

Unibrain

# Fire-i IMAQ

Adaptor for MATLAB Image Acquisition Toolbox

**Table of contents**

Table of contents..... 2

Introduction..... 3

Architecture..... 4

Requirements ..... 4

Registering Fire-i IMAQ adaptor..... 5

Unregistering Fire-i IMAQ adaptor ..... 5

Using Fire-i IMAQ adaptor ..... 6

Using 3<sup>rd</sup> party cameras..... 9

## Introduction

Fire-i IMAQ is an adaptor for MATLAB Image Acquisition Toolbox (IMAQ toolbox).

Mathworks' IMAQ toolbox software is a collection of functions that extend the capability of the MATLAB numeric computing environment. The toolbox provides a wide range of image acquisition operations.

For further details on IMAQ toolbox please refer to <http://www.mathworks.com>.

For accessing the features and functions of the cameras, an adaptor, developed by the camera manufacturer, must be provided. Now with Fire-i IMAQ adaptor, users who operate IIDC cameras with our ubCore PRO driver stack can now make use of the IMAQ's toolbox functionality having the ability to control all the camera features supported by our drivers.

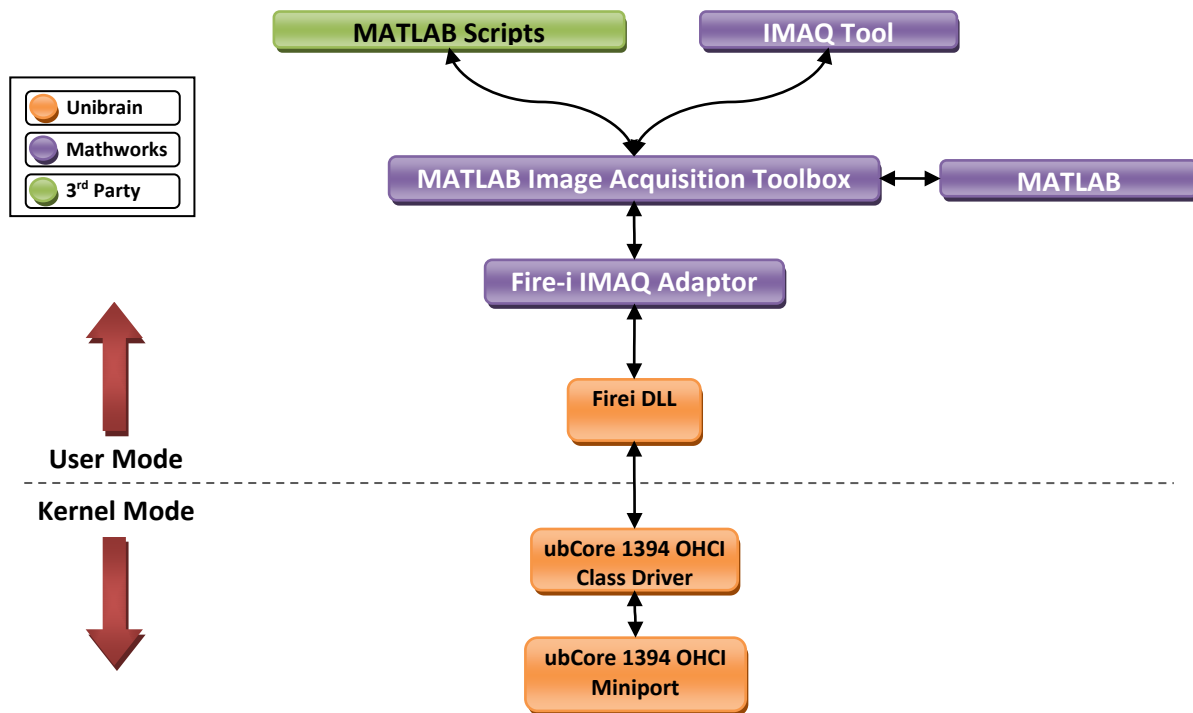
Our driver stack supports all Unibrain camera models as well as any 3<sup>rd</sup> party camera<sup>1</sup> that complies with the IIDC spec. Thus IMAQ toolbox users can use our Fire-i IMAQ adaptor for any IIDC camera they may use.

---

<sup>1</sup> A license is required for enabling full usage of a 3<sup>rd</sup> party camera with our drivers

## Architecture

The following illustration shows how our driver stack interacts with MATLAB and Image Acquisition toolbox.



