



**Thank you for choosing the sCMOS Development Kit from Critical Link.**

The sCMOS Development Kit Application Quick Start Guide will guide you through the software installation process and the steps to acquire your first image.

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**1 Revision History**

Revision	Date	Notes
Draft	6 Jul 2012	Draft Release
Rel. 1.0	8 Aug 2012	Initial 1.0 Release
Rel. 1.1	26 Aug 2012	MityViewer software install



## 2 Install USB to 10/100 Ethernet Adapter

Communication with the sCMOS development kit is over Ethernet using a USB Network Interface Card (NIC). Critical Link has supplied an independent NIC adapter to facilitate interfacing to the development kit while eliminating modifications and changes to the user's PC network settings.

This device should have been configured during the Hardware Setup Guide that has been printed and included with the sCMOS Development Kit. If this has not been performed yet, then please follow the steps outlined in that guide.

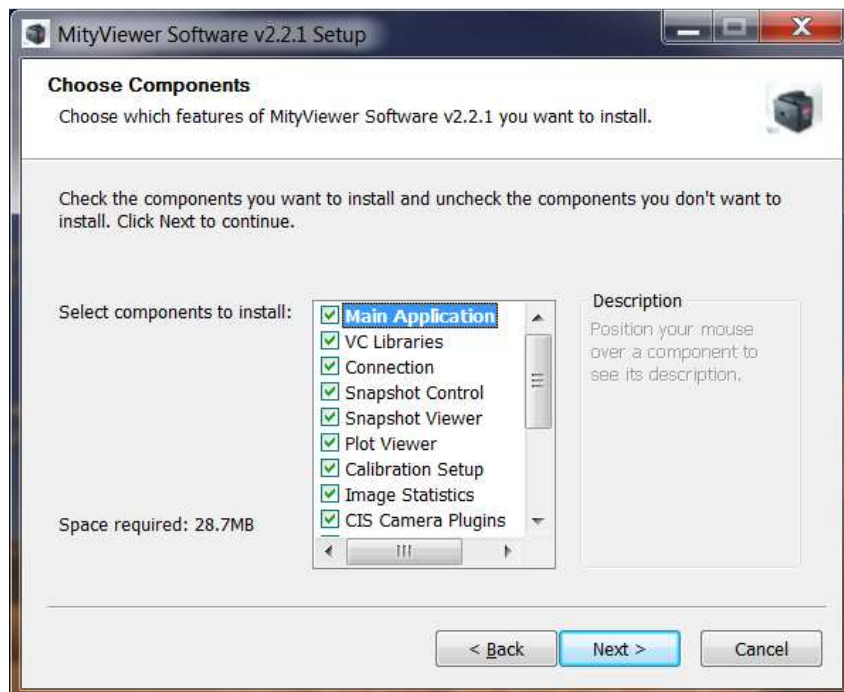
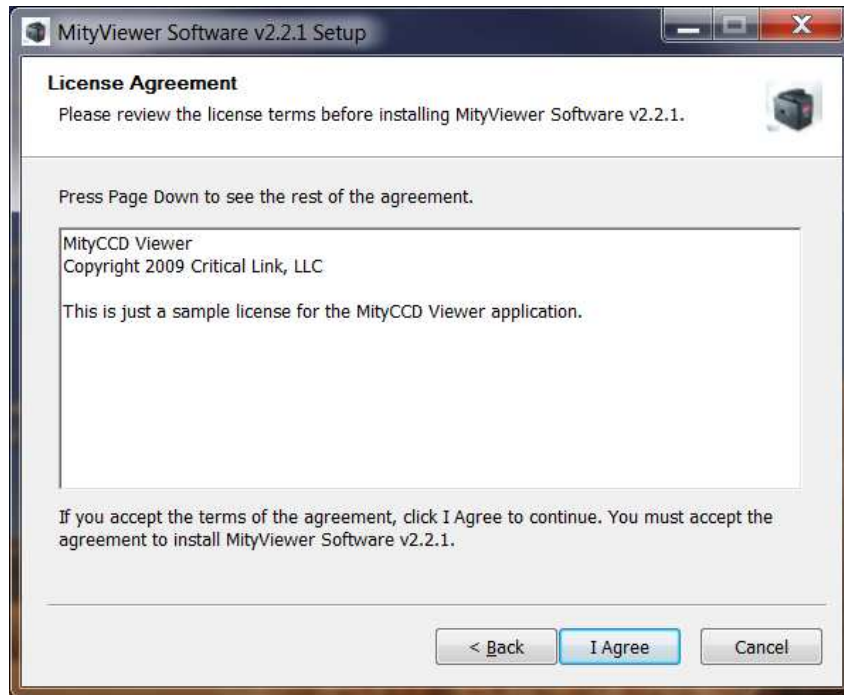
## 3 Install MityCCD Viewer Software

