

# LinearActuator(pololu)

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김영기

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# jrk Configuration utility initialize

- pololu의 jrk Configuration Utility 프로그램을 설치 한 후 (설치링크 :<https://www.pololu.com/docs/0J38/3.a>)
- <https://www.pololu.com/product/2327> 링크에서 다음 순서에 따라서 jrk configuration utility 프로그램을 셋팅해준다.

1. If you have not already, read through the [Jrk G2 Motor Controllers User's Guide](#) and download its drivers and configuration software.
2. Before connecting power and your actuator to your Jrk, confirm that it is working by connecting your Jrk to a PC with a USB cable and launch the configuration utility. The red LED should be on, and the green LED should be flickering quickly.
3. Download the appropriate settings file for your linear actuator:
  - for versions with the **5:1** gear ratio: [Jrk 21v3 settings file for use with LACTxP-12V-5](#) (2k txt)
  - for versions with **10:1 or 20:1** gear ratios: [Jrk 21v3 settings file for use with LACTxP-12V-10 or LACTxP-12V-20](#) (2k txt)



**Note:** These same settings files will work also with the Jrk G2 24v13 if you open them with a text editor and change the “product” field near the top from “21v3” to “24v13”.

4. In the configuration utility, choose File → Open settings file (Ctrl + O), and navigate to the location of the settings file you downloaded in step 3.
5. Click on the PID tab of the configuration utility and verify that the proportional and derivative coefficients are not zero. If they are zero, the settings file was probably not loaded properly and you should try performing the previous step again.
6. Click “Apply settings”.
7. With your power supply off and USB disconnected, connect your linear actuator to your Jrk using the connections shown in the picture above.
8. Turn on power, plug in USB, and reconnect to the configuration utility (use the “Connected to” drop down box if the configuration utility doesn't automatically reconnect to your Jrk).
9. On the Status tab, move the slider around to change the target position and get your actuator to move the target position.
10. The settings in these files should work fairly well with any length Glideforce light-duty actuator that has a feedback potentiometer (model LACTxP-12V). However, to ensure you can control your actuator across its full stroke, you should recalibrate the feedback. Instructions for doing this can be found in the [analog feedback section of the Jrk G2 User's Guide](#).

# jrkl Configuration utility initialize

Pololu Jrkl Configuration Utility

File Edit Window Help

Connected to: #00215472

Target: 0

PID period count: 348

☒ Stop

Firmware version: 1.3

Scaled Feedback: 0

PID period exceeded: No

Errors:

Input Feedback PID Motor Errors

Input mode: Serial

Analog to digital conversion

Analog samples: 128

☐ Detect disconnect with AUX

Serial interface

☐ USB Dual Port

☐ USB Chained

☐ UART, detect baud rate

☒ UART, fixed baud rate: 9600

☐ Enable CRC

Device Number: 11

Timeout (s): 0.00

☐ Never sleep (ignore USB suspend)

Scaling (Analog and Pulse Width mode only)

☐ Invert input direction

Input Target

Absolute Max: 4095

Maximum: 4095

Neutral Max: 2048

Neutral Min: 2048

Minimum: 0

Absolute Min: 0

Degree: 1 - Linear

Max

<

0

Reload settings from device

Stop Motor

Run Motor

Pololu Jrkl Configuration Utility

File Edit Window Help

Connected to: #00215472

Target: 0

PID period count: 1479

☒ Stop motor

Firmware version: 1.3

Scaled Feedback: 0

PID period exceeded: No

Errors: 0x0003

Input Feedback PID Motor Errors

Feedback mode: Analog voltage

Scaling (Analog and Tachometer mode only)

☐ Invert feedback direction

Calibration

Absolute Max: 4030

Maximum: 3965

Minimum: 131

Absolute Min: 66

Learn...

