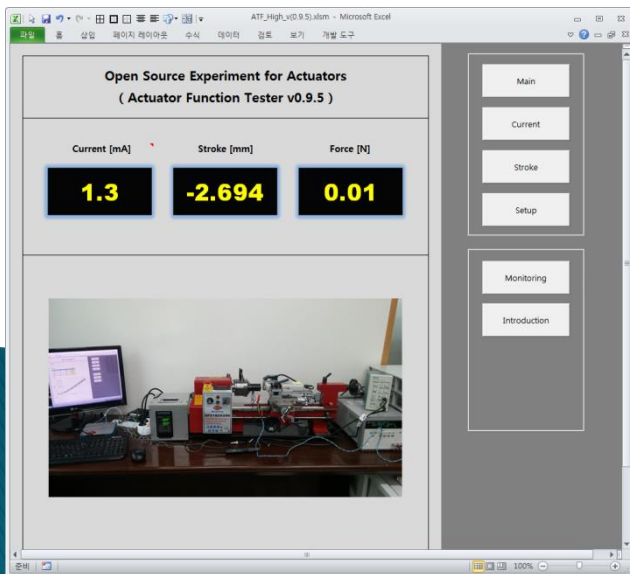


# AFT Installation

( Actuator Function Tester )

2018-04-22

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# Installation of Drivers

# Arduino IDE Installation

## ➤ Arduino IDE Installation

- **When using Arduino Due for communication port connection, Arduino IDE must be installed**
- Download Web : <https://www.arduino.cc/en/Main/Software>

Download the Arduino IDE



**ARDUINO 1.8.5**  
The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and based on Processing and other open-source software.  
This software can be used with any Arduino board. Refer to the [Getting Started](#) page for installation instructions.

**Windows** Installer  
Windows ZIP file for non admin install

**Windows app** [Get](#)

**Mac OS X** 10.7 Lion or newer

**Linux** 32 bits  
**Linux** 64 bits  
**Linux** ARM

[Release Notes](#)  
[Source Code](#)  
[Checksums \(sha512\)](#)

## ➤ Arduino IDE Installation

- Set basic settings for installation

# NI Hardware Driver Installation

## ➤ NI Hardware Driver Installation

- **When using NI DAQ Board, Hardware Driver (NI-DAQmx) must be installed**
- Download Web : <http://www.ni.com/en-us/support.html>

## Technical Support

The screenshot shows the NI Technical Support website interface. At the top, there is a search bar with a 'SUPPORT' dropdown menu and a search icon. Below the search bar, the 'POPULAR SUPPORT PAGES' section is displayed. It is organized into three columns: SOFTWARE, HARDWARE DRIVER, and HARDWARE. The 'HARDWARE DRIVER' column contains a list of links, with 'NI-DAQmx' highlighted by a red rectangular box. Other links in this column include 'NI-VISA' and 'NI-488.2'. The 'SOFTWARE' column lists 'LabVIEW', 'DIAdem', 'LabWindows™/CVI', 'Measurement Studio', 'Multisim', and 'TestStand'. The 'HARDWARE' column lists 'USB-6008', 'cDAQ-9188', 'cRIO-9074', 'Vision Acquisition Software', 'NI-Motion', 'GPIB-USB-HS+', 'NI 9237', and 'NI 9205'.

SOFTWARE	HARDWARE DRIVER	HARDWARE
<ul style="list-style-type: none"><li>• LabVIEW</li><li>• DIAdem</li><li>• LabWindows™/CVI</li></ul>	<ul style="list-style-type: none"><li>• NI-DAQmx</li><li>• NI-VISA</li><li>• NI-488.2</li></ul>	<ul style="list-style-type: none"><li>• USB-6008</li><li>• cDAQ-9188</li><li>• cRIO-9074</li><li>• Vision Acquisition Software</li><li>• NI-Motion</li><li>• GPIB-USB-HS+</li><li>• NI 9237</li><li>• NI 9205</li></ul>

