



Thank you for choosing a MityCAM-B2521F/B1910F from Critical Link.

The MityCAM-B2521F/B1910F MityViewer Quick Start Guide will guide you through the software installation process and the steps to acquire your first image with the MityViewer application.

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1 Revision History

Revision	Date	Notes
Draft	12/11/2014	Draft Release
1.0	1/27/2015	Updates for Gigabit Ethernet enabled MityCAM
1.1	2/11/2015	Combine 2521F and 1910F into one document

2 Interface Options

2.1 Setup USB/RNDIS PC Adapter

All MityCAM-B2521F/B1910F models feature the option to send image data over the USB 2.0 interface of the camera. This communication occurs over a USB 2.0 Remote Network Driver Interface Specification (RNDIS) to a PC. The camera is already configured to have an IP address of 10.1.47.2 for this interface and the PC should configure its corresponding RNDIS USB Gadget address to be 10.1.47.1.

This device should have been configured using the Hardware Setup Guide that was included with the MityCAM. If this has not been performed yet, then please follow the steps outlined in that guide.

In addition to image capture with the MityViewer application the USB interface allows SSH access to the camera for configuration and debug activities.

2.2 Gigabit Ethernet Enabled MityCAM Setup

For MityCAM-B2521F/B1910F cameras that feature the Gigabit Ethernet interface type configuration of the USB/RNDIS interface is not recommended for image capture as the Ethernet interface offers superior frame rate capabilities.

Each MityCAM is pre-configured to obtain an IP address from a DHCP server running on a network. If directly connecting to a PC a DHCP server would need to be run on the PC or the camera must be configured to use a static IP address instead. Please contact your Critical Link account representative for further details about how to make such modifications.

Once the camera and the PC are connected to the same DHCP enabled network no other configuration is necessary to communicate using the MityViewer application, once installed on the PC, Section 3.



3 Install MityViewer Software v2.5.2+

The MityViewer is a Windows PC application which lets you setup and configure the CIS 2521F/1910F sensor/camera 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_X_Y_Z.exe) from the CD / DVD and then follow the prompts