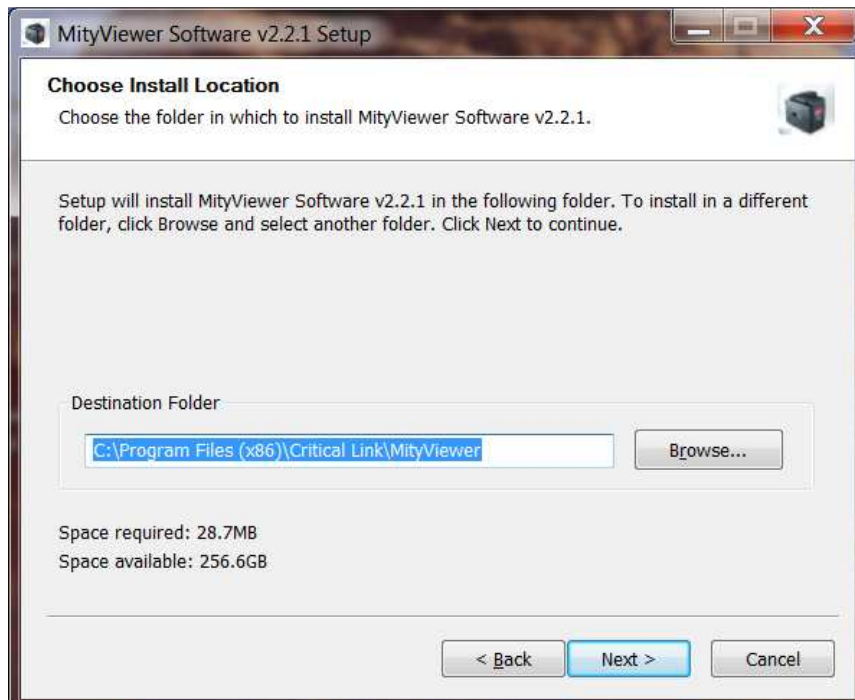
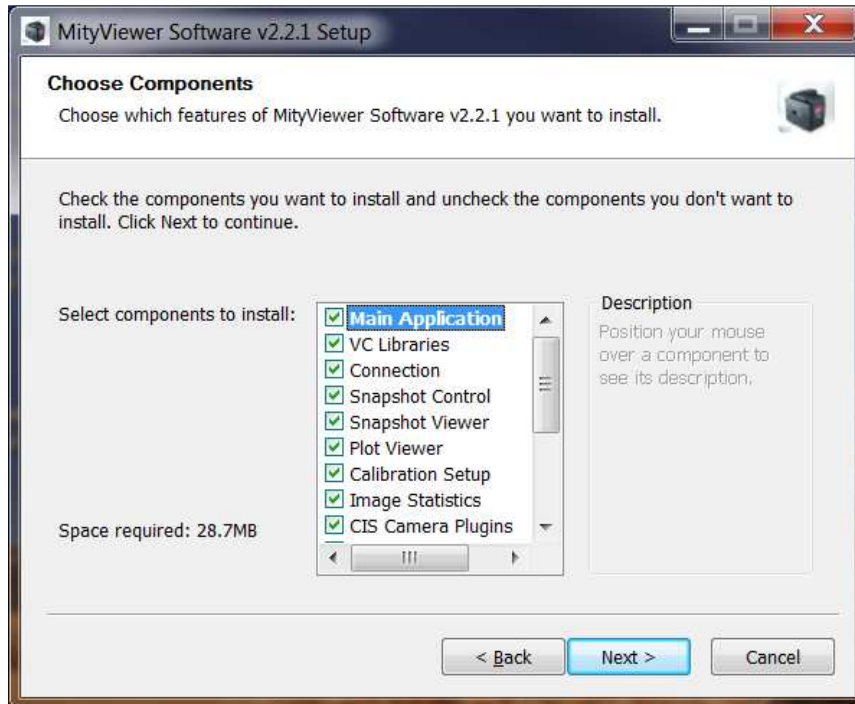
The MityViewer is a Windows PC application which lets you setup and configure the sCMOS sensor and development kit as well as acquire and display image data. Follow the steps below to install the MityViewer application on your PC.

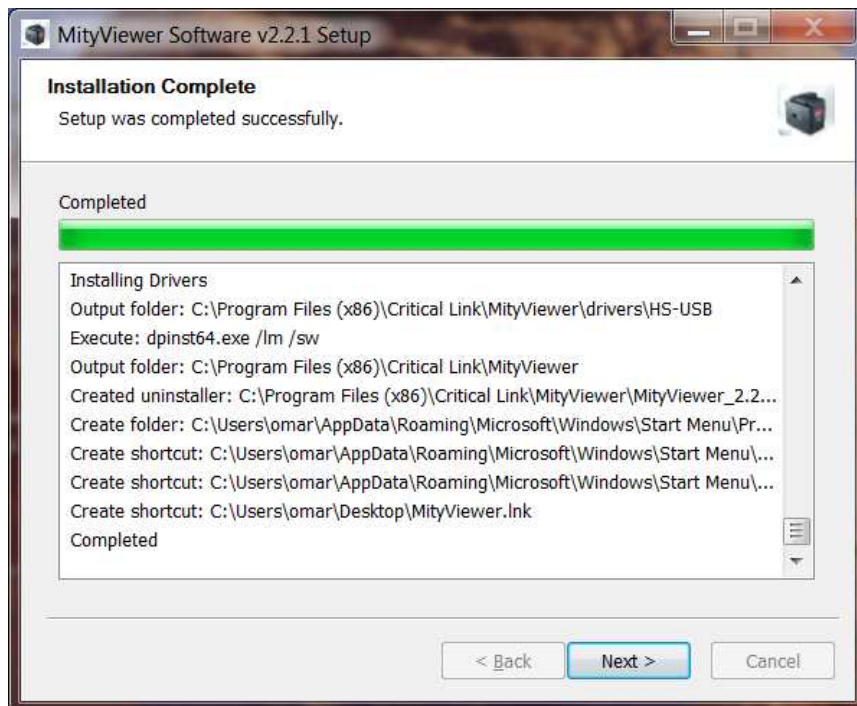
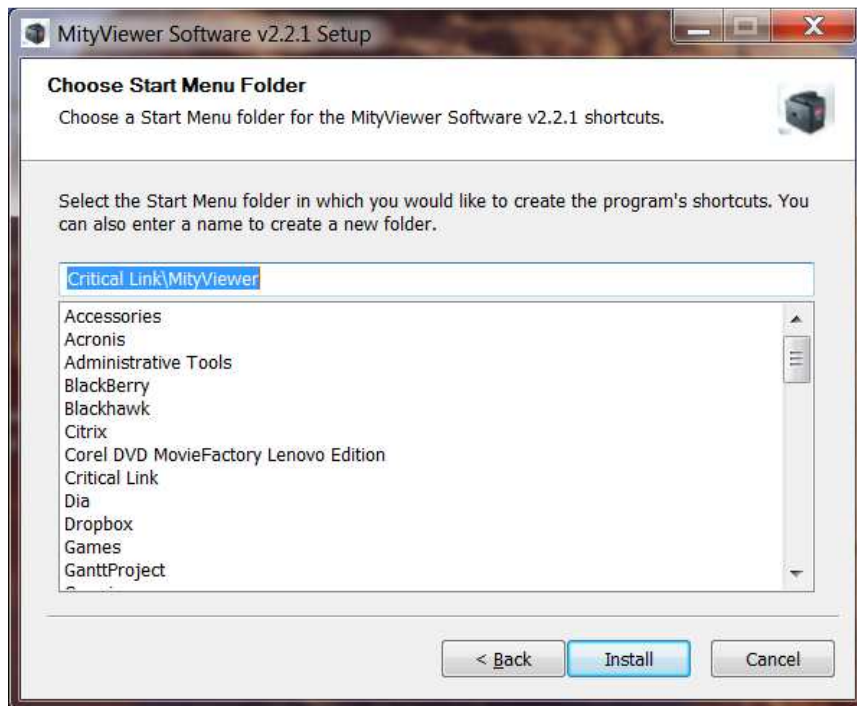
Installing the application on your computer will create shortcuts to start it under the standard menus (Start→Programs→Critical Link→MityCCD on a windows based computer). During the installation, you will be able to select which plugin elements you wish to install. Some of the plugins are designed for factory and/or development use and will require keys to install. The default set should be adequate for the majority of users.