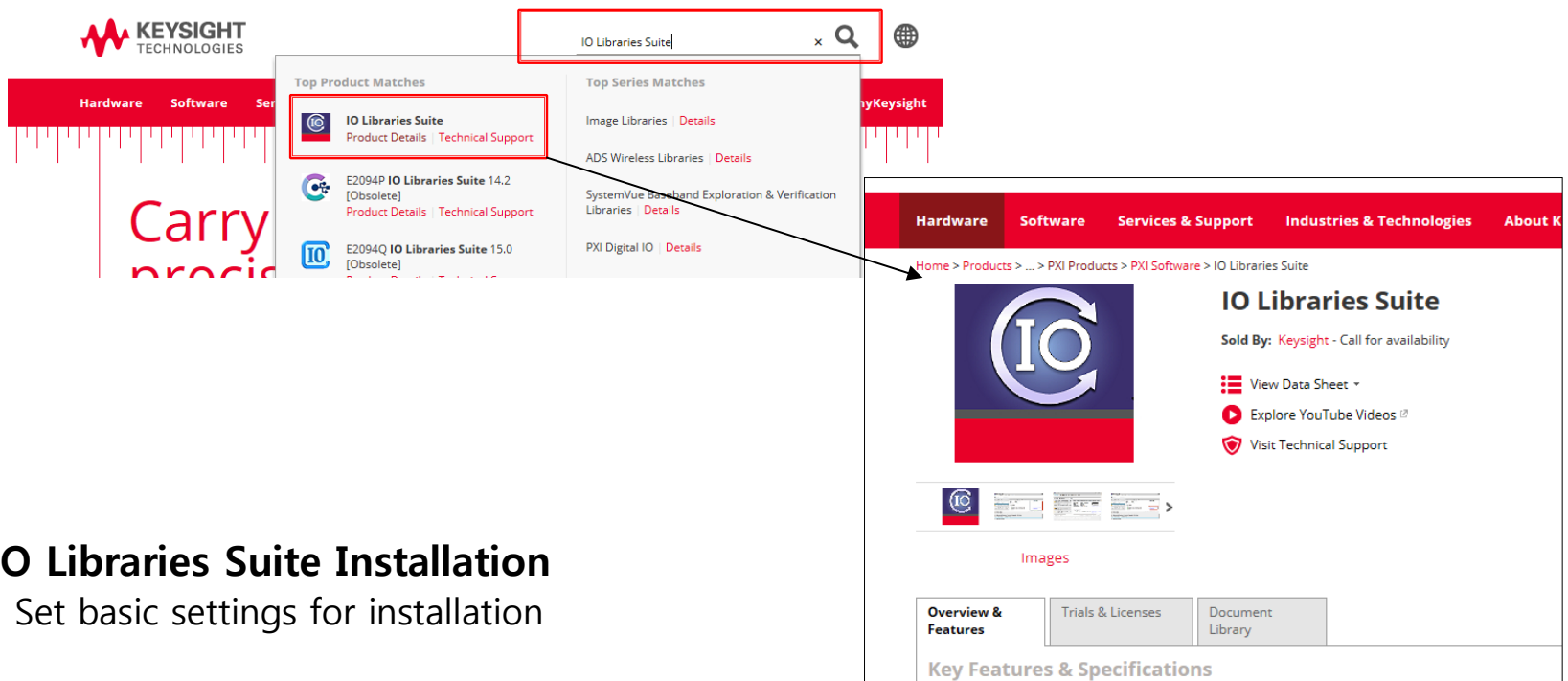
## ➤ NI-DAQmx Installation

- Set basic settings for installation

# Power Supply Driver Installation

## ➤ KeySight PS Driver Installation

- **When using KeySight Power Supply for SCPI communication, Driver must be installed**
- Search "IO Libraries Suite" at search textbox in <http://www.keysight.com> and download



The image shows a screenshot of the Keysight website. The top navigation bar includes 'Hardware', 'Software', 'Services & Support', 'Industries & Technologies', and 'About K'. A search bar at the top right contains the text 'IO Libraries Suite'. Below the search bar, a dropdown menu displays 'Top Product Matches' and 'Top Series Matches'. The 'Top Product Matches' section lists 'IO Libraries Suite' as the first result, with links for 'Product Details' and 'Technical Support'. Below it are two obsolete versions: 'E2094P IO Libraries Suite 14.2 [Obsolete]' and 'E2094Q IO Libraries Suite 15.0 [Obsolete]'. The 'Top Series Matches' section lists 'Image Libraries', 'ADS Wireless Libraries', 'SystemVue Baseband Exploration & Verification Libraries', and 'PXI Digital IO'. An arrow points from the 'IO Libraries Suite' link in the search results to the product page. The product page features the 'IO Libraries Suite' logo, a breadcrumb trail 'Home > Products > ... > PXI Products > PXI Software > IO Libraries Suite', and a 'Sold By: Keysight - Call for availability' notice. Below this are links for 'View Data Sheet', 'Explore YouTube Videos', and 'Visit Technical Support'. At the bottom, there are tabs for 'Overview & Features', 'Trials & Licenses', and 'Document Library', followed by a section for 'Key Features & Specifications'.

