How to Setup Touchlib and Run Multitouch Demos using a MTmini

Version 1.0

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Software Requirements:

- Flash Player 9 (only required if running swf Flash Demos)
- Java runtime 1.6+ (only required if running swf Flash Demos)
- Visual Studio 2005 SP1 x86 redistributable package

1. Download the latest version **of MTmini Package** from http://ssandler.wordpress.com/MTmini
2. Open the zip file and extract the contents to your preferred location.

Hardware Requirements:

- A prebuilt MTmini (multitouch pad) or front Illumination Multitouch Table.

or:

- Quickly Build a MTmini with (video link):
  - Cardboard Box
  - Transparent/clear material
  - Paper
  - Webcam

Setup

Configuration – The Touchlib Configapp

1. Start (double click) ***Configuration.bat*** in the main folder.
2. A ***Property Sheet*** dialog box will open that asks for camera configuration.
3. Choose a setting that works well with your camera and click '***Ok***.'
   note: A higher ***Frame Rate*** will work better than a higher resolution (***Output Size***).

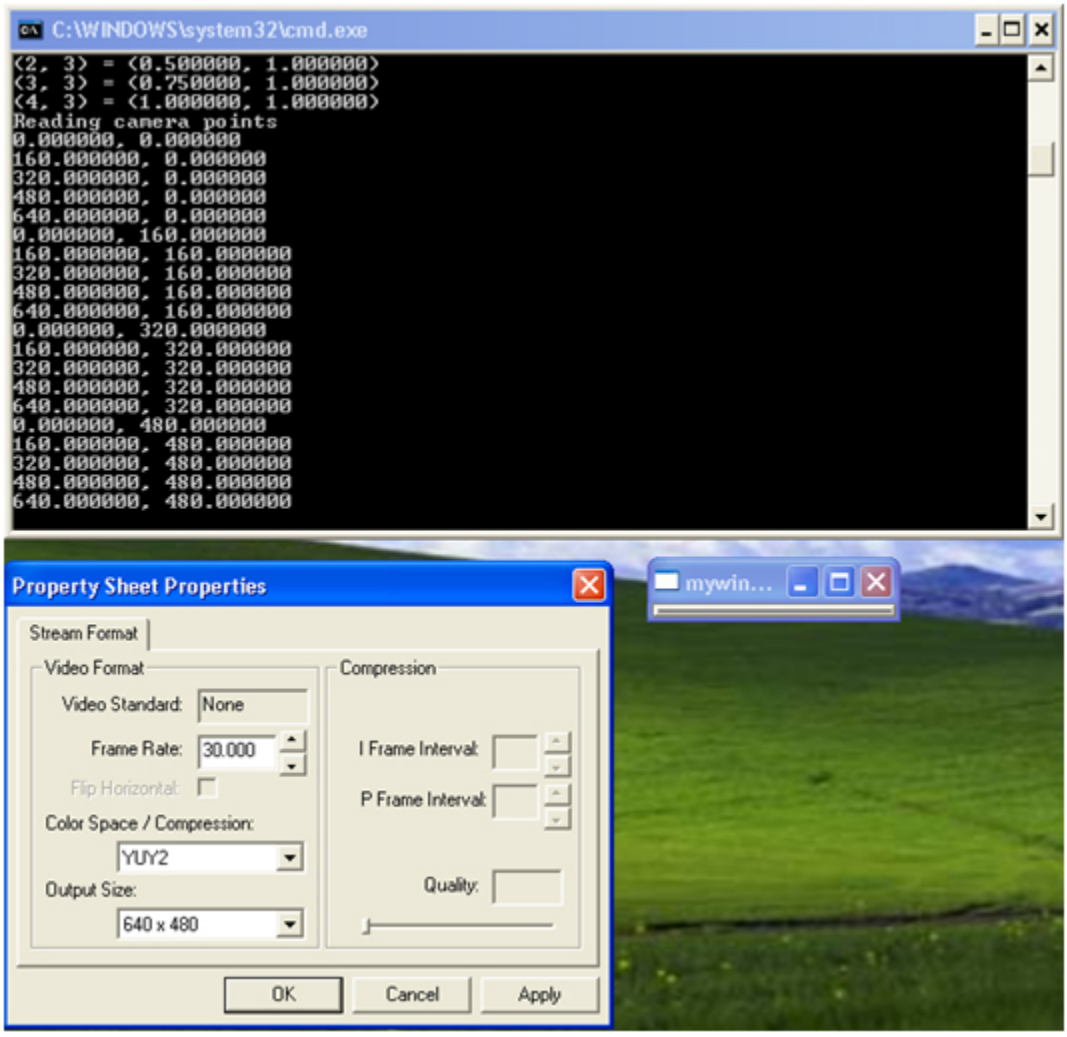

Figure 1. Configuration Startup and Property Sheet Dialog Box

4. Multiple windows will open with images from the camera (see **Figure 2**).
   note: if only grey windows (no image) open or the wrong camera is displayed, skip to the ***help*** section at the end of this guide.
5. Adjust the sliders until the ***rectify*** window only has blobs coming from your fingers (no background noise, etc).
6. When the rectify window is set well, press "***ESC***" to quit.
7. The ***configapp*** will save your settings in ***Touchlib_Tracking_Software/config.xml***.