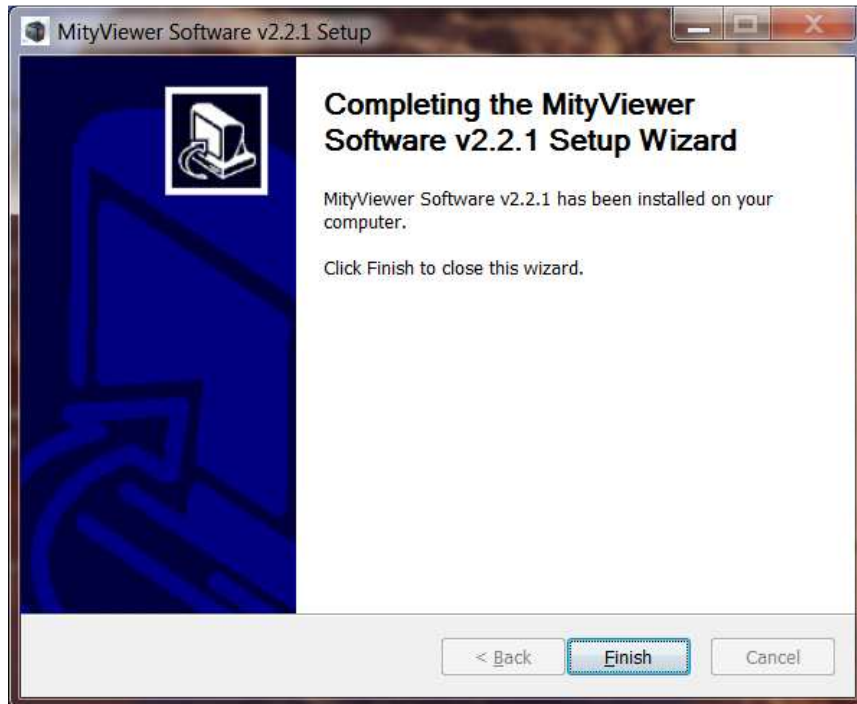
1. Select the application (MityViewer\_setup\_2\_2\_1.exe) from the CD / DVD and then follow the prompts











## 4 Acquire First Image

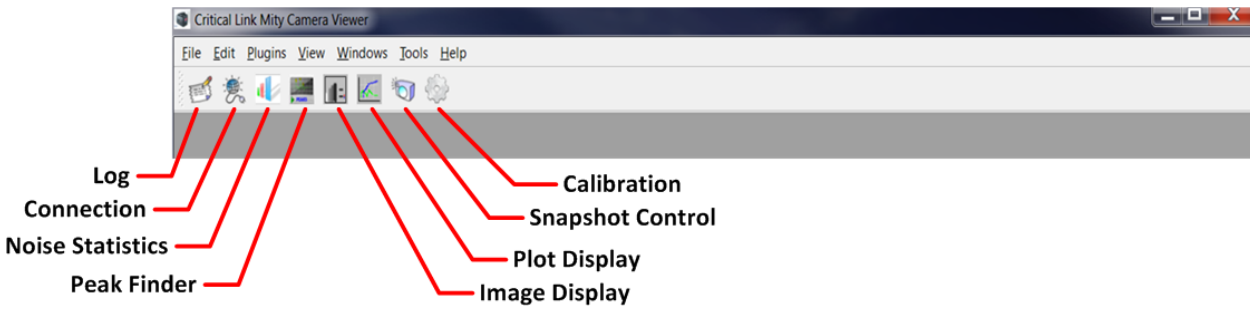
This section discusses the steps needed to connect to the camera, launch the Viewer software and acquire the first image.

### 4.1 Launch MityCCD Viewer

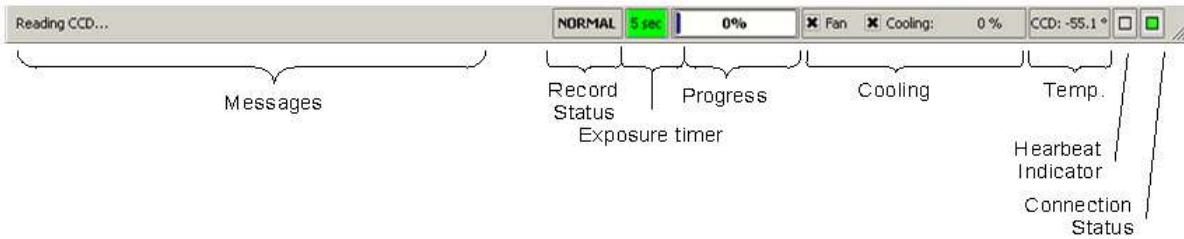
Launch the MityCCD Viewer software by going to the Windows Start menu and typing MityCCD Viewer. The program will start and the main screen will appear (Windows 7). Use (Start→Programs→Critical Link→MityCCD) for Windows XP.

## 4.2 MityViewer

All key features of the Viewer are easily accessible via icons below the menu bar.

