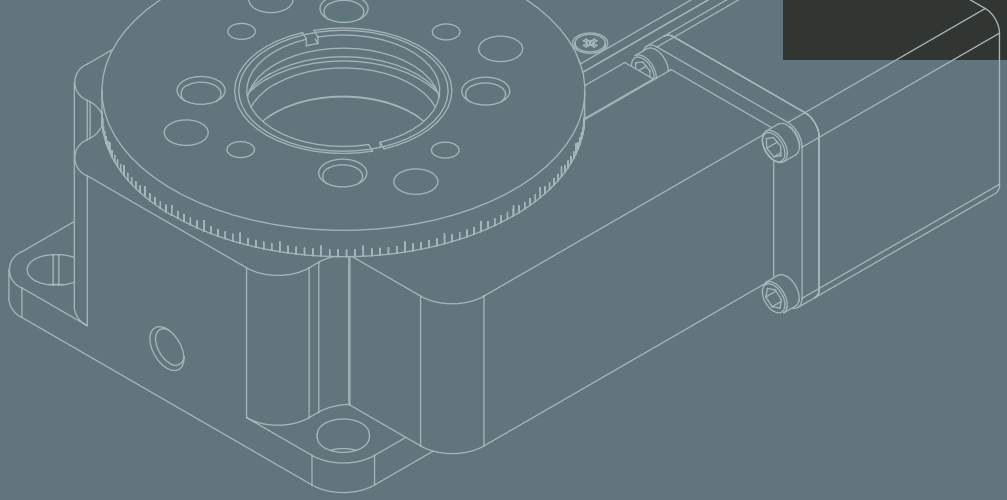

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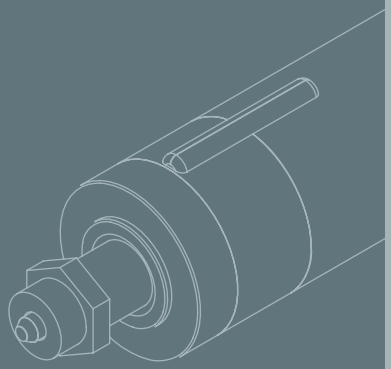
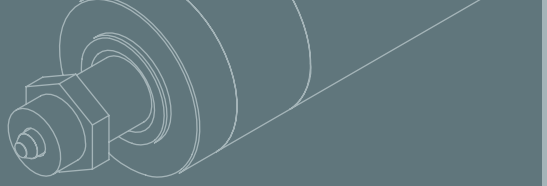


ZABER TECHNOLOGIES

Simplifying Motion Control



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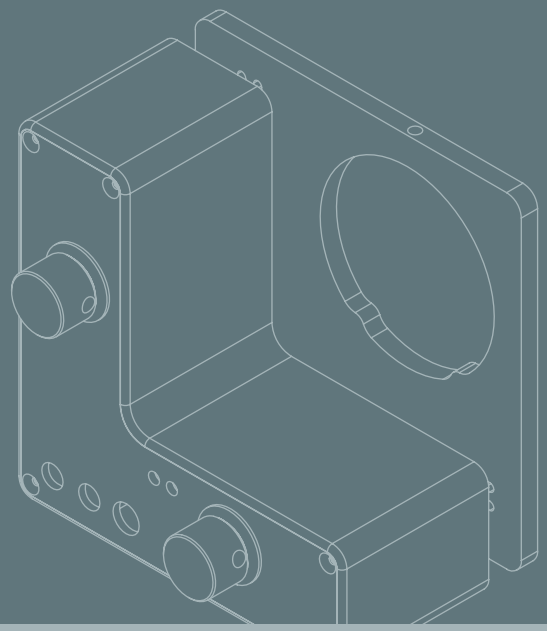
Fax	1-604-648-8033



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ZABER Simplifying Motion Control

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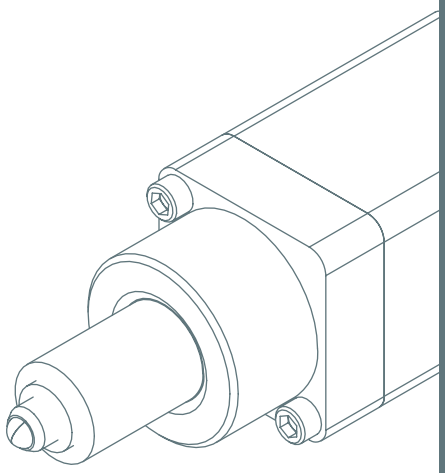


ZABER TECHNOLOGIES

ZABER

How Zaber got its start

Zaber Technologies was founded in 1997 by a group of friends with diverse interests and knowledge of electro-mechanical systems, programming, and physics.

Back then, precision linear actuators all used DC motors with gearboxes and encoders, and they required complicated motion control cards, bulky controllers, separate driver amplifiers, and special power supplies. Precision motion control was expensive, difficult to set up, and cumbersome to use.

Zaber's founders recognized the need for an inexpensive, integrated solution for motion control. They wanted to make motion control products that were easy to set up and ready to use right out of the box, so they created the world's first precision linear actuator with a built-in controller. It was based on a stepper motor instead of a DC motor, gearbox, and encoder combination. The integration of all control and drive electronics in the same package became the foundation of Zaber's T-Series product line.

Where we are today

Since the introduction of our first linear actuator, the T-LA28, we have expanded our offerings to include over 100 motion control products distributed worldwide. Researchers, engineers, distributors, system integrators, and OEMs have come to appreciate our innovative products and excellent support. We continue to advance our in-house manufacturing processes allowing us to build, test, and ship most of our products within 3–5 days.

At Zaber, we are dedicated to:

Integrating your feedback into our products

When you talk, we listen. We continually grow and improve our product line based on your feedback and requests.

Providing excellent service and support

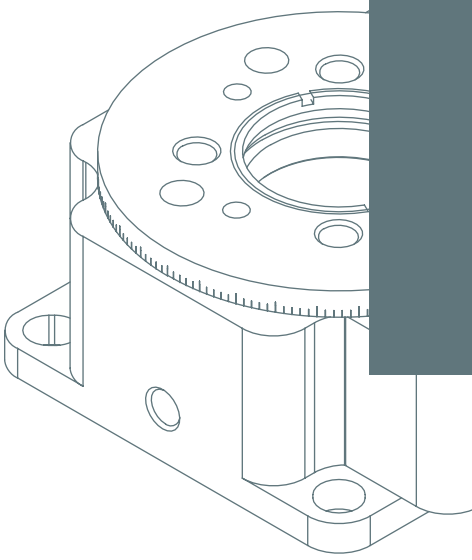
We strive to offer the best service and technical support in the industry. We believe that these are the key ingredients in creating and sustaining a positive relationship with you.

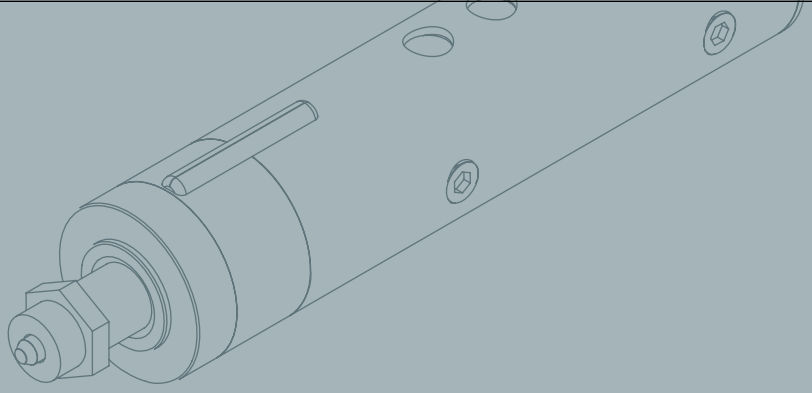
Offering the best price to performance ratio on the market

We make products that strike a unique balance between quality, performance, and economy.

Simplifying motion control

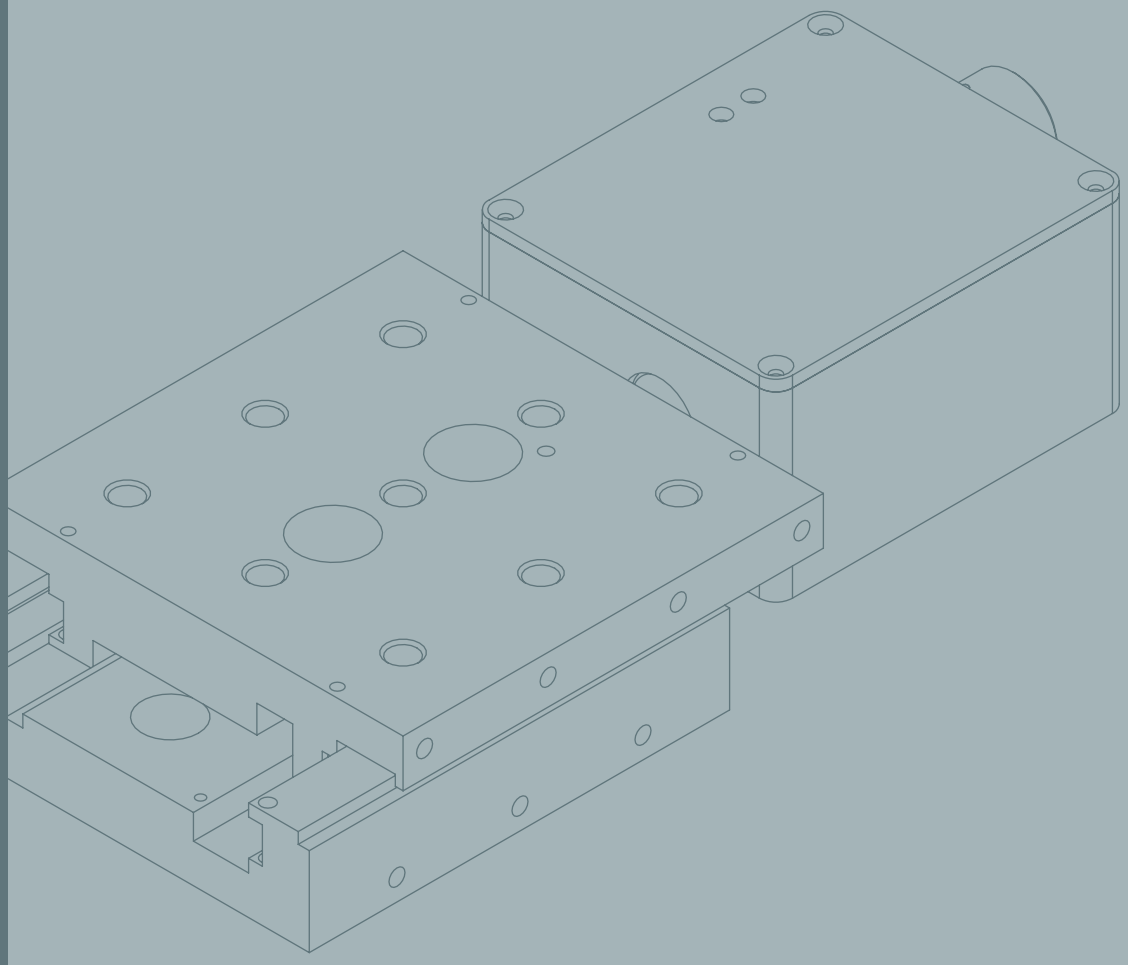
Most of our products are ready to plug into a computer and run right out of the box. Our software is quick to install and easy to use. No one likes paperwork, so we also try to make ordering and servicing as painless as possible.





ZABER

We specialize in motion control technology



ZABER

Simplifying Motion Control

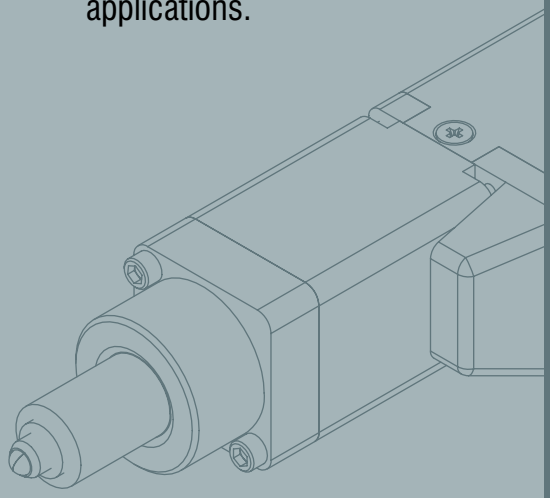
ZABER TECHNOLOGIES

Automate precision positioning tasks quickly and easily with Zaber products.

We offer an extensive line of computer controlled linear actuators, linear slides, rotary stages, mirror mounts, motors, and other devices.

Most Zaber products have built-in controllers and can be daisy-chained and controlled from a single serial port.

Whether you need a single device or want to seamlessly combine several units in a multi-axis set-up, Zaber's motion control equipment is ideal for a broad range of precision positioning applications.



Linear

Linear Actuators
with Built-In Controllers

Linear Actuators Requiring
External Controllers

Linear Slides
with Built-In Controllers

Manual Translation Stages

Tilt

Mirror Mounts
with Built-In Controllers

Rotary

Rotary Stages
with Built-In Controllers

Stepper Motors
with Built-In Controllers

Stepper Motors
Requiring External Controllers

Controllers

Stepper Motor Controllers

Programmable Joysticks

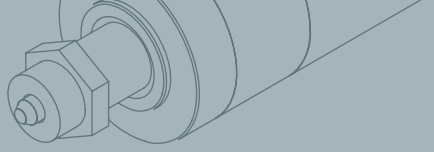
Stand-Alone Device Controllers

www.zaber.com

When you talk, we listen. We are continually growing and improving our product line based on your feedback.