Reset to full range

Analog to digital conversion

Analog samples: 1024

☐ Detect disconnect with AUX

Reload settings from device

Stop Motor

Run M

Pololu Jrkl Configuration Utility

File Edit Window Help

Connected to: #00215472

Target: 0

PID period count: 1479

☒ Stop motor

Firmware version: 1.3

Scaled Feedback: 0

PID period exceeded: No

Errors: 0x0003

Input Feedback PID Motor Errors

Proportional Coefficient

10

0

2

=

10.00000

Integral Coefficient

819

13

2

=

0.09998

Derivative Coefficient

7

0

2

=

7.00000

PID period (ms): 30

Integral limit: 6000

☐ Reset integral when proportional term exceeds max duty cycle

Feedback dead zone: 3

Reload settings from device

Stop Motor

Run Motor

Apply settings to device

Pololu Jrkl Configuration Utility

File Edit Window Help

Connected to: #00215472

Target: 0

PID period count: 1860

☒ Stop motor

Firmware version: 1.3

Scaled Feedback: 0

PID period exceeded: No

Errors: 0x0003

Input Feedback PID Motor Errors

PWM frequency: 20 kHz

☐ Invert motor direction

Detect Motor Direction

Forward Reverse

Max, duty cycle: 600

Max, acceleration: 600

Brake duration (ms): 0

Max, current (A): 0,000

Current calibration: 1

Max, duty cycle while feedback is out of range: 600

When motor is off: ☒ Brake ☐ Coast

Reload settings from device

Stop Motor

Run Motor

Apply settings to device

Pololu Jrkl Configuration Utility

File Edit Window Help

Connected to: #00215472

Target: 0

PID period count: 2185

☒ Stop motor

Firmware version: 1.3

Scaled Feedback: 0

PID period exceeded: No

Errors: 0x0003

Input Feedback PID Motor Errors

Bit mask	Error	Setting	Currently stopping motor?	Occurrence count
0x0001	Awaiting command	<input checked="" type="radio"/> Enabled and latched	Yes	1
0x0002	No power	<input checked="" type="radio"/> Enabled <input type="radio"/> Enabled and latched	Yes	2135
0x0004	Motor driver error	<input checked="" type="radio"/> Enabled <input type="radio"/> Enabled and latched	No	0
0x0008	Input invalid	<input checked="" type="radio"/> Enabled <input type="radio"/> Enabled and latched	No	0
0x0010	Input disconnect	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled <input type="radio"/> Enabled and latched	No	0
0x0020	Feedback disconnect	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled <input type="radio"/> Enabled and latched	No	0
0x0040	Max, current exceeded	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled <input type="radio"/> Enabled and latched	No	0
0x0080	Serial signal error	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled <input type="radio"/> Enabled and latched	No	0
0x0100	Serial overrun	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled <input type="radio"/> Enabled and latched	No	0
0x0200	Serial RX buffer full	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled <input type="radio"/> Enabled and latched	No	0
0x0400	Serial CRC error	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled <input type="radio"/> Enabled and latched	No	0
0x0800	Serial protocol error	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled <input type="radio"/> Enabled and latched	No	0
0x1000	Serial timeout error	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled <input type="radio"/> Enabled and latched	No	0

Clear Errors

Reset counts

Reload settings from device

Stop Motor

Run Motor

Apply settings to device

HRVL (Human-centered Robotics & Vision Lab)

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# jrkl Motor control command

- jrkl Guide를 참고하여 아두이노 코드 작성  
<https://www.pololu.com/docs/0J38>
- jrkl Git내용을 참고하여 lib 사용 <https://github.com/pololu/jrkl-g2-arduino>

## Motor Off

Compact protocol: **0xFF**

Pololu protocol: **0xAA, device number, 0x7F**

This command will turn the motor off by setting the Awaiting Command error bit. The jrkl will not restart the motor until it receives a Set Target command. The jrkl can be configured to either brake or coast while the motor is off ([Section 3.e](#)).

## Set Target High Resolution

Compact protocol, binary: **110LLLLL, 0HHHHHHH**

Compact protocol, hex: **0xC0 + target low 5 bits, target high 7 bits**

Pololu protocol, binary: **10101010, device number, 010LLLLL, 0HHHHHHH**

Pololu protocol, hex: **0xAA, device number, 0x40 + target low 5 bits, target high 7 bits**

(where target is the 12-bit number HHHHHHHLLLLL)

This command clears the Awaiting Command error bit and (if Input Mode is Serial) lets you set the 12-bit target to any of its allowed values (0–4095). The meaning of the target depends on what Feedback Mode the jrkl is in ([Section 3.c](#)). The lower 5 bits of the command byte represent the lower 5 bits of the target, while the lower 7 bits of the data byte represent the upper 7 bits of the target.

For example, if you want to set the target to 3229 (110010011101 in binary), you could send the following byte sequence:

in binary: 11011101, 01100100

in hex: 0xDD, 0x64

in decimal: 221, 100

Here is some example C code that will generate the correct serial bytes, given an integer “target” that holds the desired target (0–4095) and an array called serialBytes:

```
1 serialBytes[0] = 0xC0 + (target & 0x1F); // Command byte holds the lower 5 bits of target.
2 serialBytes[1] = (target >> 5) & 0x7F; // Data byte holds the upper 7 bits of target.
```