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THORLABS

CR1-Z7 - June 19, 2017

Item # CR1-Z7 was discontinued on June 19, 2017. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

MOTORIZED WORM DRIVE ROTATION STAGE

- High-Torque DC-Servo Motor
- Continuous 360° Rotation
- 25 lb Max Vertical Load

CR1A

CR1-Z7
Motorized Continous Rotation Platform

Application Idea

CR1-Z7
Shown with PM3 Clamping Arm and Prism PS610

Hide Motorized Continuous Rotation Stage

Motorized Continuous Rotation Stage

Hide Overview

OVERVIEW

Rotation Stage Features

- 360° Continuous Motion Provided by Fine Pitch Worm Gear
- High-Torque DC-Servo Motor with Gear Head and Optical Encoder
- High-Count Optical Encoder (12,288 pulses/rev)
- Vernier Scale Provides 5 arcmin Resolution
- Designed for Mounting MS1 and T12X Series Translation Stages (Using the CR1A Adapter Plate)
- Application Tested for Vertical Loads up to 25 lbs.

The CR1-Z7 motorized rotation stage with round strain relief cables offers high-precision continuous motion in a sturdy, compact package. The reduced-backlash worm gear design, coupled with a high-resolution incremental optical encoder provides the rotational precision required in optical laboratories. The high torque 12 VDC servo motor supplies ample power for rotating vertical loads up to 25 lbs. We recommend using the CR1-Z7 with the KDC101 DC Motor Controller.

Hide Specs

SPECS

Specification	Value
Travel	Continuous 360°
Max Load (Vertical)	25 lbs (11.3 kg)
Maximum Torque in Vertical Configuration	6.25 lbF-in.
Gear Type	Worm Gear, 96 Teeth
Gear Reduction	256:1
Worm	Double Thread
Motor Type	DC Servo
Motor Drive Voltage	12 V
Max Recommended Current	80 mA
Min Incremental Motion	2.19 arcsec
Wobble	<2 arcsec
Repeatability	<1 arcmin
Feedback	Motor Mounted Rotary Encoder 48 Points/Rev at the Motor
Encoder Counts per Revolution of the Leadscrew	12,288
Speed Range	22 arcsec/sec to 6 °/sec
Index Signal	None
Cable Length	9.0' (2.743 m)
Compatible Controllers	KDC101

How to Calculate the Rotational Displacement per Encoder Count

In order to explain the rotational displacement calculation we must first understand the gear train of the rotational stage. The main platform is fixed directly to a worm gear. This worm gear is actuated by the worm which is attached to the output shaft of the gearhead fixed to the motor.

There are 48 encoder counts per revolution of the motor. The output shaft of the motor goes into a 256:1 planetary gear head. This requires the motor to rotate 256 times to rotate the double thread worm one revolution. In return the worm must rotate 48 times to rotate the 96 pitch worm gear one full revolution.

Encoder Counts per Revolution of the Double-Threaded Worm:

48 x 256 = 12,288 Encoder Counts per Revolution of the Double-Threaded Worm

Calculate the Gear Ratio of the Worm to Worm Gear:

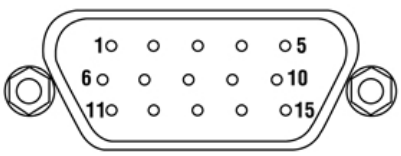
96 / 2 = 48 Revolutions of the Worm per One Revolution of the Worm Gear

360° / (12288 x 48) = 0.0006° x 3600 = 2.16 arcsec per Encoder Count

Hide Pin Diagram

PIN DIAGRAM

Controller Connection



Pin	Description	Pin	Description
1	Ground	9	39k Identification Resistor

2	Not Used	10	Vcc
3	Not Used	11	Encoder Channel B
4	Not Used	12	Not Used
5	Motor (+)	13	Encoder Channel A
6	Not Used	14	Not Used
7	Motor (-)	15	Not Used
8	Not Used	Case	Ground

Hide Smart Pack

SMART PACK

Smart Pack

- Reduce Weight of Packaging Materials
- Increase Usage of Recyclable Packing Materials
- Improve Packing Integrity
- Decrease Shipping Costs

Click to Enlarge
CR1-Z7
Packaging

Thorlabs' Smart Pack Initiative is aimed at waste minimization while still maintaining adequate protection for our products. By eliminating any unnecessary packaging, implementing packaging design changes, and utilizing eco-friendly packaging materials for our customers when possible, this initiative seeks to improve the environmental impact of our product packaging. Products listed above are now shipped in re-engineered packaging that minimizes the weight and the use of non-recyclable materials.[b] As we move through our product line, we will indicate re-engineered packages with our Smart Pack logo.