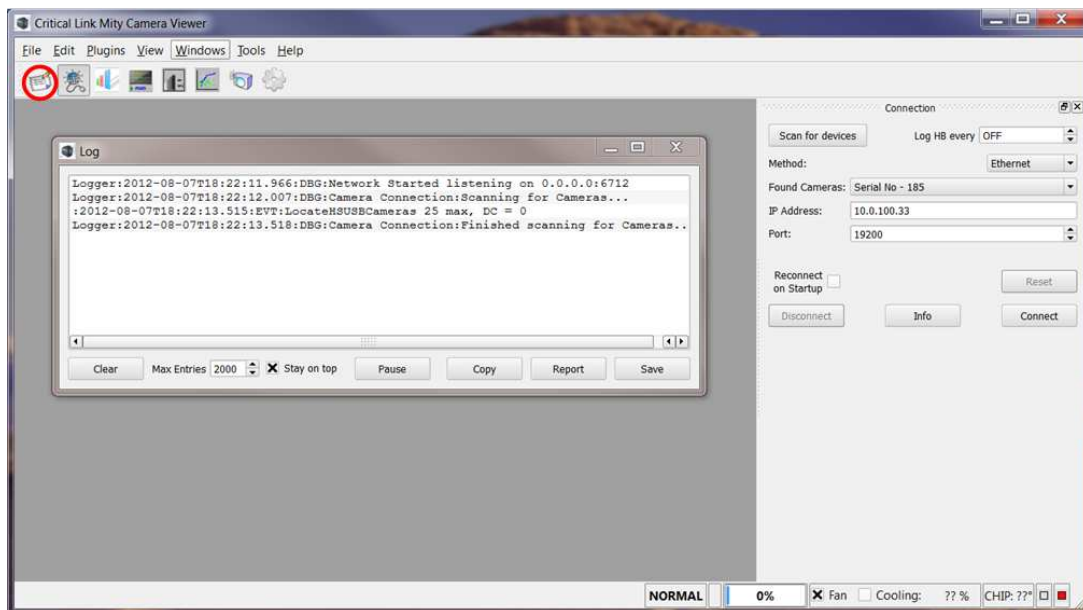


The status bar – displayed at the bottom of the window – shows a summary of camera / image acquisition status.



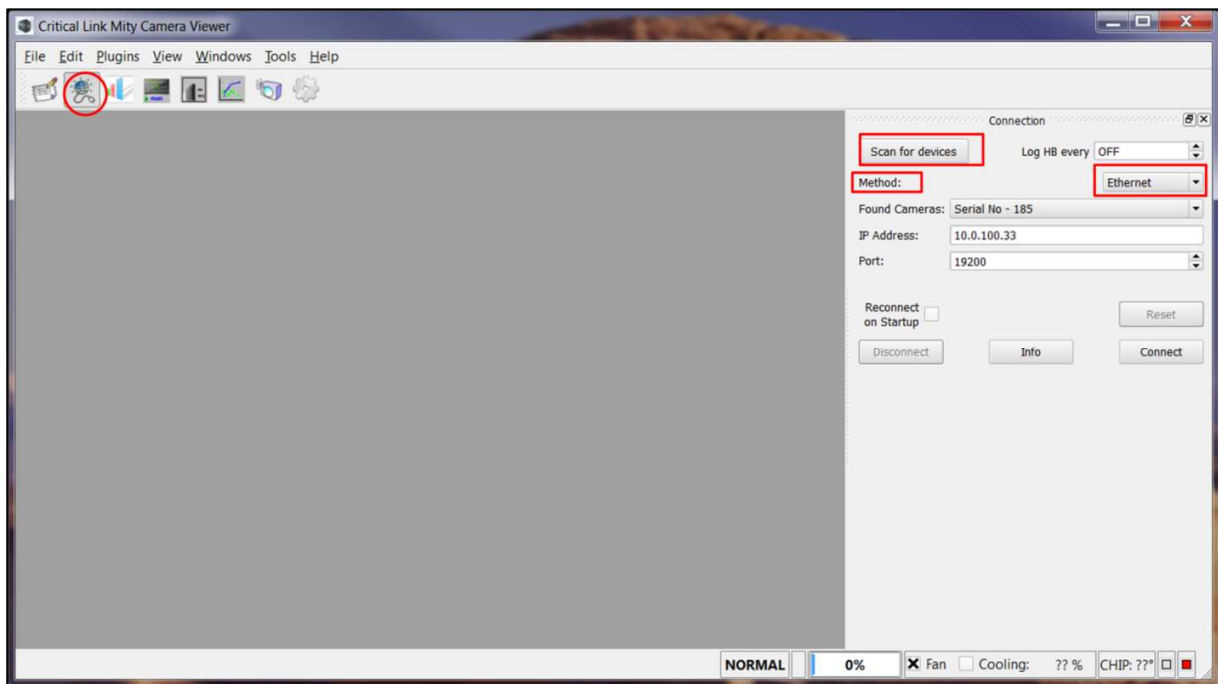
## 4.3 Launch Log Viewer

This dialog shows all the communication between the camera and PC and can assist in understanding overall operation. Click on the Log Viewer icon to launch the Log window.



#### 4.4 Connecting to Camera

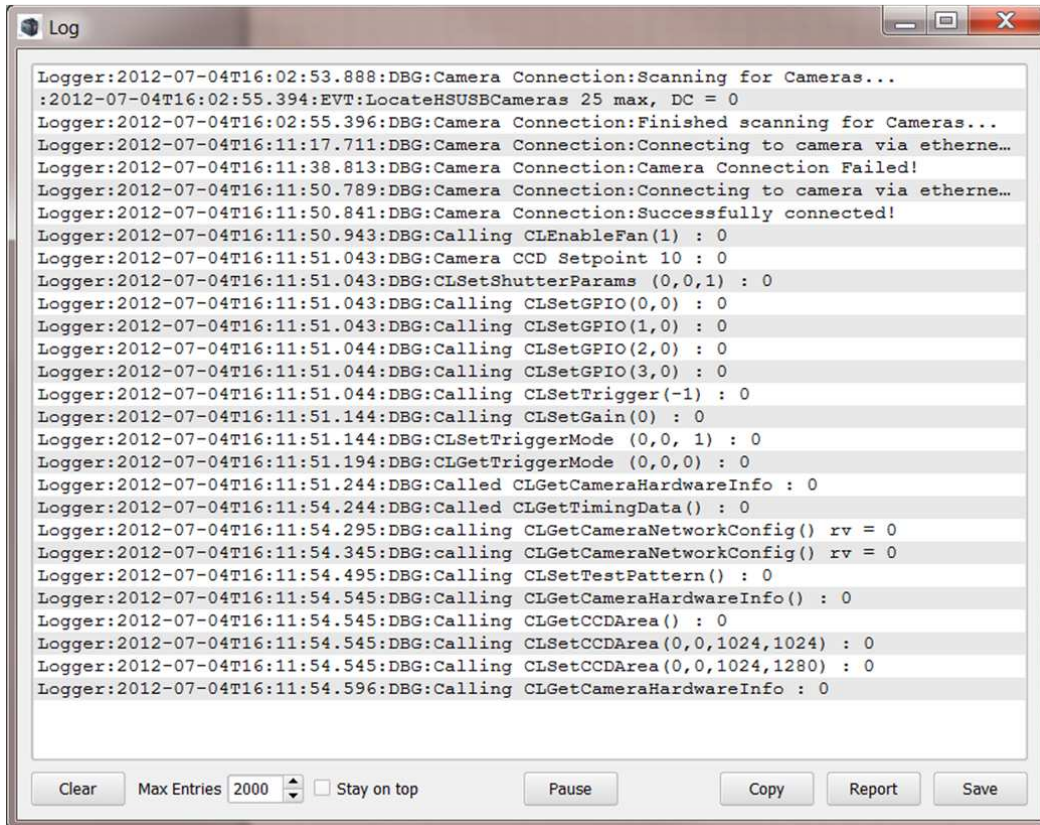
1. Attach Ethernet cable to USB-NIC adapter and camera
2. Turn on the camera via toggle switch and you should hear the fan turn on
3. If the connection dialog is not open, then select the connection icon from menu bar
4. Select **Ethernet** as the communication method
5. Select **Scan for devices** button



