

Configuring IonWizard 6x with IO24

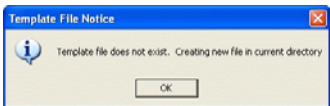



July 5, 2007

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After installing the IonWizard 6x hardware, interface card(s), and driver(s) you will need to configure IonWizard. These steps should only need to be performed once and a separate from configuring your experiments. This document explains the details

1 Create an IonWizard user

1.	When you start IonWizard for the first time you will see this message. Click Ok	
2.	Next you will be asked to enter a user name. You can enter any string that you would like. <i>Please note that hardware configurations and experiment settings are stored globally for all users of this version of IonWizard. Only the template settings are stored on a user by user basis</i>	
3.	If this is a new installation you will see and error that says "...error opening IAB_D4.EST..." click ok	
4.	You will get another one for the file IAB_D4.GST, click ok	
5.	You should now see the main IonWizard menu bar which will have three menus "File", "Collect" and "Help"	

2 Device Overview

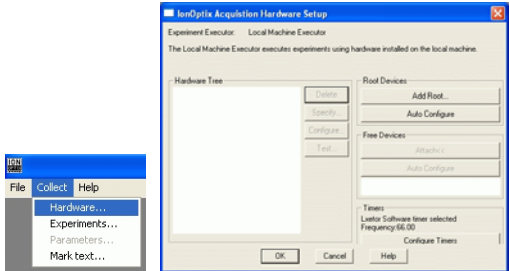
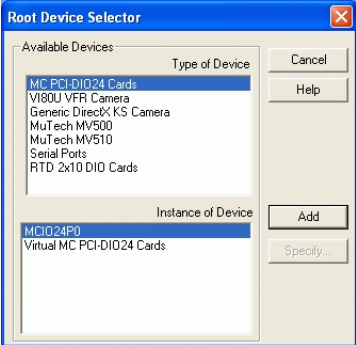
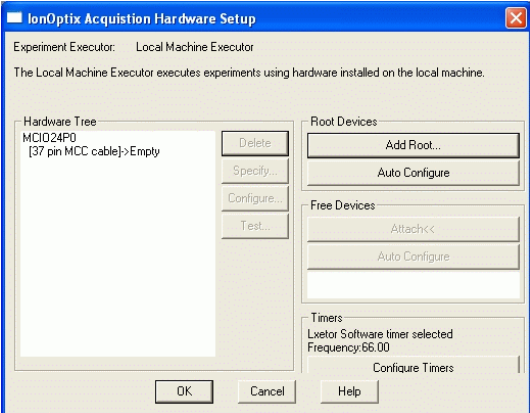
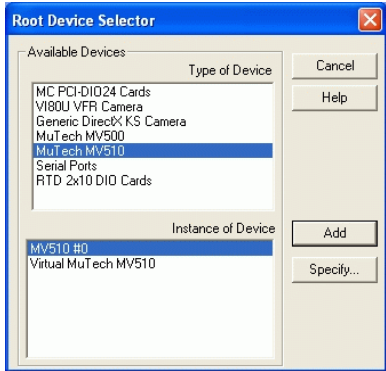
The hardware configuration for IonWizard is based on a hierarchical tree setup. At the "base" of this tree are the root devices. A device is considered a root device if it connects directly to the computer.

