

# AFT (Actuator Function Tester) Settings

2017-12-03

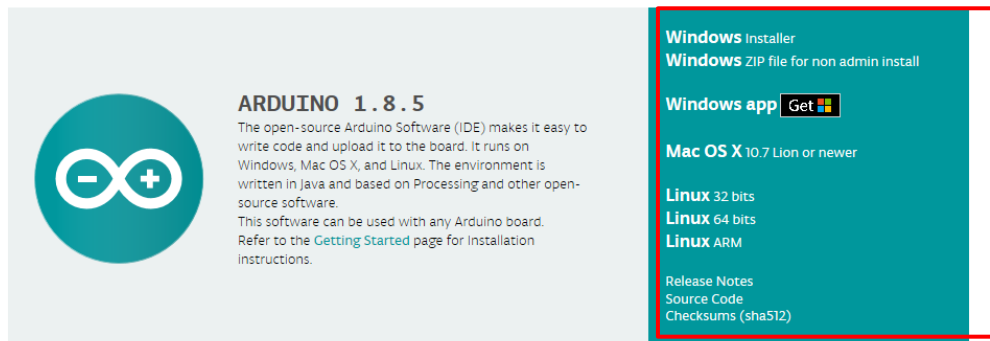
<http://OpenActuator.org> (zgitae@gmail.com)

# 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 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 dark navigation bar with a 'SUPPORT' dropdown menu and a search icon. Below this, the 'POPULAR SUPPORT PAGES' section is displayed, 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', '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><b>NI-DAQmx</b></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>GPIB-USB-HS+</li><li>NI 9237</li><li>NI 9205</li></ul>

