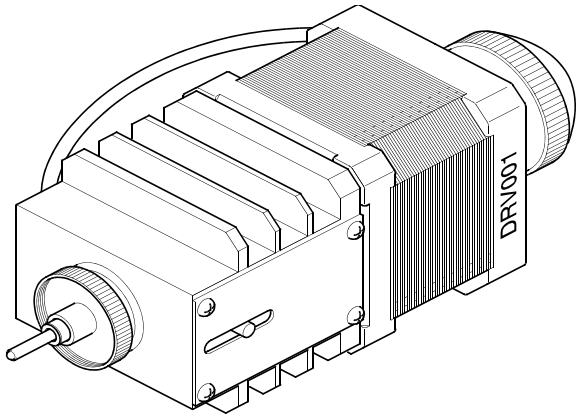
DRV001

Stepper Motor Actuator



1.1 Introduction

These Stepper Motor Actuators were designed for use with Thorlabs stages compatible with modular drives (such as our NanoMax300 and 600 series). However, they can be fitted to other stages by using a Modular Quick Connect Adapter (MCA1 for Ø3/8" mounting or MCA2 for Ø10mm mounting).

When driven by a Thorlabs BSC20x series stepper motor controller, this actuator is capable of speeds as high as 4mm/sec and offers 8mm of travel. The powerful stepper motor is capable of handling a load capacity of up to 48lbs. (22kg.) Bidirectional repeatability of around 0.5µm.

1.2 Initial Set Up

To ensure that a particular stage is driven properly by the system, a number of parameters must first be set. These parameters relate to the physical characteristics of the stage being driven (e.g. min and max positions, leadscrew pitch, homing direction etc.).

To assist in setting these parameters correctly, it is possible, using the APT Config utility, to associate a specific stage type and axis with the motor controller channel. Once this association has been made, the APT server applies automatically, suitable default parameter values on boot up of the software.

To ensure correct operation, it is important to select the correct stage type for your controller. If using a BSC20x series controller, select the appropriate 'HS NanoMax' option. If using a legacy BSC0xx or BSC10x controller, choose an option without the 'HS' prefix.

1) Shut down all applications using the APT server (e.g. APT User or your own custom application).
2) Run the APT Config utility - Start/All Programs/Thorlabs/ APT Config/APT Config.
3) From the 'APT Configuration Utility' window, click the 'Stage' tab.

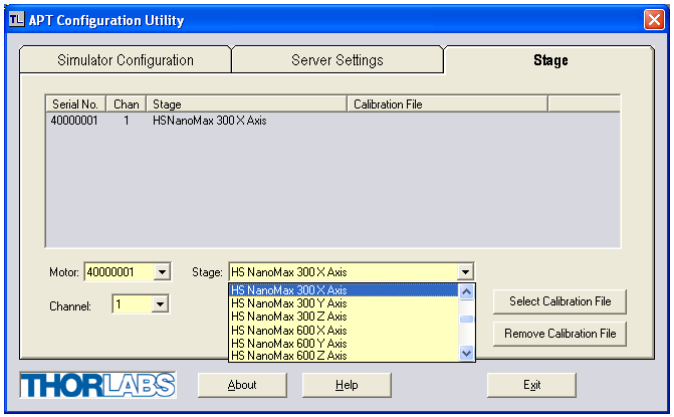


Fig. 1.1 APT Configuration Utility - Stage Tab

4) In the 'Motor' field, select the serial number of the stepper motor controller to be configured (this number can be found on the rear panel of the controller unit).

Note

To ensure correct operation, it is important to select the correct stage type for your controller. If using a BSC20x series controller, select the appropriate 'HS NanoMax' option. If using a legacy BSC0xx or BSC10x controller, choose an option without the 'HS' prefix.

Selecting an incompatible stage type could result in reduced velocity and resolution or, if using a joystick this may not function.

5) In the 'Stage' field, select your actuator type from the list displayed (e.g. HS NanoMax 300 X Axis).
6) Click the 'Add Stage Association' button.
7) A default configuration is set at the factory and stored in the non-volatile memory of the motor controller. The server reads in the stage and controller information on start up. See the handbook supplied with the stepper motor controller for further information.

