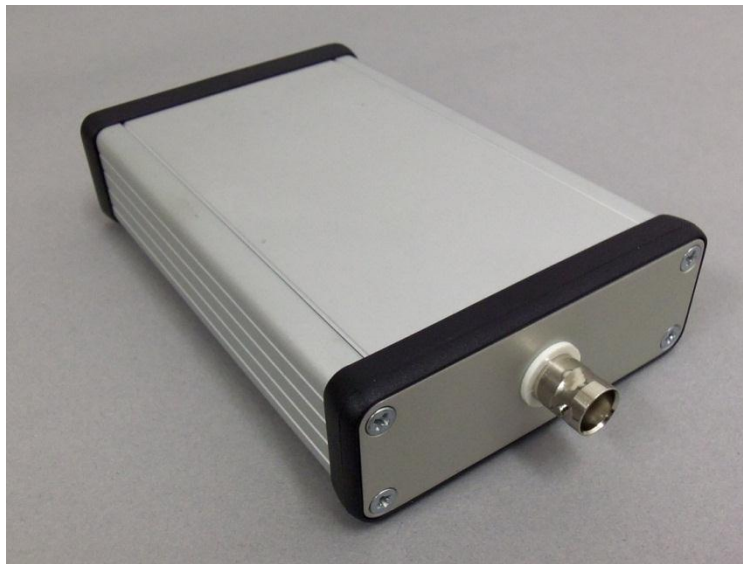


USB-TTL Interface User Manual



Software version: 1.01

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Contents

USB-TTL Interface Description	3
Health and Safety	3
Setup of the Device	4
Package List.....	4
System overview	6
General Specifications.....	6
Software Installation	7
Installation of the Arduino drivers and software.....	7
Setup for Micro-Manager software.....	7
Usage by HyperTerminal software	16

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USB-TTL Interface Description

The USB-TTL Interface is designed to enable a simple use of Prizmatix LED light sources with a computer through USB serial port. The USB-TTL Interface enables a simple control of Prizmatix LED light sources from such PC software as Micro-Manager (www.micro-manager.org) or by simple HyperTerminal commands.

Prizmatix USB-TTL Interface is based on Arduino microcontroller board. Arduino is an open-source* physical computing platform based on a simple microcontroller board, and development environment for writing software for the board for more details see: www.arduino.cc.

Health and Safety

Prizmatix products are NOT authorized for use as components in life support devices or systems.

**The USB-TTL Interface is intended for use
as laboratory equipment only.
It is not cleared or authorized for
clinical use.**

Any maintenance shall ONLY be performed by a technician authorized by Prizmatix.

Cellular phones or other radio transmitters should not be used within the vicinity of the unit.




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Setup of the Device

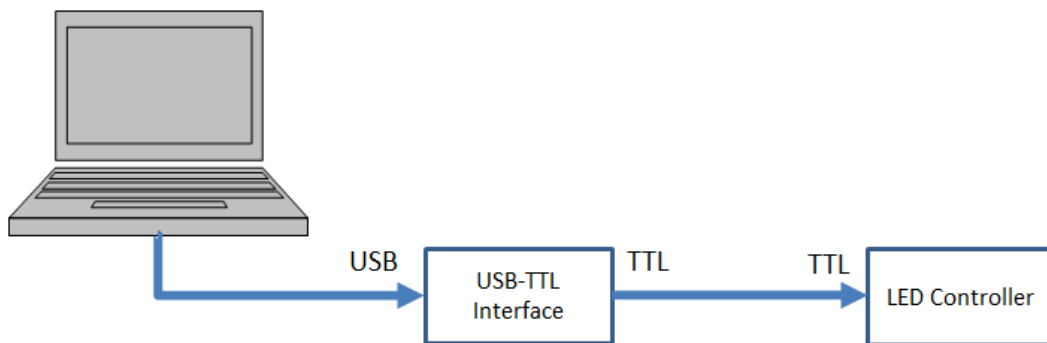
Remove the device from packaging and inspect the device for loose components or any sign of damage. Notify Prizmatix if the device appears damaged in any way: do not install damaged device.

Package List

<p>USB-Interface-Box</p> 	<p>USB-A to USB-B Cable</p> 
<p>Software Installation</p> <p>See: www.prizmatix.com www.micro-manager.org www.arduino.cc</p>	<p>BNC-BNC Cable</p> 

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#	Item	Description	QTY
1	USB-TTL Interface	Metal enclosure box containing the Arduino microcontroller with USB and BNC connectors	1
2	USB Cable	USB-A to USB-B Cable for connection of USB-TTL Interface to a PC	1
3	BNC-BNC Cable	BNC-BNC cable for connection of the USB-TTL Interface to Prizmatix LED controller	3
4	Software	Please down load software	1



The USB-TTL Interface setup

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System overview

The USB-TTL Interface based on Arduino UNO Rev3 board. The schematics of the board can be found at:

http://arduino.cc/en/uploads/Main/Arduino_Uno_Rev3-schematic.pdf

The USB-TTL Interface uses pin 13 of the board (pin 3 of ICSP connector) output to drive the TTL output.