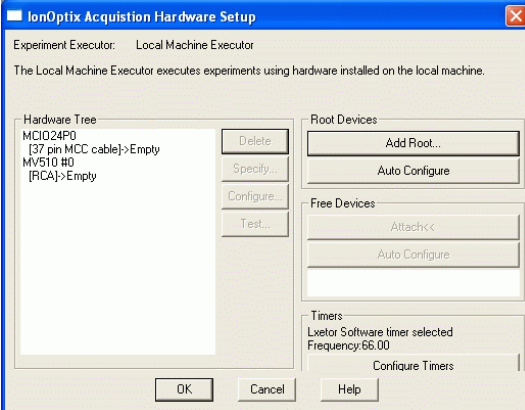
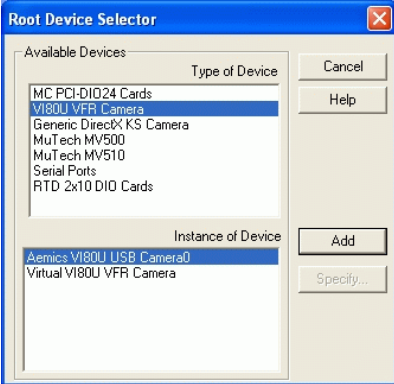
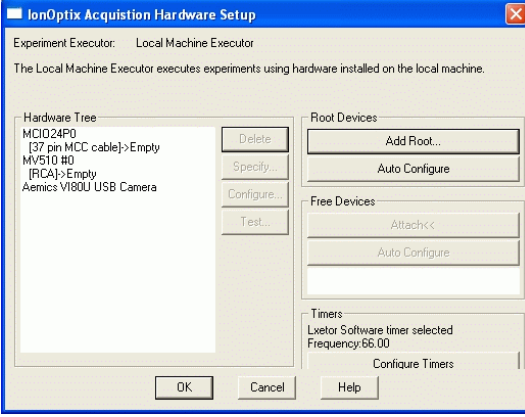
The following devices are considered root devices

- All PCI or ISA interface cards
- Any USB or Firewire device
- All standard serial/parallel ports (even though they may be built into the computer they appear to software as separate interface cards)

3 Add Root Devices

The first thing to do is to add the root devices for your system.

<p>1.</p>	<p>Pick “Hardware..” from the “Collect” menu and you should see any an empty Hardware Setup Dialog box</p>	
<p>2.</p>	<p>Click on the “Add Root...” button then</p> <p>In Type of Device select MCC PCI-DIO24 Cards</p> <p>In Instance of Device select MCIO24Px</p> <p>Click Ok</p> <p><i>Note the “x” at the end of MCIO24P will vary and is not relevant</i></p>	
<p>3.</p>	<p>You will be returned to the main hardware dialog with the MCIO24 device added to the hardware tree.</p>	
<p>4.</p>	<p><i>Note - Skip to step 6 if you do not have a MuTech frame grabber</i></p> <p>Click on the “Add Root...” button then</p> <p>In Type of Device select MuTech MV510</p> <p>In Instance of Device select MV510 #x</p> <p>Click Ok</p> <p><i>(again the value of x will vary)</i></p>	


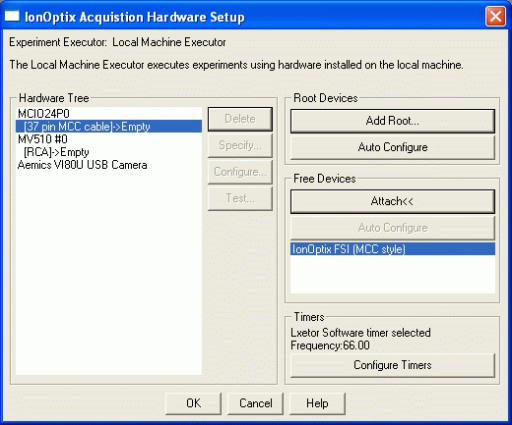
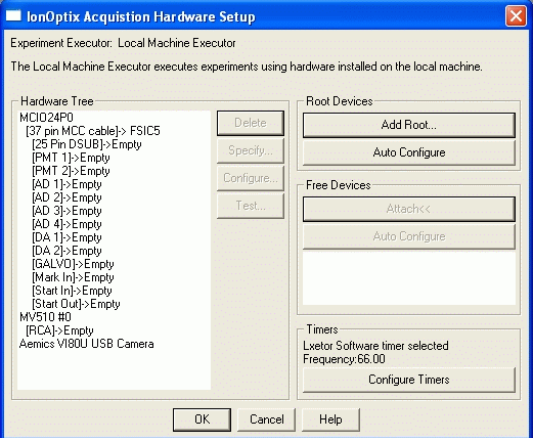
<p>5.</p>	<p>You will be returned to the main hardware dialog with the MV510 device added to the hardware tree.</p>	
<p>6.</p>	<p><i>Note – Skip to step 8 if you do not have a Myocam-S</i></p> <p>Click on the “Add Root...” button then</p> <p>In Type of Device select VI80U VFR Camera</p> <p>In Instance of Device select Aemics VI80U USB Camerax</p> <p>Click Ok</p> <p><i>(again the value of x will vary)</i></p>	
<p>7.</p>	<p>You will be returned to the main hardware dialog with the Aemics VI80U USB Camera device added to the hardware tree.</p>	
<p>8.</p>	<p>Click OK to save your changes</p>	