ZABER

Simplifying
Motion Control

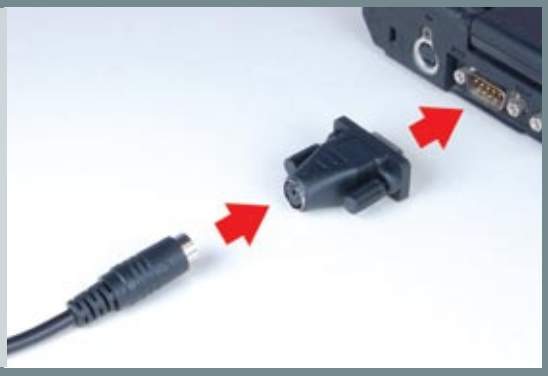


ZABER TECHNOLOGIES

Easy installation

Step 1.

Connect your Zaber device to your RS-232 port using the included serial adaptor. We offer USB to RS-232 converters if you have no RS-232 port.

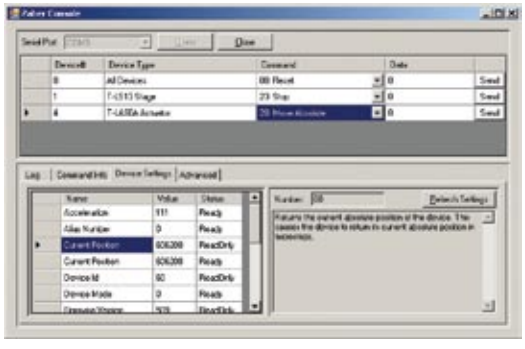


Step 2.

Connect the included power supply to your Zaber device.

Step 3.

Install free Zaber software to execute simple instructions or complex motion sequences.



Expandable design

Automating more than one axis?
You can daisy-chain up to 254 Zaber devices to a single RS-232 or USB port. Power can be transmitted through the data cables of most models allowing multiple devices to be powered from a single power supply. Minimal hardware and cabling make Zaber products easy to set up and help reduce clutter on the workbench.

Versatile software

Zaber software is easy to use.
It automatically recognizes all your devices and allows you to communicate with each one. You can easily set up automated routines, and programmers can modify the source code for advanced customization.

Our software is available in many popular languages including Labview, Visual Basic, C#, Excel, Qbasic, and C. All our software is available for free download.

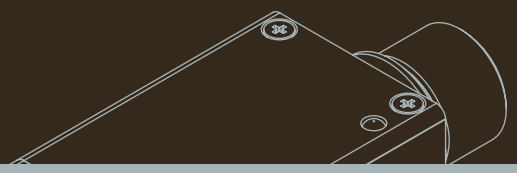
Questions or concerns?
Our technical support is here for you.

At Zaber, we specialize in motion control technology. When you contact us, you'll be speaking with an experienced applications engineer who knows our products inside and out. If you need help with your products, we can guide you. User manuals and troubleshooting guides are available online. Plus all our products are covered by a one year warranty.

1-888-276-8033 (Toll Free – Canada and USA)
1-604-569-3780 (Direct)

www.zaber.com

About Our Products



Built-in controllers simplify your set-up

We've designed most of our precision positioning equipment with integrated controllers, so there's no additional hardware for you to install. The controller and stepper motor driver are built right in, which reduces cost, device footprint, and cable clutter.

The choice is yours: enjoy complete automation through computer control, or use manual control

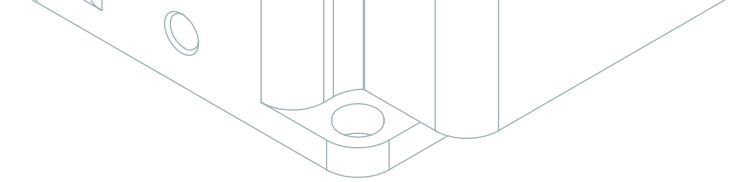
Zaber devices are perfect for automating your positioning needs. Our free software allows you to send single commands or complex sequences. Most models offer a manual control knob so that when you want to, you can position your device by hand as well. The speed varies depending on how far you turn the knob in either direction, and the computer will continue to track the device's position throughout a manual move.

We've got the accessories you need

Most Zaber products use standard 15 V wall-mounted power supplies, and we offer suitable alternatives to match the input voltage in different regions around the world. Kit versions of Zaber products come complete with a power supply, a six-foot cable, and a serial port adaptor. We recommend you start with a kit version, though if you need multiple motion devices for your application, each device can also be purchased without accessories. If you need longer cables, alternate power supplies, or other optional items, we can help you choose the right ones. You can see a list of compatible accessories, including power supply substitutions for each device, on our web site.

Sustainability is important to us

It's important to us to minimize any negative impact we may have on the environment and on the health and safety of our communities. We are continually improving our devices to reduce the use of any hazardous substances, and our products are available in RoHS-compliant versions. The packaging we use is recyclable in most regions. If you have any suggestions for how we can further reduce the environmental impact of our products or activities, we would be happy to hear from you!



SpinX Technologies

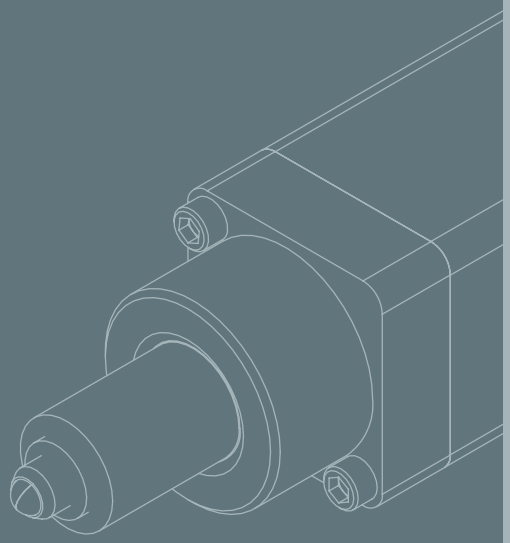
www.spinx-technologies.com

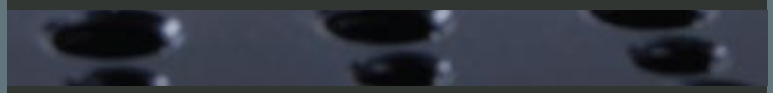
The SpinX Lab integrates liquid handling, incubation and detection of nanolitre assays into a bench-top instrument for applications in pre-clinical drug discovery ranging from assay development to compound profiling. Currently, in-house compound profiling is generally limited to a panel of less than a dozen assays in any project, largely because no existing instrument allows a wider panel to be performed in a convenient and cost-effective manner. SpinX Lab enables dozens of compounds to be tested in hundreds of conditions in a single run.

SpinX uses two dovetail motorized slides inside the SpinX Lab instrument, namely for accurate and repeatable positioning of optical elements. The accuracy and repeatability, the compactness, and the competitive pricing of Zaber's products were extremely attractive to us for this application. In addition, the integrated stepper motor controller coupled with the relatively simple control using RS-232 made the integration into our device straightforward.

– SpinX Technologies

Linear





Miniature Linear Actuators: T-NA

- **Integrated motor and controller in a tiny package**
- **Excellent thrust, speed, and accuracy**
- **Daisy-chain and control multiple devices through a single serial port**

Zaber's T-NA series actuators are computer controlled linear actuators with 0.05 μm resolution, and either 25 mm or 50 mm travel. Each actuator comes with a hardened ball tip that you can remove if you prefer to use the built-in threaded tip or a flat tip.

Installation

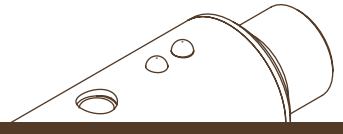
One or more actuators can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices, including any T-Series products, can be daisy-chained to a single port. An industry standard 3/8″ (9.5 mm) diameter micrometer shank allows the T-NA to fit many popular stages. The plunger of the T-NA actuator does not rotate.

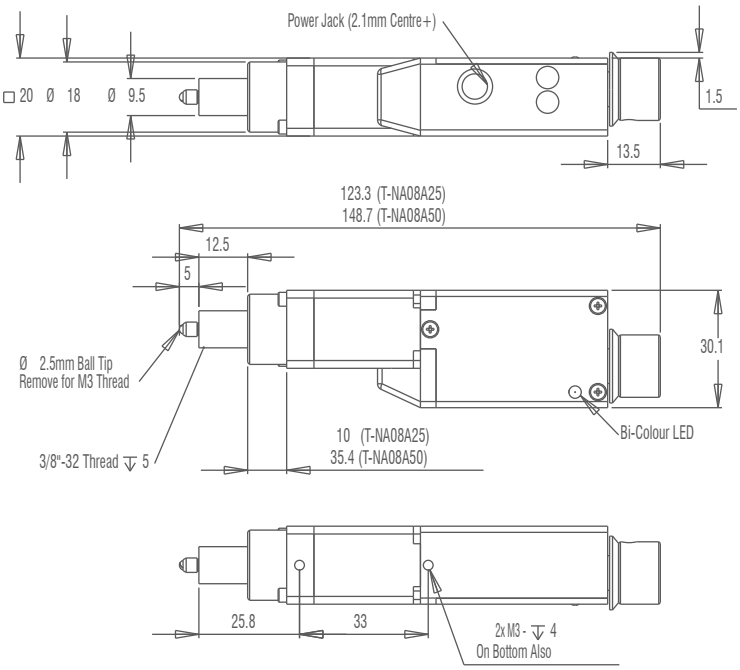
Computer Control

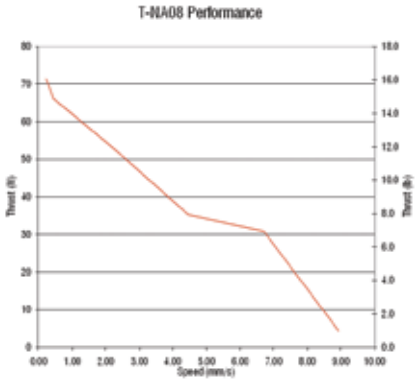
We provide software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the actuator reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

An optional knob permits smooth manual control at variable speeds in both directions. During a manual move the actuator's position is constantly transmitted to the computer and is displayed by the software.







Miniature Linear Actuators: T-NA

Model	Travel Range (mm)	Microstep Size (Resolution) (µm)	Accuracy (µm)	Repeatability (µm)	Backlash (µm)	Minimum Speed (µm/s)	Maximum Speed (mm/s)	Weight (kg)
T-NA08A25	25.4	0.048	+/- 8	< 1	< 4	0.22	8	0.13
T-NA08A50	50.8	0.048	+/- 8	< 1	< 4	0.22	8	0.15

Even though there is a time difference between China and Canada, there is hardly any delay in getting technical and business support from Zaber's product managers. We appreciate Zaber's professional and customer-oriented working style.

– Sunny Gu, RayScience, Shanghai, China

Miniature Linear Actuators: T-LA

- **Integrated motor and controller**
- **Standard mounting interface replaces most manual micrometers**
- **Manual control knob lets you move the actuator at variable speeds**
- **Daisy-chain and control multiple devices through a single serial port**

Zaber's T-LA series products are computer controlled linear actuators with up to 60 mm travel and 0.1 μm resolution.

T-LA actuators keep their position even with no power applied, and if the actuator is idle, power to the motor is automatically removed so it can stay cool. We also offer vacuum compatible versions rated to 10^{-6} Torr.

Installation

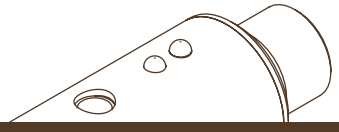
One or more actuators can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices, including any T-Series products, can be daisy-chained to a single port. An industry standard 3/8″ (9.5 mm) diameter micrometer shank allows the T-LA to fit many popular stages. The plunger of the T-LA actuator does not rotate.

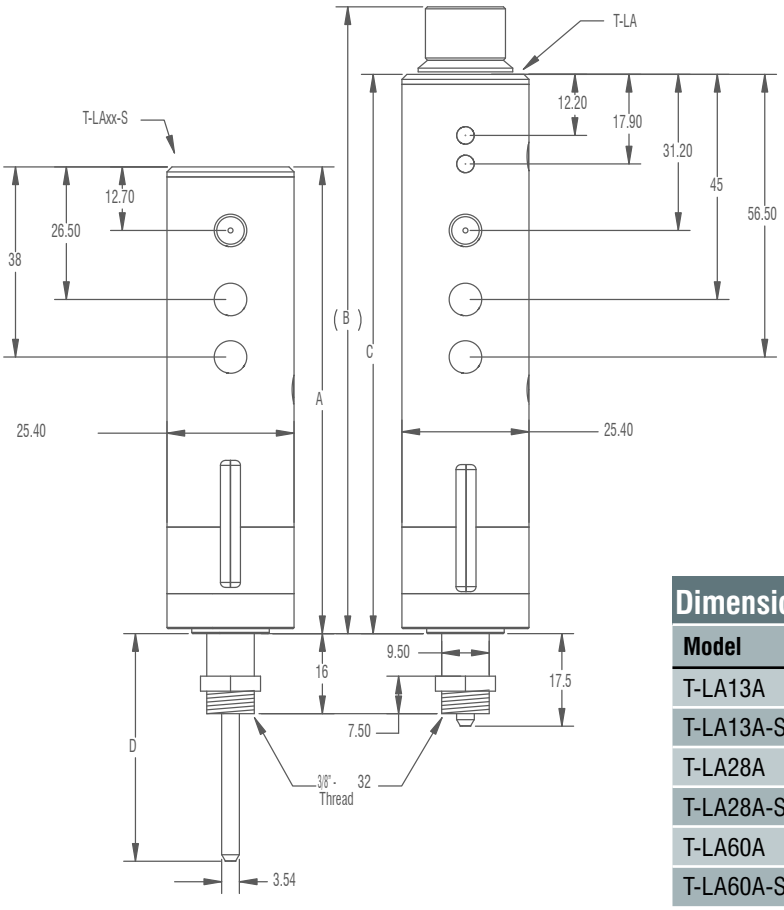
Computer Control

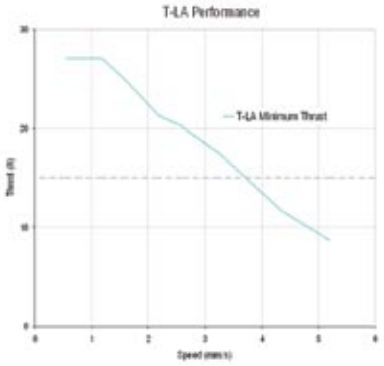
We provide software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the actuator reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

An optional knob permits smooth manual control at variable speeds in both directions. During a manual move the actuator's position is constantly transmitted to the computer and is displayed by the software.