The BNC connector is connected to pin 3 of the ICSP connector through a 200ohm resistor to limit the output current.

General Specifications

Max output current:	40mA
Dimensions:	25 x 50 x 110 (WxHxL)
Input Connector:	USB Type A
Output Connector:	BNC (standard TTL levels)

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Software Installation

The software installation is performed in two steps:

1. Installation of the Arduino driver software
2. Setup of PC software
 - Micro-Manager software
 - HyperTerminal
 - Any other software supporting serial communication

Installation of the Arduino drivers and software

In general the installation shall be performed according to instructions at:

<http://arduino.cc/en/Guide/HomePage>

Important remarks:

- (a) There is no official webpage for download and installation of just the *.inf hardware configuration file. The whole Arduino installation file needs to be downloaded and unzipped.
- (b) The Arduino Uno's driver file, named "ArduinoUNO.inf", located in the "Drivers" folder of the Arduino Software download (not the "FTDI USB Drivers" sub-directory).

Setup for Micro-Manager software

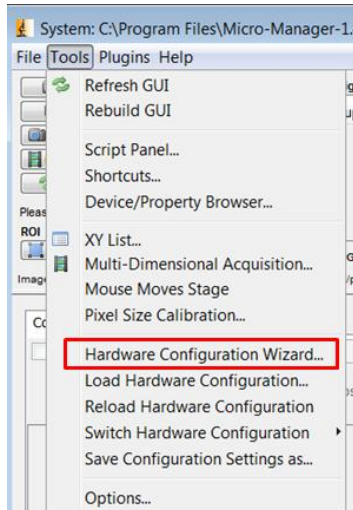
In general the installation of Micro-Manager software shall be performed according to instructions at www.micro-manager.org the specific page is:

http://valelab.ucsf.edu/~MM/MMwiki/index.php/Download_Micro-Manager_Latest_Release

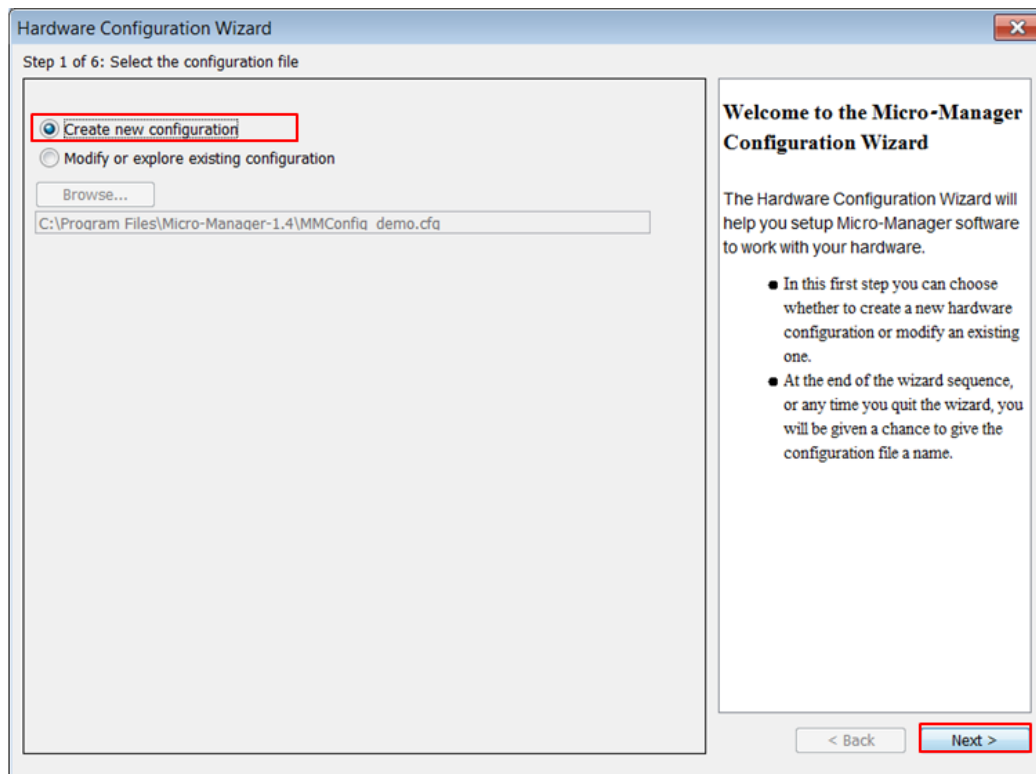
After successful installation follow these steps to configure the software in order to use the USB-TTL Interface:

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1. Run the Micro-Manager software.
2. Select Hardware Configuration Wizard from Tools menu:

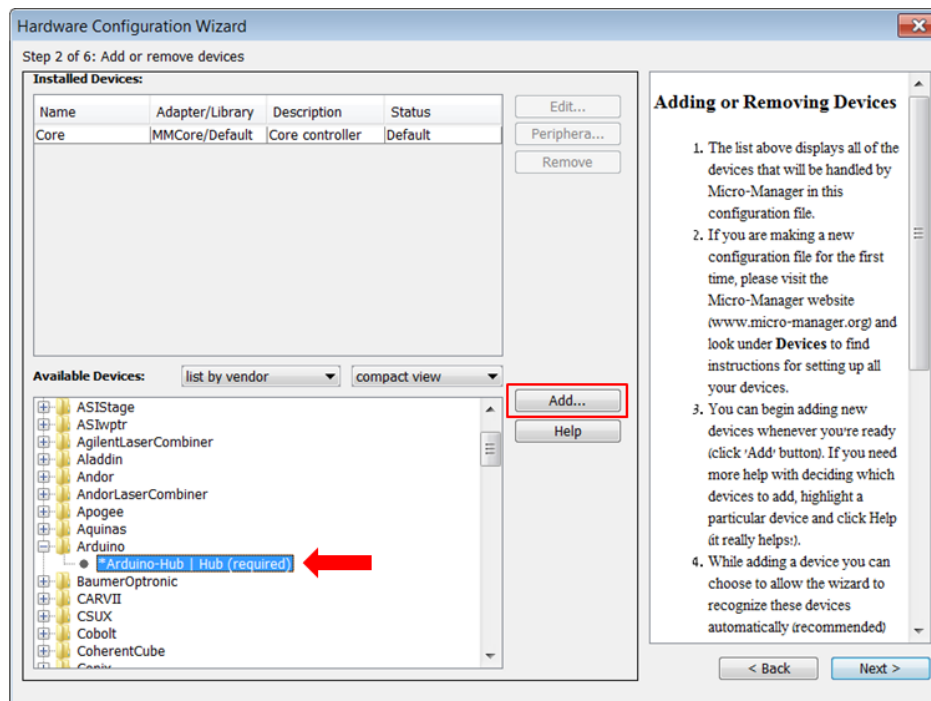


3. Select Create new configuration or Modify and click Next button

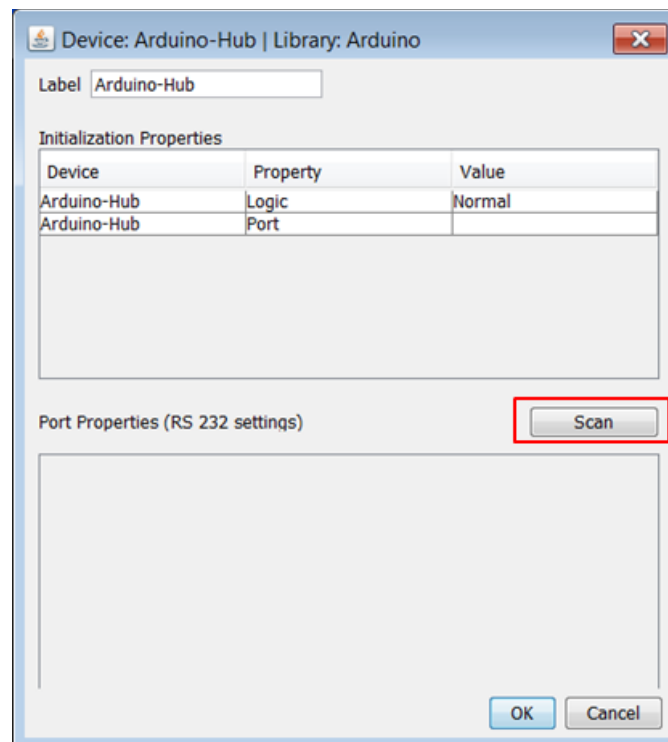


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4. Select Arduino Hub from list of devices and click on Add button.

