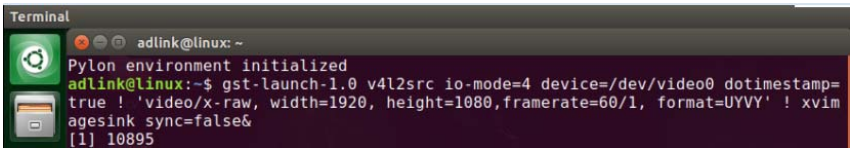
| <ctrl> | <ctrl> description | <val> type | <val> description |
|---|---|---|---|
| trigger_wb_rgain | set the r gain of white balance at trigger mode | int | min=1<br>max=4095<br>step=1<br>default=1024 |
| trigger_wb_bgain | set the b gain of white balance at trigger mode | int | min=1<br>max=4095<br>step=1<br>default=1024 |
| trigger_wb_colortemp | set the color temperature at trigger mode | int | min=2000<br>max=12000<br>step=1<br>default=5500 |
| trigger_start_stop | start trigger/stop trigger | button | |
| external_trigger_polarity | choose to trigger externally at falling edge or rising edge | Menu<br>0: Falling<br>1: Rising | min=0<br>max=1<br>default=1 |

**Figure 3-7: Neon-20XA Trigger API Function Options**

### 3.8.2 Trigger API Example

**Step 1**: Open a terminal and enter the following command to start streaming.

```
gst-launch-1.0 v4l2src io-mode=4 device=/dev/
     video0 dotimestamp=true ! 'video/x-raw,
     width=1920, height=1080,framerate=60/1,
     format=UYVY' ! xvimagesink sync=false&
```



**Step 2**: To test the functionality of the software trigger of the pulsed trigger mode, enter:

```
v4l2-ctl --set-ctrl=trigger_mode=1
v4l2-ctl --set-ctrl=trigger_start_stop=1
```

**Step 3**: To test the functionality of the hardware trigger of the pulsed trigger mode, enter:

```
v4l2-ctl --set-ctrl=trigger_mode=1
```

**Step 4**: To test the functionality of the software trigger of the automatic trigger mode, enter:

```
v4l2-ctl --set-ctrl=trigger_mode=2
v4l2-ctl --set-ctrl=trigger_start_stop=1
v4l2-ctl --set-ctrl=trigger_start_stop=1
```

In automatic trigger mode, the first **trigger_start_stop** command will trigger continuously while the second **trigger_start_stop** command will stop the trigger.

# Important Safety Instructions

For user safety, please read and follow all instructions, Warnings, Cautions, and Notes marked in this manual and on the associated device before handling/operating the device, to avoid injury or damage.

- Read these safety instructions carefully
- Keep the User's Manual for future reference
- Read the Specifications section of this manual for detailed information on the recommended operating environment
- Operating temperature: 35ºC with USB Type C Adaptor/Hub or 40ºC with the adapter supply.
- When installing/mounting or uninstalling/removing device; or when removal of a chassis cover is required for user servicing:
  - Turn off power and unplug any power cords/cables
  - Reinstall all chassis covers before restoring power
- To avoid electrical shock and/or damage to device:
  - Keep device away from water or liquid sources
  - Keep device away from high heat or humidity
  - Keep device properly ventilated (do not block or cover-ventilation openings)
  - Always use recommended voltage and power source settings
  - Always install and operate device near an easily accessible electrical outlet
  - Secure the power cord (do not place any object on/over the power cord)
  - Only install/attach and operate device on stable surfaces and/or recommended mountings
- If the device will not be used for long periods of time, turn off and unplug from its power source
- Never attempt to repair the device, which should only be serviced by qualified technical personnel using suitable tools

- A Lithium-type battery may be provided for uninterrupted backup or emergency power.


Risk of explosion if battery is replaced with one of an incorrect type; please dispose of used batteries appropriately.

- The device must be serviced by authorized technicians when:
  - The power cord or plug is damaged
  - Liquid has entered the device interior
  - The device has been exposed to high humidity and/or moisture
  - The device is not functioning or does not function according to the User's Manual
  - The device has been dropped and/or damaged and/or shows obvious signs of breakage
- Disconnect the power supply cord before loosening the thumbscrews and always fasten the thumbscrews with a screwdriver before starting the system up
- Ensure that the power adapter cord of the device connects to a socket outlet with a ground/earth connection.
- It is recommended that the device be installed only in a server room or computer room where access is:
  - Restricted to qualified service personnel or users familiar with restrictions applied to the location, reasons therefor, and any precautions required
  - Only afforded by the use of a tool or lock and key, or other means of security, and controlled by the authority responsible for the location

| | |
|---|---|
|  | ***BURN HAZARD***<br>Touching this surface could result in bodily injury. To reduce risk, allow the surface to cool before touching. |

# Consignes de Sécurité Importante

*S'il vous plaît prêter attention stricte à tous les avertissements et mises en garde figurant sur l'appareil, pour éviter des blessures ou des dommages.*