Dimensions

Model	A (mm)	B (mm)	C (mm)	D (mm)
T-LA13A	N/A	125.5	111.8	30.5
T-LA13A-S(V)	93.3	N/A	N/A	30.5
T-LA28A	N/A	125.5	111.8	45.5
T-LA28A-S(V)	93.3	N/A	N/A	45.5
T-LA60A	N/A	160.5	146.8	77.5
T-LA60A-S(V)	128.3	N/A	N/A	77.5

Miniature Linear Actuators: T-LA

Model	Travel Range (mm)	Microstep Size (Resolution) (µm)	Accuracy (µm)	Repeatability (µm)	Backlash (µm)	Minimum Speed (µm/s)	Maximum Speed (mm/s)	Weight (kg)	Vacuum Compatible
T-LA13A	13	0.0992	+/- 12	< 0.4	< 4	0.93	4	0.14	No
T-LA13A-S	13	0.0992	+/- 12	< 0.4	< 4	0.93	4	0.11	No
T-LA13A-SV	13	0.0992	+/- 12	< 0.4	< 4	0.93	4	0.11	Yes
T-LA28A	28	0.0992	+/- 12	< 0.4	< 4	0.93	4	0.14	No
T-LA28A-S	28	0.0992	+/- 12	< 0.4	< 4	0.93	4	0.11	No
T-LA28A-SV	28	0.0992	+/- 12	< 0.4	< 4	0.93	4	0.11	Yes
T-LA60A	60	0.0992	+/- 16	< 0.4	< 4	0.93	4	0.15	No
T-LA60A-S	60	0.0992	+/- 16	< 0.4	< 4	0.93	4	0.14	No
T-LA60A-SV	60	0.0992	+/- 16	< 0.4	< 4	0.93	4	0.14	Yes

Linear Actuators: NA

- **Available in several sizes for a variety of thrusts and speeds**
- **Resolution down to 0.05 μm**
- **Designed for use with T-CD stepper motor controllers**
- **Threaded tip for multiple mounting options**

Zaber's NA series actuators offer a wide range of size, thrust, and speed options not available in our actuators with built-in controllers. These actuators are available with travel ranges from 16 mm to 60 mm and thrust up to 2200 N (490 lb), and they have a threaded tip for push/pull operation.

Installation

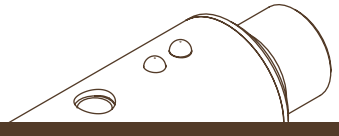
The NA series actuators are designed to connect directly to Zaber's T-CD stepper motor controller (purchased separately). T-CD controllers can be daisy-chained with any of Zaber's T-Series products.

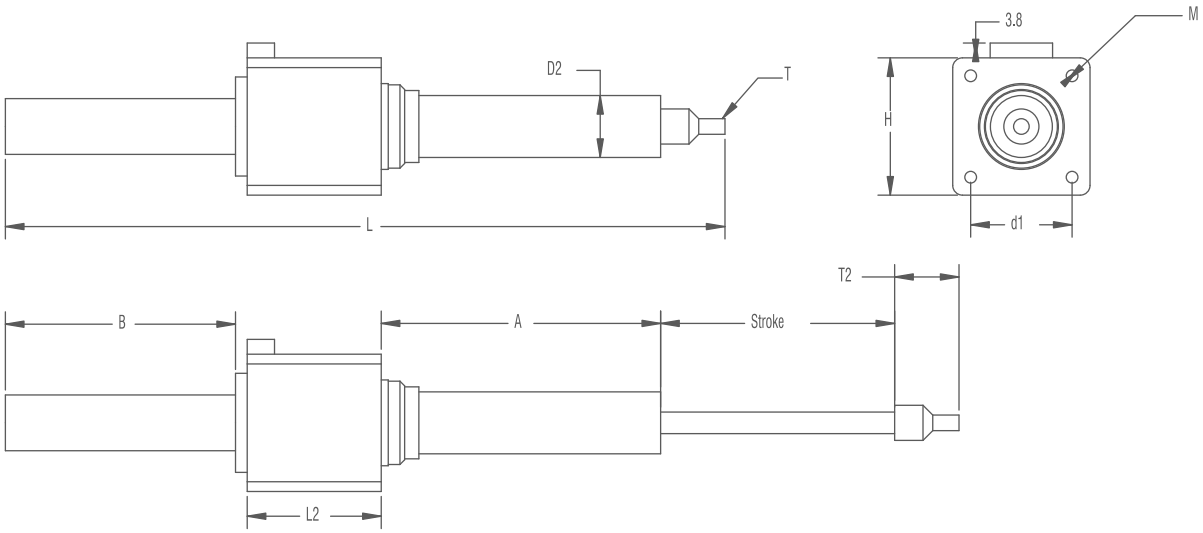
Computer Control

We provide software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the controller reports the new position of the actuator. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

A convenient knob on the T-CD controller permits smooth manual control at variable speeds in both directions. During a manual move the actuator's position is constantly transmitted to the computer and is displayed by the software. The knob on the T-CD controller allows you to use the NA actuator even without a computer.





Dimensions

Model	A (mm)	B (mm)	L (mm)	d1 (mm)	D2 (mm)	H (mm)	L2 (mm)	M	T	T2 (mm)
NA08x16	20.2	19.3	80	15.4	9	20	27	M2	#4-40	12
NA08x30	32.6	31.4	104.2	15.4	9	20	27	M2	#4-40	12
NA11B16	26.8	14.7	85	23	14	28.1	31.7	M2.5	M3	8.8
NA11B30	39.5	28	111	23	14	28.1	31.7	M2.5	M3	8.8
NA11B60	71.3	59	173.8	23	14	28.1	31.7	M2.5	M3	8.8
NA14B16	27.2	15	96.1	26	15.9	35.2	34.4	M3	M4	16.5
NA14B30	39.88	29	122.8	26	15.9	35.2	34.4	M3	M4	16.5
NA14B60	71.63	59	184.5	26	15.9	35.2	34.4	M3	M4	16.5
NA23C60	76.5	65.5	208.4	47.1	28	56.4	45.2	5.2	1/4″-20	22.2
NA34C60	81.9	65.5	264.5	69.3	40	86.3	78.6	6.6	7/16″-14	38.6

Motorized Linear Actuators: NA

Model	Travel Range (mm)	Microstep Size (Resolution) (µm)	Accuracy (µm)	Repeatability (µm)	Backlash (µm)	Minimum Speed (µm/s)	Maximum Speed (mm/s)	Weight (kg)
NA08A16	16	0.047625	+/- 8	< 0.4	< 2	0.447	10	0.06
NA08A30	30	0.047625	+/- 8	< 0.4	< 2	0.447	10	0.07
NA08B16	16	0.09525	+/- 8	< 0.4	< 2	0.893	28	0.06
NA08B30	30	0.09525	+/- 8	< 0.4	< 2	0.893	28	0.07
NA11B16	16	0.09921875	+/- 8	< 0.4	< 2	0.930	20	0.14
NA11B30	30	0.09921875	+/- 8	< 0.4	< 2	0.930	20	0.15
NA11B60	60	0.09921875	+/- 8	< 0.4	< 2	0.930	20	0.16
NA14B16	16	0.09525	+/- 8	< 0.4	< 2	0.893	10	0.14
NA14B30	30	0.09525	+/- 8	< 0.4	< 2	0.893	10	0.21
NA14B60	60	0.09525	+/- 8	< 0.4	< 2	0.893	10	0.22
NA23C60	60	0.1984375	+/- 8	< 0.4	< 2	0.930	17	0.74
NA34C60	60	0.1984375	+/- 8	< 0.4	< 2	0.930	4	2.63

Motorized Translation Stages: T-LS

- **Integrated stage, motor, and controller**
- **Mount multiple stages in XY or XYZ configuration**
- **Daisy-chain and control multiple stages through a single serial port**
- **Manual control knob lets you move the stage at variable speeds**

Zaber's T-LS series products are computer controlled motorized translation stages with 0.1 μm resolution, available with either 13 mm or 28 mm travel. They mount together in XY configuration or XYZ configuration with our AB90 angle bracket.

Installation

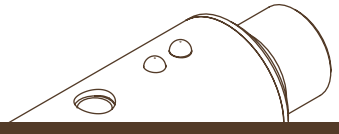
One or more stages can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices, including any T-Series products, can be daisy-chained to a single port. Convenient 6-pin mini din cables on the stage allow for direct interconnection between devices in close proximity. For longer distances, we offer standard cable extensions.

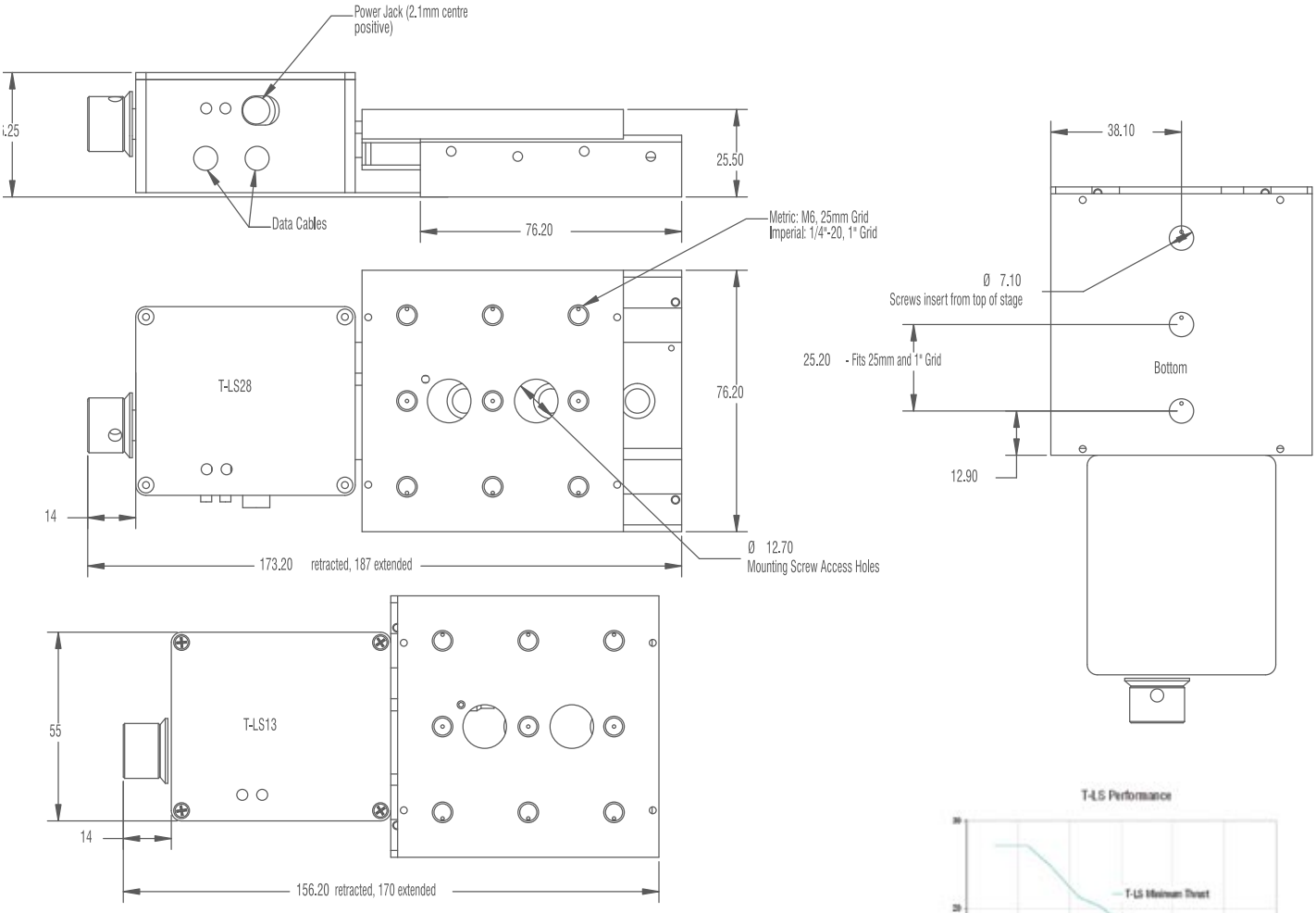
Computer Control

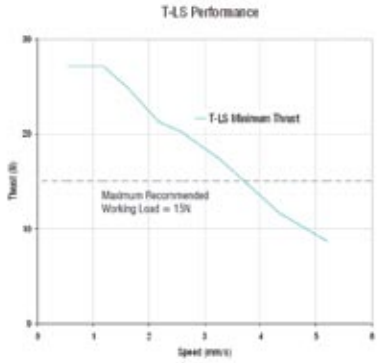
We provide software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the stage reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

An optional knob permits smooth manual control at variable speeds in both directions. During a manual move the stage's position is constantly transmitted to the computer and is displayed by the software. The knob allows you to use the stage even without a computer.







Motorized Linear Stages: T-LS

Model	Travel Range (mm)	Microstep Size (Resolution) (µm)	Accuracy (µm)	Repeat-ability (µm)	Backlash (µm)	Minimum Speed (µm/s)	Maximum Speed (mm/s)	Maximum Centred Load (N)	Maximum Cantilever Load (N·cm)	Maximum Thrust (N)	Weight (kg)
T-LS13-I	13	0.099	+/- 10	< 0.4	< 4	0.93	4	100	125	15	0.57
T-LS13-M	13	0.099	+/- 10	< 0.4	< 4	0.93	4	100	125	15	0.57
T-LS13-SI	13	0.099	+/- 10	< 0.4	< 4	0.93	4	100	125	15	0.57
T-LS13-SM	13	0.099	+/- 10	< 0.4	< 4	0.93	4	100	125	15	0.57
T-LS28-I	28	0.099	+/- 10	< 0.4	< 4	0.93	4	100	125	15	0.59
T-LS28-M	28	0.099	+/- 10	< 0.4	< 4	0.93	4	100	125	15	0.59
T-LS28-SI	28	0.099	+/- 10	< 0.4	< 4	0.93	4	100	125	15	0.59
T-LS28-SM	28	0.099	+/- 10	< 0.4	< 4	0.93	4	100	125	15	0.59

Motorized Linear Slides: T-LSR

- **Integrated motor and controller**
- **Daisy-chain and control multiple devices through a single serial port**
- **Ready to assemble in XY or XYZ configuration**

Zaber's T-LSR series products are computer controlled motorized linear slides with travel ranges from 75 mm up to 450 mm. Slides are available with various leadscrew pitches so you can select the device with the resolution and speed capability you need. Zaber's innovative slide design is capable of speeds up to 80 mm/s, and can support loads up to 20 kg. These slides are ready for assembly in XY or XYZ configuration with no additional hardware required.