6. Wait for a few seconds and the camera S/N should appear on the **Found Cameras** drop down list. Note, it takes the camera 30 seconds to boot-up from a power-on cycle so you may need to wait 30 ~ 45 seconds to connect successfully. If the **Found Cameras** drop down list is empty, then select **Scan for devices** again. If you have multiple cameras on your network, then all **Found Cameras** should appear in this drop down list.
7. Select the camera based on S/N. A printed label with S/N may be found on the back of the camera.



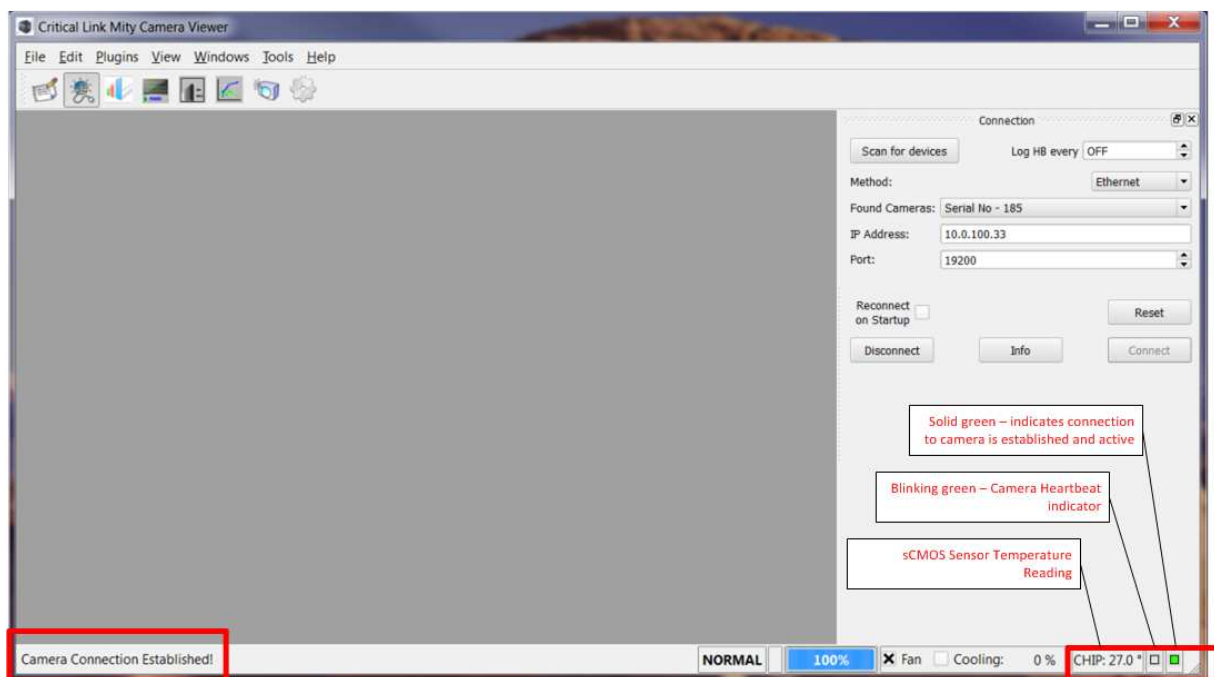
8. Select **Connect** button and observe display on Log Viewer. If the connect fails initially, then select the **Connect** button a second time.



```
Log
Logger:2012-07-04T16:02:53.888:DBG:Camera Connection:Scanning for Cameras...
:2012-07-04T16:02:55.394:EVT:LocateHSUSBCameras 25 max, DC = 0
Logger:2012-07-04T16:02:55.396:DBG:Camera Connection:Finished scanning for Cameras...
Logger:2012-07-04T16:11:17.711:DBG:Camera Connection:Connecting to camera via etherne...
Logger:2012-07-04T16:11:38.813:DBG:Camera Connection:Camera Connection Failed!
Logger:2012-07-04T16:11:50.789:DBG:Camera Connection:Connecting to camera via etherne...
Logger:2012-07-04T16:11:50.841:DBG:Camera Connection:Successfully connected!
Logger:2012-07-04T16:11:50.943:DBG:Calling CLEnableFan(1) : 0
Logger:2012-07-04T16:11:51.043:DBG:Camera CCD Setpoint 10 : 0
Logger:2012-07-04T16:11:51.043:DBG:CLSetShutterParams (0,0,1) : 0
Logger:2012-07-04T16:11:51.043:DBG:Calling CLSetGPIO(0,0) : 0
Logger:2012-07-04T16:11:51.043:DBG:Calling CLSetGPIO(1,0) : 0
Logger:2012-07-04T16:11:51.044:DBG:Calling CLSetGPIO(2,0) : 0
Logger:2012-07-04T16:11:51.044:DBG:Calling CLSetGPIO(3,0) : 0
Logger:2012-07-04T16:11:51.044:DBG:Calling CLSetTrigger(-1) : 0
Logger:2012-07-04T16:11:51.144:DBG:Calling CLSetGain(0) : 0
Logger:2012-07-04T16:11:51.144:DBG:CLSetTriggerMode (0,0, 1) : 0
Logger:2012-07-04T16:11:51.194:DBG:CLGetTriggerMode (0,0,0) : 0
Logger:2012-07-04T16:11:51.244:DBG:Called CLGetCameraHardwareInfo : 0
Logger:2012-07-04T16:11:54.244:DBG:Called CLGetTimingData() : 0
Logger:2012-07-04T16:11:54.295:DBG:calling CLGetCameraNetworkConfig() rv = 0
Logger:2012-07-04T16:11:54.345:DBG:calling CLGetCameraNetworkConfig() rv = 0
Logger:2012-07-04T16:11:54.495:DBG:Calling CLSetTestPattern() : 0
Logger:2012-07-04T16:11:54.545:DBG:Calling CLGetCameraHardwareInfo() : 0
Logger:2012-07-04T16:11:54.545:DBG:Calling CLGetCCDArea() : 0
Logger:2012-07-04T16:11:54.545:DBG:Calling CLSetCCDArea(0,0,1024,1024) : 0
Logger:2012-07-04T16:11:54.545:DBG:Calling CLSetCCDArea(0,0,1024,1280) : 0
Logger:2012-07-04T16:11:54.596:DBG:Calling CLGetCameraHardwareInfo : 0

Clear Max Entries 2000 Stay on top Pause Copy Report Save
```