## Requirements

- Windows XP/2003/Vista/7, 32bit or 64 bit editions
- An *IEEE 1394 OHCI controller* must be installed on the system
- Unibrain's [ubCore PRO driver package](http://www.unibrain.com/ubCore/ubCore_PRO_driver_package) must be installed on the system
- Microsoft's Visual C++ 2010 redistributable package
  - <http://www.microsoft.com/download/en/details.aspx?id=5555> (32 bit operating systems)
  - <http://www.microsoft.com/download/en/details.aspx?id=14632> (64 bit operating systems)

## Registering Fire-i IMAQ adaptor

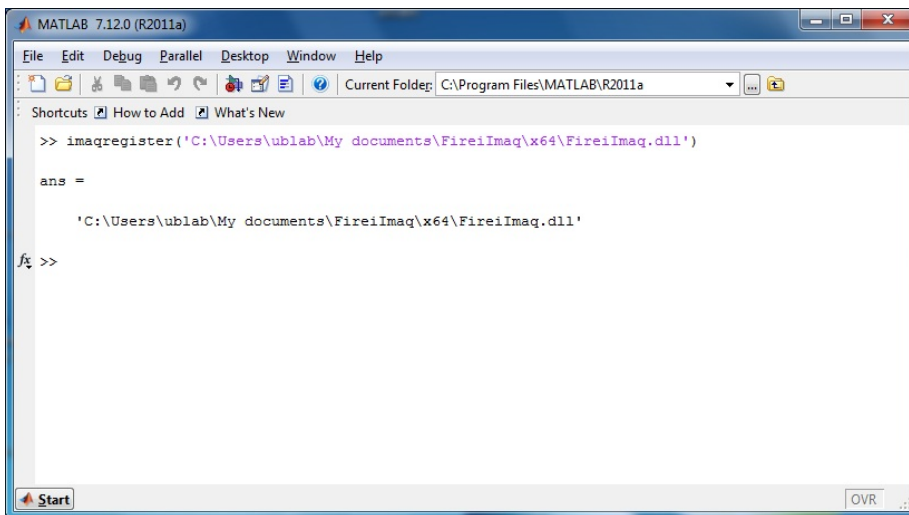
Fire-i IMAQ adaptor is a simple DLL file. This DLL must be registered in MATLAB only once.

Extract *Fireilmaq.zip* to a folder on your system. If you are using 32bit operating system, you should register the DLL located in the *Fireilmaq\x86* folder. Else, if you are using 64bit operating system, you should register the DLL located in the *Fireilmaq\x64* folder.

Open MATLAB program and enter the command:

```
>> imaqregister('PATH to the DLL file\Fireilmaq.dll')
```

For example in the screenshot below we have extracted the zip file in the “My documents” folder and we use 64bit operating system:



This is it! From now on you do not have to register the Fire-i IMAQ adaptor again, unless you unregister it.

## Unregistering Fire-i IMAQ adaptor

For unregistering the adaptor, you should use the *imaqregister* command with two string parameters, the path to the DLL (that you used earlier for registration) plus the string *'unregister'* as second parameter:

```
>> imaqregister('PATH to the DLL file\Fireilmaq.dll', 'unregister')
```

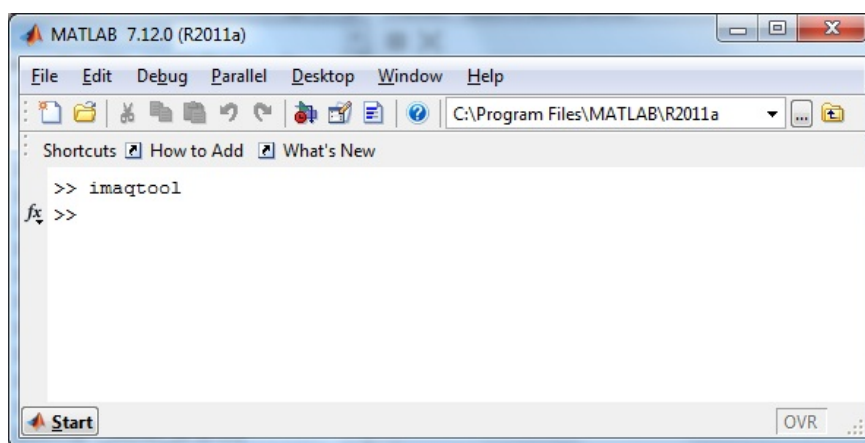
## Using Fire-i IMAQ adaptor

The Fire-i IMAQ adaptor is oriented for users familiar with MATLAB environment and MATLAB scripting (m-Files) and have studied the documentation provided by Mathworks (<http://www.mathworks.com>) for Image Acquisition Toolbox.