Installation

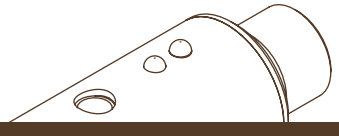
One or more slides can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices, including any T-Series products, can be daisy-chained to a single port. Convenient 6-pin mini din cables on the slide allow for direct interconnection between devices in close proximity. For longer distances, we offer standard cable extension.

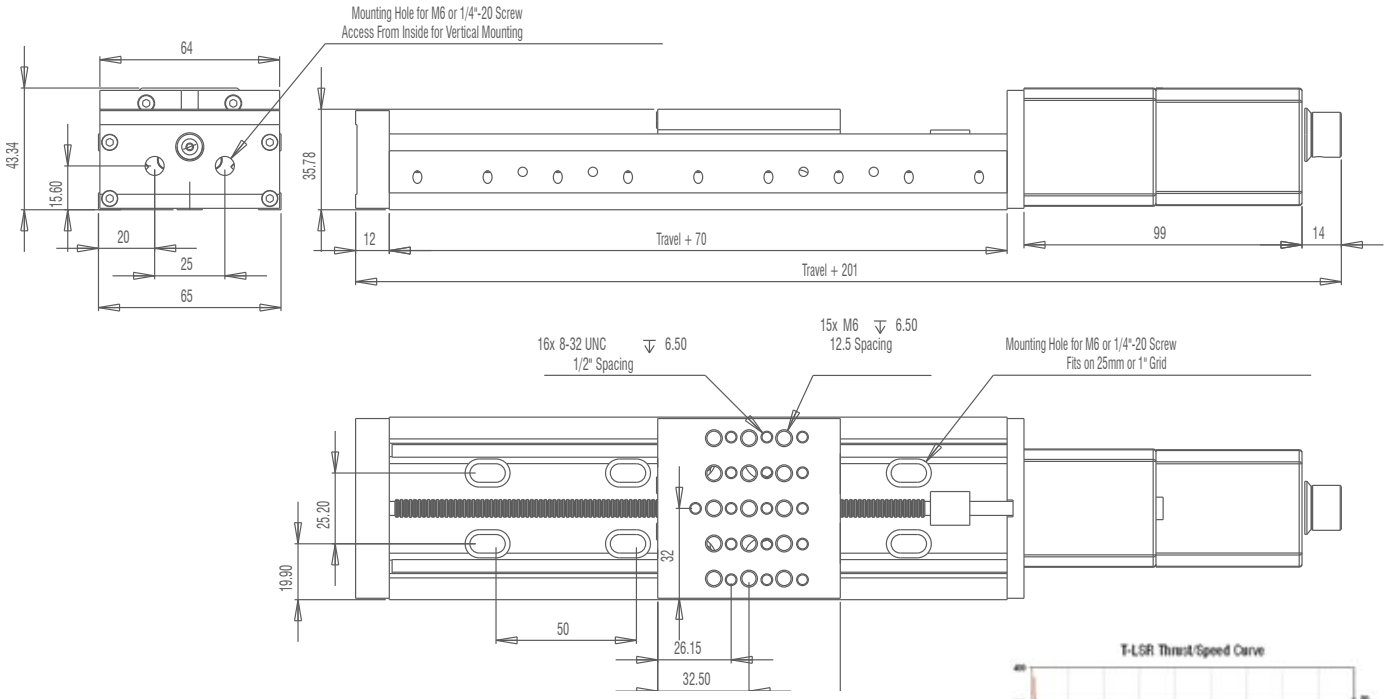
Computer Control

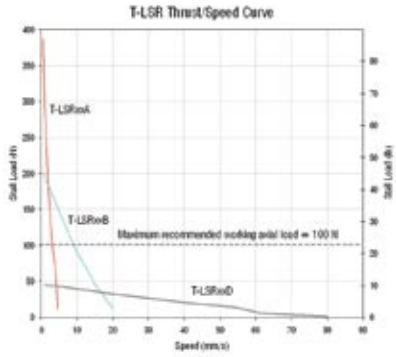
We provide software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the slide reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

A convenient knob permits smooth manual control at variable speeds in both directions. During a manual move the slide's position is constantly transmitted to the computer and is displayed by the software. The knob allows you to use the stage even without a computer.



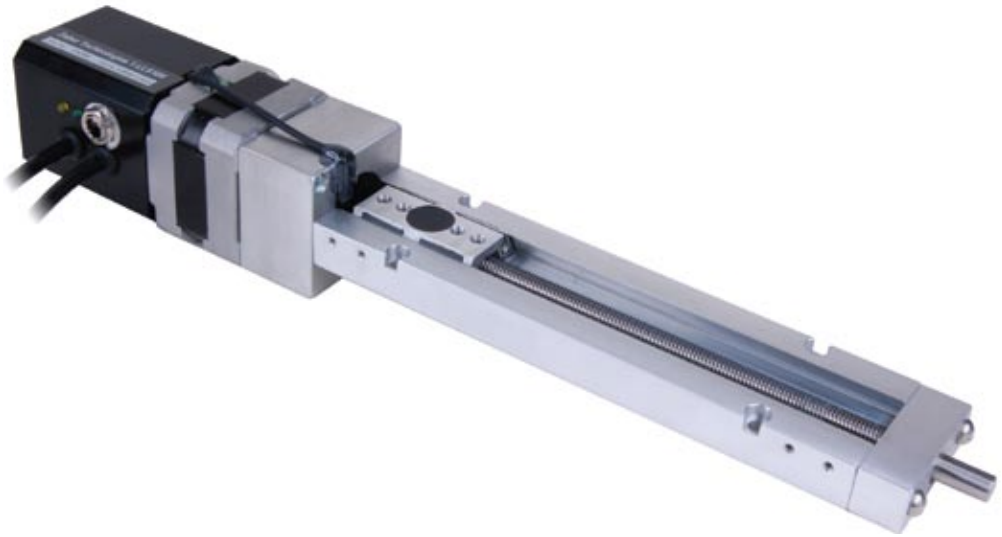




Motorized Linear Slides: T-LSR

Model	Travel Range (mm)	Microstep Size (Resolution) (µm)	Accuracy (µm)	Repeatability (µm)	Backlash (µm)	Minimum Speed (µm/s)	Maximum Speed (mm/s)	Maximum Centred Load (N)	Maximum Cantilever Load (N-cm)	Weight (kg)
T-LSR75A	75	0.099	+/- 11	< 2.5	< 5	0.93	4	200	200	1.2
T-LSR75B	75	0.496	+/- 7	< 2.5	< 7	4.65	20	200	200	1.2
T-LSR75D	75	1.984	+/- 20	< 3	< 20	18.6	80	200	200	1.2
T-LSR150A	150	0.099	+/- 22	< 2.5	< 5	0.93	4	200	200	1.4
T-LSR150B	150	0.496	+/- 7	< 2.5	< 7	4.65	20	200	200	1.4
T-LSR150D	150	1.984	+/- 20	< 3	< 20	18.6	80	200	200	1.4
T-LSR300A	300	0.099	+/- 45	< 2.5	< 5	0.93	4	200	200	1.8
T-LSR300B	300	0.496	+/- 15	< 2.5	< 7	4.65	20	200	200	1.8
T-LSR300D	300	1.984	+/- 20	< 3	< 20	18.6	80	200	200	1.8
T-LSR450A	450	0.099	+/- 67	< 2.5	< 5	0.93	4	200	200	2.3
T-LSR450B	450	0.496	+/- 22	< 2.5	< 7	4.65	20	200	200	2.3
T-LSR450D	450	1.984	+/- 22	< 3	< 20	18.6	80	200	200	2.3

Motorized Dovetail Slides: T-LLS



- **Integrated slide, motor, and controller**
- **Ideal for single axis motion up to 260 mm**
- **Daisy-chain and control multiple devices through a single serial port**
- **Manual control knob lets you move the slide at variable speeds**

Zaber's T-LLS series products are computer controlled linear dovetail slides with 0.16 μm resolution, available in 105 mm and 260 mm travel ranges.

The T-LLS series is ideal for single axis applications. For XY and XYZ configurations, we recommend T-LSR motorized linear slides.

Installation

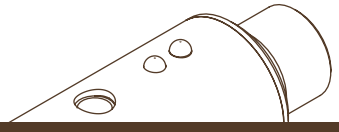
One or more slides can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices, including any T-Series products, can be daisy-chained to a single port. Convenient 6-pin mini din cables on the slide allow for direct interconnection between devices in close proximity. For longer distances, we offer standard cable extensions.

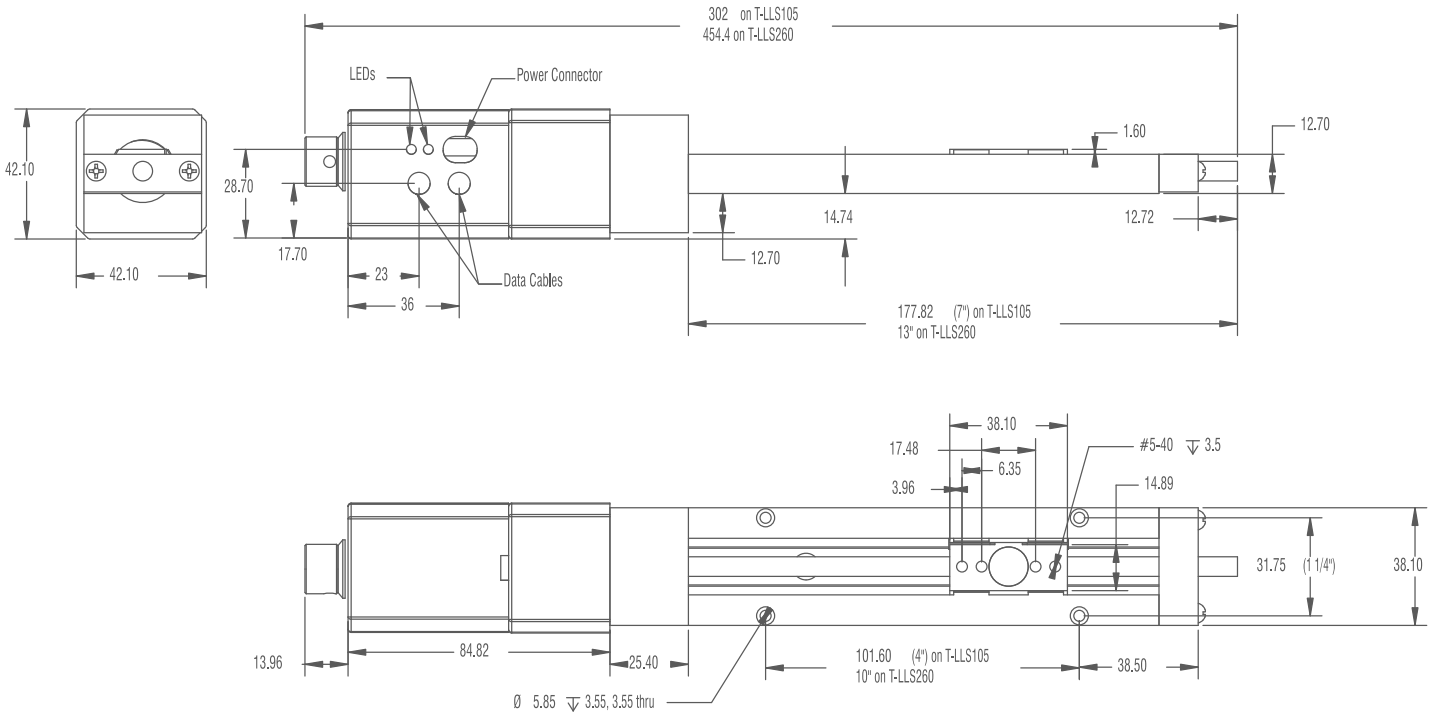
Computer Control

We provide software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the slide reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

A convenient knob permits smooth manual control at variable speeds in both directions. During a manual move the slide's position is constantly transmitted to the computer and is displayed by the software. The knob allows you to use the slide even without a computer.





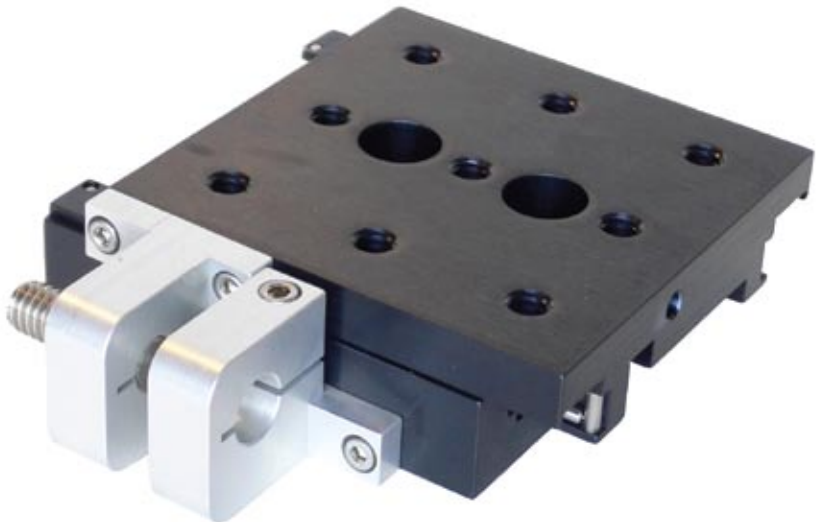
Motorized Dovetail Slides: T-LLS

Model	Travel Range (mm)	Microstep Size (Resolution) (µm)	Accuracy (µm)	Repeat-ability (µm)	Backlash (µm)	Minimum Speed (µm/s)	Maximum Speed (mm/s)	Maximum Centred Load (N)	Maximum Cantilever Load (N·cm)	Maximum Thrust (N)	Weight (kg)
T-LLS105	105	0.156	+/- 15	< 0.5	< 16	1.4	6	14	80	90	0.55
T-LLS105-S	105	0.156	+/- 15	< 0.5	< 16	1.4	6	14	80	90	0.55
T-LLS260	260	0.156	+/- 15	< 0.5	< 16	1.4	6	14	80	90	0.7
T-LLS260-S	260	0.156	+/- 15	< 0.5	< 16	1.4	6	14	80	90	0.7

We are convinced of the quality of Zaber products and highly satisfied by their delivery and reliability.