9. Once the camera has successfully connected, then two green indicators will appear on the bottom right of the status bar. The right-most green indicator indicates connection to the camera. The indicator next to the left most indicator flashes green and indicates receipt of a periodic heartbeat message from the camera. A message indicating that the **Camera Connection Established** also appears on the bottom left
10. The periodic heartbeat message contains status information and some of the information may be shown by selecting the **info** button.
11. The board temperature should be around 30C and indicates temperature sensor on the electronics board.



## 4.5 Sensor Configuration and Calibration

1. Select the **CIS Calibration** icon to display the **Calibration** Control Panel.



### 4.5.1 Select Output Channel

1. Set channel selection to **Combined**. This selection combines the both high and low gain channels into a single pixel output. Alternatively you may select High Gain or Low Gain channel data from the drop down list.

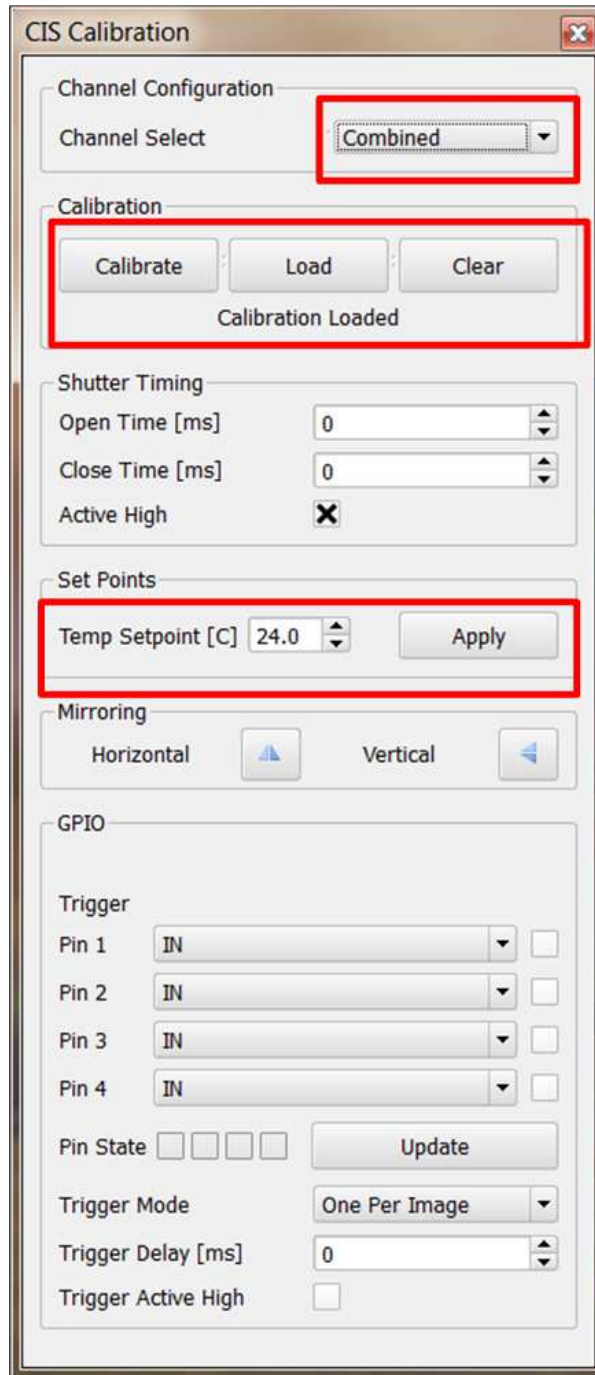
### 4.5.2 Calibration

1. Load sensor calibration data by selecting the **Load** button and note the confirmation message **Calibration Data Loaded** is shown.