## ➤ IO Libraries Suite Installation

- Set basic settings for installation

# AFT Settings

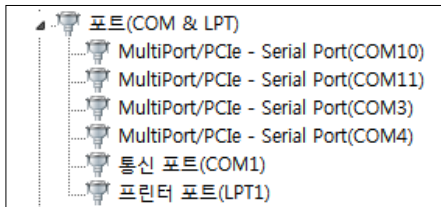
# AFT Settings

## ➤ Confirming Equipment Connection

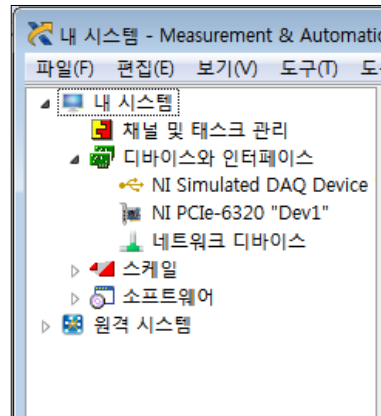
- Confirm serial No. of connection equipment



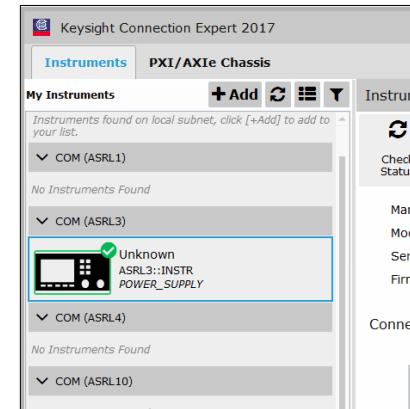
[ Manager Com confirmation ]



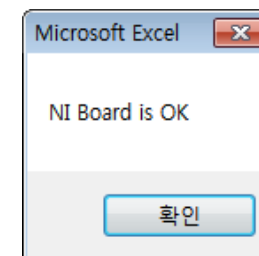
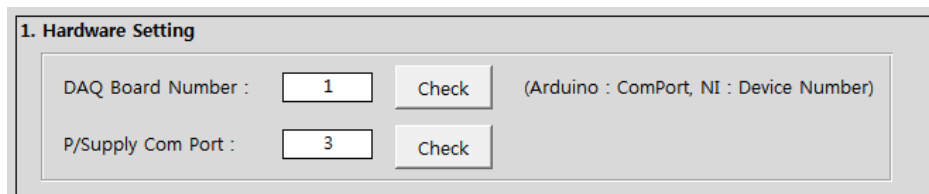
[ NI Max Dev confirmation ]



[ Connection Expert Com confirmations ]



- Open the AFT Excel File.
- Move to Setup page and input relevant numbers of DAQ Board Number and PS Com Port, then Click "Check" button.



# AFT Settings

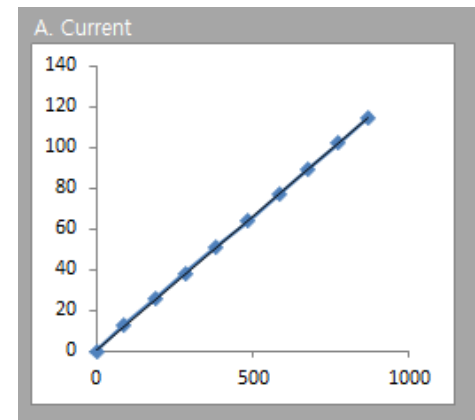
## ➤ Current level adjustment

- Connect an actuator with Power Supply and install the Current Sensor
- Initialize the Current Sensor
- Move to the Setup Page in AFT Excel File
- Make sure that the current is zero
- Enter 0 to the first cell of current region and press "Get Data" button (When pressing button, current cell that you want must be selected)
- Increase the Voltage manually in the Power Supply
- Input the current value into the next cell of the current region and press "Get Data" button
- Repeat the steps above and measure 10 levels of currents
- Check the linearity of the right-side current curve
- Check the slop and intercept to adjust the current value

