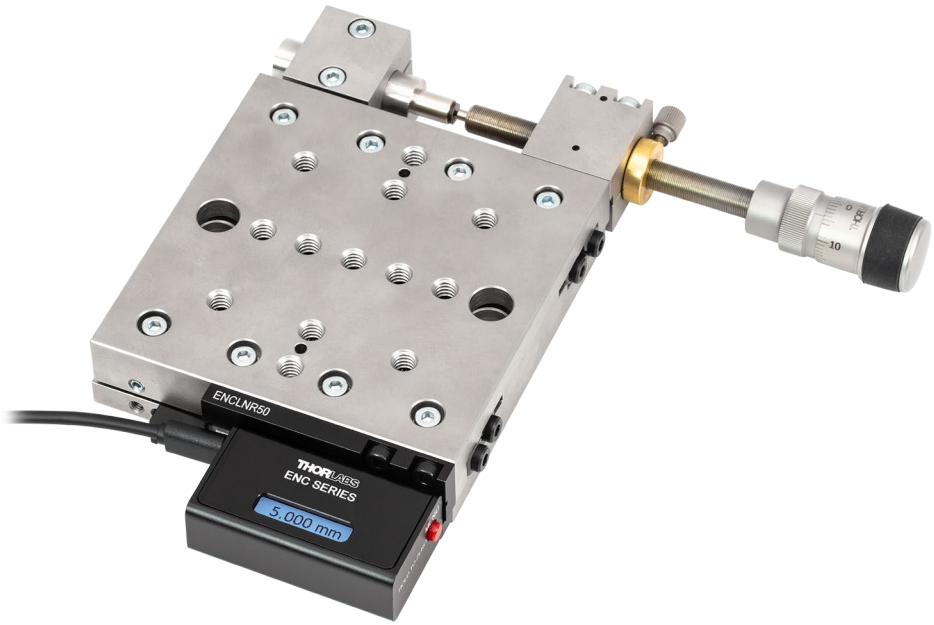
ENCLNR50
Digital Position Readout Module for LNR Series Stages

User Guide



Original Instructions

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Chapter 1 Introduction and Overview

1.1. Introduction

The ENCLNR Series Digital Position Readout Module is a bolt on accessory compatible with associated LNR50 series stages. The module comprises a bolt on optical encoder scale assembly and a digital display. The module is powered via a USB micro B connection.

The readout module is supplied complete with fixtures for the associated LNR50 series stages.

Chapter 2 Installation

2.1. Mechanical Installation



Warning

Operation outside the following environmental limits may adversely affect operator safety.

2.1.1. Environmental Conditions

Location	Indoor use only
Temperature range	5°C to 40°C
Maximum Humidity	Less than 80% RH (non-condensing) at 31°C

To ensure reliable operation the unit should not be exposed to corrosive agents or excessive moisture, heat or dust.

If the unit has been stored at a low temperature or in an environment of high humidity, it must be allowed to reach ambient conditions before being powered up.

The unit must not be used in an explosive environment.

2.2. Mounting to LNR50 Series Stages



Caution

The encoder scale is made of glass and is very fragile. Carefully handle the scale holder and avoid scratching the scale surface.

If required, remove the locking plate then proceed as follows.

1. Using the two M4 x 0.7 x 5 mm cap screws and 3 mm hex supplied, fit the encoder scale holder to the edge of the associated LNR50 series stage top plate and make sure it is parallel/flush with the surface.
2. Using the two M4 x 0.7 x 8 mm cap screws and 3 mm hex supplied, fit the position readout box to the edge of the associated LNR50 series stage bottom plate and make sure it is parallel/flush with the surface.

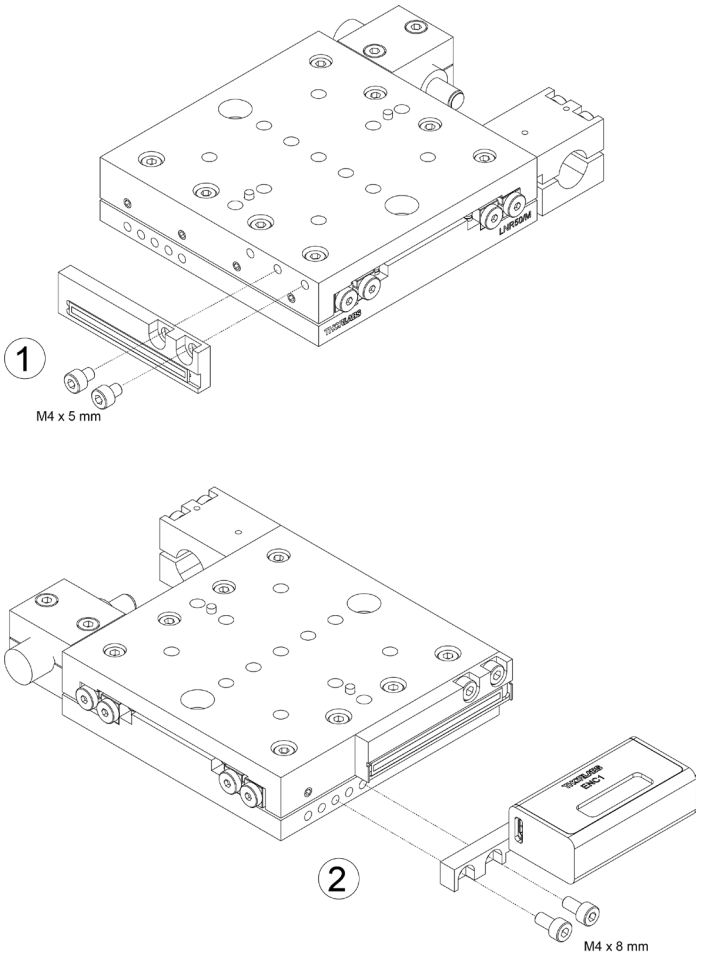


Figure 1 Mounting to an LNR50 Series Stage

2.3. Connecting the Module

The side of the unit is fitted with a USB micro B type socket providing connection to the PC USB port or USB hub. Connection to a PC also allows the unit to be operated via the Kinesis software.

Chapter 3 Manual Operation

3.1. Introduction

When the stage is operated, the position is shown on the digital display in either inches or millimeters. When the unit is powered on it will display 'Setup'. Press and hold red button (MENU) for 3 seconds to navigate to the operating menu.



Figure 2 SETUP Menu

3.2. Operating Menu

The button on the front of the module has a dual function: a short press is used to cycle through the operating menu and a long press is used to enter the current selection. A long press while on the position display will zero the position readout.

The various menu options are detailed below.

UNITS – displays the position in inches or millimetres.

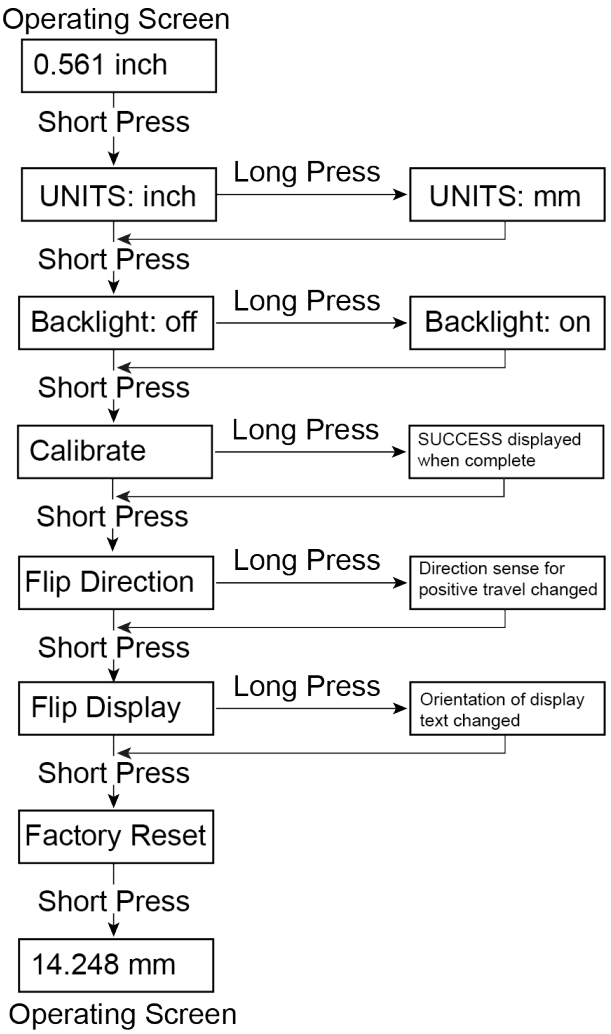
Backlight – turns the back light On and Off.

Calibrate – Starts the calibration routine (see below).

Flip Direction – changes the direction of positive (i.e., increasing) travel.

Flip Display: Changes the orientation of the display text.

Factory Reset: Sets the menu option back to the factory default values.



For example, to change from inches to millimetres:

1. Use short presses to scroll through the menu until the UNITS screen is displayed.
2. Use a long press to toggle to mm.
3. Use short presses to scroll back to the operating (position) display.

3.3. Calibration

After the unit is first fitted to a stage, the scale needs to be calibrated.

1. Scroll through the menu until ‘Calibrate’ is displayed, then press and hold the button.
2. The display will count down from 3 seconds. When the countdown begins, move the top platform of the stage backwards and forwards by hand a few times until ‘Successful’ is displayed.

3.4. Zeroing the position

The encoder unit can be set to zero at any position, with moves in a forward and reverse direction then shown as positive or negative moves from this position.

1. Move the stage to the required zero position.
2. Ensure that the display shows the operating screen.
3. Press and hold the button on the front of the module for around 3 seconds.

The unit is set to zero at the current position and all moves are now measured from this position.

Chapter 4 Software Operation

4.1. Introduction

The following brief tutorial guides the user through a typical series of moves and parameter adjustments performed using the software.

4.2. Connect The Hardware

1) Perform the mechanical installation as detailed in Chapter 2.
2) Install the Kinesis Software (V1.14.34 or higher).

> **Caution**
> During items (3) to (6) the instructions should be followed strictly in the order stated. Problems may occur if the process is not performed in the correct sequence.

3) Connect the stage unit to your PC.

> **Note**
> The USB cable should be no more than 3 meters long. Communication lengths more than this can be achieved by using a powered USB hub.

4) Windows should detect the new hardware. Wait while Windows installs the drivers for the new hardware.

> **Note**
> If any problems are encountered during the connection and power up process, power cycle the unit to clear the error.

4.3. Verifying Software Operation

4.3.1. Initial Setup

1) Run the Kinesis software and check that the Graphical User Interface (GUI) panel appears and is active.

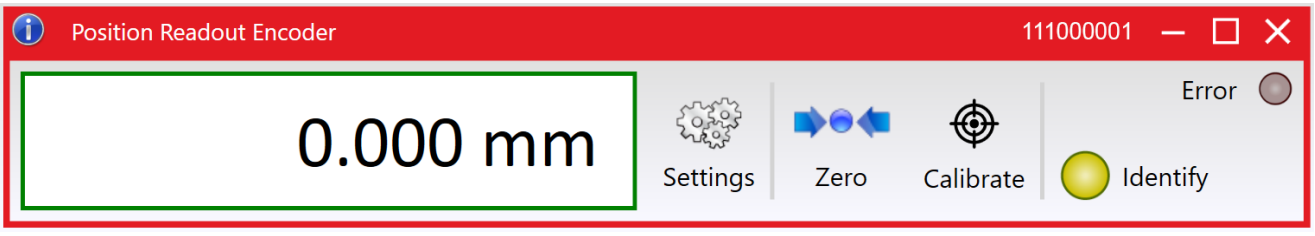


Figure 3 GUI Panel for ENC1 Position Readout Module

2) Click the 'Ident' button. The display on the associated unit flashes. This is useful in multi-channel systems for identifying which unit is associated with which GUI.
3) After the unit is first fitted to a stage, the scale needs to be calibrated. Click the Calibrate button. The display will count down from 3 seconds. When the countdown begins, move the top platform of the stage backwards and forwards by hand a few times until 'Successful' is displayed.

Chapter 5 Software Reference

5.1. GUI Panel

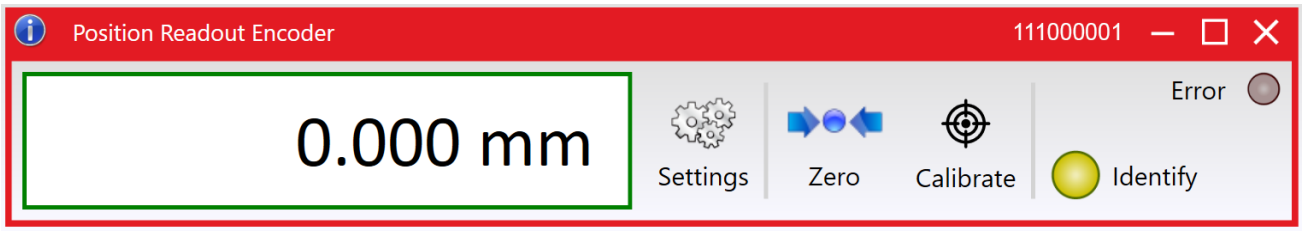
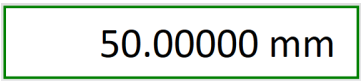
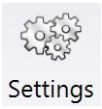


Figure 4 GUI Panel



Position window - shows the position (in inches or mm) of the stage. The position will not be meaningful until after the stage is zeroed. After zeroing, the stage's position is reported relative to the zero reference point.



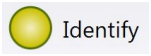
Settings - Displays the 'Settings' panel, which allows the operating parameters to be entered for the unit.



Zero – When this button is pressed, the display is zeroed at the present position. Moves in a forward and reverse direction are then shown as positive or negative moves from this position.



Calibrate - After the unit is first fitted to a stage, the scale needs to be calibrated. Click the Calibrate button. The display will count down from 3 seconds. When the countdown begins, move the top platform of the stage backwards and forwards by hand a few times until 'Successful' is displayed.



Identify - when this button is pressed, the display on the front panel of the associated hardware unit will flash for a short period.



Error -This LED is lit red when the calibration procedure fails. Hovering the mouse over the LED displays a description of the error.

5.2. Settings Panel

5.2.1. Display Tab

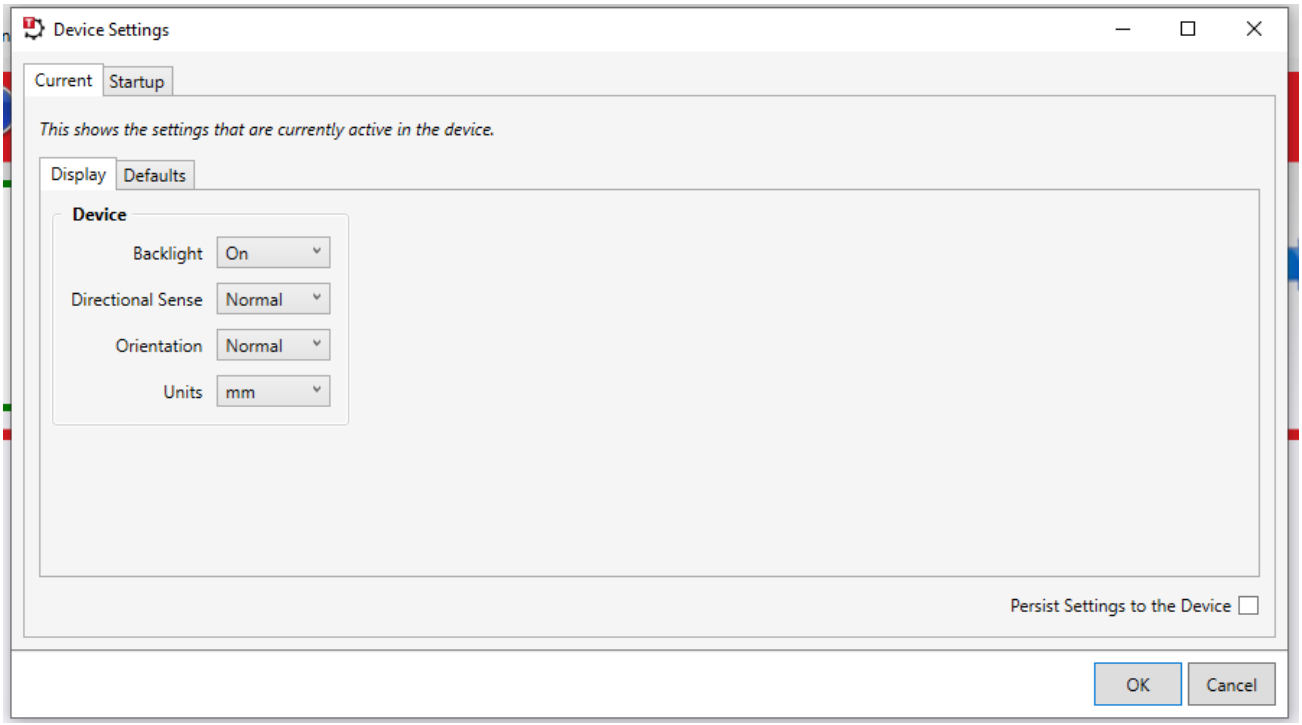


Figure 5 Display Tab

Backlight – Select whether the backlight is ON or OFF

Directional Sense – Changes the direction of positive (increasing) travel. Select whether the positive direction sense is Normal (away from the actuator) or Inverted (towards the actuator).

Orientation – Changes the orientation of the readout display. Select whether the display orientation is Normal (for reading when the actuator is positioned to the left) or Inverted (for reading when the actuator is to the right).

Units – Select whether the displays show the position in mm or inches.

5.2.2. Defaults Tab

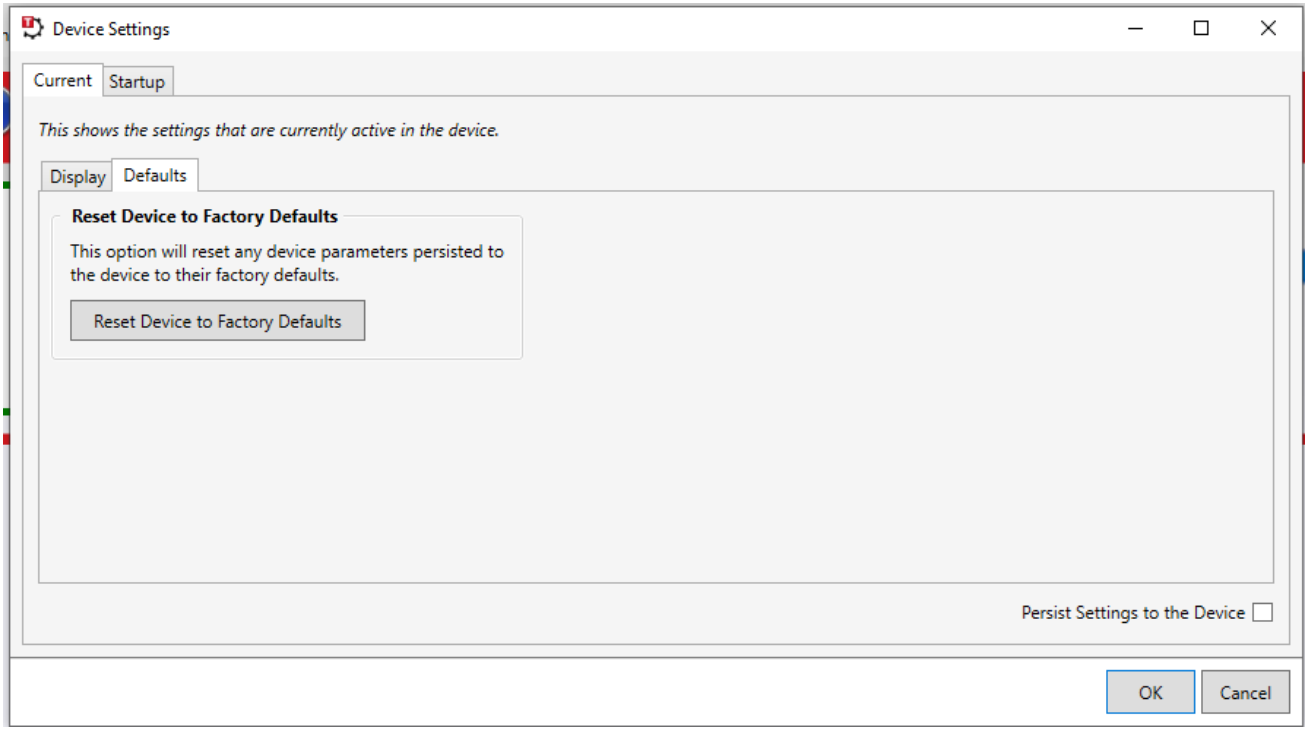


Figure 6 Defaults Tab

If adjustment of the parameter values previously described has resulted in unstable or unsatisfactory system response, this tab can be used to reset all parameter values to the factory default settings.

To restore the default values, click the 'Reset Stage to Factory Defaults' Button, then click OK. The unit must then be power cycled before the default values can take effect.

5.2.3. Calibration Wizard

To assist in calibrating the unit, when the 'Calibrate' button is clicked, a Calibration Wizard window is displayed to guide the user through the process. Simply click the 'Begin' button and follow the on-screen instructions.

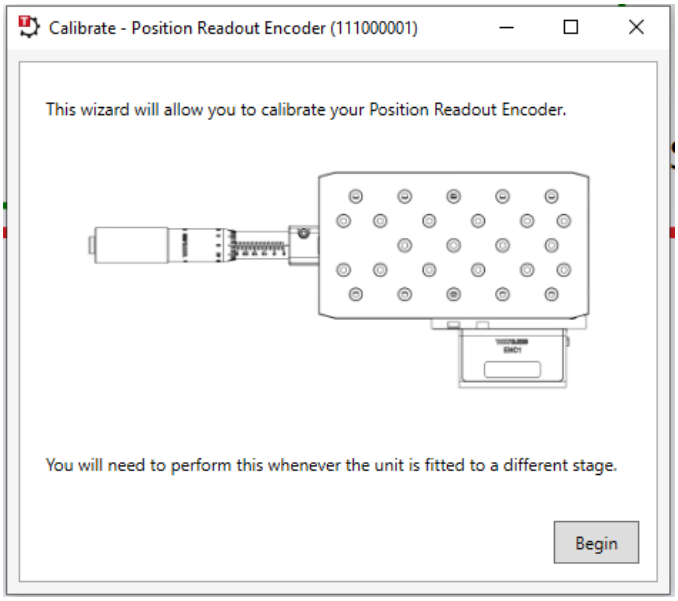


Figure 7 Calibration Wizard

Chapter 6 Specifications

Parameter	ENCLNR50	ENC Encoder
Typical On-Axis Accuracy	10.0 µm	4.0 µm
Typical Repeatability	2.0 µm	1.0 µm
Resolution	1.0 µm	1.0 µm
Input Voltage	5 V Regulated DC	

Note: The ENC encoder data refers to the encoder unit when not mounted to a stage.

Chapter 7 Safety

For the continuing safety of the operators of this equipment, and the protection of the equipment itself, the operator should take note of the Warnings, Cautions and Notes throughout this handbook and, where visible, on the product itself.



Warning: Risk of Electrical Shock
Given when there is a risk of electrical shock.



Warning
Given when there is a risk of injury to the user.



Warning: Risk of Finger Trap
Given when there is a risk of trapping fingers between parts.



Caution
Given when there is a possibility of damage to the product.

Note
Clarification of an instruction or additional information.

General Warnings

Warning
If this equipment is used in a manner not specified in the handbook, the protection provided by the equipment may be impaired. In particular, excessive moisture may impair operation.



Spillage of fluid, such as sample solutions, should be avoided. If spillage does occur, clean up immediately using absorbent tissue. Do not allow spilled fluid to enter the internal mechanism.

The equipment is for indoor use only.

The equipment is not designed for use in an explosive atmosphere.

Chapter 8 Certifications and Compliance



EU Declaration of Conformity

in accordance with EN ISO 17050-1:2010

We: Thorlabs Ltd.

Of: 204 Lancaster Way Business Park, Ely, CB6 3NX, UK

in accordance with the following Directive(s):

2014/30/EU	Electromagnetic Compatibility (EMC) Directive
2011/65/EU + 2015/86	Restriction of Use of Certain Hazardous Substances (RoHS)

hereby declare that:

Model: ***ENCLNR50***

Equipment: ***Digital Position Readout Module for LNR50 series Translation Stages***

is/are in conformity with the applicable requirements of the following documents:

EN 61326-1	Electrical Equipment for Measurement, Control and Laboratory Use - EMC Requirements	2013
EN 63000	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances	2018

and which, issued under the sole responsibility of Thorlabs, is/are in conformity with Directive 2011/65/EU of the European Parliament and of the Council of 8th June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, for the reason stated below:

contains no substances in excess of the maximum concentration values tolerated by weight in homogenous materials as listed in Annex II of the Directive

I hereby declare that the equipment named has been designed to comply with the relevant sections of the above referenced specifications, and complies with all applicable Essential Requirements of the Directives.

Signed: Keith Dhese *On:* 10 May 2023

Name: Keith Dhese

Position: General Manager *EDC - ENCLNR50 -2023-05-10*

CE

Chapter 9 Thorlabs Worldwide Contacts

For technical support or sales inquiries, please visit us at www.thorlabs.com/contact for our most up-to-date contact information.



USA, Canada, and South America

Thorlabs, Inc.

sales@thorlabs.com

techsupport@thorlabs.com

UK and Ireland

Thorlabs Ltd.

sales.uk@thorlabs.com

techsupport.uk@thorlabs.com

Europe

Thorlabs GmbH

europe@thorlabs.com

Scandinavia

Thorlabs Sweden AB

scandinavia@thorlabs.com

France

Thorlabs SAS

sales.fr@thorlabs.com

Brazil

Thorlabs Vendas de Fotônicos Ltda.

brasil@thorlabs.com

Japan

Thorlabs Japan, Inc.

sales@thorlabs.jp

China

Thorlabs China

chinasales@thorlabs.com



THORLABS

www.thorlabs.com