– Bastian Dzeia, Dipl.-Ing.(FH) Product Manager, LINOS Photonics GmbH & Co. KG, Germany

Manual Translation Stages: TSB



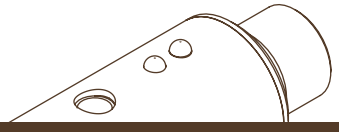
- **Compatible with Zaber's T-NA, T-LA, and NA11 actuators**
- **Mounts directly to most Zaber stages**
- **Reversible mounting bracket allows left-hand or right-hand operation**
- **Brackets have a convenient clamping mechanism for easy adjustments**

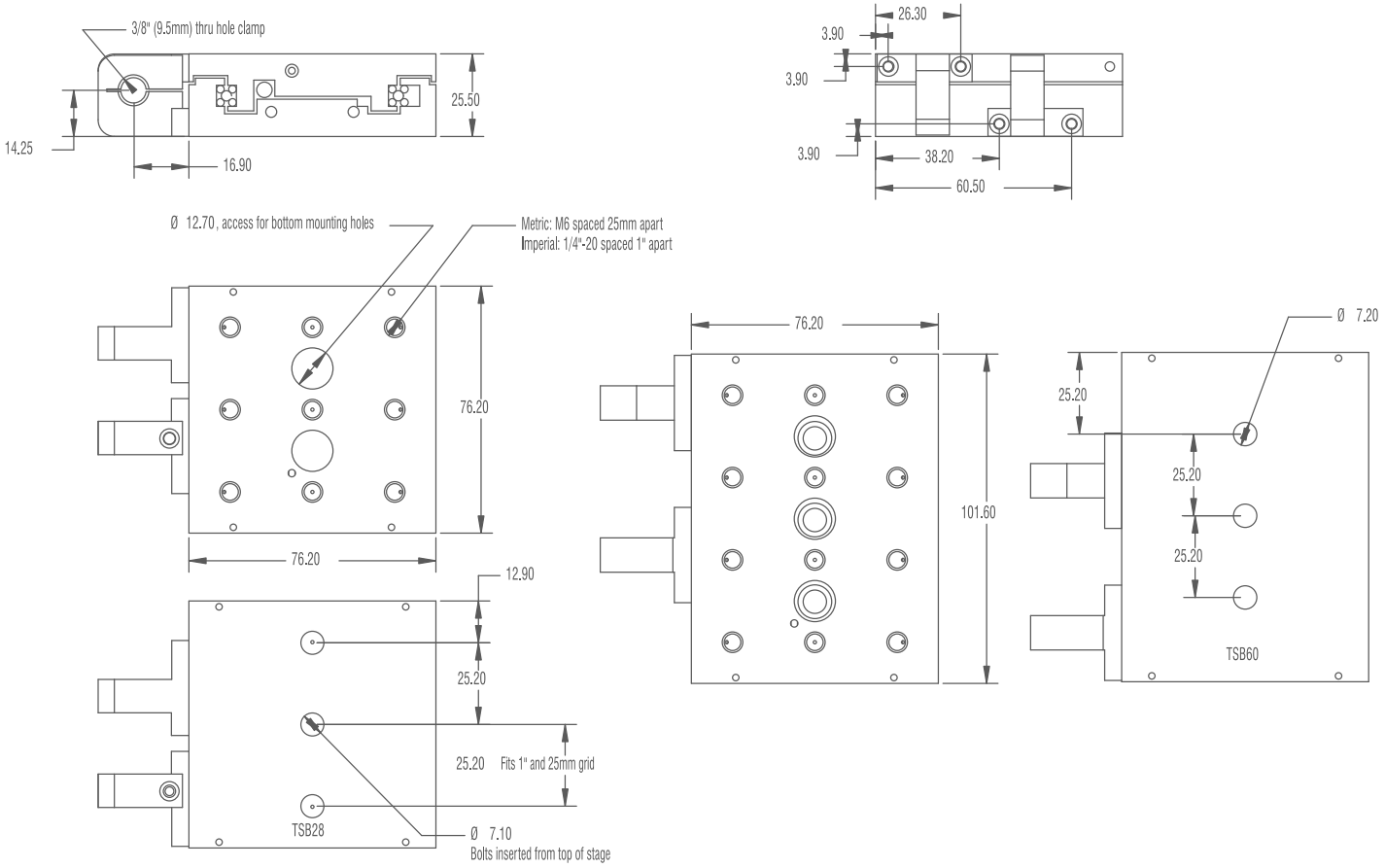
Zaber's TSB ball bearing translation stages are available in two sizes, offering either 28 mm or 60 mm of travel. TSB stages ensure smooth and accurate motion: they are made from precision-machined anodized aluminum, with precision-ground rails and ball bearings. Choose from either metric M6 mounting holes on 25 mm spacing, or imperial 1/4″-20 mounting holes on 1″ spacing.

Vacuum compatible stages (TSBxx-xV) use vacuum compatible grease and non-anodized components. They are rated for 10^{-6} Torr.

Installation

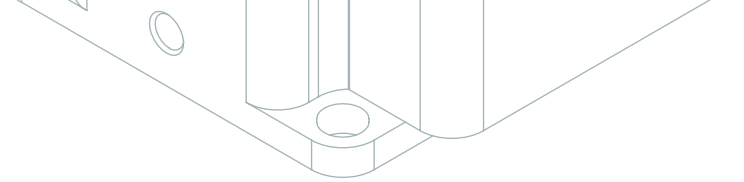
Each stage includes a pair of actuator mounting brackets that include a convenient clamping mechanism to grip actuators, and are easily adjusted or locked in place. The mounting brackets are compatible with Zaber actuators: the standard 9.5 mm brackets fit our T-NA and T-LA series of actuators; if you want to use our NA11 actuators, we offer optional 14 mm brackets. TSB stages can be mounted directly in XY configuration. Optional AB90 angle brackets are available for mounting in XYZ configuration.





Linear Translation Stages: TSB

Model	Travel Range (mm)	Maximum Centred Load (N)	Maximum Cantilever Load (N-cm)	Stage Parallelism (μm)	Vacuum Compatible	Mounting Thread
TSB28-I	28	100	125	< 100	No	1/4″-20
TSB28-IV	28	100	125	< 100	Yes	1/4″-20
TSB28-M	28	100	125	< 100	No	M6
TSB28-MV	28	100	125	< 100	Yes	M6
TSB60-I	60	100	125	< 100	No	1/4″-20
TSB60-IV	60	100	125	< 100	Yes	1/4″-20
TSB60-M	60	100	125	< 100	No	M6
TSB60-MV	60	100	125	< 100	Yes	M6



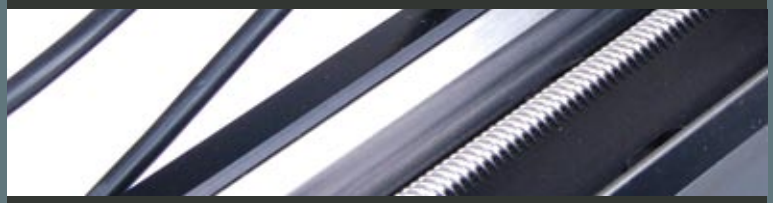
T-JOY3 Joystick

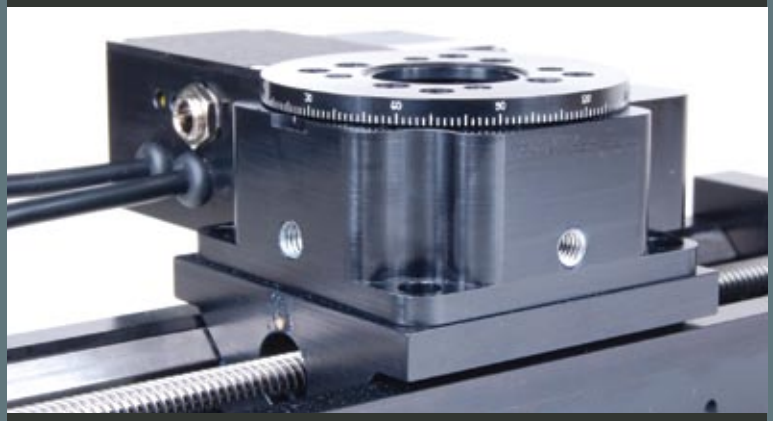
At Zaber we often develop products in direct response to customer requests. Our programmable joystick, the T-JOY3, is a classic example. We had been getting a lot of requests for a joystick that could be used for manual control of our products mounted in XY, XYZ, or XY-rotary configurations. Many customers wanted to position something under a microscope or camera: X and Y would adjust the position and Z would adjust the focus or magnification.

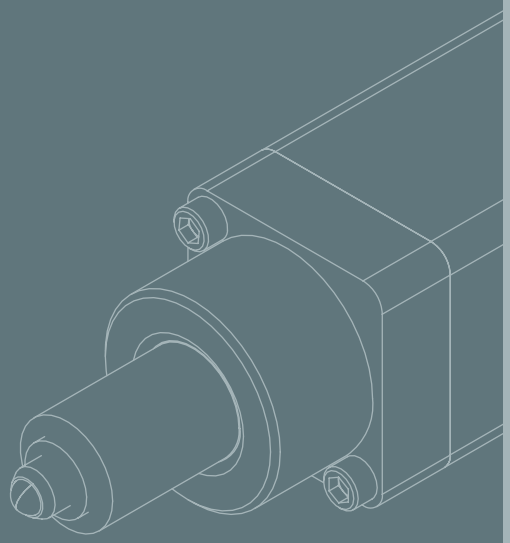
We had a lot of success in the concept stage so we were able to design, test, and launch the T-JOY3 in a matter of months. I was happy to see the project completed so quickly. I was even happier to see orders start coming in, followed by positive feedback from customers.

– Andrew Lau, Product Manager, Zaber Technologies

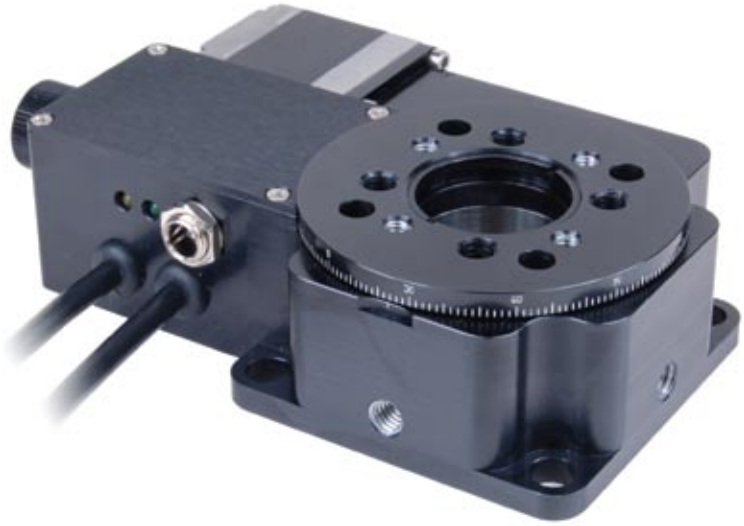
Rotary







Motorized Rotary Stage: T-RS



- **Continuous 360° rotation stage with built-in controller**
- **Home sensor at 0°**
- **0.00023° resolution**
- **Through-hole for 1″ optics**

Zaber's T-RS60 rotary stage provides precise, continuous 360° rotation in a compact package. The robust bearing design allows the stage to handle up to 45 kg (99 lb) of load. A precision worm gear provides a 120:1 ratio allowing a stage resolution of 0.00023°. The built-in controller makes set-up a snap: just connect the stage to a computer and it is ready to use.

Installation

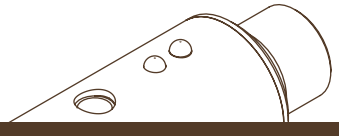
One or more stages can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices, including any T-Series products, can be daisy-chained to a single port.