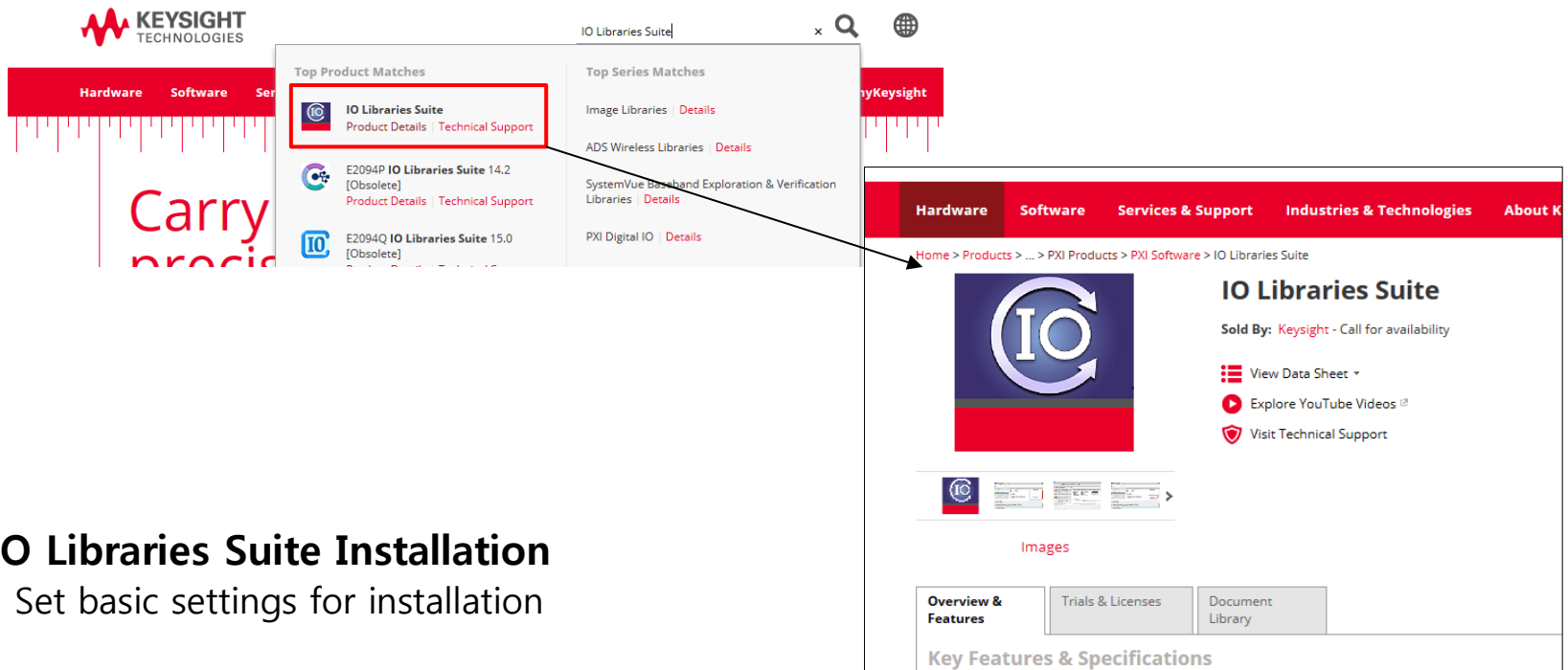
## ➤ NI-DAQmx Installation

- 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 and download from <http://www.keysight.com> Search window.



## ➤ IO Libraries Suite Installation

- Set basic settings for installation

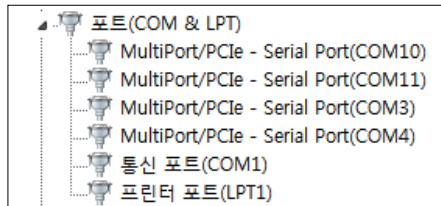
# AFT Settings

## ➤ Confirming Equipment Connection

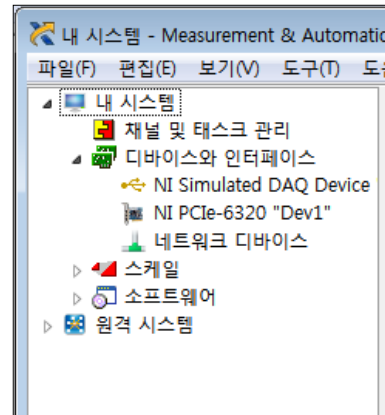
- Confirm connection equipment serial No.



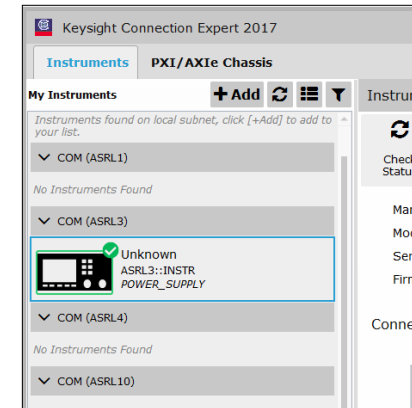
[ Manager Com confirmation ]



[ NI Max Dev confirmation ]



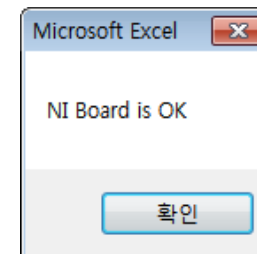
[ Connection Expert Com confirmations ]



- Open AFT Excel File.
- Move to Setup page and input relevant numbers in DAQ Board Number and PS Com Port, then press confirm

**1. Hardware Setting**

DAQ Board Number :	<input type="text" value="1"/>	<input type="button" value="Check"/>	(Arduino : ComPort, NI : Device Number)
P/Supply Com Port :	<input type="text" value="3"/>	<input type="button" value="Check"/>	

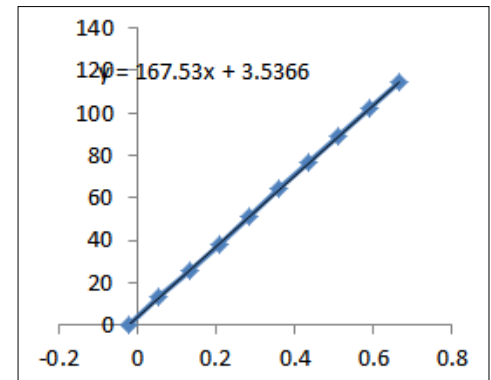


# AFT Settings

## ➤ Current amount adjustment

- Connect Actuator to the Power Supply and install the Current Sensor
- Initialize Current Sensor
- Move to AFT Excel File Setup Page
- Make sure that the current does not flow
- Enter 0 to the measured current first cell and press Level Measure button  
( The measurement current cell that requires measurement must be selected)
- Increase the Voltage manually in the Power Supply
- Input the current value into the next cell of Measurement Current and press Measure button
- Increase gradually Power Supply's Voltage
- Repeat the steps above and measure total 10 levels of measurements
- Check the linearity of the right-side current curve
- Check the gradient and intercept to adjust the current amount