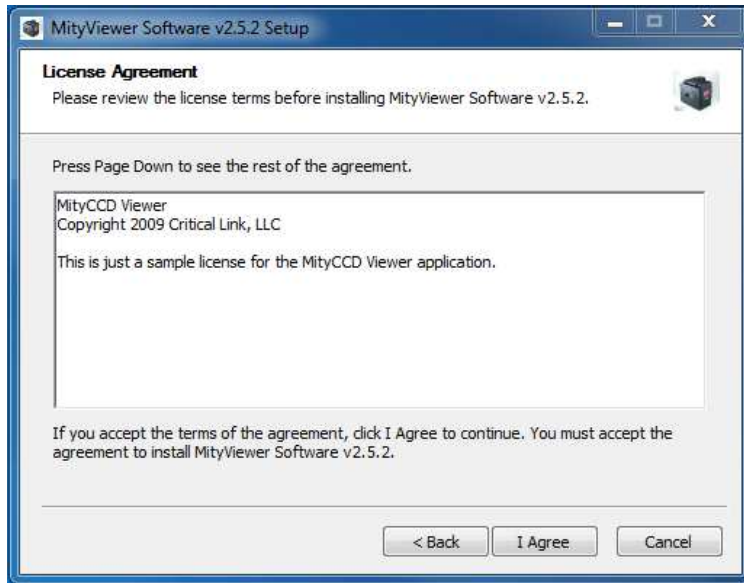


Figure 1: Software License Information

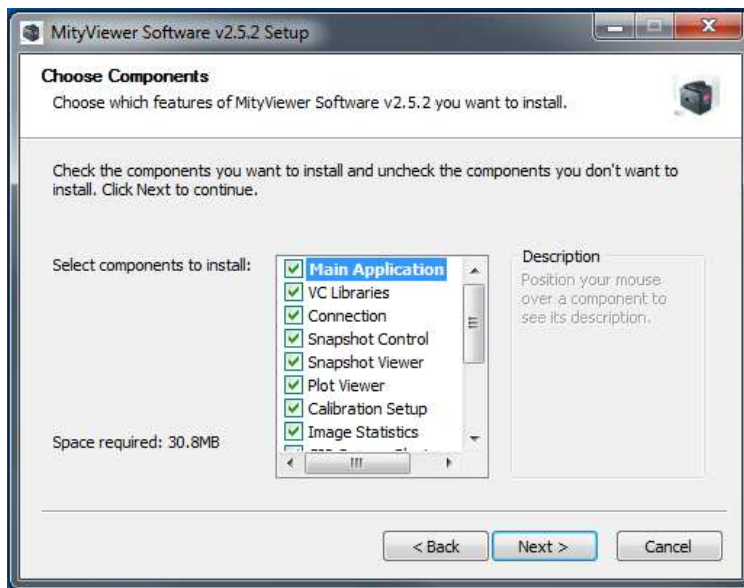


Figure 2: All components are selected by default

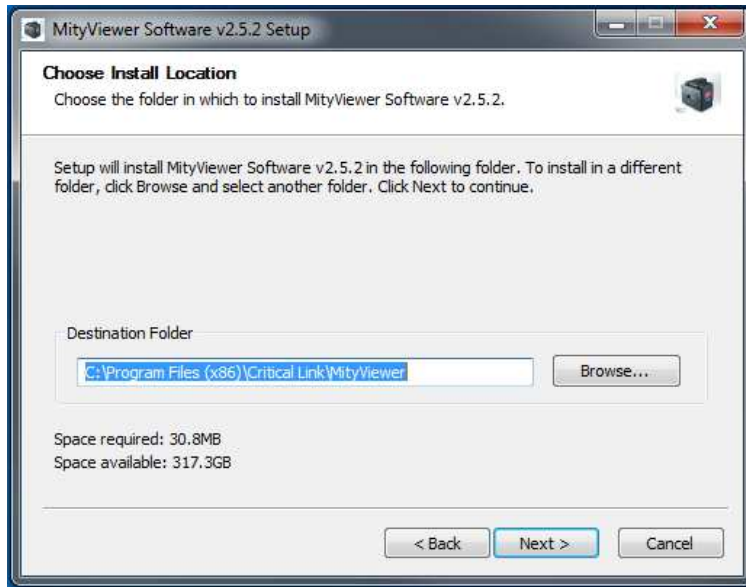


Figure 3: Default installation location



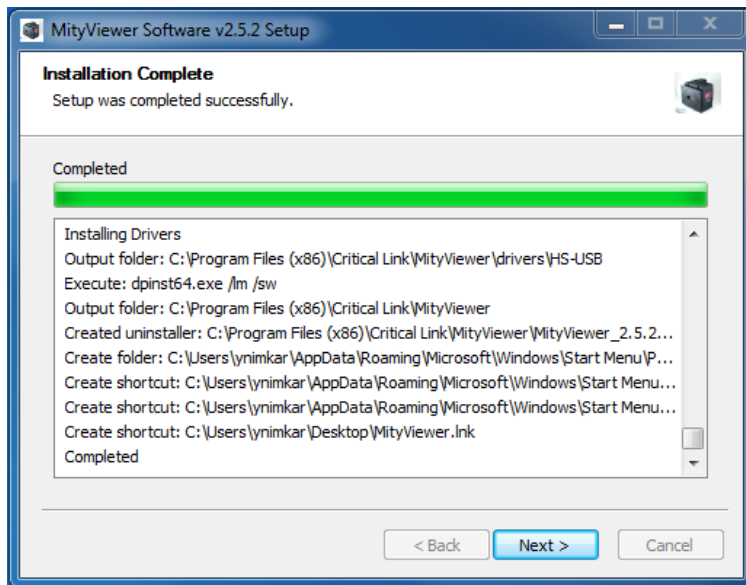


Figure 4: MityViewer Installation Complete

4 Acquire First Image

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

4.1 Launch MityViewer

Launch the MityViewer software by going to the Windows Start menu and typing MityViewer. The program will start and the desktop will appear (Windows 7). Alternatively you can also find the application in your start menu under Start→Programs→Critical Link→MityViewer.

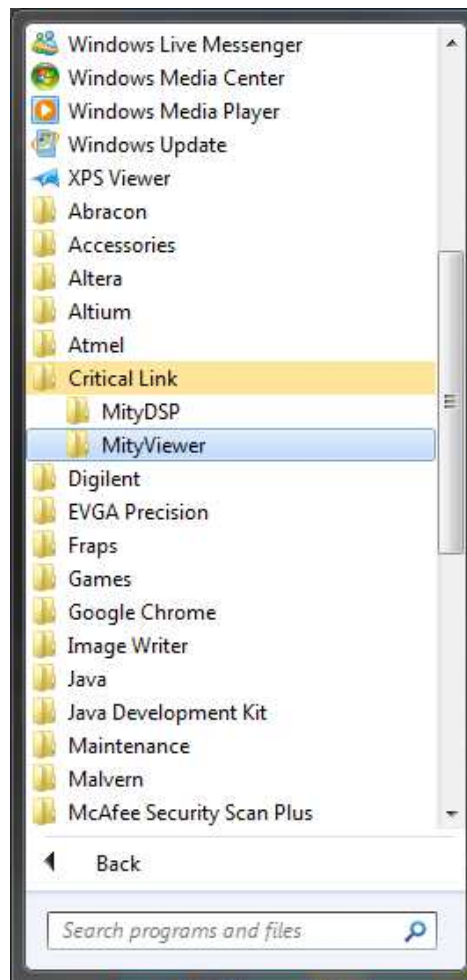
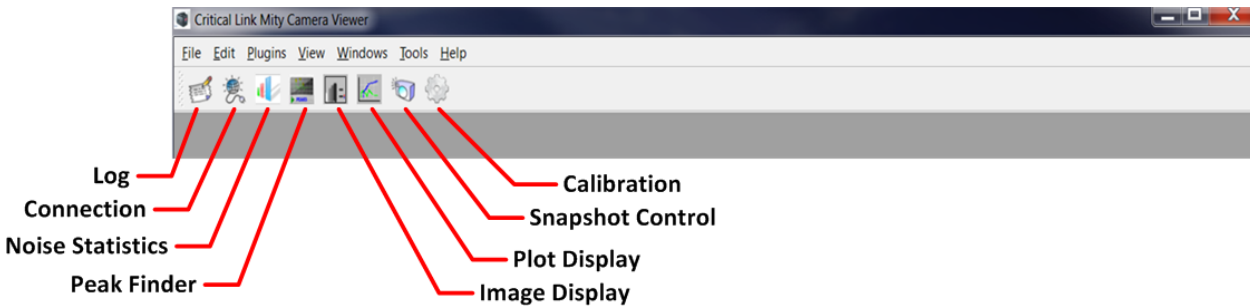