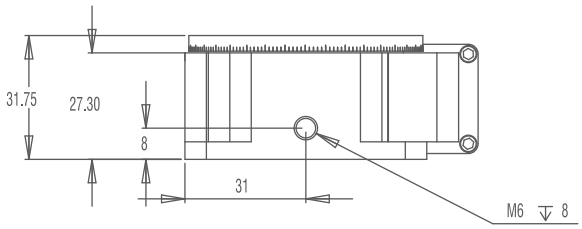
Computer Control

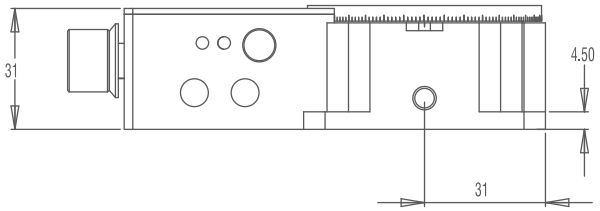
We provide software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the stage reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

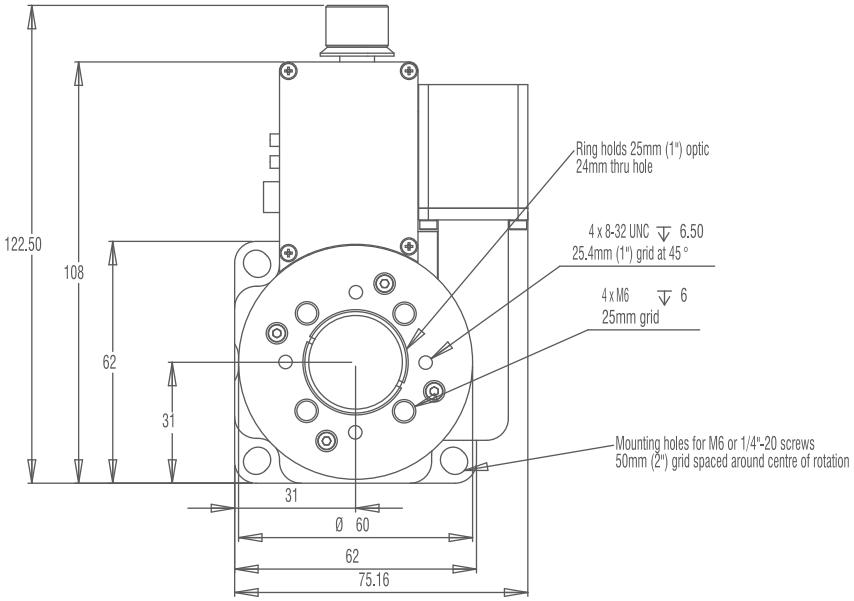
Manual Control

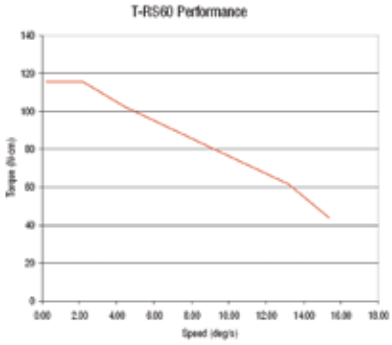
A convenient knob permits smooth manual control at variable speeds in both directions. During a manual move the stage's position is constantly transmitted to the computer and is displayed by the software. The knob allows you to use the rotary stage even without a computer.











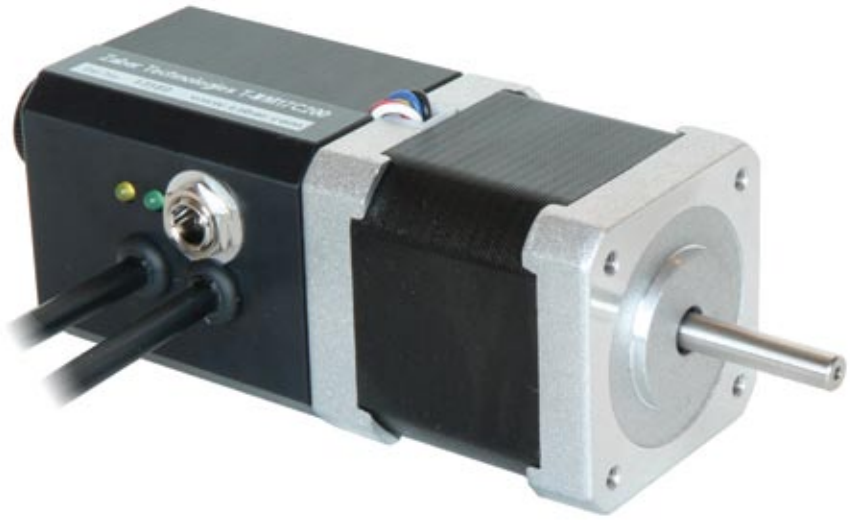
Motorized Rotary Stages: T-RS

Model	Microstep Size (Resolution) (°)	Maximum Centred Load (N)	Accuracy (°)	Repeatability (°)	Backlash (°)	Minimum Speed (°/s)	Maximum Speed (rpm)	Maximum Torque (N·cm)	Weight (kg)
T-RS60	0.00023	450	+/- 0.05	< 0.02	< 0.05	0.00018	2.2	115	0.48

My favourite part about working at Zaber is that everyone is very open-minded, supportive, and knowledgeable. I am currently halfway through a master's degree in business administration, which frequently requires me to do assignments that apply to my workplace. It's great to be able to approach my co-workers and superiors with ideas and questions about the company. Working with people who really support my decision to further my studies has made the whole process a lot easier.

– Bryan Cassidy, Marketing, Zaber Technologies

Stepper Motors with Built-In Controllers: T-NM



- **Integrated motor and controller**
- **Manual control knob lets you move the stepper motor at variable speeds**
- **Daisy-chain and control multiple devices through a single serial port**

Zaber's T-NM products are computer controlled stepper motors with 0.028° resolution. The stepper motor is matched to the built-in controller, so there's no need to fiddle with parameters.

Installation

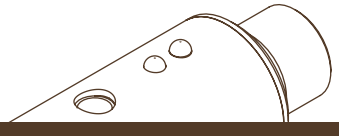
One or more T-NM devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices, including any T-Series products, can be daisy-chained to a single port.

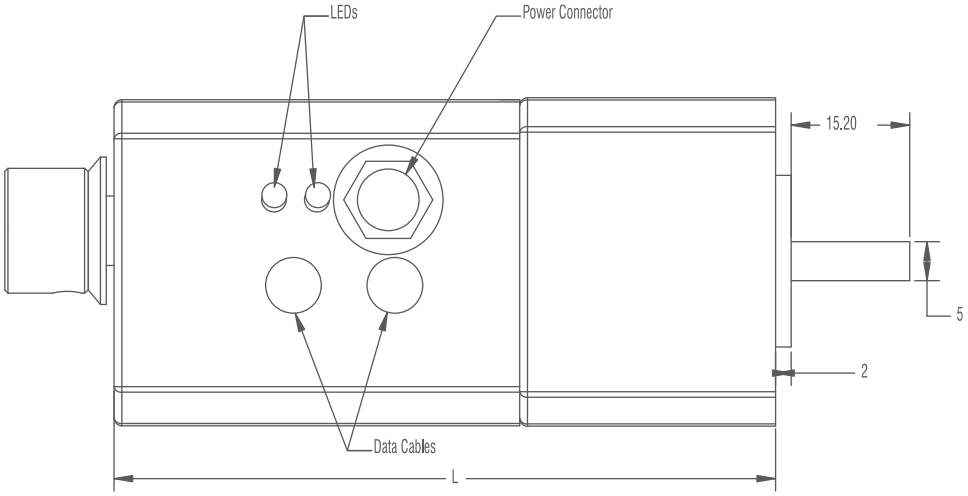
Computer Control

We provide software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the device reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

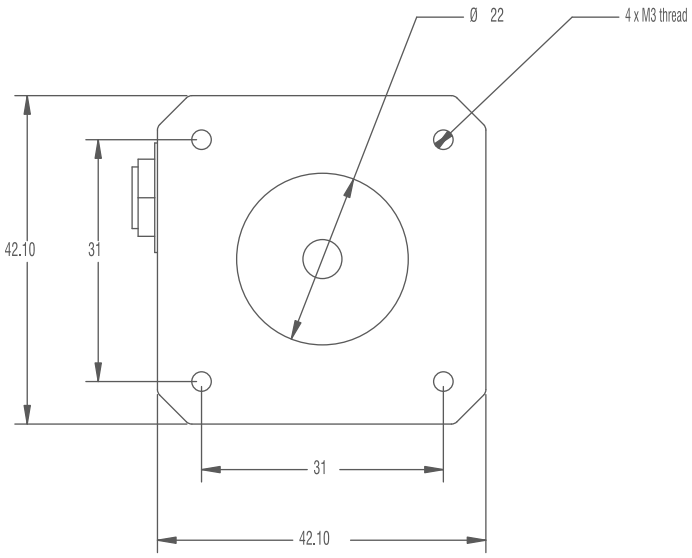
An optional knob at the end of the unit permits smooth manual control at variable speeds. Turn the knob a little and the unit will move at its minimum speed or turn it all the way for maximum speed. During a manual move the motor constantly transmits its position so the controlling computer can track it.





Dimensions

Model	L (mm)
T-NM17A	84.8
T-NM17C	99



Stepper Motors with Built-In Controllers: T-NM

Model	Microstep Size (Resolution) (°)	Accuracy (°)	Repeatability (°)	Minimum Speed (°/s)	Maximum Speed (rpm)	Maximum Torque (N·cm)	Weight (kg)
T-NM17A200	0.0281	+/- 0.5	< 0.1	0.264	180	20.6	0.31
T-NM17A200-S	0.0281	+/- 0.5	< 0.1	0.264	180	20.6	0.31
T-NM17C200	0.0281	+/- 0.5	< 0.1	0.264	180	31.4	0.4
T-NM17C200-S	0.0281	+/- 0.5	< 0.1	0.264	180	31.4	0.4

Stepper Motors: NM

- **Available in several sizes for a variety of torques and speeds**
- **Resolution down to 0.028°**
- **Designed for use with T-CD stepper motor controllers**

Zaber's NM series motors offer a wide range of size, torque, and speed options not available in our motors with built-in controllers. NM series motors are available with speeds up to 1400 rpm and torque up to 650 N·cm (900 oz·in).

Installation

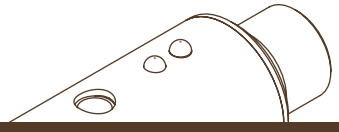
The NM series motors are designed to connect directly to our T-CD stepper motor controllers (purchased separately). The T-CD controllers can be daisy-chained with each other or any of Zaber's T-Series products.

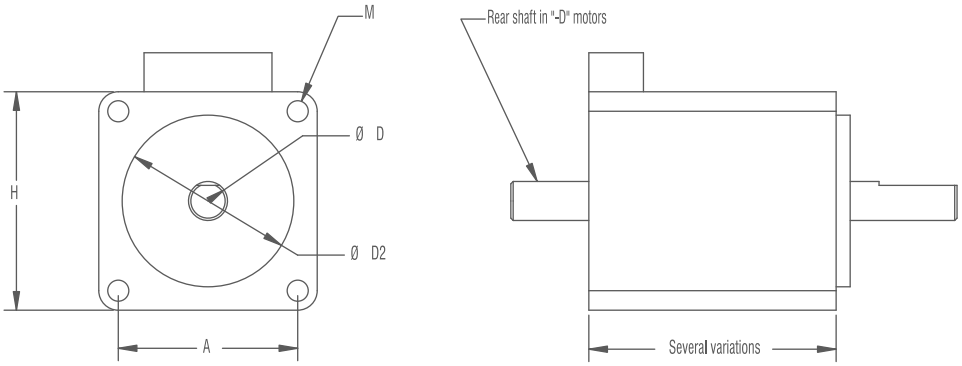
Computer Control

We provide software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the controller reports the new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

A convenient knob on the T-CD controller permits smooth manual control at variable speeds in both directions. During a manual move the motor's position is constantly transmitted to the computer and is displayed by the software. The knob on the T-CD controller allows you to use the NM motor even without a computer.





See www.zaber.com for details

Dimensions

Series	H (mm)	A (mm)	D (mm)	D2 (mm)	M
NM08	20	15.4	4	16	M2 Thread
NM11	28	23	5	22	M2.5 Thread
NM17	42.2	31	5	22	#4-40 Thread
NM23	56.4	47.1	6.35	38.1	4.75 Hole
NM34	85	69.6	12.7	73	6.5 Hole

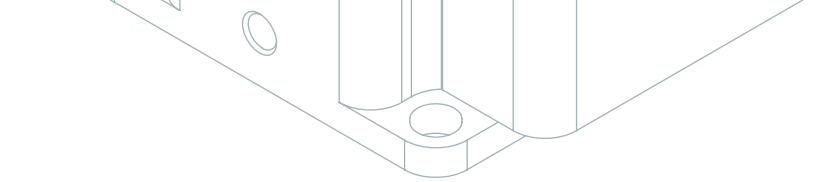
Stepper Motors: NM

Series *	Microstep Size (Resolution) (°)	Accuracy (°)	Repeatability (°)	Minimum Speed (°/s)	Maximum Speed (rpm)	Maximum Torque (N·cm)	Current Rating (mA/phase)	Weight (kg)
NM08	0.0281	+/- 1	< 0.1	0.1318	Up to 1407	Up to 2.8	Up to 800	Up to 0.06
NM11	0.0281	+/- 1	< 0.1	0.1318	Up to 1167	Up to 12	Up to 670	Up to 0.2
NM17	0.0281	+/- 1	< 0.1	0.1318	Up to 417	Up to 32	Up to 1200	Up to 0.35
NM23	0.0281	+/- 1	< 0.1	0.1318	Up to 700	Up to 135	Up to 1000	Up to 1.0
NM34	0.0281	+/- 1	< 0.1	0.1318	Up to 202	Up to 657	Up to 2000	Up to 3.8

* Due to the large number of NM models available, this table shows data for each series rather than for individual models. See our web site for more complete information on specific motors.

One of our primary goals at Zaber has always been to hire people who will enjoy their work. Our hobbies and interests are reflected in the roles we play within the company, and most of us would be doing much the same work whether we were being paid to or not. People who work happy work better, and that is reflected in the quality of our products and customer service.

