Zaber Technologies Inc.
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Low Profile Series User's Manual

Multiple axis stages built with LSMs



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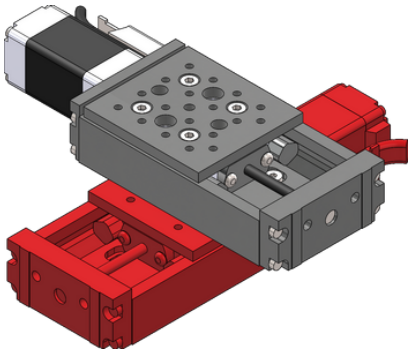
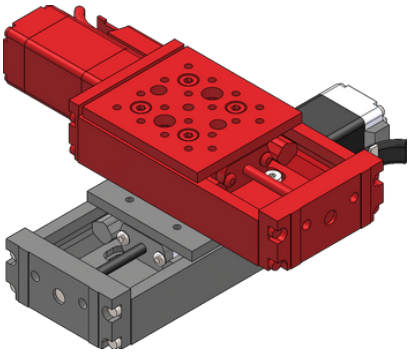
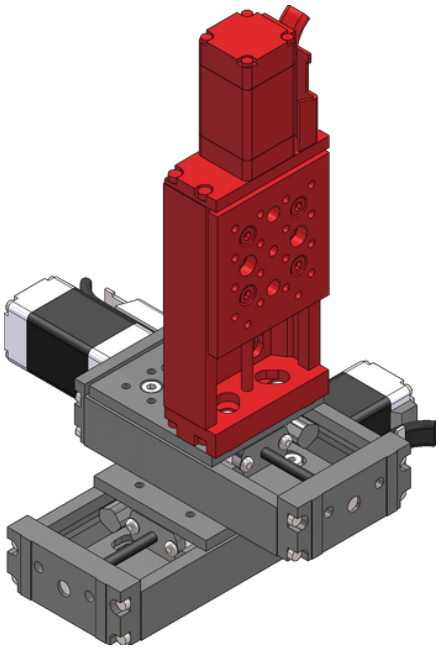
Precautions

Collision Hazard! Zaber XY XYZ stages contain motion products with significant thrust and load capacities. Take caution to prevent collisions with operators, work surfaces, and sensitive equipment.

Heavy! Completely assembled products, partial assemblies and some stages can be very heavy. Exercise caution when lifting/moving larger assemblies and products. Loosely fasten stage axes as soon as they are placed during assembly, to prevent tipping and falling hazards.

Important: XY XYZ products must be properly assembled and aligned to function optimally. Follow assembly instructions closely and contact Zaber Customer Support for help at any time, if needed.

Product Overview

X-Axis	Y-Axis	Z-Axis (Optional)
		

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Cable Lengths

Cable Type	Short Cable	Long Cable
Data Cable	X-DC02 (0.6 m)	X-DC06 (2.0 m)
Motor Cable	MC10(T3) (1.5 m)	MC10(T3)L300 (3.0 m)

If using X-series devices with an integrated controller, refer to the data cable equations below:

Connection	Equation
X-Y Connection	If X-travel + Y-travel/2 > 300, use the 2 m cable. Otherwise use the 0.6 m cable.
Y-Z Connection	If Y-travel + Z-travel > 400, use the 2 m cable. Otherwise use the 0.6 m cable.

If using an X-MCC coordinated motion controller, refer to the motor cable equations below:

Axis	Equation
X-axis	Use 1.5 m cable.
Y-axis	If X-travel + (Y-travel/2) >= 1000, use the 3.0 m cable. Otherwise use the 1.5 m cable.
Z-axis	If X-travel + (Y-travel/2) + Z-travel >= 1000, use the 3.0 m cable. Otherwise use the 1.5m cable.

XY XYZ Stage Assembly and Setup

Zaber's XY XYZ stages require some assembly and set-up upon arrival. These XY XYZ stages can be disassembled, packed, and transported for use in new locations, or re-configured with new motion control axes to suit new applications. To set up your XY or XYZ stage, complete the following steps (where applicable).

Required Tools

- 2.5 mm hex key
- Machinist's square [SQ3] (Included)

Preparation

1. Unpack the brackets, adaptor plates, and other hardware.
    - Keep fasteners with their labelled bags to easily identify/locate the correct fastener for a step.
2. Unpack the stage axes and identify the X-axis stage, Y-axis stage and the Z-axis stage if included. Refer to your purchase to determine which axis each stage belongs to.
    - Typically the longest stage should be the X-axis. The X and Y axis will have the same pitch. The Z axis will generally have a fine pitch screw (A pitch) or a brake.
3. Determine your mounting surface. The instructions provided assume a metric optical breadboard is used to mount the X-axis stage.
4. Determine stage orientations and location of the X-MCC controller, if included. The controller is typically located near the motor cable connections of the X-axis (lowest stage). If the controller is required to be mounted at a significant distance from the stages, longer cables or cable extensions may be necessary. See MC10T3(Lxxx) for longer 15 pin female to 26 pin male cables or MC10(Lxxx) for 26 pin female to 26 pin male extensions cables here: Zaber Accessories.
    - *Note: 'xxx' denotes a length in cm*

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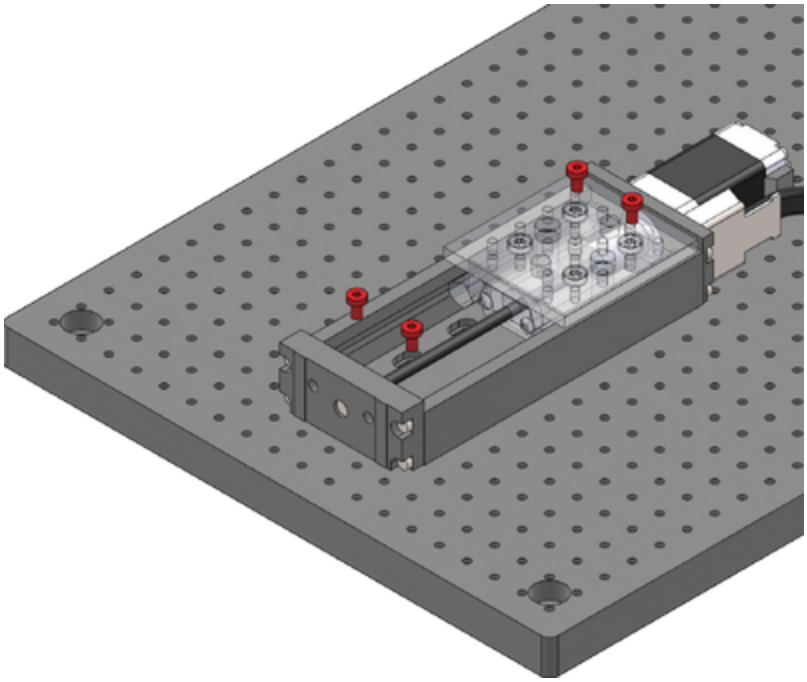
LSM X-Axis Stage to Breadboard

Assembly



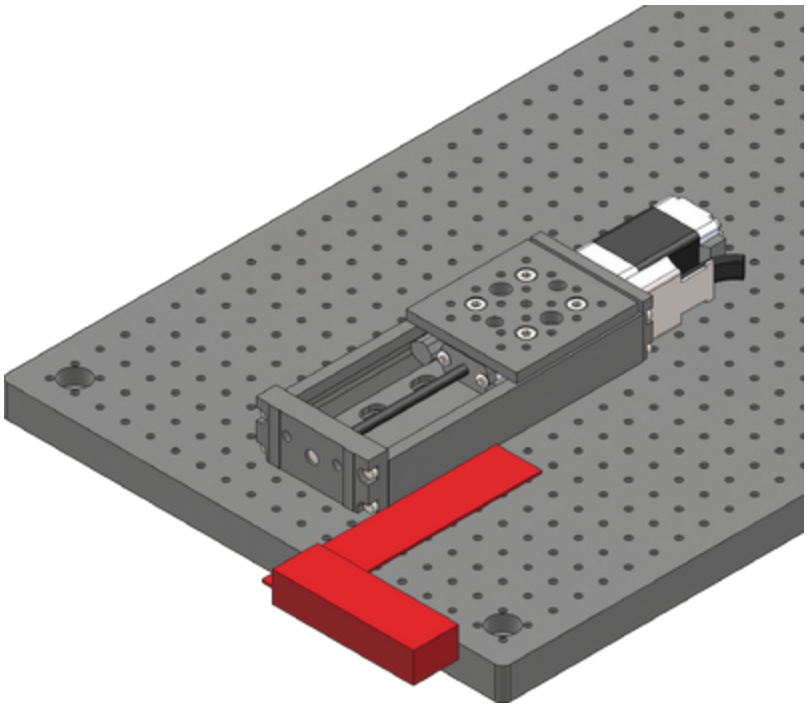
ORDER OF CONNECTORS AND KNOB LOCATION MAY VARY BETWEEN DEVICES

- For the next steps, first connect the stage to power using the provided power supply. If using an X-MCC coordinated motion controller, connect the stage to the controller as well. Confirm that the manual control knob on the controller can be used to move the carriage around to provide access to the mounting slots beneath the carriage.

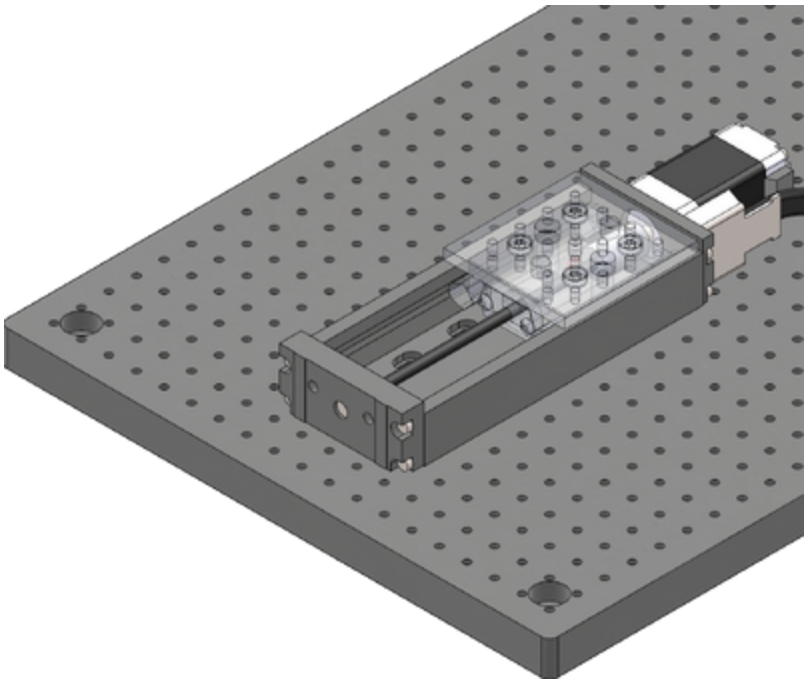


- Loosely attach the X-axis stage on a breadboard or other mounting surface using the four provided stainless steel M3 screws and a 2.5 mm hex key. Move the carriage as necessary to access mounting slots. Two holes in the LSM carriage allow M3 screws to pass through to the mounting slots. Where possible, space fasteners out equally and place fasteners at each end of travel.

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- Using the included machinist's square, align the X-axis stage to an edge of the breadboard or other reference edge.



- Firmly tighten down all fasteners mounting the X-axis stage.

LSM Y-Axis Stage to X-Axis

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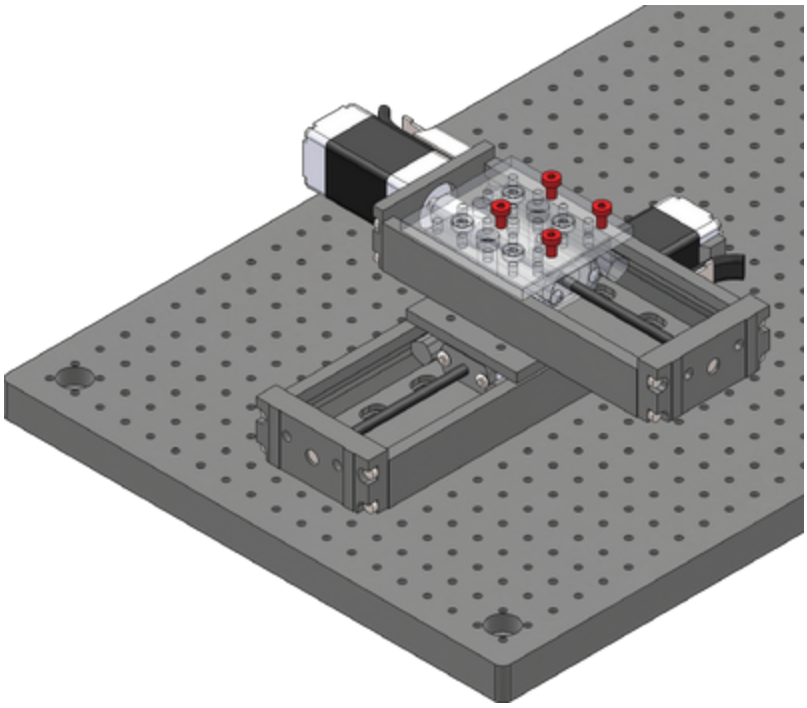
Precautions

Important: Where possible, mount the Y-axis stage so that its travel is centered on the X-axis stage to reduce moment loads and off-axis motion errors.

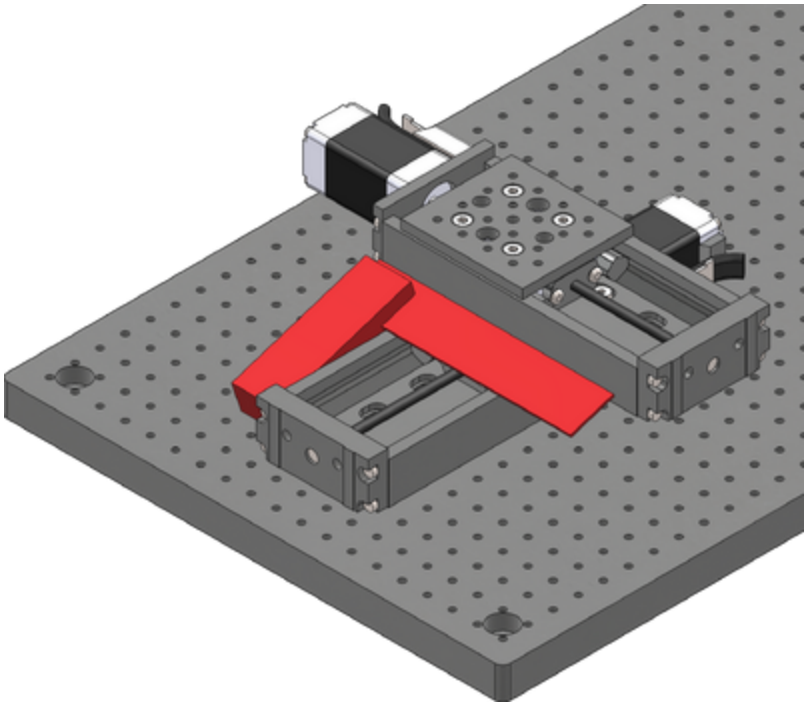
Assembly



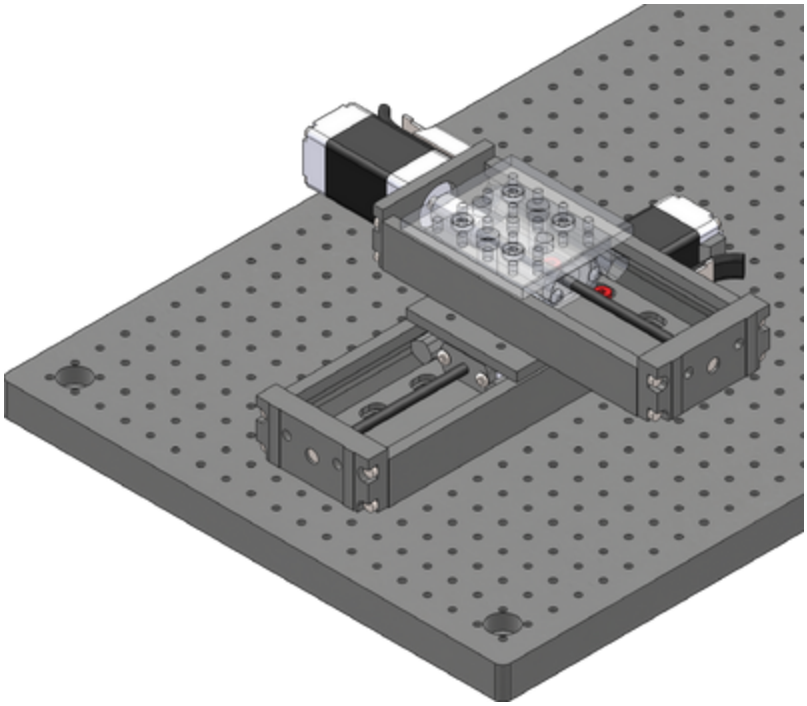
- For the next steps, first connect the stage to power using the provided power supply. If using an X-MCC coordinated motion controller, connect the stage to the controller as well. Confirm that the manual control knob on the controller can be used to move the carriage around to provide access to the mounting slots beneath the carriage



- Loosely attach the Y-axis stage over the X-axis using the four provided stainless steel M3 screws and a 2.5 mm hex key. The Y-axis stage should be mounted so that the travel is centered on the X-axis. The system specifications and load ratings are provided assuming a centered mounting. If mounted elsewhere, the stiffness of the system will change, and in some cases loads may exceed the lower stage's carrying capacity.



- Using the included machinist's square, align the Y-axis stage to the X-axis stage.



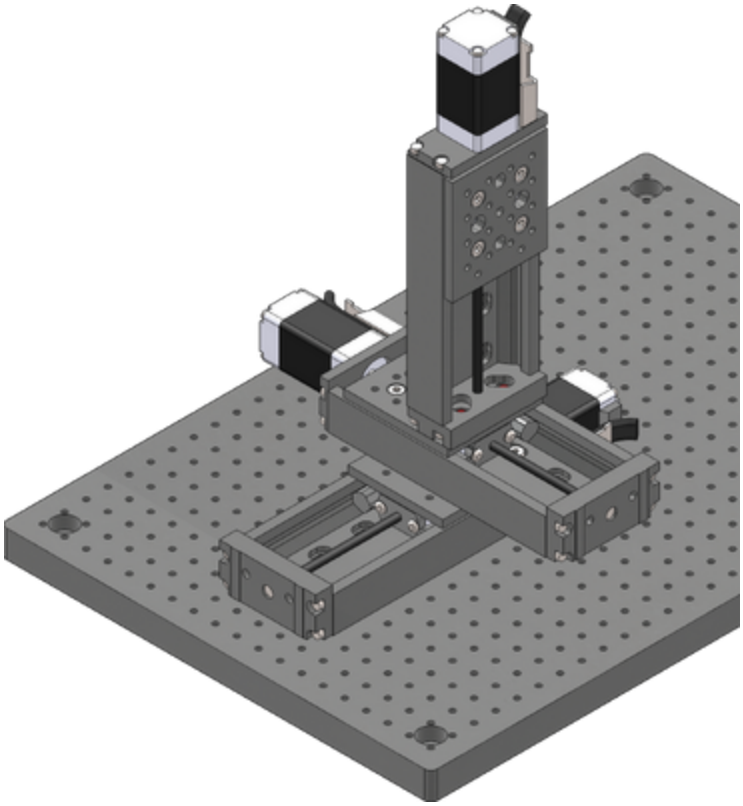
- Firmly tighten down all fasteners mounting the Y-axis stage.

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LSM Z-Axis Stages to Y-Axis

This section is only applicable for XYZ stage products and can be ignored for XY stages.

Assembly

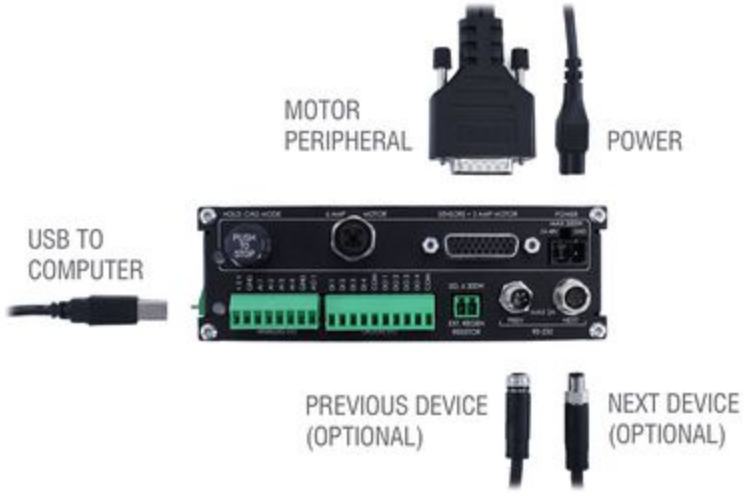


- Attach the Z-axis stage over the Y-axis using the two provided M3 screws and a 2.5 mm hex key. The stage can be rotated 90 degrees to overhang the Y-axis stage. If desired, the machinist's square can be used for better rotational alignment.

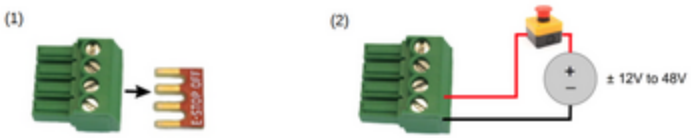
Cabling and Options



- If using X-series Zaber stages with integrated controllers, then cabling is as simple as connecting the appropriate RS 232 data cables between each stage. These cables can be used to daisy chain both power and data, reducing clutter. For an XY stage, one data cable is needed, and for an XYZ stage, two data cables are needed. Refer to the cable table to determine which cables go where.



- If using the X-MCC coordinated motion controller, then each stage needs to be directly connected to the controller with a motor cable. For an XY stage, two motor cables are needed, and for an XYZ stage, three motor cables are needed. Refer to the cable table to determine which cables go where.



- If using the X-MCC, the ES01 E-Stop accessory should also be installed at this point.

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- Connect the stage to the computer using the provided USB adaptor cable. This should be connected to the the X-axis stage (for X-series stages) or the X-MCC controller.



- The optional joystick should be connected in-line between the computer and the X-axis stage (for X-series stages) or the X-MCC controller.



- Power can be supplied to either the stages or the controller using the provided power supply brick. If multiple power supplies were provided, they should all be connected to the system to ensure sufficient current supply.

Device Product Manuals

Zaber's XY XYZ stage products are combinations of several Zaber motion control devices. For device operation, maintenance procedures and troubleshooting, consult the detailed product manuals for these devices:

X-LSM Linear Stage
Provides X,Y and optional Z axis linear motion in X-LSM XY XYZ Stages.
X-LSM-E Linear Stage
Provides X,Y and optional Z axis linear motion in X-LSM-E XY XYZ Stages.
LSM Linear Stage
Provides X,Y and optional Z axis linear motion in LSM XY XYZ Stages.
LSM-E Linear Stage
Provides X,Y and optional Z axis linear motion in LSM-E XY XYZ Stages.

X-MCC Universal Drive Controller
These controllers are available with 1-4 axes. In an XY XYZ stage, a two or three axis controller is typically used to provide coordinated motion for when the path by the system taken matters. This controller may be daisy-chained with other Zaber controllers or motion devices with integrated control.
X-JOY3 Joystick
Optional programmable joystick with 8 buttons allows for direct interaction with the XY XYZ stage.

Warranty and Repair

For Zaber's policies on warranty and repair, please refer to the Ordering Policies.

Standard products

Standard products are any part numbers that do not contain the suffix ENG followed by a 4 digit number. Most, but not all, standard products are listed for sale on our website. All standard Zaber products are backed by a one-month satisfaction guarantee. If you are not satisfied with your purchase, we will refund your payment minus any shipping charges. Goods must be in brand new saleable condition with no marks. Zaber products are guaranteed for one year. During this period Zaber will repair any products with faults due to manufacturing defects, free of charge.

Custom products

Custom products are any part numbers containing the suffix ENG followed by a 4 digit number. Each of these products has been designed for a custom application for a particular customer. Custom products are guaranteed for one year, unless explicitly stated otherwise. During this period Zaber will repair any products with faults due to manufacturing defects, free of charge.

How to return products

Customers with devices in need of return or repair should contact Zaber to obtain an RMA form which must be filled out and sent back to us to receive an RMA number. The RMA form contains instructions for packing and returning the device. The specified RMA number must be included on the shipment to ensure timely processing.

Email Updates

If you would like to receive our periodic email newsletter including product updates and promotions.

Contact Information

Contact Zaber Technologies Inc by any of the following methods:

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Web	www.zaber.com
Email	Please visit our website for up to date email contact information.

The original instructions for this product are available at https://www.zaber.com/manuals/LSM-XY-XYZ.

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