1.3 Dimensions

all dimensions in millimetres (inches)

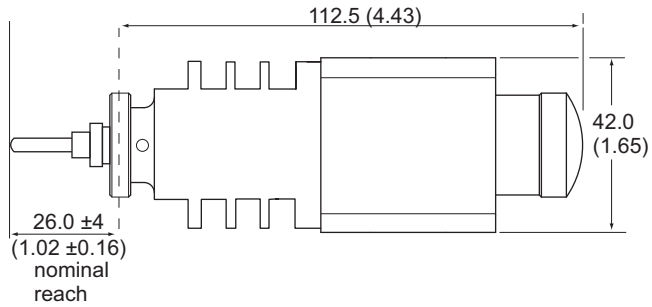


Fig. 1.2 Dimensions

1.4 Maintenance

After prolonged use, and particularly in applications where small movements are continually repeated, the grease on the drive shaft may build up in ridges. This may cause rough or noisy movement, vibration and excessive heating.

It is good practise to run the motor periodically from one end of travel to the other several times in order to redistribute the grease.

1.5 Using the MCA Modular Quick Connect Adapters

Modular quick connect adapters allow the DRV001 actuators to be fitted to stages with standard mounting clamps (MCA1 for Ø3/8" mounting or MCA2 for Ø10mm mounting).

Simply remove the circlip from the end of the drive rod, remove the washers, then screw on the adapters.

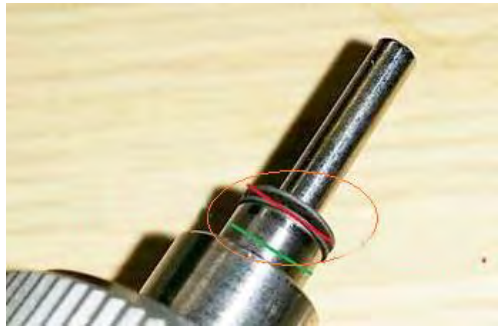
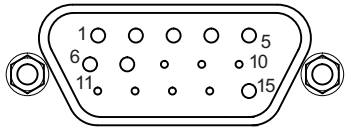


Fig. 1.3 Circlip and Washers

1.6 Motor Connector Pin Out

The 'Motor' connector provides connection to the stepper motor controller. The pin functions are detailed in Fig. 1.4.



Pin	Description	Pin	Description
1	Limit Switch Ground	9	
2	Not Connected	10	
3	CW Limit Switch	11	
4	Phase B -ve	12	
5	Phase B +ve	13	5 V
6	Phase A -ve	14	
7	Phase A +ve	15	Ground
8			

Fig. 1.4 Motor Connector Pin Descriptions

1.7 Specification

Total Travel: 8 mm

Resolution: 1.2 nm (Theoretical)

Max Speed: Controller and stage dependent, 4 mm/second with Thorlabs BSC20x and MAX300 stage

Load Capacity: 48 lbs. (22 kg)

About the Company

Thorlabs Ltd is an a leading manufacturer of motion control systems, vibration isolation systems, machine vision products and multi-element optical systems for fiber-optic, semiconductor and reprographic applications.

We offer customers an in-depth understanding of optical component manufacture, allowing us to quickly and confidently develop optimal positioning solutions.

As a part of Thorlabs inc., manufacturers of innovative photonics products, we are committed to providing the service, relationships and attention to detail that make businesses excel.

Technical Support

Thorlabs provide a comprehensive after sales service. Contact us through your local representative, or at the address below:

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Product Warranty

All Thorlabs products are covered by a manufacturers warranty against faulty workmanship and materials, valid for 12 months from the date of original purchase. All products returned under warranty must be returned in their original packaging.

Prior to installation, the equipment referred to in this handbook must be stored in a clean, dry environment, in accordance with any instructions given. Periodic checks must be made on the equipment's condition.

Customer Feedback

It is always helpful to have detailed and accurate information about any problems encountered by customers

We welcome comments or suggestions about any aspect of the equipment and instruction handbooks.

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