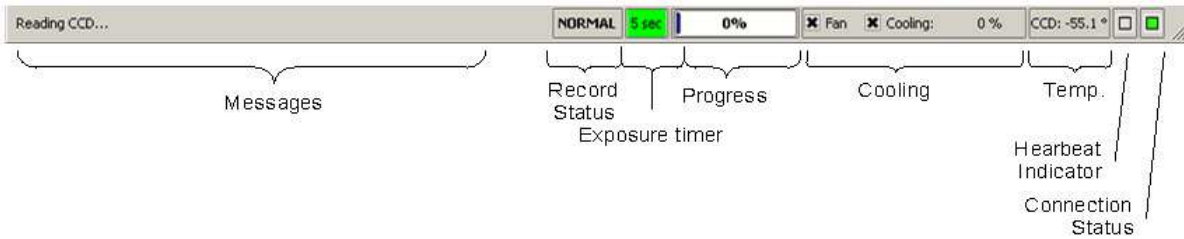
Figure 5: Start Menu Location

4.2 MityViewer

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

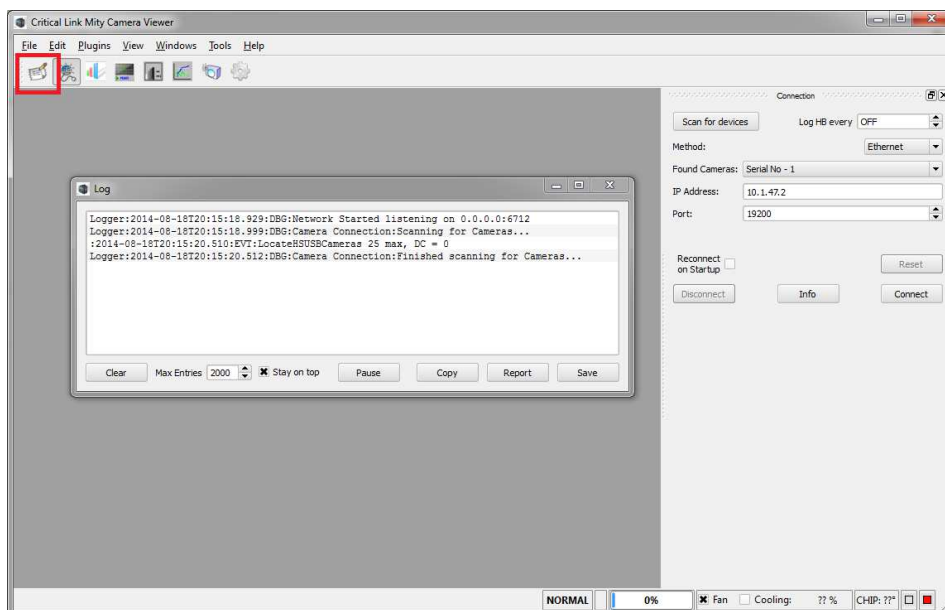


The status bar – displayed at the bottom of the window – shows a summary of camera / image acquisition status.