A. Current [mA]		Get Data
Current	Level	
0	0.08	
13	87.76	
26	188.96	
38	282.46	
51	382.84	
64	483	
77	582.84	
89	673.24	
102	771.9	
115	869.84	

Slope	0.1311
Intercept	0.8257





# AFT Settings

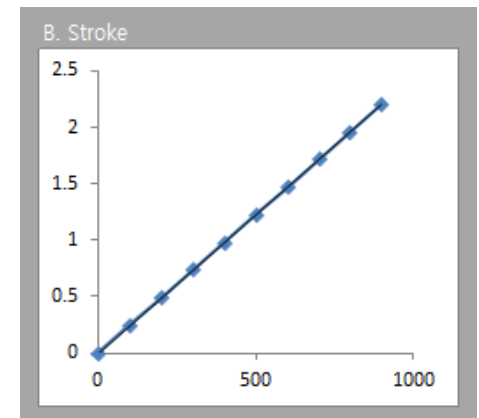
## ➤ Stroke Adjustment

- Move to the Setup Page in AFT Excel File
- Initialize the Stroke Sensor (Initialize Zero Point)
- In the first cell of stroke region, input 0 and click "Get Data" Button (When pressing button, stroke cell that you want must be selected)
- Move the sensor part a little.
- In the next cell of Stroke Measurement, Input the stroke value at stroke sensor and click "Get Data" button
- Repeat the steps above and measure 10 levels of stroke
- Check the linearity of the right-side stroke curve
- Check the slope and intercept to adjust the stroke value

Stroke	Level
0	0
0.245	100
0.49	200
0.735	300
0.98	400
1.225	500
1.47	600
1.715	700
1.96	800
2.205	900

Get Data

Slope	0.0025
Intercept	0.0000



# AFT Settings

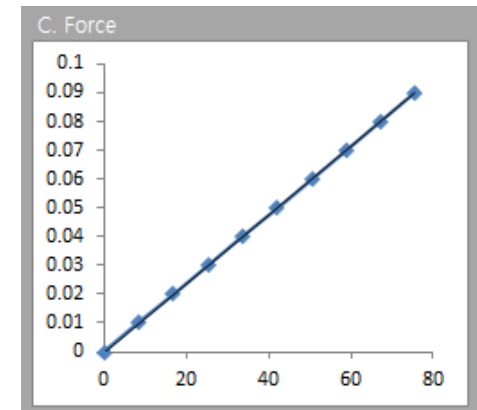
## ➤ Magnetic Force Adjustment

- Connect an actuator with Power Supply
- Move to the Setup Page in AFT Excel File
- Initialize the Force Sensor and make sure that current is zero
- In the first cell of force region, input 0 and click "Get Data" button  
(When pressing button, force cell that you want must be selected)
- Increase the voltage on the Power Supply
- In the next cell of force region,  
Input the Force value at the force sensor and press "Get Data" button
- Repeat the steps above and measure 10 levels of force.
- Check the linearity of the right-side force curve
- Check the slope and intercept to adjust the force value

Force	Level
0	0
0.01	8.4
0.02	16.8
0.03	25.2
0.04	33.6
0.05	42
0.06	50.4
0.07	58.8
0.08	67.2
0.09	75.6

Get Data

Slope	0.0012
Intercept	0.0000



# AFT Settings

## ➤ Setting of Measurement Conditions

- Sampling Period : Time interval of measurement
- Moving average Count : Moving average count
- Max. Current : Maximum Current
- Max. Voltage : Maximum Voltage
- Initial Current : Initial Current of current measurement
- Final Current : Final Current of current measurement
- Current Step Count : No. of current measurement steps
- Initial Stroke : Initial Stroke of stroke measurement
- Final Stroke : Final Stroke of stroke measurement
- Stroke Step Count : No. of Stroke measurement steps

**3. Measurement Setting**

Sampling Period :	<input type="text" value="50"/> ms	Max Current :	<input type="text" value="500"/> mA
Moving average Count :	<input type="text" value="5"/>	Max Voltage :	<input type="text" value="40"/> V

<b>가. 전류 측정</b>	<b>나. 변위 측정</b>		
Initial Current :	<input type="text" value="0"/> mA	Initial Stroke :	<input type="text" value="0"/> mm
Final Current :	<input type="text" value="315"/> mA	Final Stroke :	<input type="text" value="1"/> mm
Current Step Count :	<input type="text" value="8"/>	Stroke Step Count :	<input type="text" value="20"/>

**Thank You**