– Rob Steves, President, Zaber Technologies



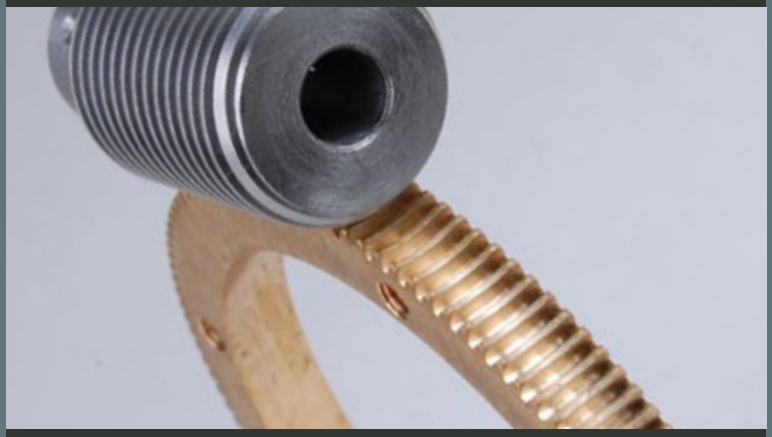
T-LSR Linear Slide

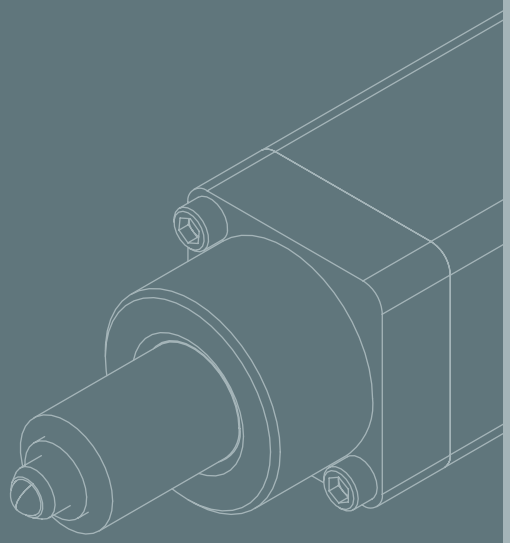
A lot of people were requesting linear slides with longer travel and higher speed than what we had. In particular, I remember one customer who wanted to position a 20 kg camera to within 0.1 µm resolution, and another who wanted to shake a mobile phone at 10 Hz to see how long it would take to fail. There was a real demand to move things faster, and to move things much heavier than a sensor or a petri dish. Many people also wanted to mount their slides in XY or XYZ configurations. These needs formed the basis for the design of our T-LSR series slides.

There were some frustrating moments during lifetime testing of the alpha prototype. Some of the initial component choices were inadequate, but after revising the design a few times we finally reached a point where we were really happy with it. Apparently, so are our customers! The T-LSR turned out to be more of a success than any of us expected. I'm looking forward to developing the next longer, faster, stronger version.

– Jesse Schuhlein, Product Manager, Zaber Technologies

Tilt





Motorized Mirror Mounts: T-MM

- **Two axis mirror mount with built-in controller**
- **Clear aperture accepts standard 2˝ diameter optics (mirrors, filters, or lenses)**
- **+/- 5.27° tilt**

The T-MM2 is a computer controlled two axis mirror mount with 1.5 μrad (0.000086°) resolution. It is a stand-alone unit requiring only a 15 V power supply. It has a built-in controller for each axis, so that you can easily control each axis independently.

Installation

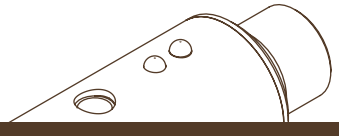
One or more mirror mounts can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices, including any T-Series products, can be daisy-chained to a single port.

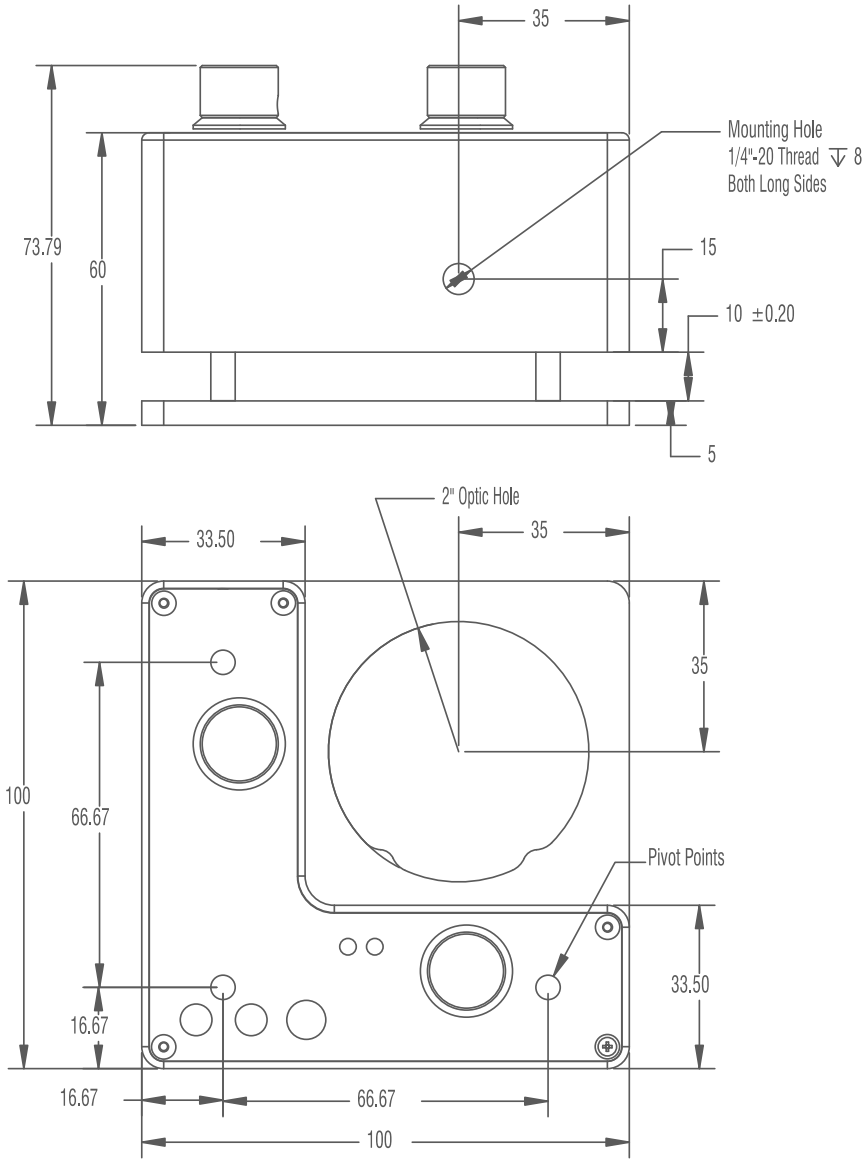
Computer Control

We provide software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like “move absolute”), and enter the desired position. After the move, the mirror mount reports the new position of each axis. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

Convenient knobs on the back of the mirror mount permit smooth manual control of each axis. Turn one of the knobs a little and the actuator for the corresponding axis moves at its minimum speed, or turn the knob fully for maximum speed. During a manual move the mirror mount’s position is constantly transmitted to the controlling computer and is displayed by the software. You can use the mirror mount without a computer as well, simply using the manual knobs for all adjustments.





Motorized Mirror Mounts: T-MM

Model	Travel Range (°)	Microstep Size (Resolution) (°)	Accuracy (°)	Repeatability (°)	Maximum Speed (°/s)	Weight (kg)
T-MM2	+/- 5.27	0.000086	+/- 0.01	< 0.0005	3.44	0.55

WITec GmbH

www.witec.de

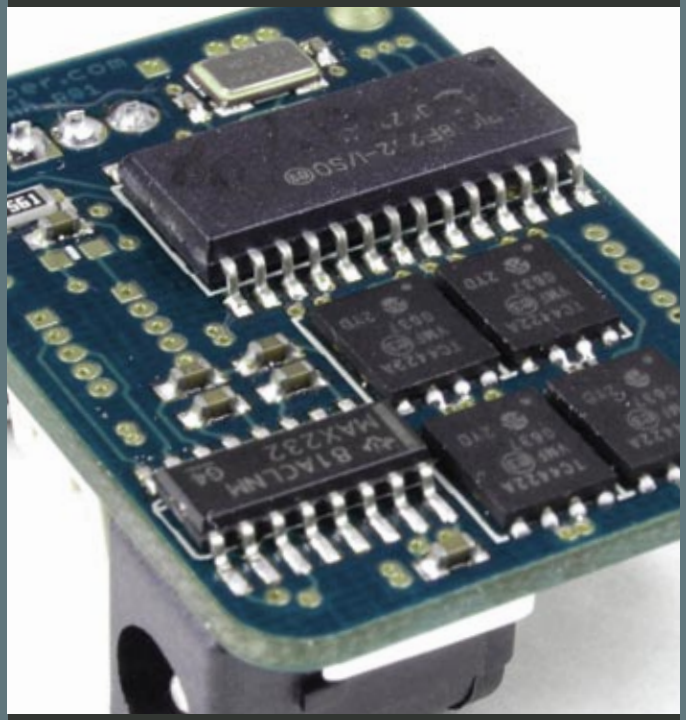
WITec is a manufacturer of high performance optical and scanning probe microscopy systems solutions for scientific and industrial applications. A modular product line allows the combination of different microscopy techniques such as Raman, NSOM, or AFM in one instrument for flexible analyses of optical, chemical, and structural properties of a sample. The instruments are distributed worldwide and are mainly used in materials sciences, life sciences, and nanotechnology. WITec Headquarters are based in Ulm, Germany, and Savoy, IL, USA.

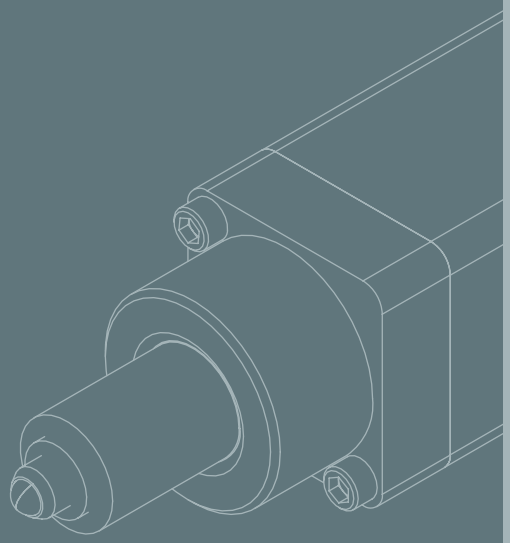
We integrate three Zaber T-LA28A-S actuators in our Scanning Near-Field Optical Microscope alpha 300 S for moving the inverted microscope's objective in three axes. An additional actuator is used for conveniently moving a filter slider. The T-LA28A-S gives us a resolution of 100 nm, perfectly matching our demanding requirements in high-resolution microscopy.

We favour the Zaber actuators because they can be easily activated by our microscope control electronics and software, and because we can easily connect several actuators in one system.

– WITec GmbH

Controllers





Stepper Motor Controllers: T-CD

- **Controls any bipolar stepper motor or actuator up to 2.5 A/phase**
- **Manual control knob so that you can move the device at variable speeds**
- **Mounts easily to panel, lab bench, or electronics cabinet**
- **Contains presets for all NA actuators and NM motors**

Zaber's T-CD stepper motor controller is a microstep driver offering microstepping down to 128 microsteps per step. With a typical stepper motor having 200 steps per revolution, the T-CD stepper motor controller allows microstepping down to 25,600 microsteps per revolution. It contains presets for all of our standard NA actuators and NM motors so you can plug them in and issue a single instruction to change all necessary settings to appropriate values. The T-CD controller can also be used with third party bipolar stepper motor devices.

Installation

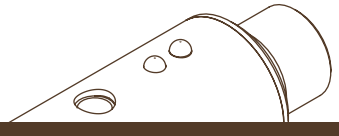
Set-up is a snap. Just connect the controller to the RS-232 port (or USB port with optional adaptor) and plug in a compatible motor or actuator. Multiple devices, including any T-Series products, can be daisy-chained to a single port. Plug in a motor or actuator and you're ready to go.

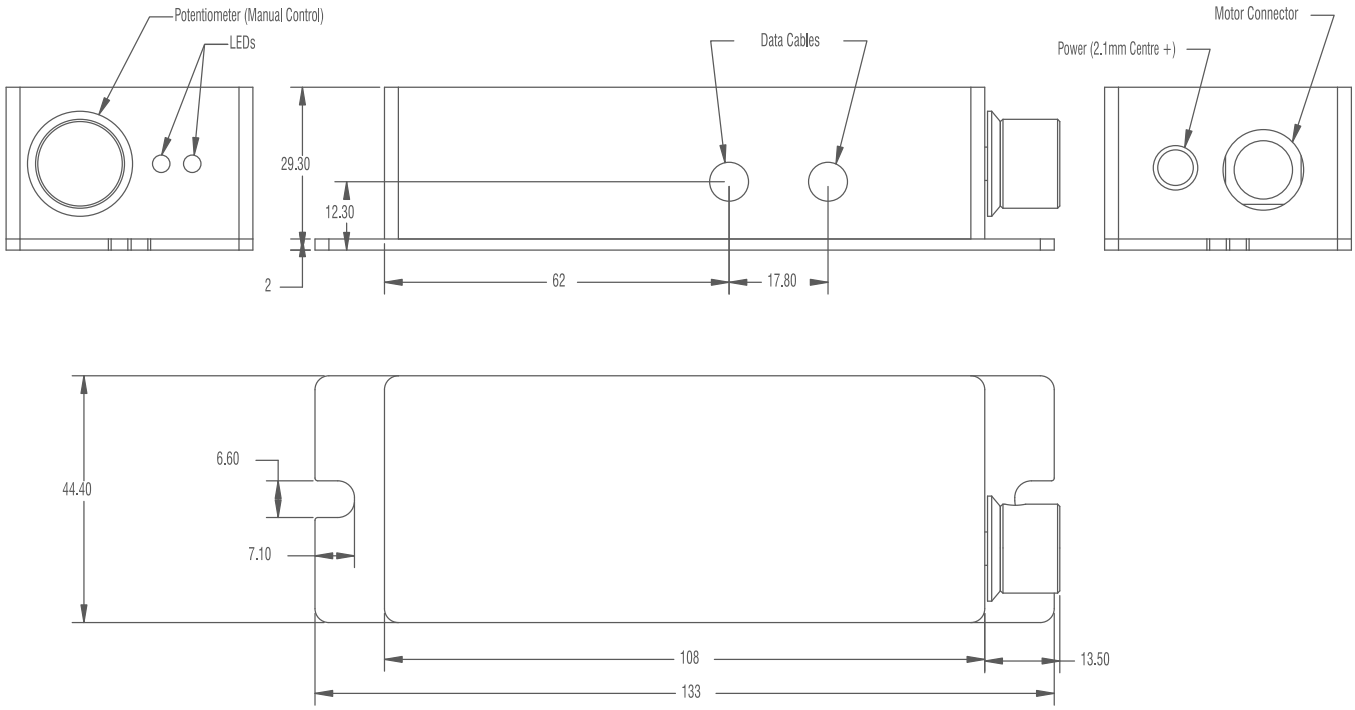
Computer Control

We provide software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the T-CD reports the device's new position. You can also change a variety of settings, such as the running current and hold current, to suit your application's needs.