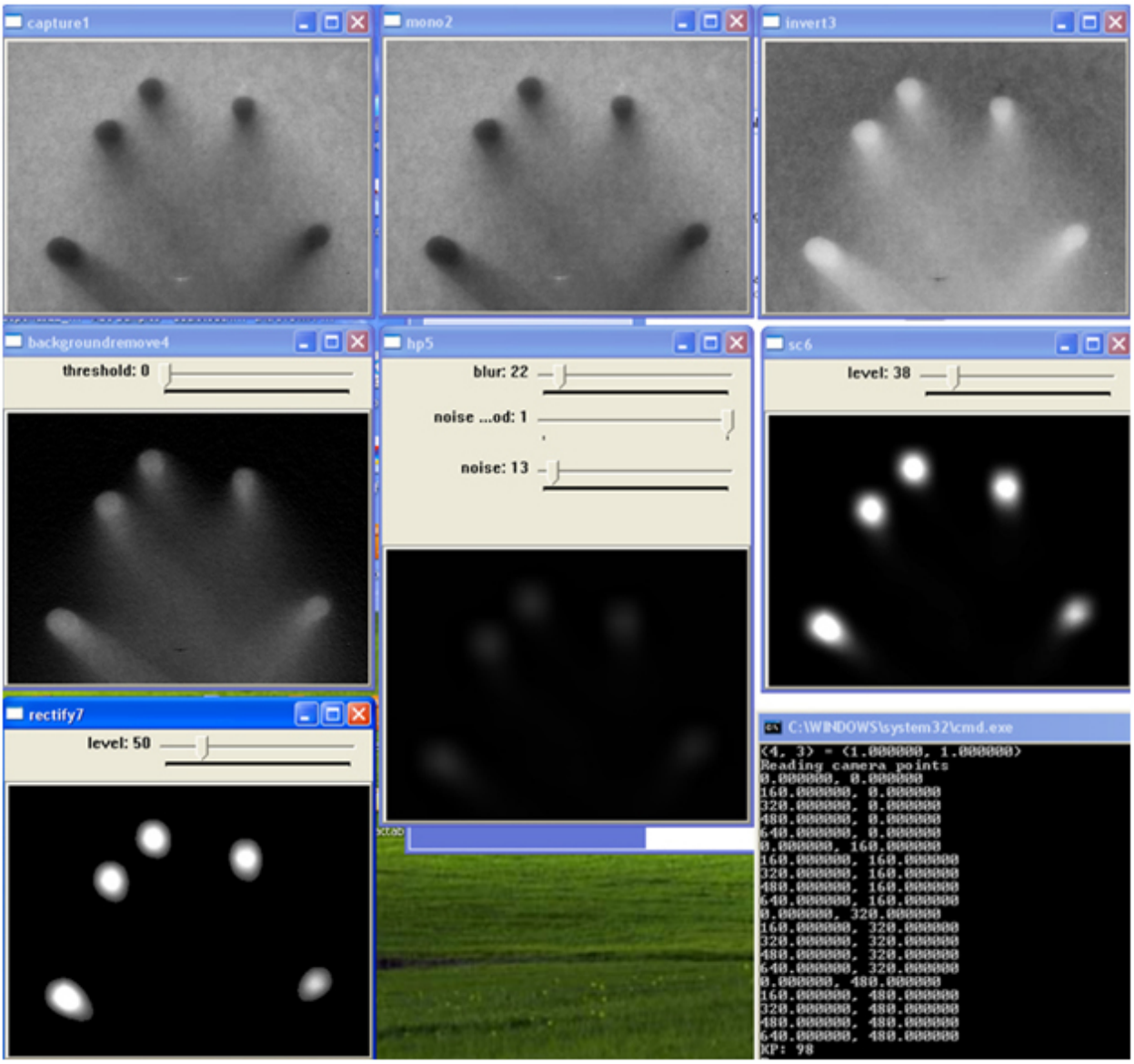

Figure 2. Touchlib Configapp

Capture (1) - is the raw video input (from the camera) window.
Mono (2) - turns the source image into a grey scale image.
Invert (3) - inverts the image Mono2 image.
BackgroundRemove (4) - subtracts the background from the current scene.
Simplehighpass (5) –lets only the brightest spots in the image through.
Scaler (6) – amplifies (bright spots become brighter) the output of the previous filter.
Rectify (7) – the final image that is used for blob tracking.

Running The Demos

Once configuration is complete, it is recommended to first test out ***Smoke Demo*** to make sure everything is working properly.

Smoke Demo