Item #	% Weight Reduction	CO_2-Equivalent Reduction[a]
CR1-Z7	15.79%	0.82 kg
CR1/M-Z7	15.79%	1.09 kg

- Travel-based emissions reduction calculations are estimated based on the total weight reduction of packaging materials used for all of 2013's product sales, traveling 1,000 miles on an airplane, to provide general understanding of the impact of packaging material reduction. Calculations were made using the EPA's shipping emissions values for different modes of transport.
- Some Smart Pack products may show a negative weight reduction percentage as the substitution of greener packaging materials, such as the Greenwrap, at times slightly increases the weight of the product packaging.

Part Number	Description	Price	Availability
CR1/M-Z7	**Motorized Continuous Rotation Stage, Metric**	**$839.00**	**Today**
CR1-Z7	**Motorized Continuous Rotation Stage**	**$839.00**	**Lead Time**

Hide Rotation Stage Adapter

Rotation Stage Adapter

Hide Overview

OVERVIEW

The CR1A adapter can be used to secure select Thorlabs mounts to the CR1 Rotation stage. The adpater is equipped with four 6-32 (M4) taps, one 1/4"-20 (M6) tap, six 4-40 taps (two 4-40 and four M3 on the metric version), eight 2-56 taps (four 2-56 and four M2 on the metric version), and four #6 (M4) clearance holes. The following table lists mounts that may be secured to the the CR1.

Click to Enlarge
A CR1A Adapter is used to secure a T12X Mini Translator onto a CR1 Rotation Stage using two 2-56 (M2) cap screws.

The CR1A adapter is attached to the CR1 stage via the #6 (M4) clearance holes with four 6-32 (M4) cap screws (included). The photo to the right shows a T12X translation stage mounted on the CR1A adapter through two #2 (M2) clearance holes in the bottom of the T12X stage.

Mount	Description
PM3 and PM4	Small and Large Clamping Arms

PH Series	Post Holders
T12 Series	1/2" Mini Translators
GN Series*	Small Platform Goniometers*

* Note: The CR1A adapter plate is not compatible with our GNL series Large Platform Goniometers.

Part Number	Description	Price	Availability
CR1A/M	CR1/M Adapter Plate	$24.50	Today
CR1A	CR1 Adapter Plate	$24.50	Today

Hide Clamping Arms

OVERVIEW

Clamping Arms

Features

Hide Overview

Thorlabs' PM3(/M) and PM4(/M) clamping arms feature a cap screw-activated flexure mechanism to secure the clamping arm to the post, while a nylon-tipped setscrew secures the optic. A Ø0.09" (Ø2.3 mm) hole located near the top of the post allows for its initial tightening with a 5/64" (2 mm) balldriver or hex key. Both screws feature a 5/64" (2 mm) socket. The PM3(/M) arm offers 0.97" (24.6 mm) of vertical travel, while the PM4(/M) arm offers 1.61" (40.9 mm) of vertical travel.

Click to Enlarge
A PM4 Clamping Arm is Used to Clamp an Equipment Plate to the CR1 Rotation Mount

Part Number	Description	Price	Availability
PM3/M	Small Adjustable Clamping Arm, M4 Threaded Post	$18.40	Today
PM3SP/M	Customer Inspired!Extension Post for PM3/M Clamping Arm, M4 Threaded	$5.10	Today
PM4/M	Large Adjustable Clamping Arm, M4 Threaded Post	$22.50	Today
PM4SP/M	Customer Inspired!Extension Post for PM4/M Clamping Arm, M4 Threaded	$5.10	Today
PM3	Small Adjustable Clamping Arm, 6-32 Threaded Post	$18.40	Today
PM3SP	Customer Inspired!Extension Post for PM3 Clamping Arm, 6-32 Threaded	$5.10	Today
PM4	Large Adjustable Clamping Arm, 6-32 Threaded Post	$22.50	Today
PM4SP	Customer Inspired!Extension Post for PM4 Clamping Arm, 6-32 Threaded	$5.10	Today