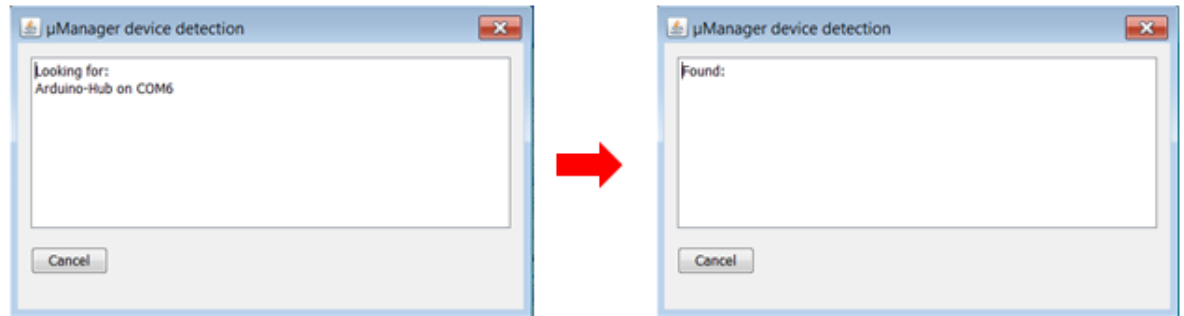


5. On next screen press Scan button

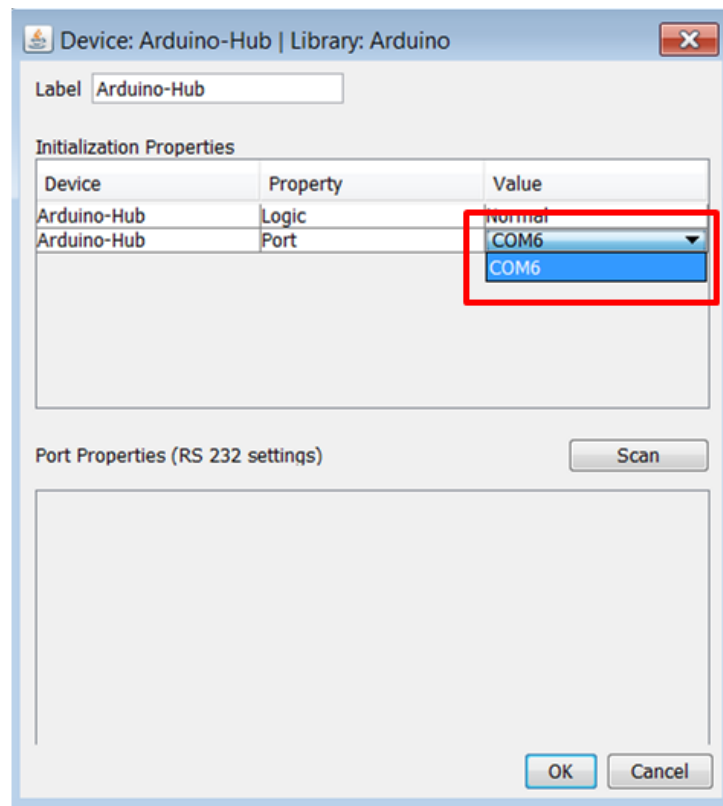


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6. After few seconds following screens will appear for few seconds:

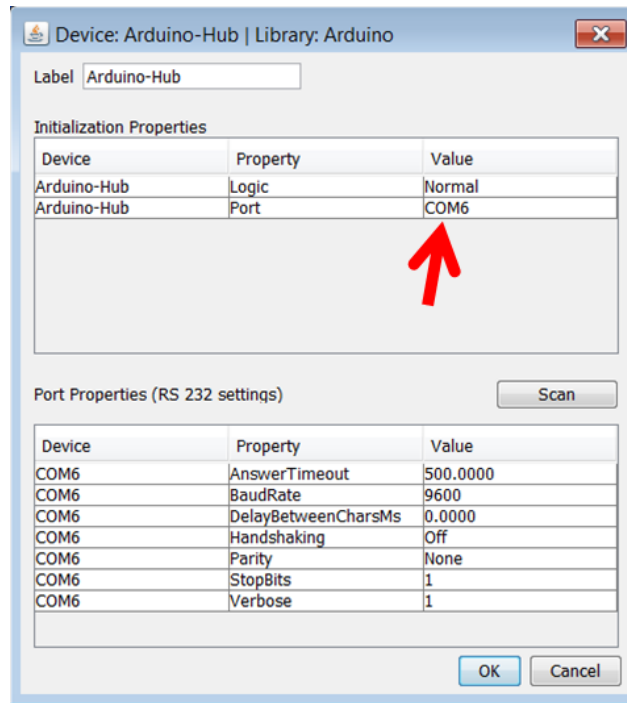


7. Eventually you will see following dialog box. Select the appropriate COM port.

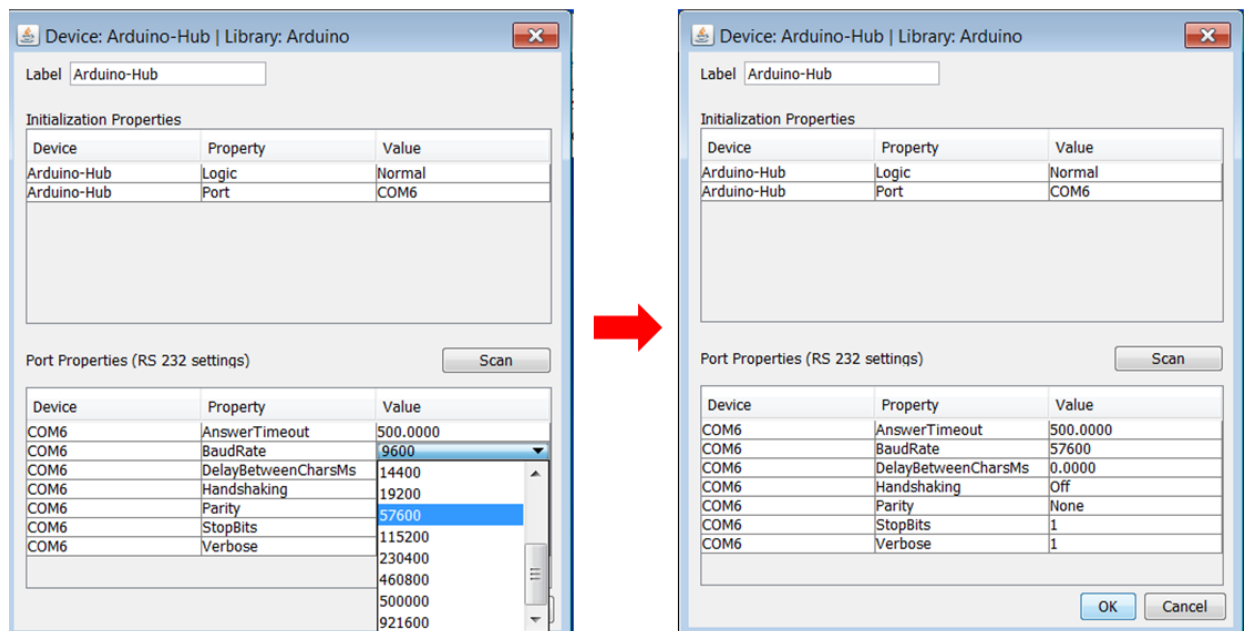


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8. In our example the USB-TTL Interface Arduino installed as COM6 port. After COM port selection following screen will appear:

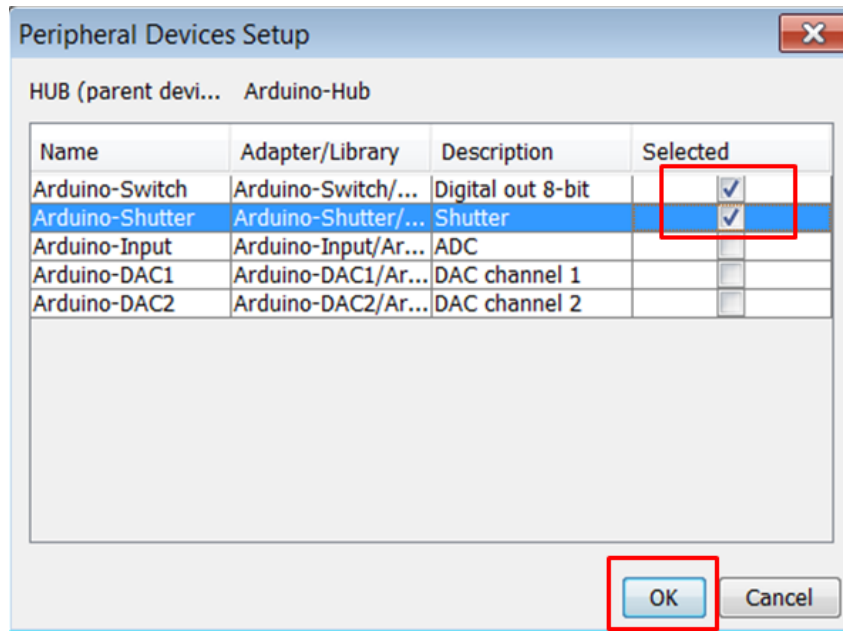


9. Choose Baud Rate 57600 as shown at following and click OK to proceed:

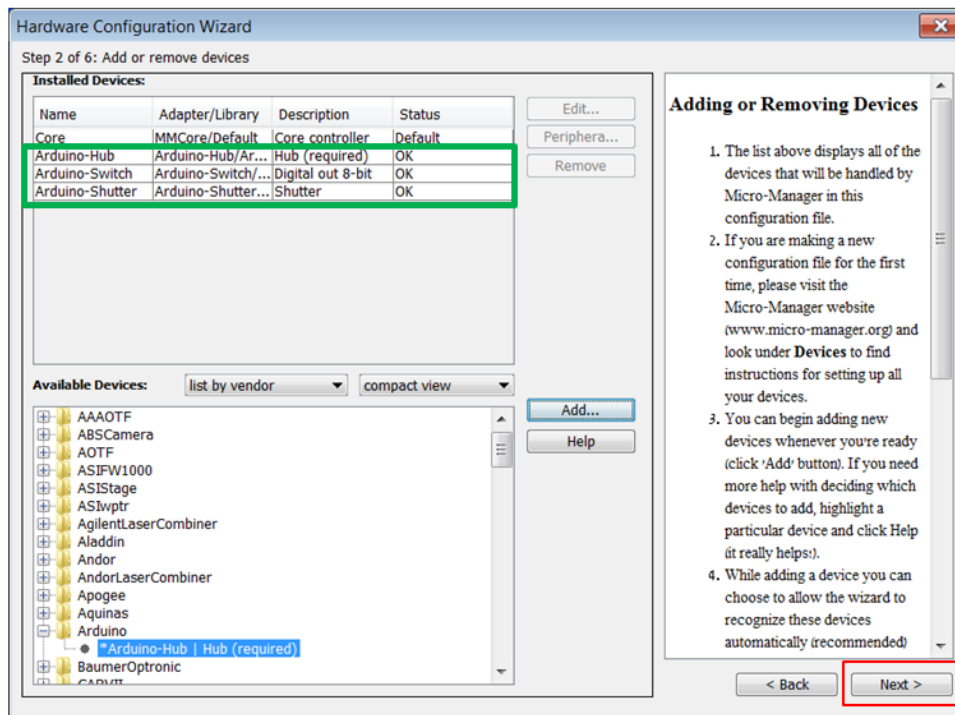


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10. Check Arduino-Switch and Arduino-Shutter and press OK button:

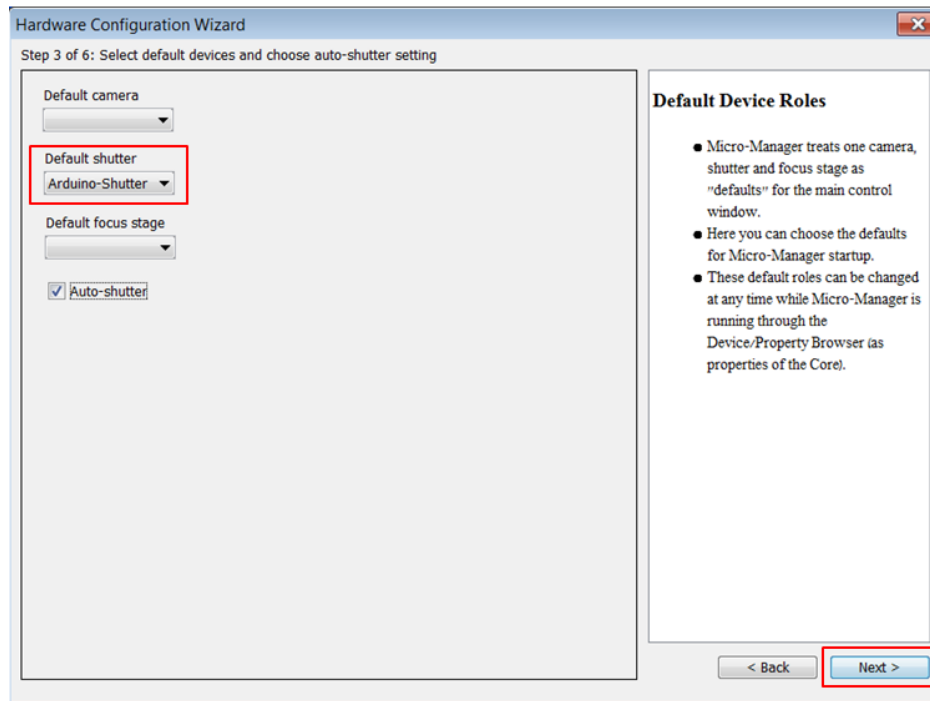


11. Following dialog box will appear. Click Next to proceed:

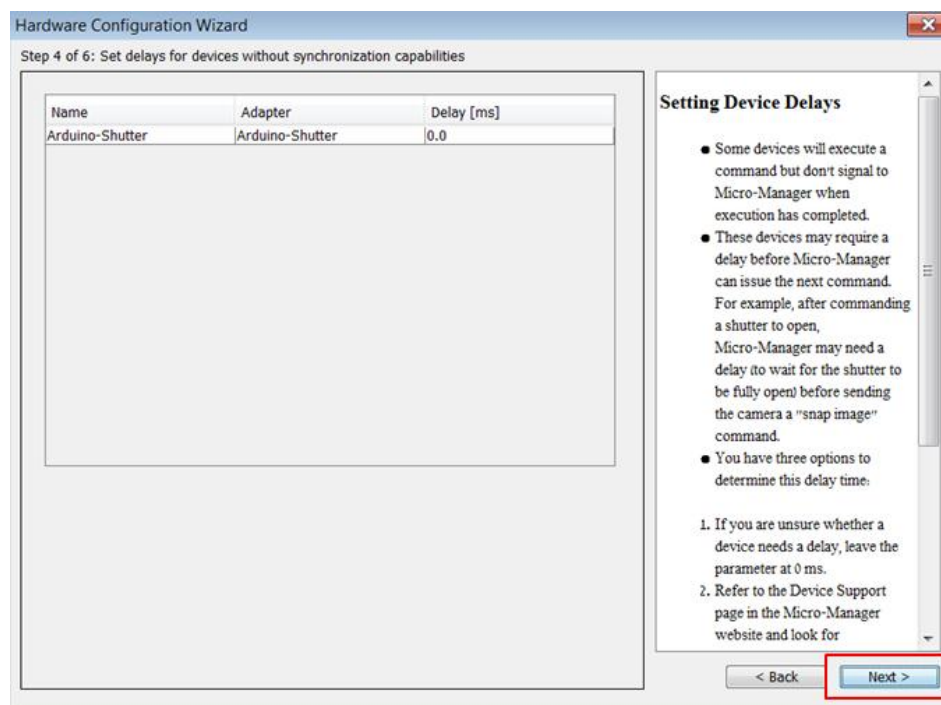


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12. Select Arduino Shutter from the list and click Next:

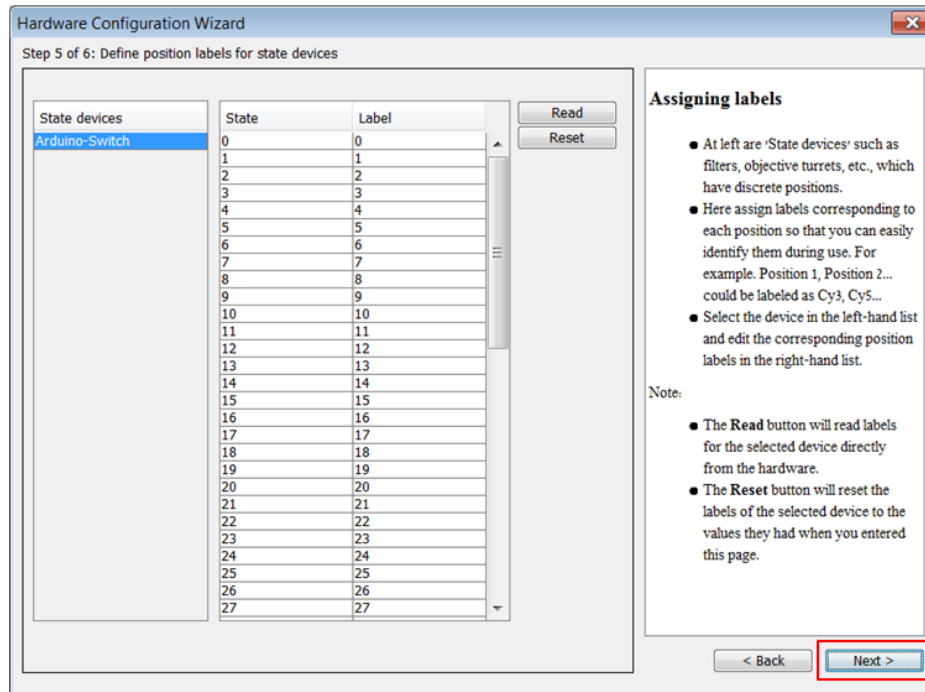


13. Check the data of next screen and click Next to proceed:

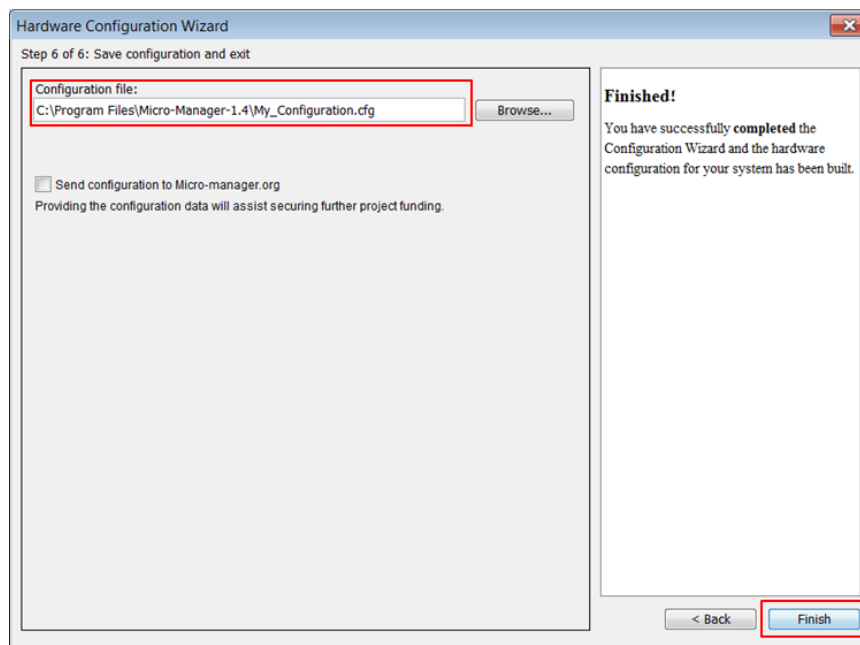


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14. On next screen click Next to proceed:

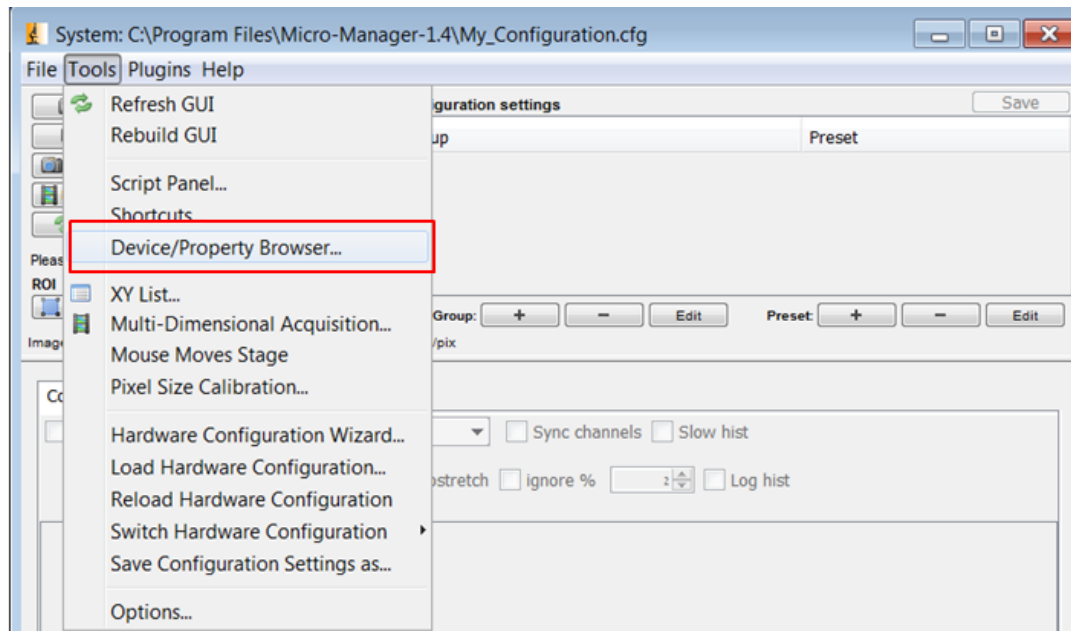


15. At next screen choose the configuration file and click Finish to end the configuration wizard:

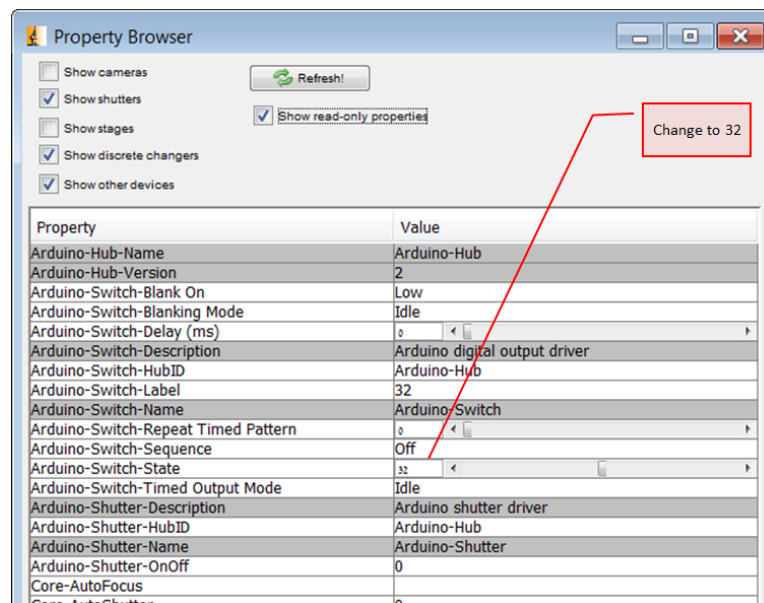


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16. To finish configuration select Device / Property Browser from Micro-Manager Tools menu:

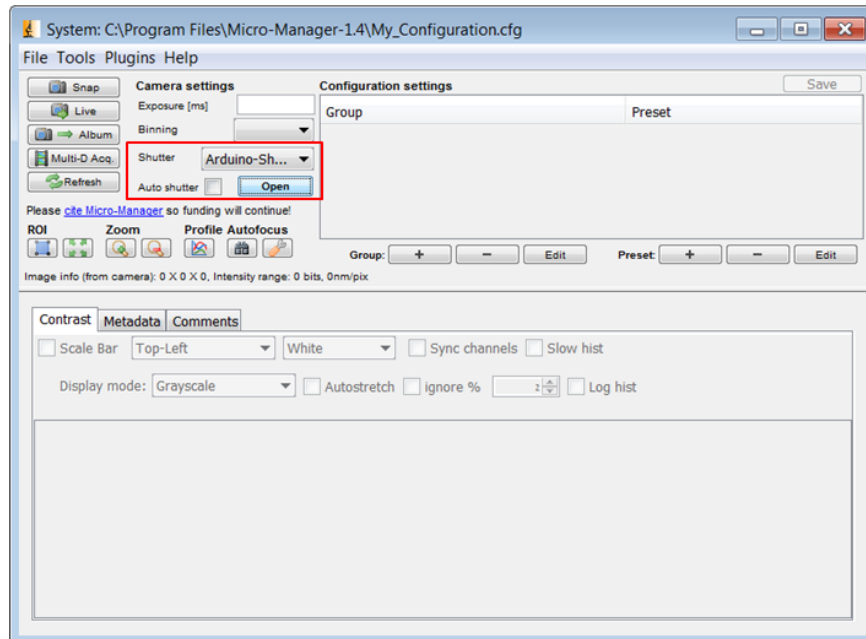


17. At Property Browser change the Arduino-Switch-State to 32 and close the dialog box.



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18. Open the Micro-Manager main screen. Choose the Arduino Shutter and try to change the Shutter state from Open to Close and vice versa. If the USB-TTL Interface is connected to LED driver the LED light shall be Turned ON at Open Shutter state and OFF at Close Sutter state:



Usage by HyperTerminal software

The USB-TTL Interface can be used with any HyperTerminal like software capable of sending and receiving simple ASCII commands over serial RS232 or USB interface. Following commands are predefined in USB-TTL Interface:

Command	Function	Echo
H	Changes TTL output to High (+5V)	ON
L	Changes TTL output to Low (0V)	OFF