1. Start (double click) ***Smoke_Demo.bat*** in the ***Demos/C++ Demos*** folder.
2. The same ***Property Sheet*** dialog box from ***configapp*** will load. Select the same settings as before and press '***Ok.***'
3. A '***Demo Smoke***' window will load. Touching the multitouch pad should create colored smoke.
4. Press '***F***' for full screen and '***Q***' to quit. If there's noise (false touches), press '***B***' at any time to recapture the background and clear the noise.

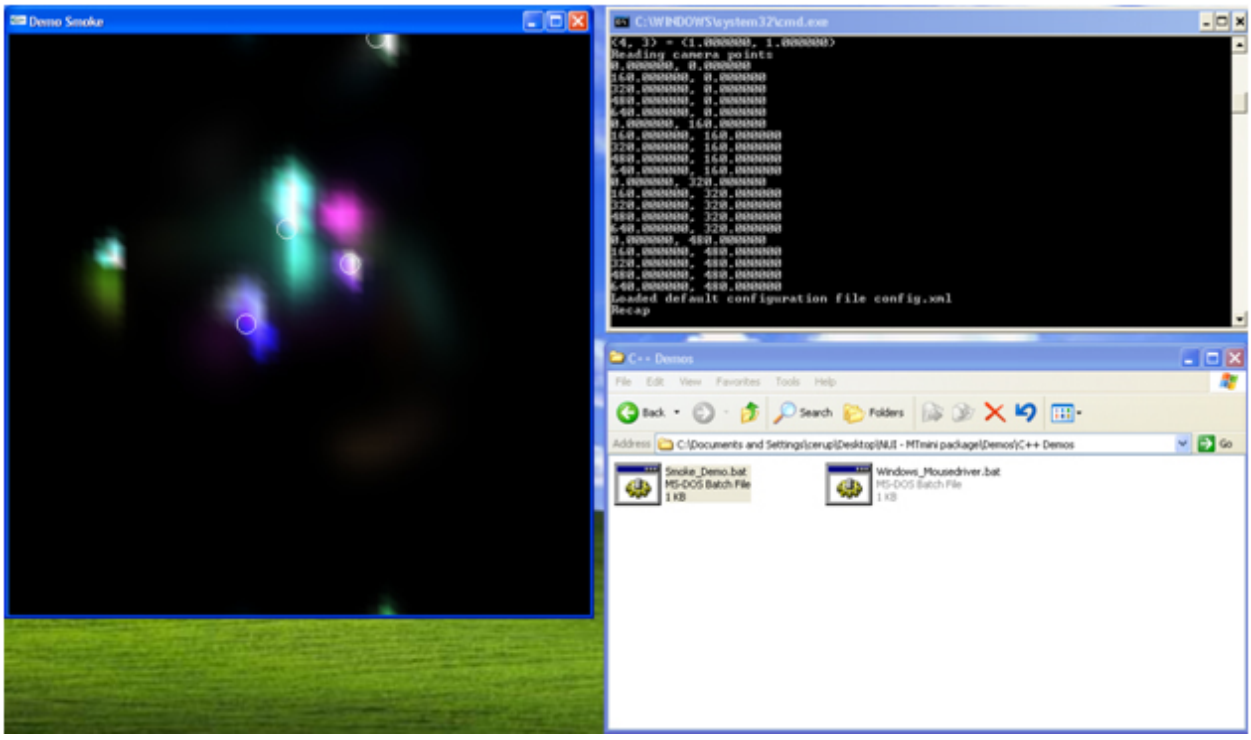

Figure 3. Smoke Demo windows (left), C++ Demos folder (bottom right), CMD window (top right)

Windows Mousedriver

caution: Only use the Windows Mousedriver on a stable setup.