4 Add/Configure Branch Devices

After adding the appropriate root devices to your hardware configuration the next step is to add the branch devices that are part of your system.

4.1 Add Fluorescence or Data System Interface

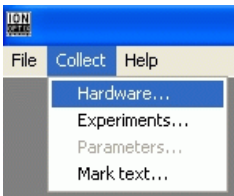
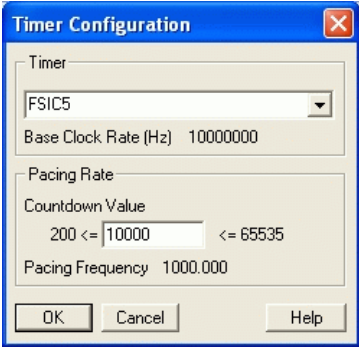
Currently every IonWizard 6x system is shipped with either a Fluorescence System Interface or a Data System Interface. Please select the appropriate choice for your hardware in the following instructions.

1.	Pick "Hardware.." from the "Collect" menu	
2.	In the Hardware Tree select [37 pin MCC Cable]->Empty (which is under the MCIO24Px device) In the Free Devices list select IonOptix FSI (MCC Style) or IonOptix DSI (MCC Style) Then click "Attach<<"	
3.	The hardware tree will now show [37 pin MCC Cable]->FSICx or [37 pin MCC Cable]->PDSix	
4.	Click OK to save your changes	

4.2 Selecting Timer and Sample Rate

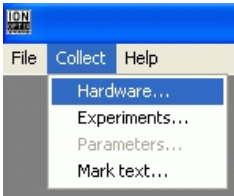
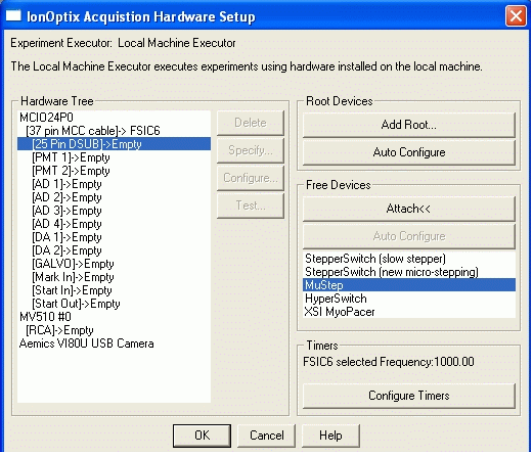
In IonWizard sampling of most inputs is done using a hardware timer from one of the attached devices. In addition there is computer-based timer that can be used when no other timers are present for sampling at a slow rate. The best timer at this point is the one that part of the Fluorescence or Data System interface.

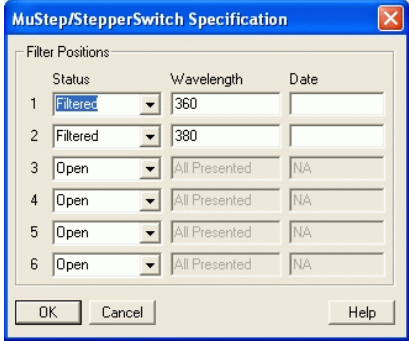
In addition to selecting the timer you may also select the pacing rate. This rate defines the fundamental sampling frequency of all devices that are not internally paced. The "normal" pacing rate is 1000 Hz.