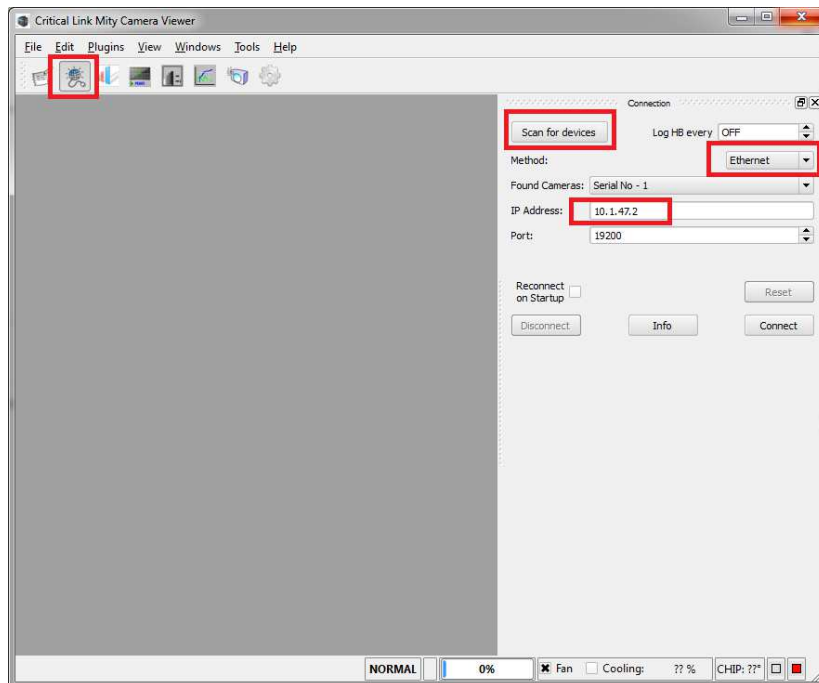
4.3 Launch Log Viewer

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



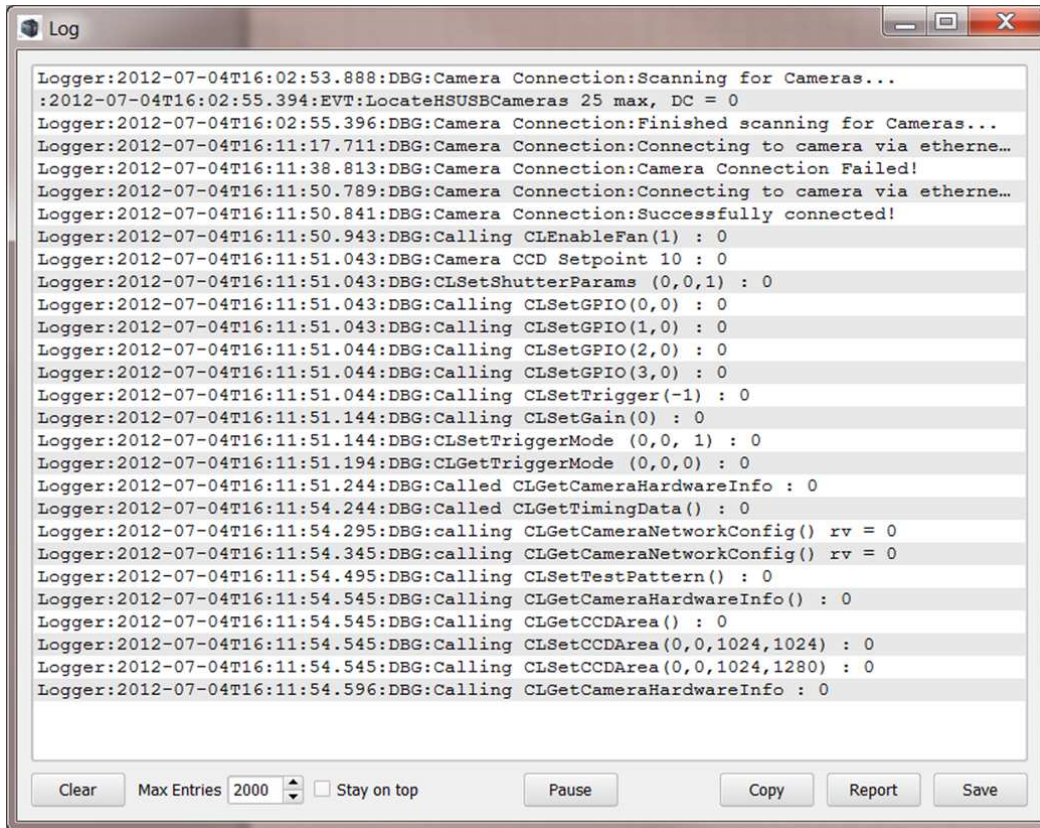
4.4 Connecting to Camera

1. Ensure that either the USB (RNDIS) or Gigabit Ethernet connection is configured properly
 - o For USB (RNDIS) follow Section 2.1
 - o For Gigabit Ethernet follow Section 2.2
2. Turn power on to the camera and you should immediately hear the fan turn on. Note, it takes the camera approximately 20 seconds to boot-up from a power-on cycle so you may need to wait 20 ~ 45 seconds to connect successfully.
3. If the connection dialog is not open, then select the connection icon from the 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. 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 the Log Viewer output confirming that the connection was successful. If the connect fails initially, then select the **Connect** button a second time.