1. Start (double click) ***Windows_Mousedriver.bat*** in the Demos/C++ Demos folder.
2. The same ***Property Sheet dialog*** box from ***configapp*** will load. Select the same settings as before and press '***Ok***.'
3. Once the word '***recap'*** is displayed in the ***CMD window*** the multitouch pad will be ready to act as a mouse.
4. A finger down performs a '***click'***; a double tap performs a '***double click***.'

Flash Applications

Steps:

1) Start Server.bat
2) Start Gateway.bat
3) Start Flash Application

Step 1) Server

1. Start (double click) ***Server.bat*** in the Main folder.
2. The same ***Property Sheet dialog*** box from ***configapp*** will load. Select the same settings as before and press '***Ok***.'
3. A grey '***Touch Listener***' window will open (no image will show).
4. Pressing on the multitouch pad should display "***Blob Detected***" in the ***CMD window***.

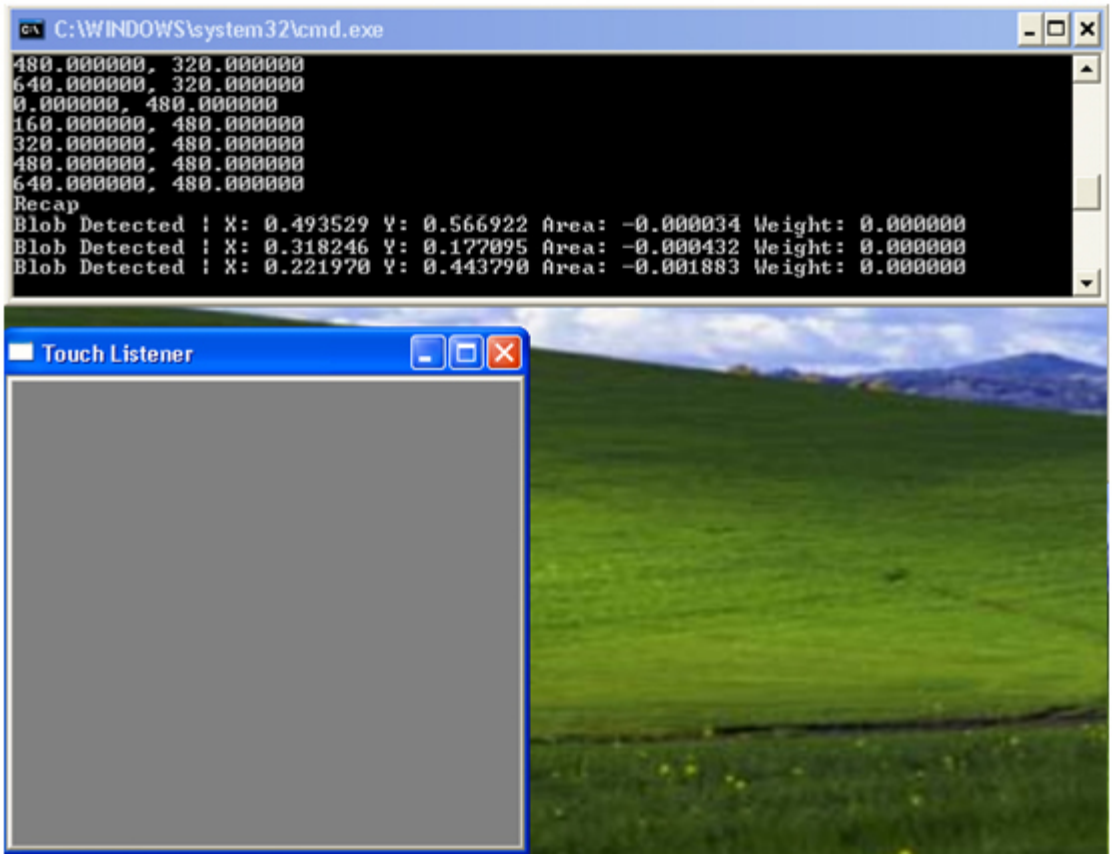

Figure 4. Server.bat (open OSC.exe), Touch Listener (grey window), Blobs detected (CMD window)