1.	Pick "Hardware.." from the "Collect" menu	
2.	<p>Click on the "Configure Timers" button.</p> <p>From the Timer list select FSICx or PDSix (<i>x=varying number</i>)</p> <p>In the Pacing rate dialog enter the timer countdown value that results in the desired pacing frequency.</p> <p>For normal use enter 10000 as the countdown value which will result in a pacing rate of 1KHz. Please contact IonOptix for instructions on running at different pacer rates.</p>	 $PacingFreq = \frac{BaseClockRate}{CountDownValue}$
4.	Click OK to save your changes	

4.3 Add Light Source

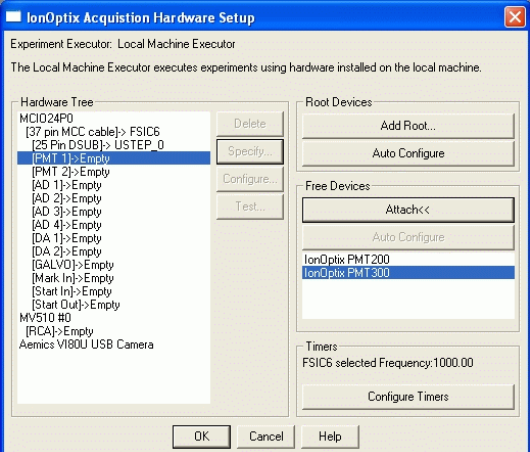
Most IonWizard systems ship with a computer controlled excitation light source. This will be either the high-speed HyperSwitch or the filter wheel based Stepper Switch. If you do not have an excitation light source skip to the next section.

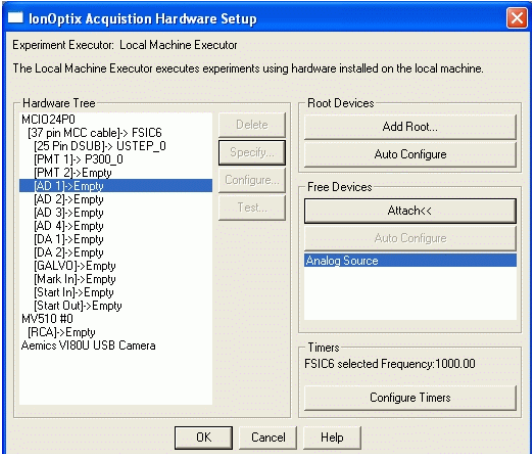
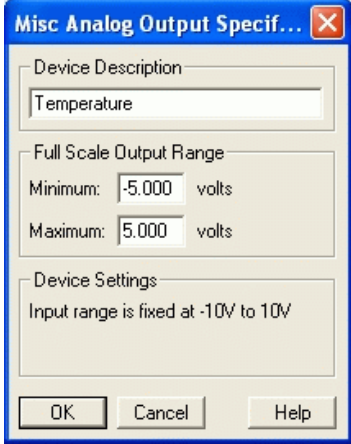
1.	Pick "Hardware.." from the "Collect" menu	
2.	<p>In the Hardware Tree select [25 Pin DSUB]->Empty (which is 2nd under the MCIO24Px)</p> <p>In the Free Devices list select MuStep StepperSwitch (new microstepping) or HyperSwitch</p> <p>Then click "Attach<<"</p> <p>The hardware tree will now display [25 Pin DSUB]->USTEP_x</p>	
3.	To complete the configuration of the excitation light source you need to specify the characteristics of the device.	