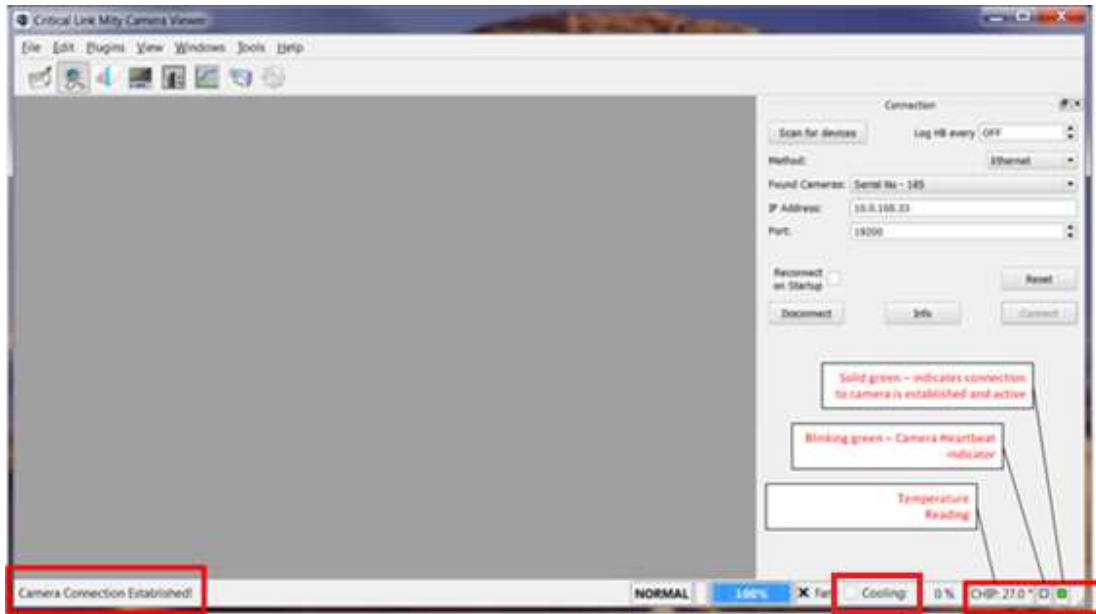


```

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
  
```

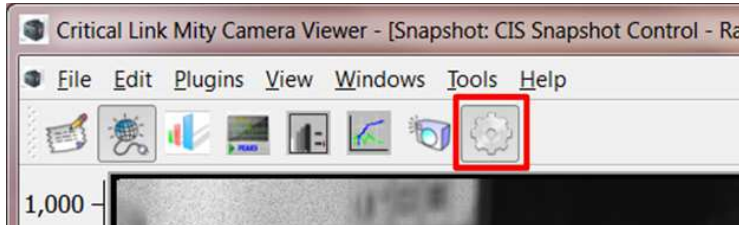
9. Once the camera has successfully connected, then two green indicators will appear on the bottom right of the status bar. The right-most green indicator indicates connection to the camera. The indicator next to the left most indicator flashes green and indicates receipt of a periodic heartbeat message 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, some of which may be shown by selecting the **Info** button.
11. The board temperature should be around +20C to +40C as measured by the temperature sensor on the electronics board inside the camera. To enable the TEC select the **Cooling** check box.



4.5 Sensor Configuration and Calibration

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



4.5.1 Channel Configuration (Figure 6)

1. Combined – Combination of high and low gain data from the sensor.
2. High Gain Only – High gain data from the sensor.
3. Low Gain Only – Low gain data from the sensor.

4.5.2 Calibration (Figure 6)

1. Calibrate – Factory use only. Please contact Critical Link for details.
2. Load – Loads column wise calibration bias stored on the camera.
3. Clear – Disables any loaded calibration bias.

4.5.3 Set Point (Figure 6)

Set the target sensor temperature for the Thermal Electric Cooler (TEC). The TEC is designed to stabilize the sensor within a couple degrees of room temperature.

4.5.4 Mirroring (Figure 6)

Mirroring over both axes is required with the **MityCAM-B1910F** to obtain proper image orientation. This is not necessary with the **MityCAM-B2521F** models.

4.5.5 Hot Pixel Noise Reduction (Figure 6)

Hot pixel noise reduction is implemented as a mean filter. Currently the high side correction is implemented and the low side correction is not currently supported.

4.5.6 Tone Mapping (Figure 6)

Takes all camera data and processes it through a square root function that compresses the 16-bits of data to 12-bits of data.

4.5.7 GPIO (Figure 7)

The GPIO section of the CIS calibration tool allows the configuration of the 4 GPIOs accessible on the rear side of the camera.

4.5.8 Shutter Timing (Figure 7)

Not currently supported.