Step 2) Gateway:

note: Java runtime 1.6+ is required for this step

1. Start (double click) ***Gateway.bat*** in the Main folder.
2. A ***FLOSC 2.0*** dialog box will load.
3. Press '**Start**'.
4. The ***CMD window*** should say '***server started,'*** if not, make sure Java runtime 1.6+ is installed.

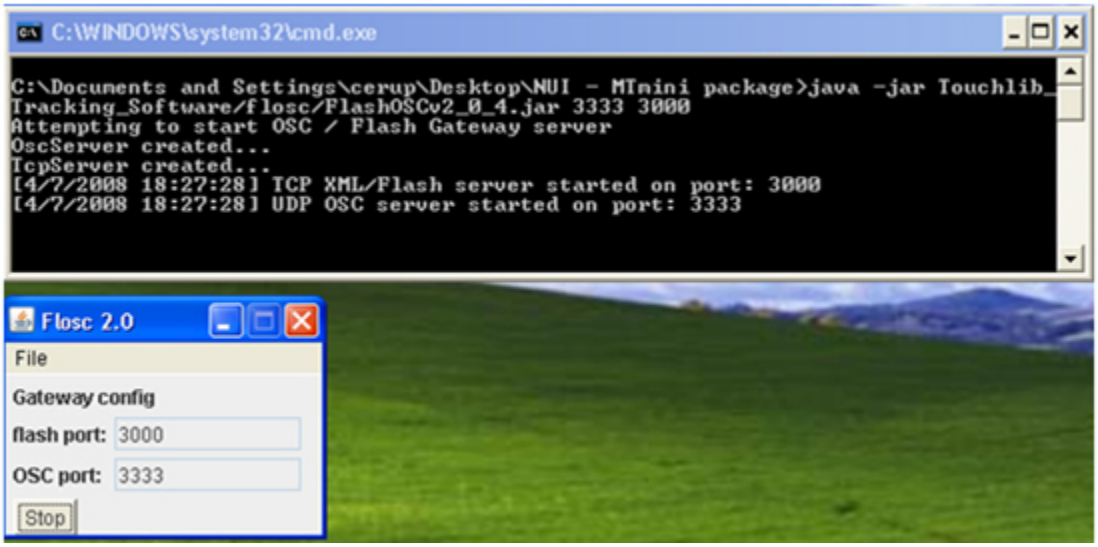

Figure 5. Gateway.bat connected and 'server started'

Step 3) Flash Application:

1. Go to the ***Demos/Flash Demos*** folder and open any Flash application (exe) file to start the application.

Extras

More Demos, as well as source code can be found on http://touchlib.googlecode.com and http://www.nuigroup.com on the NUIgroup (Natural User Interface Group) forum.

Developers (C++, .NET/Silverlight/WPF, Flash/Flex/AS3, Obj-C, Processing, PureData/Max MSP) can find more information on developing multitouch applications by visiting http://www.nuigroup.com and checking the NUIgroup (Natural User Interface Group) forum.

Help

Is your camera flipped the wrong way?

If your camera is flipped the wrong way in ***Touchlib***, first go into your ***camera settings*** and see if there's an option for '***mirroring'*** or '***flipping'*** your camera. If there is, try this option and restart ***Touchlib Configapp***.

If there is no option to flip your camera, then open ***Configapp*** and press '***enter***' to ***calibrate*** (once the sliders have been adjusted).

1. This will launch the ***Configapp*** in ***full screen mode*** and you'll see a grid of points (green pluses).
2. Press '***c***' to start ***calibrating***.
3. The current point should turn ***red***. Press on your multitouch pad where the point is (starting on the top left of your pad).
4. Continue through until all points are calibrated.
5. When you are all done, you can press '***ESC'*** to quit.
6. All your changes (slider adjustments and calibration points) are now saved. Now when you run any Touchlib application it will be calibrated (and the image will be flipped the correct way).