### 4.5.3 Set Temperature SetPoint

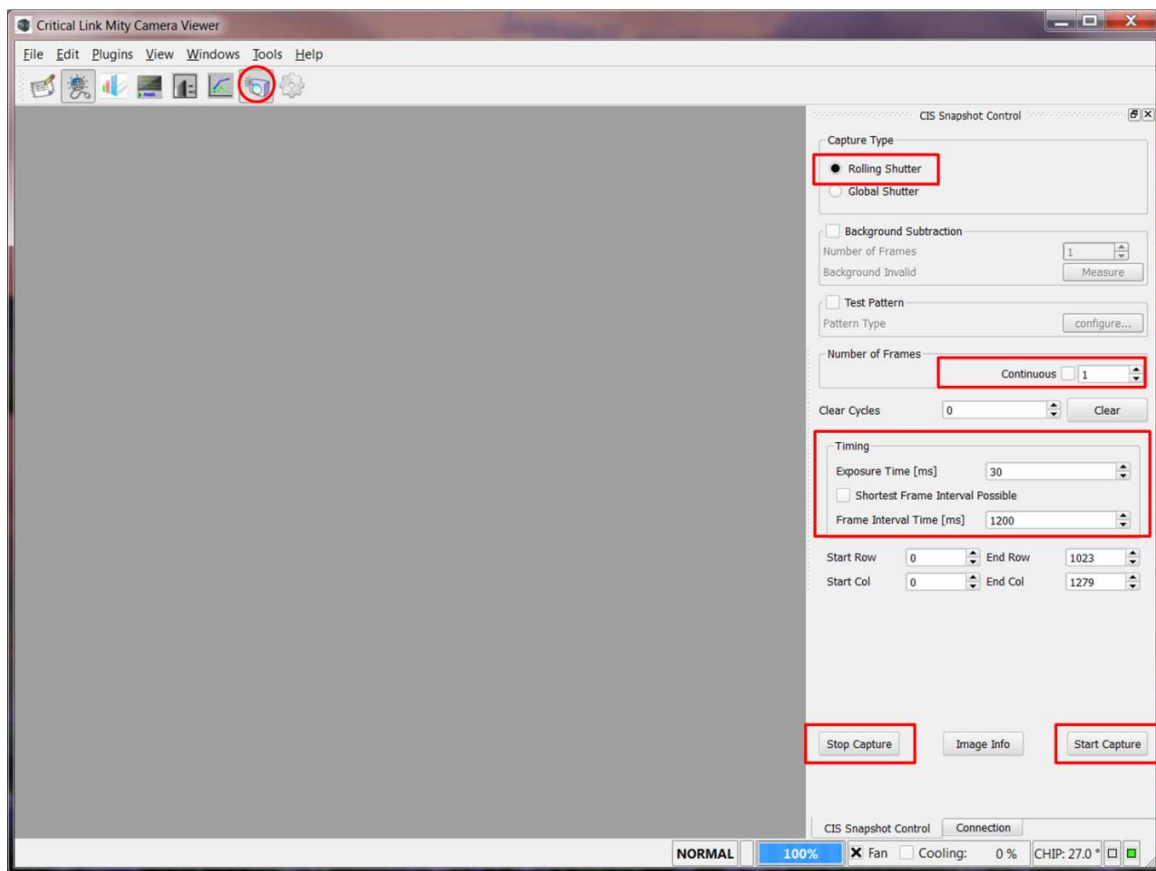
1. Note the current sensor temperature displayed on the main window status bar **Chip**. (This is the current sensor temperature.)
2. Set sensor temperature set point to 3 degrees below the temperature noted in step 1 above.
3. Turn Cooling on by selecting the check box on the main Window Status bar.

**WARNING:** The sCMOS sensor and thermoelectric cooler (TEC) are not housed in a vacuum chamber; therefore great care must be taken when operating the TEC as condensation may occur. Critical Link recommends maintaining the sensor at a minimum temperature of 5 deg. C below the sensor ambient temperature. Contact Critical Link if you notice condensation on the sensor.