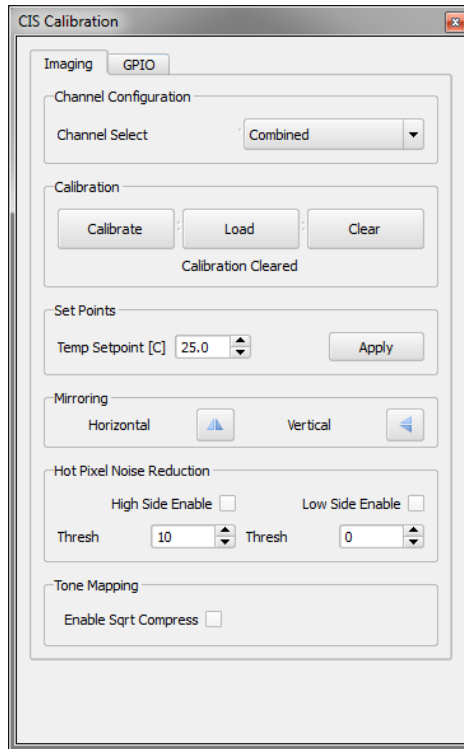


Figure 6: CIS Calibration - Imaging

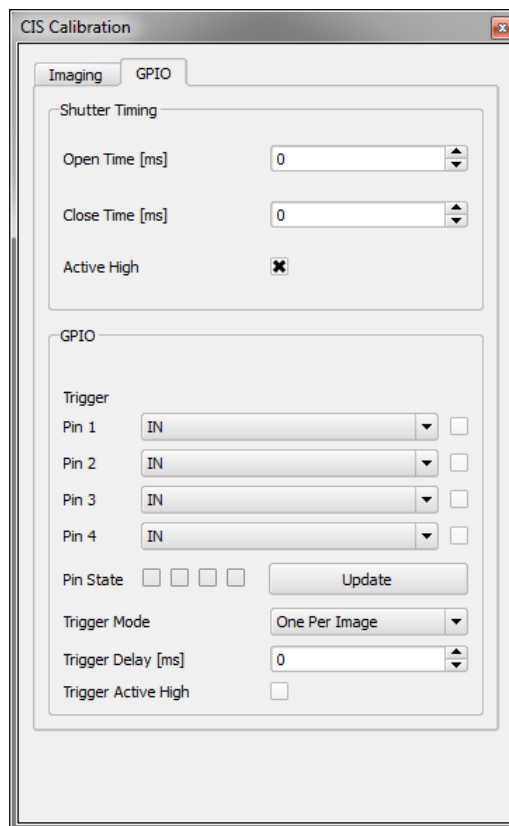
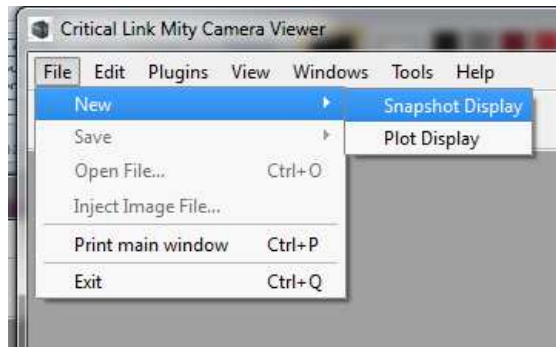