가. 전류 [mA]		레벨 측정
측정전류	측정레벨	
0	-0.02037	
13	0.055365	
26	0.131411	
38	0.208536	
51	0.284299	
64	0.361372	
77	0.436227	
89	0.512062	
102	0.588154	
115	0.664068	
기울기	167.5298	
절편	3.5366	

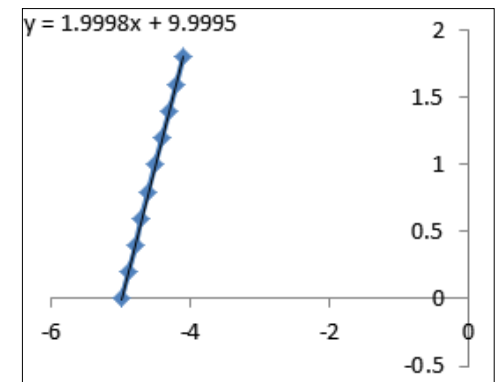


# AFT Settings

## ➤ Stroke Adjustment

- Move to AFR Excel File Setup Page
- Initialize Stroke Sensor (Initialize Zero Point)
- In the first cell of Stroke Measurement, input 0 and click Level Measure Button  
( The measurement Stroke cell that requires measurement must be selected)
- Move the Sensor part a little.
- In the next cell of Stroke Measurement, Input Stroke Amount and click Measure button
- Move the Sensor part a little.
- Repeat the steps above and measure total 10 levels of measurement.
- Check the linearity of the right-side Stroke curve.
- Check the gradient and intercept to adjust the Stroke amount

나. 변위 [mm]		레벨 측정
측정변위	측정레벨	
0	-5.0012	
0.2	-4.89975	
0.4	-4.79865	
0.6	-4.70083	
0.8	-4.60115	
1	-4.50046	
1.2	-4.39908	
1.4	-4.29969	
1.6	-4.20152	
1.8	-4.09975	
기울기	1.9998	
절편	9.9995	



# AFT Settings

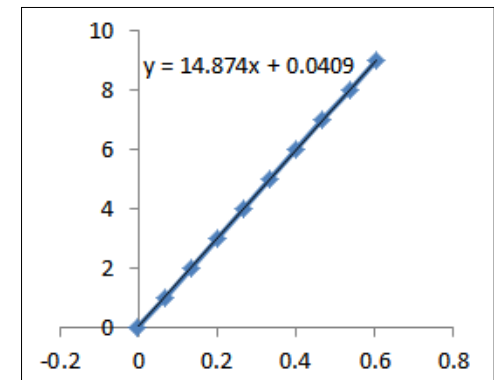
## ➤ Magnetic Force Adjustment

- Connect Actuator to the Power Supply
- Move to AFT Excel Setup page
- Initialize Force Sensor and make sure that current does not flows
- In the first cell of measurement force, input 0 and click Level Measure button.  
( The measurement magnetic force cell that requires measurement must be selected)
- Gradually increase the voltage on the Power Supply
- In the next cell of Measurement Force, input the Force value and press Measure button
- Gradually increase the Power Supply Voltage while monitoring the Force Value
- Repeat the steps above and measure total 10 levels of measurement.
- Check the linearity of the right-side Magnetic force curve
- Check the gradient and intercept to adjust the Magnetic Force amount
- Check the gradient and intercept to adjust the Stroke amount

다. 자기력 [N]		레벨 측정
측정힘	측정레벨	
0	-0.00213	
1	0.064998	
2	0.132023	
3	0.198246	
4	0.265771	
5	0.333349	
6	0.399559	
7	0.466565	
8	0.535808	
9	0.603774	

기울기	14.8739
절편	0.0409





# AFT Settings

## ➤ Setting Measurement Conditions

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

### 3. Measurement Setting

Sampling Period :  ms

Max Current :  mA

Moving average Count :

Max Voltage :  V

#### 가. 전류 측정

Initial Current :  mA

Final Current :  mA

Current Step Count :

#### 나. 변위 측정

Initial Stroke :  mm

Final Stroke :  mm

Stroke Step Count :



**– Thank You –**

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