Found a Flash Demo (swf) on NUIgroup and it's not receiving touch events?

In order to run the swf AS3 applications with touch input (touchlib, TUIO simulator, opentouch, etc.), you need to allow flashplayer's global security permission to access the file.

There are two methods to do this:

1. Go here to Flash Global Security Settings and click ***'Always Allow.'*** Where it says ***'Always trust files in these locations:'***, click '***Edit Locations'.*** Navigate to the folder you have your swf files and add either each swf file individually or the whole directory to the locations list.

2. You can also get to the global security settings page by opening the ***swf*** file you want access to, **right-click-** > ***Settings***. From settings, click on ***Privacy*** tab -> ***Advanced***. This will load up the webpage from method 1. Follow the same directions for adding locations as method 1.

Do you have grey screens or the wrong camera loading? Here's how to fix it:

1. Go to the ***Utilities Folder*** and launch ***GraphEdit***.
2. Using ***GraphEdit***, locate your capture source: ***Graphs-> Insert Filters***-> ***Video Capture Sources***
3. Write down the name of your device exactly. Mine is "***Philips SPC900NC PC Camera.***"
   note: this name can change when you reboot/plug unplug your camera

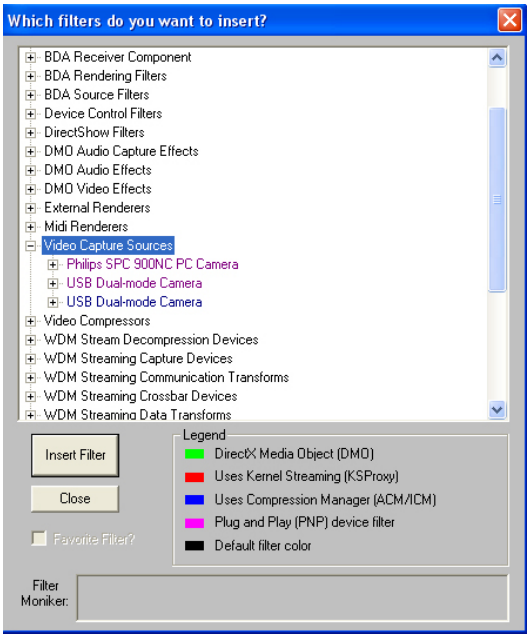

Figure 6. Graphedit Video Capture Sources window

4. Go to the "***Touchib_Tracking_Software"*** Folder and open the ***DVSL_config.xml*** file with ***Notepad.***
5. Add a ***friendly_name="Name_of_Your_Camera"*** attribute to the camera tag like this:

```
<camera show_format_dialog="true" friendly_name="Philips SPC900NC PC
Camera" frame_width="320" frame_height="240" frame_rate="30.0"
show_format_dialog= "true">
```

6. Your ***DSVL_config.xml*** should now look something like this:

```
<?xml version="1.0" encoding="UTF-8"?>
<!--Sample XML file generated by XMLSpy v2005 rel. 3
U(http://www.altova.com)
-->

<dsvl_input xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xsi:noNamespaceSchemaLocation="DsVideoLib.xsd">

      <camera input_device="WDM_CAP" friendly_name="Name of Your Camera"
      frame_width="320" frame_height="240" frame_rate="30.0"
      show_format_dialog="true">

            <pixel_format>
                  <RGB24/>
            </pixel_format>

      </camera>

</dsvl_input>
```

Acknowledgements and Resources

Touchib Developers:

- David Wallin – Original Author
- Sebastian Hartman
- Christian Moore
- Johannes Hirche
- Laurence Muller
- Seth Sandler

Demo Developers:

- Christian Moore
- David Wallin
- Seth Sandler
- Adithya Ananth
- Divesh Jaiswal
- Laurence Muller
- Tim Roth

Resources:

- NUIgroup (Natural User Interface Group)
- NUIgroup Community forum – For information on building a full Multitouch Table and other Natural User Interface devices and software

- MTmini - current Home of the MTmini
- Touchlib Source code and Demo code: http://touchlib.googlecode.com

Help:

- MTmini **Software** help can be found here
- MTmini **Hardware** help can be found here

Please visit http://ssandler.wordpress.com/MTmini for future MTmini package updates.
Thank you and enjoy your multitouch device!