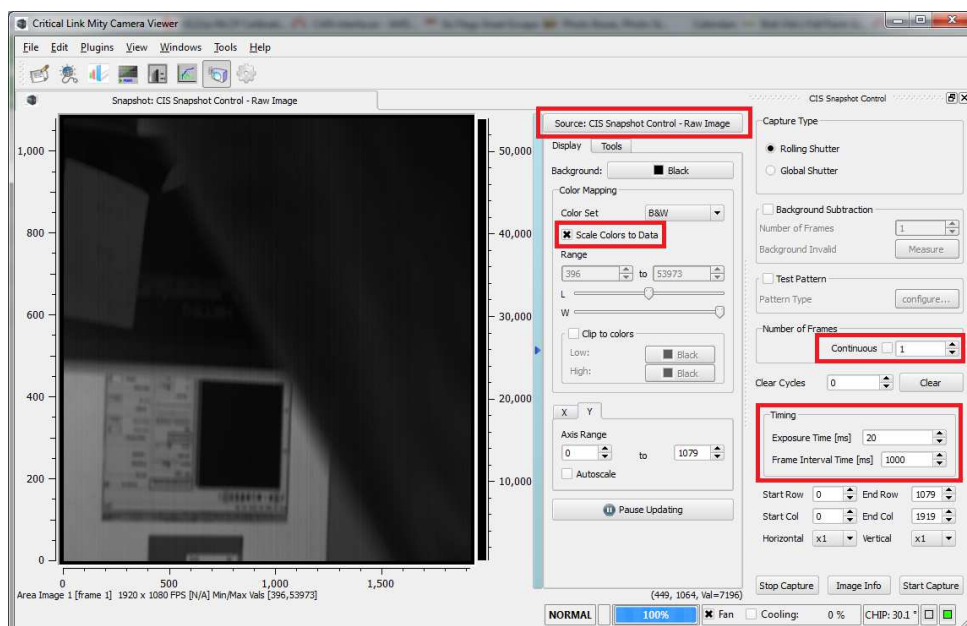
Figure 7: CIS Calibration - GPIO

4.6 Display Image

1. To view the Image Data, load a Snapshot Display. Click File→New→Snapshot Display.



2. Select the **Raw Image** as the **Source Snapshot Display**.
3. Select **Scale Color to Data** checkbox.
4. If using a **MityCAM-B2521F** please skip to the next step. The **MityCAM-B1910F** requires that the image be mirrored over both the Y axis and X axis to obtain proper image orientation. These settings can be found on the **CIS – Calibration** control panel, Figure 6, of Section 4.5.
5. Adjust the lens iris and focus and select **Start Capture** on the **Snapshot Control** panel.
6. An image should appear on the **Snapshot Display** control panel.
7. 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, do not make changes to the **Exposure Time** or **Frame Interval Time** during continuous acquisition.

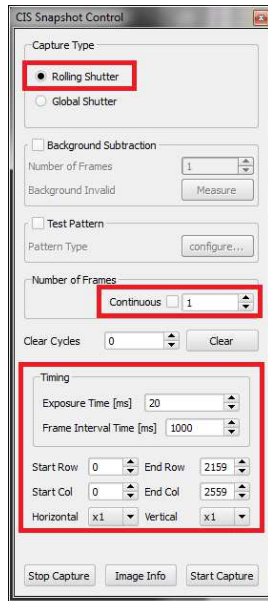


4.7 Acquire Single Image

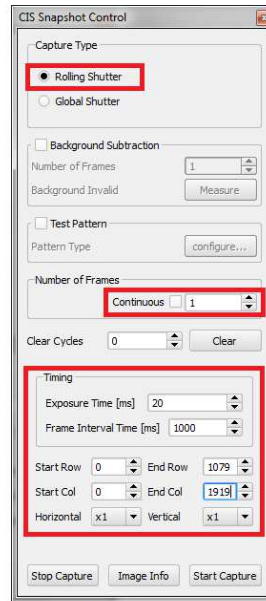
1. Select the snapshot icon to display the **Snapshot** Control Panel.



2. Set **Capture Type** to Rolling Shutter.
3. Set **Number of Frames** to 1 and keep the **Continuous** check box unchecked.
4. Set **Exposure Time** to 20 ms.
5. Set **Frame Interval Time** to 1000 ms.
6. Set the **ROI** to the maximum image size.
 - **MityCAM-B2521F**
 - The start row is 0 and the end row is 2159. The start row is 0 and the end row is 2559. At this time binning is set to Horizontal x1 and Vertical x 1 (full image shown). For binning details please reference Section 0.
 - **MityCAM-1910F**
 - The start row is 0 and the end row is 1079. The start row is 0 and the end row is 1919. At this time binning is set to Horizontal x1 and Vertical x 1 (full image shown). For binning details please reference Section 0.
7. If using a **MityCAM-B2521F** please skip to the next step. The **MityCAM-B1910F** requires that the image be mirrored over both the Y axis and X axis to obtain proper image orientation. These settings can be found on the **CIS – Calibration** control panel, Figure 6, of Section 4.5.
8. Select **Start Capture**.



MityCAM-B2521F



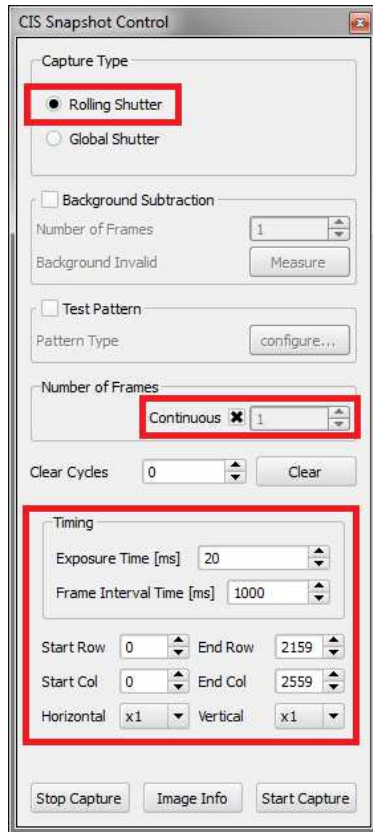
MityCAM-B1910F

4.8 Acquire Continuous Images

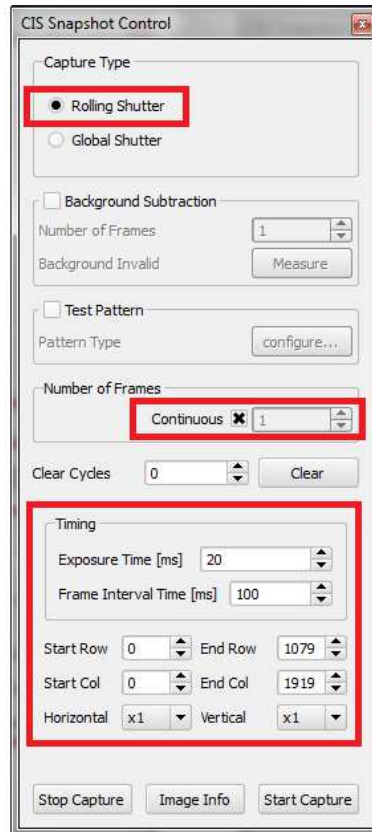
1. Select the snapshot icon to display the **Snapshot Control Panel**.



2. Set **Capture Type** to Rolling Shutter.
3. Check the **Continuous** check box.
4. Set **Exposure Time** to 20 ms.
5. Set **Frame Interval Time**
 - **MityCAM-B2521F**
 - 1000 mS
 - **MityCAM-B1910F**
 - 100 mS
 - This will allow (assuming the PC used can process the data quickly enough) images to be displayed at up to 10 FPS
6. Set the **ROI** to the maximum image size.
 - **MityCAM-B2521F**
 - The start row is 0 and the end row is 2159. The start row is 0 and the end row is 2559. At this time binning is set to Horizontal x1 and Vertical x 1 (full image shown). For binning details please reference Section 0.
 - **MityCAM-B1910F**
 - The start row is 0 and the end row is 1079. The start row is 0 and the end row is 1919. At this time binning is set to Horizontal x1 and Vertical x 1 (full image shown). For binning details please reference Section 0.
7. If using a **MityCAM-B2521F** please skip to the next step. The **MityCAM-B1910F** requires that the image be mirrored over both the Y axis and X axis to obtain proper image orientation. These settings can be found on the **CIS – Calibration** control panel, Figure 6, of Section 4.5.
8. Select **Start Capture**.



MityCAM-B2521F



MityCAM-B1910F

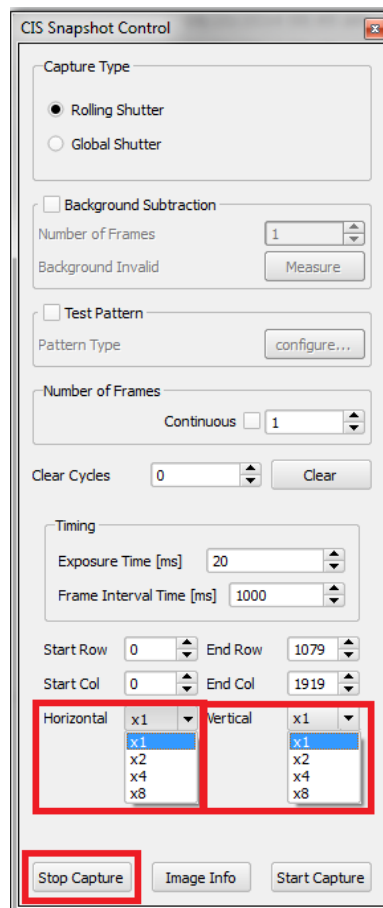
4.9 Image Binning

The MityCAM-B2521F/B1910F supports binning of the image in both horizontal and vertical directions. When image binning is enabled (any setting aside from x1 and x1) the frame-rate that can be transmitted from the camera is increased. The settings for this are found on the “CIS Snapshot Control” panel.

1. Select the snapshot icon to display the **Snapshot Control Panel**.

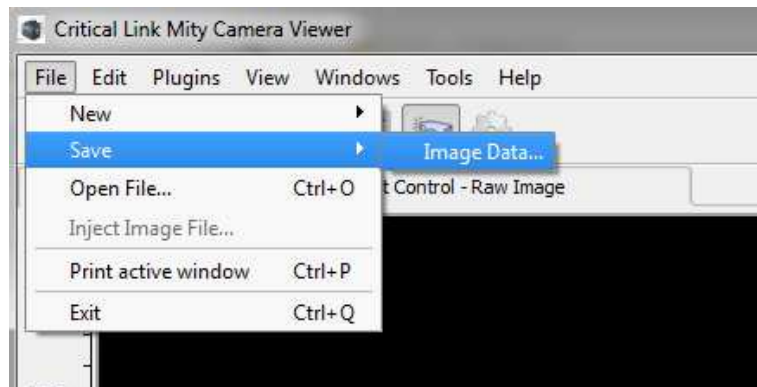


2. Ensure that the camera is NOT capturing any images prior to changing the binning settings; press the **Stop Capture** button.
3. The **Horizontal** and **Vertical** directions have independent binning settings of either x1, x2, x4 or x8.
4. Once the desired binning mode is selected follow the steps outlined in Sections 4.7 or 4.8 for image capture.



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 Stream Image Data to PC / Laptop

1. To view the Image Data, load a Snapshot Display. Click File→New→Snapshot Display.
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 1000 mS for either MityCAM-B2521F/B1910F.
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.

7 Stream Image Data to Internal Memory

1. To view the Image Data, load a Snapshot Display. Click File→New→Snapshot Display.
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 50mS for either MityCAM-B2521F/B1910F.
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.