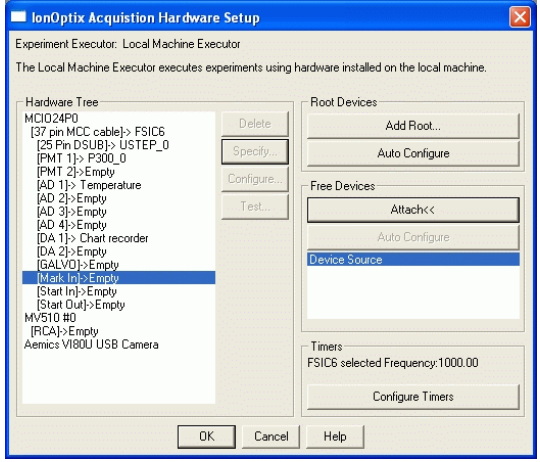
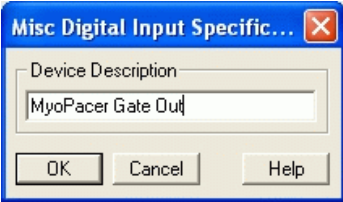
<p>For MuStep or StepperSwitch...</p> <p>Highlight [25 Pin DSUB]->USTEP_x then click on the "Specify..." button.</p> <p>Make the changes similar to figure at right using the actual filter values that are present your filter wheel. You may use "date" value is to help you track the age of the filters or you may leave them blank.</p>	
<p>For Hyperswitch...</p> <p>Highlight [25 Pin DSUB]->HYPSW_x then click on the "Specify..." button.</p> <p>Specific instructions to follow...</p>	<p>Figure to follow</p>
<p>4. Click OK to save your changes</p>	

4.4 Add PhotoMultiplier(s), Analog input(s) and Event input(s)

Photometry systems will include one or more Photo multiplier tubes for acquiring light intensity data. In addition the both system interfaces support four general purpose analog inputs and one or two digital event inputs. This section will show you how to add and configure these inputs.

<p>1. Pick "Hardware.." from the "Collect" menu</p>	
<p>2. <i>Note – skip to step 3 if you do not have any photomultiplier tubes</i></p> <p>In the Hardware Tree select [PMT 1]->Empty (which is 3rd under the MCIO24Px)</p> <p>In the Free Devices list select IonOptix PMT 300</p> <p>Then click "Attach<<"</p> <p>The hardware tree will now display [25 Pin DSUB]->PMT300_x</p> <p><i>If you have a 2nd photomultiplier tube repeat step 2 and attach it to [PMT 2]</i></p>	

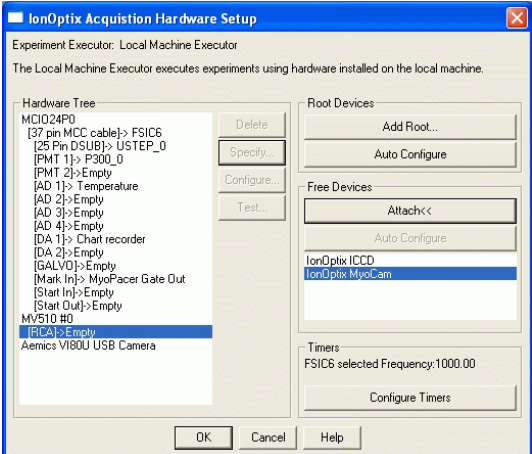
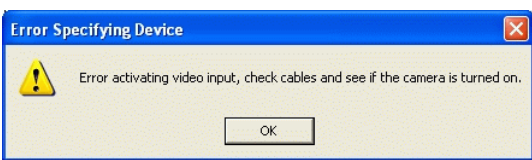
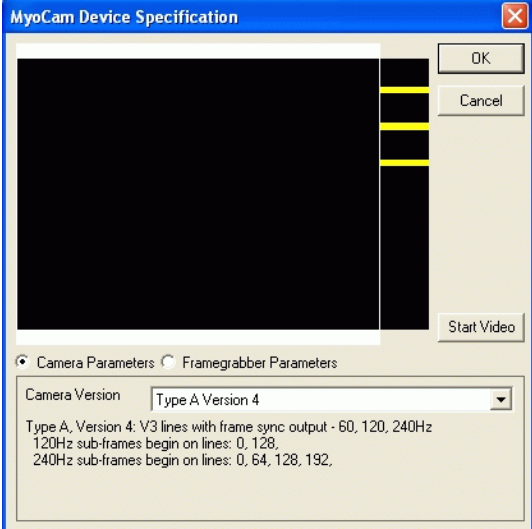
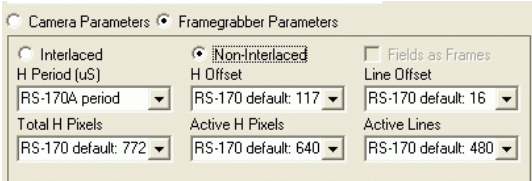
<p>3.</p>	<p><i>Note – if you are not going to use any general purpose analog inputs skip to step 5</i></p> <p>In the Hardware Tree select [AD 1]->Empty In the Free Devices list select Analog Source Then click “Attach<<”</p> <p>The hardware tree will now display [AD 1]->Unspecified</p>	
<p>4.</p>	<p>Highlight [AD 1]->Unspecified then click the “Specify...” button.</p> <ul style="list-style-type: none"> - In the device description enter a description of the signal that you are connecting TO the analog input. That is if you are connecting it to the analog input to the Temperature monitor output of you chamber system enter “Temperature” - The Full Scale output range is meant as a way for you to record what voltages the device can output - The device settings block shows you what the voltages the input is capable of recording. If the input device had configurable input range you would select the appropriate range here <p>After you have finished specifying the analog input click ok. The hardware tree will now display [AD 1]->Temperature</p> <p><i>Repeat steps 3 & 4 for any other analog inputs uses [AD 2], [AD 3] or [AD 4]</i></p>	