- *Lisez attentivement ces consignes de sécurité.*
- *Conservez le manuel de l'utilisateur pour pouvoir le consulter ultérieurement.*
- *Lisez la section Spécifications de ce manuel pour des informations détaillées sur l'environnement d'exploitation recommandé.*
- *Température de fonctionnement: 35 ° C avec adaptateur / concentrateur USB Type C ou 40 ° C avec l'adaptateur.*
- *Lors de l'installation / du montage ou de la désinstallation / suppression du périphérique; ou lorsque le retrait d'un capot de châssis est requis pour l'entretien par l'utilisateur:*
  - *Coupez l'alimentation et débranchez tous les cordons / câbles d'alimentation*
  - *Réinstallez tous les couvercles de châssis avant de rétablir l'alimentation*
- *Pour éviter les chocs électriques et / ou les dommages à l'appareil:*
  - *Gardez l'appareil éloigné de l'eau ou des sources de liquide*
  - *Gardez l'appareil loin de la chaleur ou de l'humidité élevée*
  - *Gardez l'appareil correctement ventilé (ne bloquez pas et ne couvrez pas les ouvertures de ventilation)*
  - *Utilisez toujours les paramètres de tension et de source d'alimentation recommandés*
  - *Installez et utilisez toujours l'appareil à proximité d'une prise électrique facilement accessible*
  - *Fixez le cordon d'alimentation (ne placez aucun objet sur / par-dessus le cordon d'alimentation)*
  - *Installez / fixez et utilisez l'appareil uniquement sur des surfaces stables et / ou des supports recommandés*
- *Si l'appareil n'est pas utilisé pendant de longues périodes, éteignez-le et débranchez-le de sa source d'alimentation*
- *N'essayez jamais de réparer l'appareil, qui ne doit être entre-*

*tenu que par du personnel technique qualifié à l'aide d'outils appropriés.*

- *Une batterie de type lithium peut être fournie pour une alimentation de secours ou une alimentation de secours ininterrompue.*

---


*Risque d'explosion si la pile est remplacée par une autre de type incorrect. Veuillez jeter les piles usagées de façon appropriée.*

---

- *L'appareil doit être réparé par des techniciens autorisés lorsque:*
  - *Le cordon d'alimentation ou la fiche est endommagé*
  - *Du liquide a pénétré à l'intérieur de l'appareil*
  - *L'appareil a été exposé à une humidité élevée et / ou à l'humidité*
  - *L'appareil ne fonctionne pas ou ne fonctionne pas selon le manuel de l'utilisateur*
  - *L'appareil est tombé et / ou endommagé et / ou montre des signes évidents de casse*
- *Débranchez le cordon d'alimentation avant de desserrer les vis moletées et fixez toujours les vis moletées avec un tournevis avant de démarrer le système*
- *Assurez-vous que le cordon de l'adaptateur secteur de l'appareil est connecté à une prise de courant avec une connexion terre / terre.*
- *Il est recommandé d'installer l'appareil uniquement dans une salle de serveurs ou une salle informatique où l'accès est:*
  - *Réservé au personnel de service qualifié ou aux utilisateurs familiers avec les restrictions appliquées à l'emplacement, les raisons de celles-ci et les précautions nécessaires*
  - *Seulement permis par l'utilisation d'un outil ou d'une serrure et d'une clé, ou d'autres moyens de sécurité, et contrôlé par l'autorité responsable de l'emplacement*

| | |
|---|---|
|  | ***RISQUE DE BRÛLURES***<br>*Ne touchez pas cette surface, cela pourrait entraîner des blessures.*<br>*Pour éviter tout danger, laissez la surface refroidir avant de la toucher.* |

# Getting Service

**Ask an Expert:** http://askanexpert.adlinktech.com

**ADLINK Technology, Inc.**
9F, No.166 Jian Yi Road, Zhonghe District
New Taipei City 235, Taiwan
Tel: +886-2-8226-5877
Fax: +886-2-8226-5717
Email: service@adlinktech.com

**Ampro ADLINK Technology, Inc.**
5215 Hellyer Avenue, #110
San Jose, CA 95138, USA
Tel: +1-408-360-0200
Toll Free: +1-800-966-5200 (USA only)
Fax: +1-408-360-0222
Email: info@adlinktech.com

**ADLINK Technology (China) Co., Ltd.**
300 Fang Chun Rd., Zhangjiang Hi-Tech Park
Pudong New Area, Shanghai, 201203 China
Tel: +86-21-5132-8988
Fax: +86-21-5132-3588
Email: market@adlinktech.com

**ADLINK Technology GmbH**
Hans-Thoma-Strasse 11
D-68163 Mannheim, Germany
Tel: +49-621-43214-0
Fax: +49-621 43214-30
Email: emea@adlinktech.com

Please visit the Contact page at www.adlinktech.com for information on how to contact the ADLINK regional office nearest you: