

## MLJ050 - October 12, 2017

Item # MLJ050 was discontinued on October 12, 2017. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

### MOTORIZED LAB JACK

- ▶ Integral APT Controller
- ▶ Rugged, Dual Pantograph Design
- ▶ Power Supply Included
- ▶ Large Array of Mounting Holes



MLJ050



Power Supply and  
USB Connections

[Hide Overview](#)

#### OVERVIEW

##### Features

- Motorized Lab Jack with Integral APT Controller
- Quiet, Smooth Motion
- Stepper Motor Driven
- Limit Switches
- Power Supply Included

The MLJ050 Motorized Lab Jack offers up to 2" (51 mm) of smooth, motorized height adjustment via a stepper motor. It has an integrated electronic controller that can be operated either remotely using a PC or manually via the buttons and velocity potentiometer on the control keypad. Parameter settings can be adjusted on the PC and stored in non-volatile memory within the unit itself. When the unit is next powered up, these settings are applied automatically. This feature is particularly useful when operating the unit manually in the absence of a PC and USB link. Guards are fitted to completely eliminate finger traps and other obstructions.

This motorized lab jack provides a rugged, height-adjustable platform ideal for mounting optomechanical sub-assemblies requiring height adjustment. It incorporates a large 4.9" x 5.6" (125 mm x 142 mm) mounting platform that is capable of moving loads up to 44 lbs (20 kg) at up to 3 mm/s. It offers excellent rigidity and platform parallelism. The top plate has 25 1/4" -20 (M6) tapped holes, while the bottom plate has clearance slots for general mounting requirements.

The unit is supplied with a location-specific power supply with an input of 85 to 264 VAC. **Note:** Connect the power supply (PSU) to the lab jack before connecting the PSU to a power outlet.

##### Specifications

Specifications	
Travel	2.0" (50 mm)
Load (Max)	44 lbs (20 kg)
Velocity (Max)	3.0 mm/s (All Loads)
Resolution	0.8 nm
Unidirectional Repeatability	<10 μm

[Hide Specs](#)

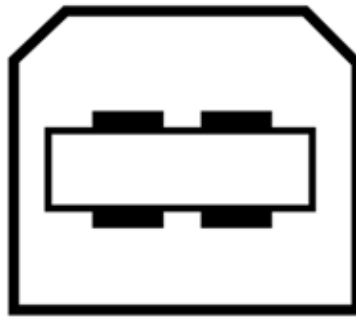
## S P E C S

Controller Specifications	
Microsteps per Full Step	2048
Microsteps per Revolution of Motor	409,600
Motor Drive Voltage	24 V
Motor Drive Power	Up to 25 W (Peak) / 12.5 W (Avg)
Motor Speeds	Up to 720 RPM
Stage Specifications	
Travel	2.0" (50 mm)
Gear Ratio	3 to 1 (1228800 microsteps = 1 mm Travel)
Load (Max)	44 lbs (20 kg)
Moment Load (Max)	5 kg (11 lb) 100 mm (3.9") from Center of Platform
Velocity (Max)	3.0 mm/s at All Loads
Resolution	0.8 nm
Deck Parallelism	<150 $\mu$ m Over Full Range of Travel
Unidirectional Repeatability (Software Corrected)	<10 $\mu$ m
Bidirectional Repeatability (System Backlash)	<50 $\mu$ m
Pitch/Yaw Error over 2" (50 mm) Travel	<500 $\mu$ Rad
Accuracy	<30 $\mu$ m
Lead Screw Pitch	1.0 mm
Motor Specifications	
Step Angle	1.8° (50 Poles and $\pm 2$ Phases for 360° Divided by 200, or 1.8°)
Step Accuracy	5%
Rated Phase Current	0.85 A
Phase Resistance	5.4 $\Omega$
Phase Inductance	5.6 mH
Holding Torque	20 N•cm
Detent Torque	2.0 N•cm
Operating Temperature	-20 to 40 °C (Motor Specification Only)
Input Power Requirements	
Current	1.25 A
Voltage	24 VDC
Power	30 W (Peak)
General	
Dimensions (W x D x H)	Extended: 125.0 mm x 207.5 mm x 116 mm (4.92" x 8.17" x 4.57") Retracted: 125.0 mm x 207.5 mm x 65.0 mm (4.92" x 8.17" x 2.56")
Weight	2.47 kg (5.4 lbs)

[Hide Pin Diagram](#)

## P I N D I A G R A M

**Computer Connection**  
**USB Type B**



USB Type B to Type A Cable Included

[Hide Further Info](#)

## FURTHER INFO

### Driver Flexibility

The MLJ050 Motorized Lab Jack features an integrated apt™ compatible Controller that is fully configurable (parameterized) with key settings exposed through the associated software graphical interface panels. Jog step sizes can be selected, phase currents can be limited to suitable peak powers as required, and limit switch configuration is accommodated through flexible logic settings.



Moreover, relative and absolute moves can be initiated with move profiles set using velocity profile parameters (including acceleration/deceleration). Similarly, homing (zero position datum) sequences have a full set of associated parameters that can be adjusted for a particular application. For simplicity of operation, the apt™ software incorporates pre-configured settings for the Motorized Lab Jack.

For convenience and ease of use, adjustment of all key parameters is possible through direct interaction with intuitive software graphical panels. For example, a move to the next position can be initiated by clicking directly on the position display and entering a new value.

Note that all such settings and parameters are also accessible through the ActiveX® programmable interfaces for automated alignment sequences. Refer to the *Motion Control Software* tab for further information on the apt™ software support.

### Full Software GUI Control Suite & ActiveX® Controls Included

A full and sophisticated software support suite is supplied with the MLJ050 Motorized Lab Jack. The suite includes a number of 'out-of-the-box' user utilities to allow immediate operation of the unit without any detailed pre-configuration. All operating modes can be accessed manually, and all operating parameters may be changed and saved for next time use.

For more advanced 'custom' motion control applications, a fully featured ActiveX® programming environment is also included to facilitate custom application development in a wide range of programming environments. Note that all such settings and parameters described above are also accessible through these ActiveX® programmable interfaces. For further information on the apt™ software support for the MLJ050 Motorized Lab Jack, refer to the *Motion Control Software* tab. Demonstrator videos illustrating how to program the apt™ software are also available for viewing from the *Video Tutorial* tab.



The ActiveX® apt™ system software shipped with the Motorized Lab Jack is also compatible with other apt™ family controllers including our multi-channel rack-based system and smaller optical-table-mountable 'T-Cube' controllers. This single unified software offering allows seamless mixing of the Motorized Lab Jack with any apt™ benchtop, table top, or rack-based unit to build a single positioning application.

The key innovation of the apt™ range of controllers and associated mechanical products is the ease and speed with which complete automated alignment/positioning systems can be engineered at both the hardware and software level. All controllers in the apt™ range are equipped with USB connectivity. The 'multi-drop' USB bus allows multiple apt™ units to be connected to a single controller PC using commercial USB hubs and cables. When planning a multi-channel application, simply add up the number and type of drive channels required and connect together the associated number of APT controllers.



### Software Developers Support CD

A developers' kit is shipped with all of our apt™ series controllers. This additional software support is intended for use by software developers working on large, system integration projects that incorporate apt™ products. The kit contains an extensive selection of useful code samples as well as a library of Video

Tutorials.

[Hide Motion Control Software](#)

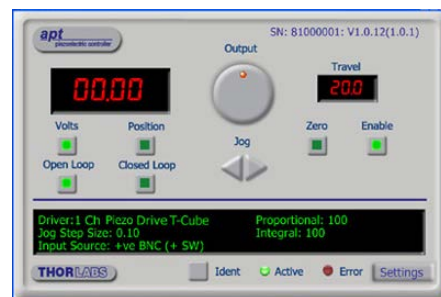
## MOTION CONTROL SOFTWARE

Thorlabs offers two platforms to drive our wide range of motion controllers: our legacy APT™ (Advanced Positioning Technology) software package or the new Kinesis software package. Either package can be used to control devices in the APT or Kinesis family, which covers a wide range of motion controllers ranging from small, low-powered, single-channel drivers (such as the K-Cubes and T-Cubes) to high-power, multi-channel, modular 19" rack nanopositioning systems (the APT Rack System).

Our legacy APT System Software platform is available by clicking on the link below. It features ActiveX-based controls which can be used by 3rd party developers working on C#, Visual Basic, LabVIEW or any Active-X compatible languages to create custom applications, and includes a simulator mode to assist in developing custom applications without requiring hardware.

The Kinesis Software features new .NET controls which can be used by 3rd party developers working in the latest C#, Visual Basic, LabVIEW or any .NET compatible languages to create custom applications. Low level DLL libraries are included for applications not expected to use the .NET framework. A Central Sequence Manager supports integration and synchronization of all Thorlabs motion control hardware.

By providing these common software platforms, Thorlabs has ensured that users can easily mix and match any of the APT and Kinesis controllers in a single application, while only having to learn a single set of software tools. In this way, it is perfectly feasible to combine any of the controllers from single-axis to multi-axis systems and control all from a single, PC-based unified software interface.



APT GUI Screen

The software packages allow two methods of usage: graphical user interface (GUI) utilities for direct interaction with and control of the controllers 'out of the box', and a set of programming interfaces that allow custom-integrated positioning and alignment solutions to be easily programmed in the development language of choice.

A range of video tutorials are available to help explain our APT system software. These tutorials provide an overview of the software and the APT Config utility. Additionally, a tutorial video is available to explain how to select simulator mode within the software, which allows the user to experiment with the software without a controller connected. Please select the *APT Tutorials* tab above to view these videos, which are also available on the software CD included with the controllers.

**Software****APT Version 3.21.1**

The APT Software Package, which includes a GUI for control of Thorlabs' APT™ and Kinesis® system controllers.

**Also Available:**

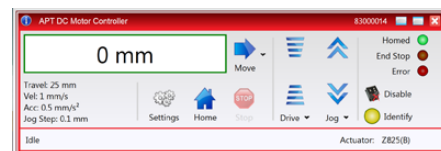
- [Software](#)  Communications Protocol

**Software****Kinesis Version 1.13.0**

The Kinesis Software Package, which includes a GUI for control of Thorlabs' Kinesis and APT™ system controllers.

**Also Available:**

- [Software](#)  Communications Protocol



Kinesis GUI Screen

[Hide APT Tutorials](#)

## APT TUTORIALS

These videos illustrate some of the basics of using the APT System Software from both a non-programming and a programming point of view. There are videos that illustrate usage of the supplied APT utilities that allow immediate control of the APT controllers out of the box. There are also a number of videos that explain the basics of programming custom software applications using Visual Basic, LabVIEW and Visual C++. Watch the videos now to see what we mean.



Click here to view the video tutorial



To further assist programmers, a guide to programming the APT software in LabView is also available.



Click here to view the LabView guide



[Hide Part Numbers](#)

Part Number	Description	Price	Availability
MLJ050/M	Motorized Lab Jack, 50.8 mm Travel, M6 Taps	\$2,628.00	Lead Time
MLJ050	Motorized Lab Jack, 2" Travel, 1/4"-20 Taps	\$2,628.00	Lead Time