<p>5. <i>Note – if you are not going to use any event inputs skip to step 7</i></p> <p>In the Hardware Tree select [Mark In]->Empty or [Start In]->Empty In the Free Devices list select Device Source Then click “Attach<<”</p> <p>The hardware tree will now display [Mark In]->Unspecified or [Start In]->Unspecified</p> <p><i>Note – the Fluorescence System Interface has two separate event inputs, The Data System Interface has a single combined Start/Mark input</i></p>	
<p>6. Highlight [Mark In]->Unspecified or [Start In]->Unspecified</p> <p>then click the “Specify...” button.</p> <ul style="list-style-type: none"> - In the Device description you should enter a description of the output signal that is connected to the event input. - Click ok <p>The hardware tree will now display [Mark In]->MyoPacer Gate Out or [Start In]-> MyoPacer Gate Out</p> <p><i>Repeat steps 5 & 6 for the other event the other event input</i></p>	
<p>7. Click OK to save your changes</p>	

4.5 Add MyoCam

If your system includes a MyoCam and a Mutech (not the USB MyoCam-s) you will need to perform the following steps to add it to the hardware tree.

<p>1.</p>	<p>Pick “Hardware..” from the “Collect” menu</p>	
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<p>2.</p>	<p>In the Hardware Tree select [RCA]->Empty In the Free Devices list select IonOptix MyoCam Then click "Attach<<"</p>	
<p>2b.</p>	<p>If you see this error, it means that the software did not see a valid video input signal on the frame grabber's RCA connector.</p> <p>Make sure that the camera video out is connected to the frame grabber, ... the cable is connected between the camera and the camera controller ... the camera controller power is on</p> <p>Click ok to dismiss the error then try step #2 again</p>	
<p>3.</p>	<p>When you enter you will see this display.</p> <p>Select "Framegrabber Parameters" which is immediately below the video display.</p>	
<p>4.</p>	<p>In the Framegrabber Parameters select "Non-interlaced" then click on "Active lines" and replace the string "RS-170 default: 480" with "240"</p>	

<p>5.</p>	<p>When the Framegrabber Parameters are set as shown in the figure to the right you can click the “Start Video” button.</p> <p>Set the camera controller switch to 240 and you should see an image similar to one shown on the right. If things are set properly the black bars between the fields in the video display (on the left) should align with the yellow bars in the ruler (on the right).</p> <p>If there are any problems contact IonOptix.</p>	
<p>6.</p>	<p>Click OK to save your changes</p>	

5 Notes

Here is a short list of notes about hardware configuration, more detailed discussion planned...

- Hardware settings are stored in the program directory in the file HWMGR.XML
- If you have separate versions of IonWizard stored in separate directories each installation of IonWizard will have its own hardware settings file.
- Removing or changing existing hardware devices will prevent your experiments from loading. Once an experiment fails to load ALL experiments will have to be deleted before you can continue.

Please refer to the document “IonWizard 6x Experiment Setup” for information on how to configure your experiment.