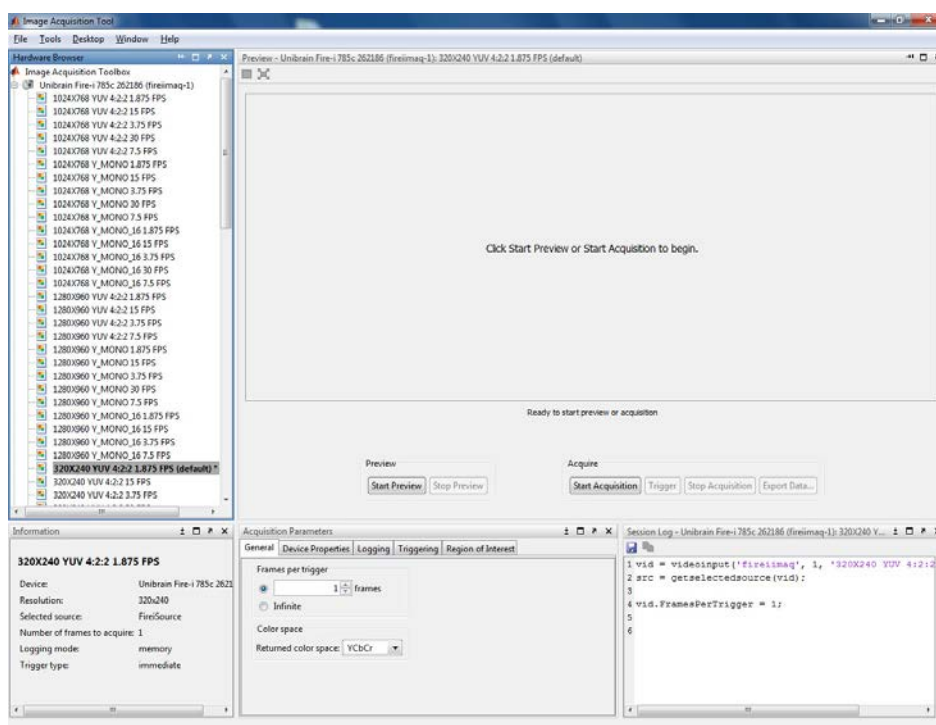
**Before starting MATLAB, the camera(s) must already be connected on the system.**

The easiest way to start after connecting your camera on the system would be by using the IMAQ tool. This is a GUI environment provided by the toolbox that provides a very convenient interface for performing the majority of the tasks you may need, e.g. setting the camera at the desired format, frame rate and adjust the various settings of the camera.

You can start it simply by running the command *imaqtool* on the workspace:

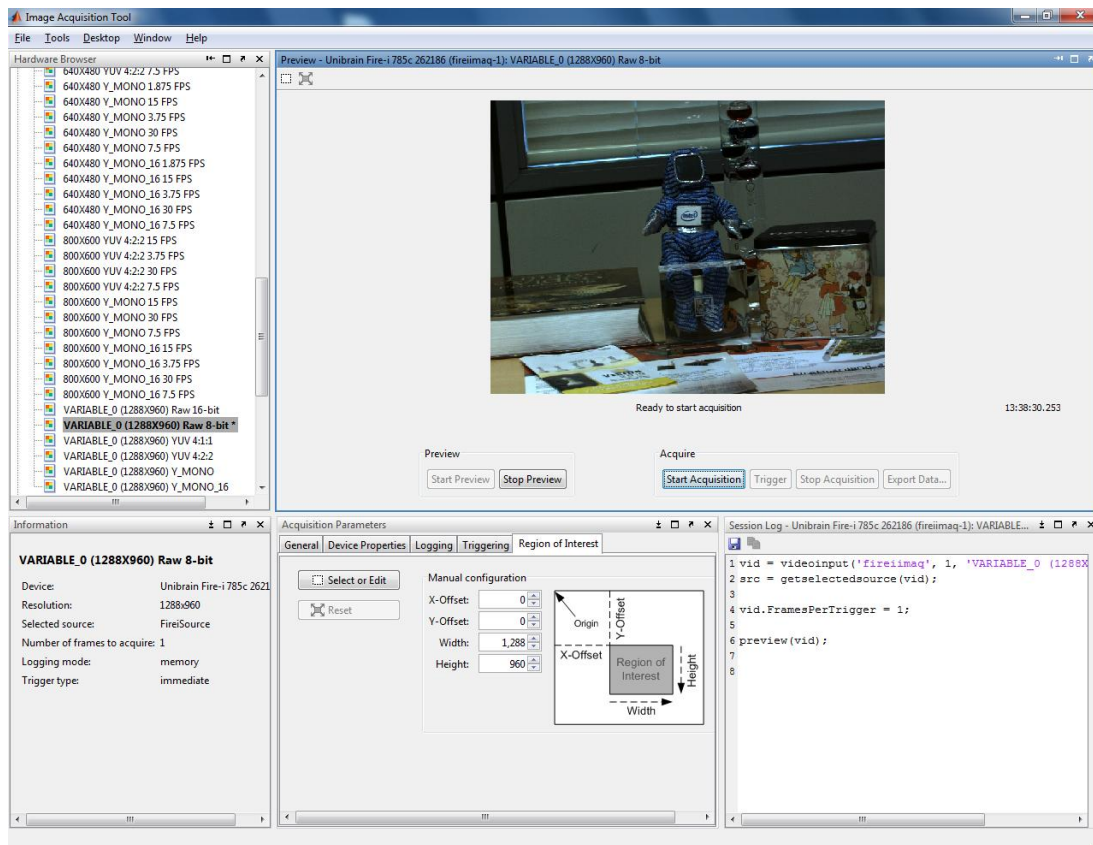


The GUI environment will open, showing on the left, the cameras enumerated by Fire-i IMAQ adaptor and the supported formats by the camera:

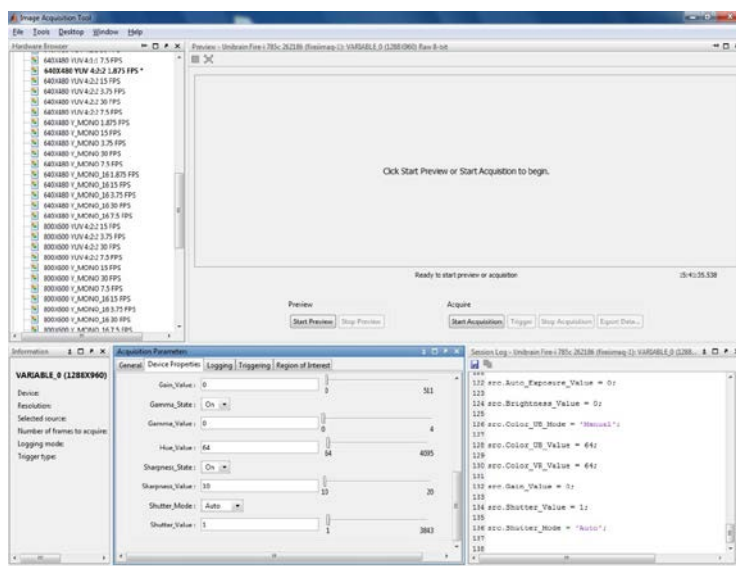


On the *Acquisition Parameters* panel, you can set the various parameters of the camera such as *shutter*, *gain*, *the area of interest* (if you choose a variable format), etc.

Select the format you want the camera to operate at and then click “*Start Preview*” for previewing the camera image or “*Start Acquisition*” for acquiring images in the toolbox:



The *Session Log* panel on the right button is very useful for checking how the operations you make on the GUI could be performed equivalently through MATLAB scripts. On the example below we adjust on the *Acquisition Parameters* panel, various camera parameters and we see on the right the corresponding commands we could use in our scripts:



For example, using the Unibrain Fire-i 785c camera (as in the above screenshots), we could start a preview with the following set of commands, without running the IMAQ tool GUI environment:

```
>>vid = videoinput('fireiimaq', 1, '800x600 yuv 4:2:2 15 fps'); % camera is set at  
the desired format
```

```
>>src = getselectedsource(vid); % returns the current selected video source object.  
This is needed for adjusting parameters on the camera
```

```
>>src.Shutter_Mode = 'Auto'; % here we set the shutter to be auto-adjusted by the  
camera
```

```
>>preview(vid); % a preview window opens, showing the picture grabbed by the camera.
```



## Using 3<sup>rd</sup> party cameras

For using 3<sup>rd</sup> party cameras with Fire-i IMAQ adaptor and our driver stack, a license should be used for the camera or for the IEEE 1394 adapter where the camera is connected.

For further details on our licensing scheme, please refer to the following page on our site:

<http://unibrain.com/Products/DriverAPI/licensing.htm>

You can evaluate Fire-i IMAQ adaptor with a 3<sup>rd</sup> party camera. A popup will show up for entering an evaluation code (it is possible to appear behind MATLAB's main window so, you should check accordingly). You can then evaluate the camera usage with Fire-i IMAQ for a period of ~20 minutes.

**IMPORTANT:** please note that when evaluation period expires, the MATLAB session will close. You should get a camera license for enabling unlimited usage of Fire-i IMAQ adaptor with the camera.