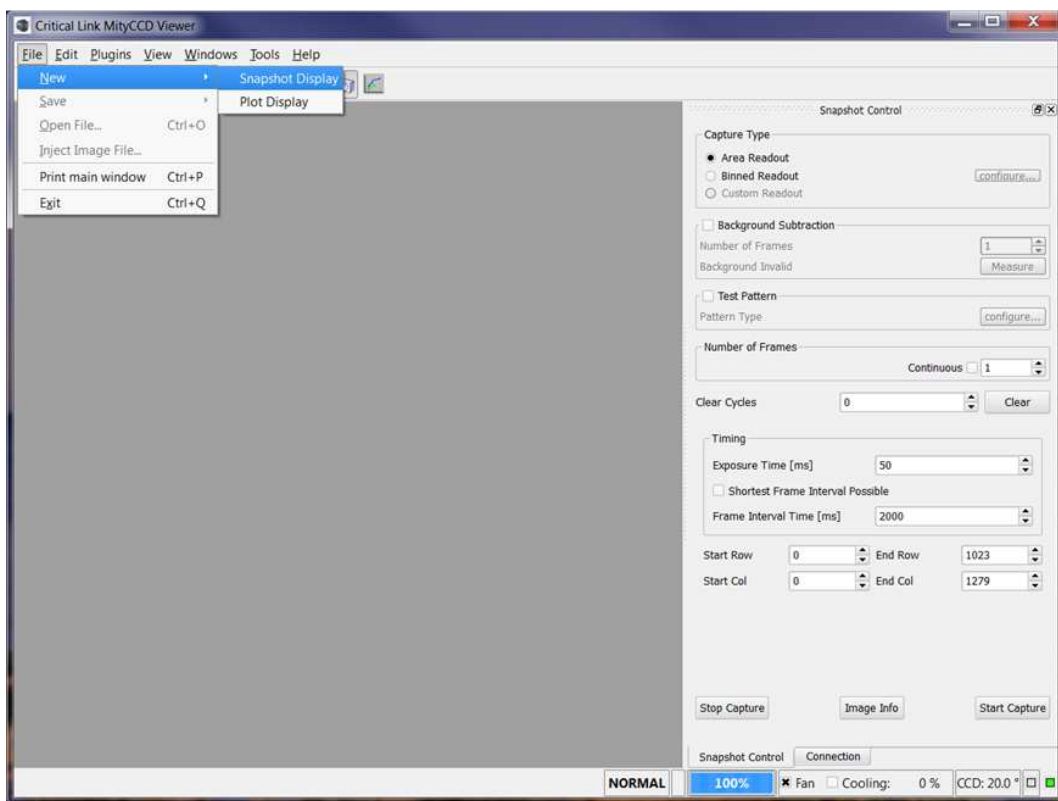
#### 4.6 Acquire Image

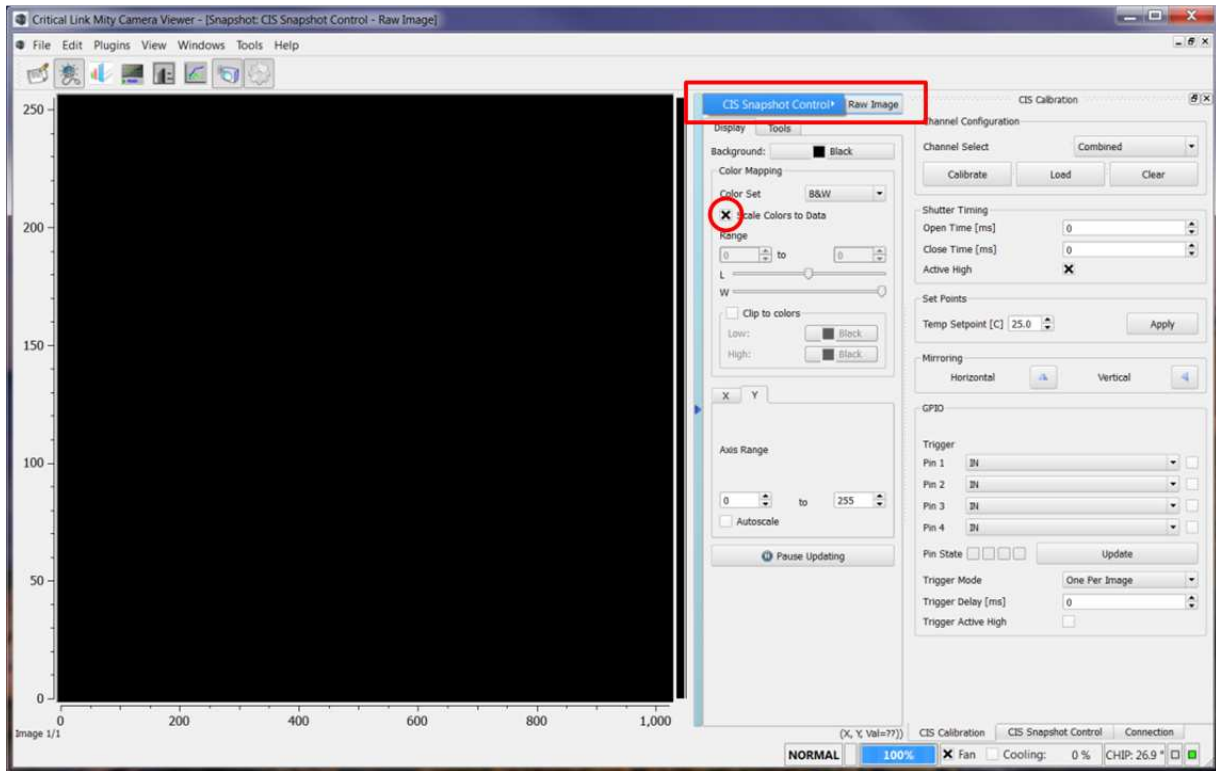
4. Select the snapshot icon to display the **Snapshot Control Panel**.
5. Set Capture Type to **Rolling Shutter**.
6. Set **Number of Frames** to 1 and keep the **Continuous** check box unchecked.
7. Set **Exposure Time** to 30 ms.
8. Set **Frame Interval Time** to 1200 ms.
9. Select **Start Capture**.



## 4.7 Display Image

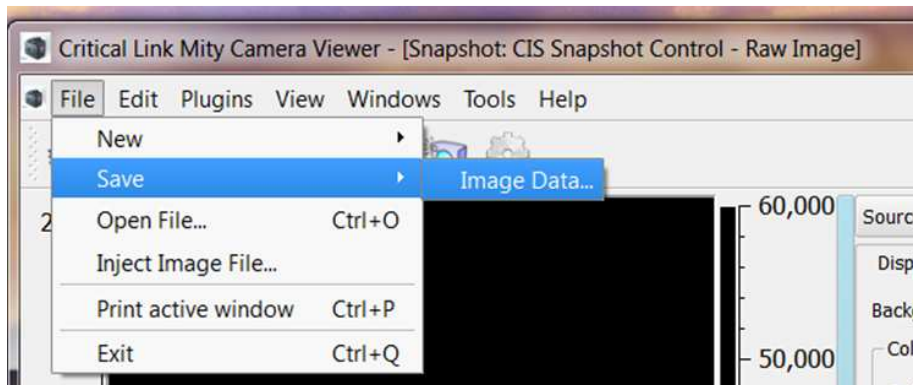
1. To view the Image Data, load a Snapshot Display. Click on the File→New→Snapshot Display menu.
2. Select the **Raw Image** as the **Source Snapshot Display**.
3. Select **Scale Color to Data** checkbox.
4. An image should appear on the **Snapshot Display** control panel.
5. Adjust the lens iris and focus and select **Start Capture** on the **Snapshot** Control panel.
6. You may also select **Continuous** on the **Snapshot** Control panel followed by **Start Capture** to continuously acquire images. Select **Stop Capture** to stop acquisition. Note, don't make any changes to the **Exposure Time** or **Frame Interval Time** during continuous acquisition.





## 5 Saving Image Data to File

1. You may save an image data as a CSV, TIFF or binary CDI format.
2. Select File -> Save and a dialog will prompt you for the file type.
3. The file may be analyzed at a later time using MS Excel or another application.



## 6 Select / Change ROI

By default, the Region of Interest (ROI) is set to the maximum size of the sensor

- CIS1210: 0,0 – 1023, 1279
- CIS1910: 0,0 – 1919, 1079

You may change the ROI by modifying the **Start Row / Column** and **End Row / Column** in the **CIS Snapshot Control** dialog. Note the following rules for changing the ROI:

- Total Bytes = Width x Height x 2
- Total Bytes = N x BL
- N must be an integer number
- BL must be evenly divisible by 8
- 32K <= BL < 64K
- The simplest way is to use regions that are multiples of 16K pixels (e.g. 16x1024) or are less than 32K pixels in size

## 7 Stream Image Data to PC / Laptop

1. To view the Image Data, load a Snapshot Display. Click on the File→New→Snapshot Display menu.
2. Select the **Raw Image** as the **Source Snapshot Display**.
3. Select **Scale Color to Data** checkbox
4. Setup **Exposure Time** in the **Snapshot Control** panel
5. Setup **Frame Interval Time** in the **Snapshot Control** panel. Ensure that the **Frame Interval Time** is at least 2000 ms for CIS1210 sensor (full ROI)
6. Select **Continuous** on the **Snapshot Control** panel
7. Select **Start Capture** to continuously acquire images.
8. Select **Stop Capture** to stop acquisition. Note, don't make any changes to the **Exposure Time** or **Frame Interval Time** during acquisition



## 8 Stream Image Data to Internal Memory

1. To view the Image Data, load a Snapshot Display. Click on the File→New→Snapshot Display menu.
2. Select the **Raw Image** as the **Source Snapshot Display**.
3. Select **Scale Color to Data** checkbox
4. Setup **Exposure Time** in the **Snapshot** Control panel
5. Setup **Frame Interval Time** in the **Snapshot** Control panel. The **Frame Interval Time** can be set to any value greater than 50 ms for CIS1210 sensor (full ROI)
6. Unselect **Continuous** on the **Snapshot** Control panel
7. Select Number of Frames to be greater than 1 (maximum is 20)
8. Select **Start Capture** to continuously acquire images.
9. Acquisition will stop after the number of frames has been acquired. The image data is captured at 20 frames / sec rate (Frame Interval = 50 ms) and sent to the PC at a slower rate