Manual Control

A convenient knob on the back of the device permits smooth manual control at variable speeds in both directions. During a manual move the T-CD constantly transmits motor or actuator position to the computer so it can be displayed by the software.





Stepper Motor Controller: T-CD				
Model	**Current Output per Phase (mA)**	**Input Voltage (Vdc)**	**Operating Temperature (°C)**	**Weight (kg)**
T-CD1000	1000	12–24	0–75	0.2
T-CD2500	2500	12–24	0–75	0.2

We think that Zaber has three strong points:

1. *You always know that you receive what you order: it is very clear on Zaber's web site where to find and how to receive exactly what you need.*
2. *Full solution: you receive from Zaber a full solution, including software, hardware, power supply, cables, etc.*
3. *Technical support: if you have any technical problems or questions about the software or hardware, you can receive direct and full help from Zaber – even if you are located some distance away.*

– Hezi Koren, TMM, Israel

Programmable Joystick Controller: T-JOY

- **Controls up to three axes with programmable sensitivity and velocity profile**
- **Compact bench-top design enables human interface with or without a computer**
- **Five programmable buttons for functions like store and recall positions**

In stand-alone operation, the T-JOY3 is ideal for XY or XYZ applications. The joystick is intuitive to use, and the buttons are pre-programmed with commands to home the devices, save current positions, and go to saved positions. It is ideal for applications where complex computer control is not required.

For more sophisticated applications, you can connect the T-JOY3 to your computer so both the computer and the joystick can simultaneously control connected motion devices transparently through the daisy-chain. The joystick's five buttons are fully programmable: send any command to the devices connected by the daisy-chain, or trigger the computer to execute pre-programmed command sequences. The software continuously displays the status of the joystick and the devices attached to it. The entire daisy-chain can be controlled through a single RS-232 port (or USB port with optional adaptor) on a laptop or desktop.

One axis is controlled by moving the joystick from left to right, another by moving the joystick from front to back, and a third by rotating the handle. By programming the joystick, you can specify which connected device corresponds to each axis.

Programmable Joystick Controller: T-JOY

Model	Current Draw (mA)	Length (mm)	Width (mm)	Height (mm)
T-JOY3	50	200	122	102

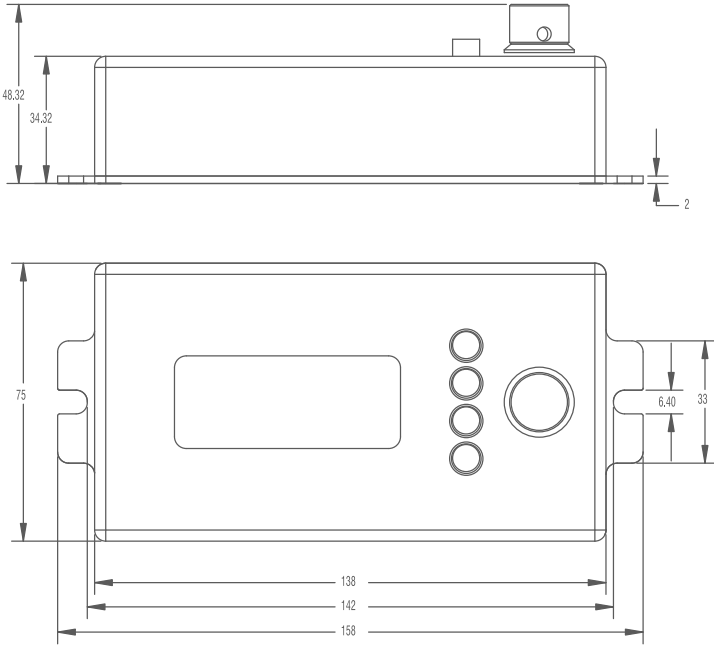
Stand-Alone Device Controller: T-CON

- **Controls up to three T-Series devices**
- **Allows remote device control when no computer is available**
- **Perfect for precise manual step-and-repeat applications**

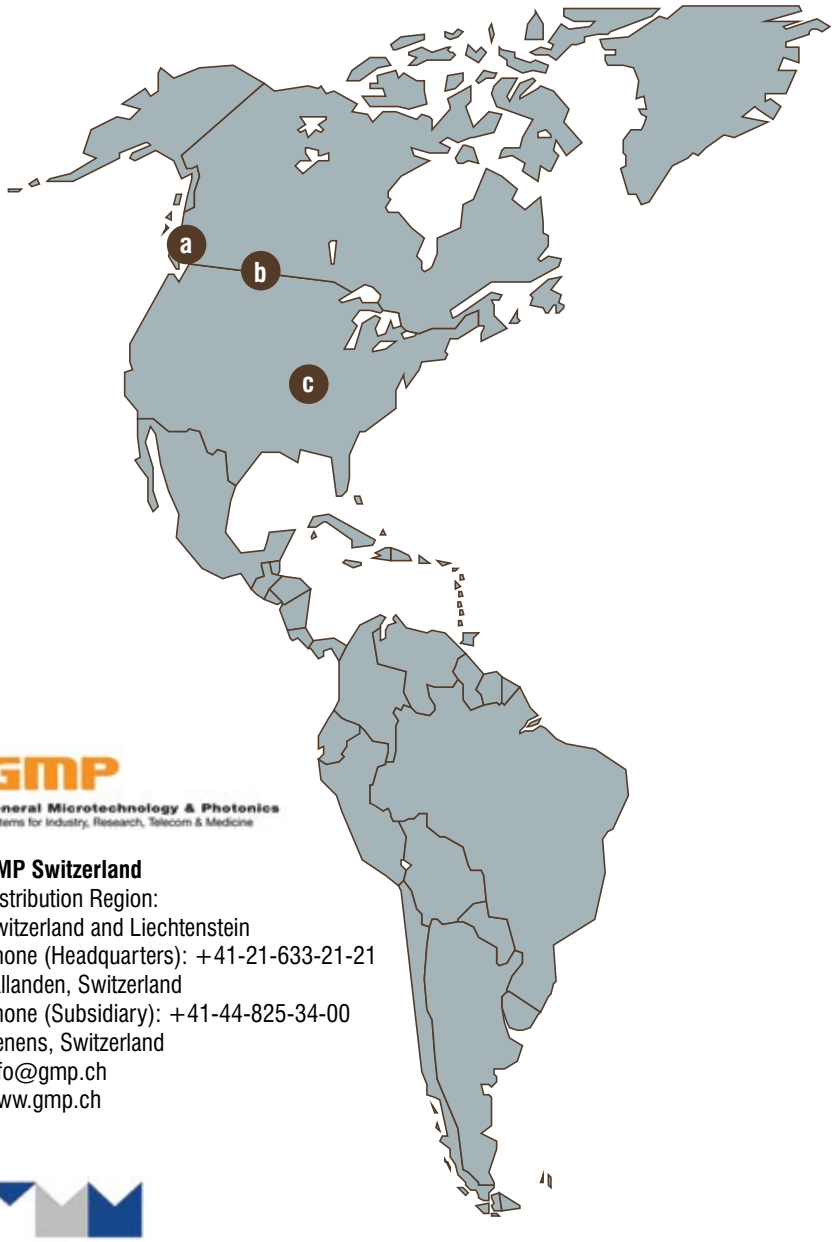
The T-CON3 provides an alternative to controlling our products through a serial port. It is a stand-alone manual positioning system that controls up to three T-Series positioning products. It's great for remote positioning tasks such as vacuum applications in which you don't need automated control, but don't have access to turn micrometer heads manually. A three line position display (one line for each device) lets you control and view the exact position of the devices attached to it.

The T-CON3 can supply power to all connected devices through the data cable. The data cable is a four wire interface (two wires for serial communications and two for power), reducing the number of feed-throughs required in vacuum chamber applications.

The user interface is intuitive and elegant, enabling rapid precision positioning capabilities well beyond those of even the most proficient user with a mechanical micrometer. After playing with the T-CON3 for a minute you will be tempted to use it for all your manual micro-positioning needs.



Distributors



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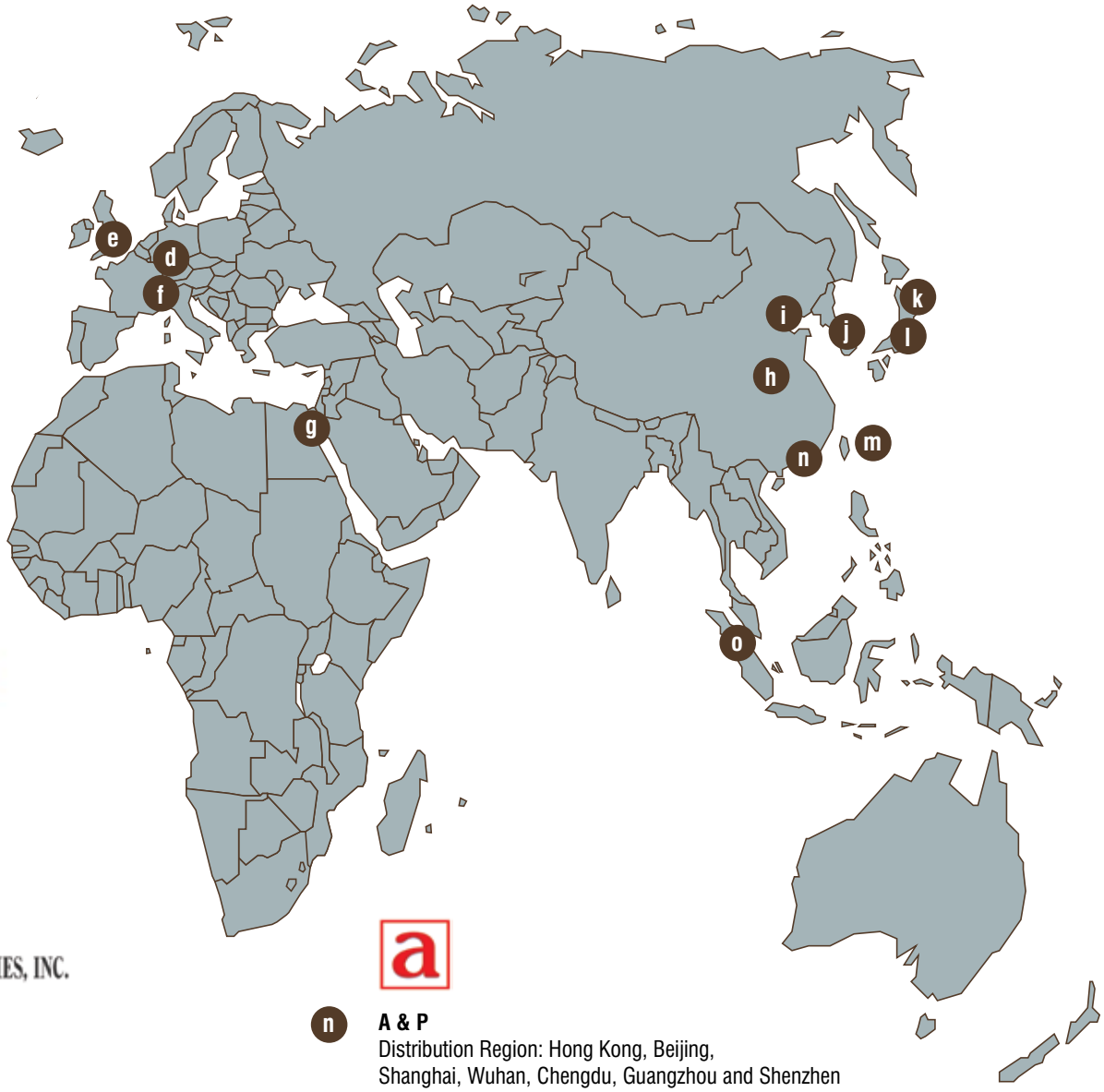

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Accuracy

The maximum deviation between the actual position and the instructed position over the full range of travel.

Backlash (Hysteresis)

The change in actual position that results from approaching the target position from the opposite direction.

Resolution

The smallest increment that a motion control device can be instructed to move (one microstep). The actual motion of the device may be different, due to error, backlash, and other mechanical characteristics.

Horizontal Runout

In the case of a linear stage or slide, this represents the maximum horizontal deviation of the stage from the axis of travel as the device is moved through its full range of motion.

Stage Parallelism

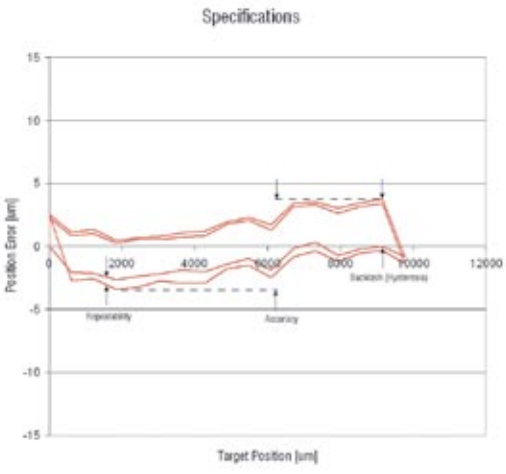
In the case of a linear or rotary stage, this represents the maximum deviation in stage height over the surface of the stage with the stage fixed at any single position in the range of travel. This should not be confused with the Vertical Runout.

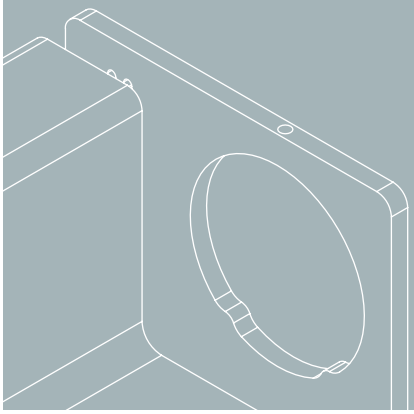
Vertical Runout

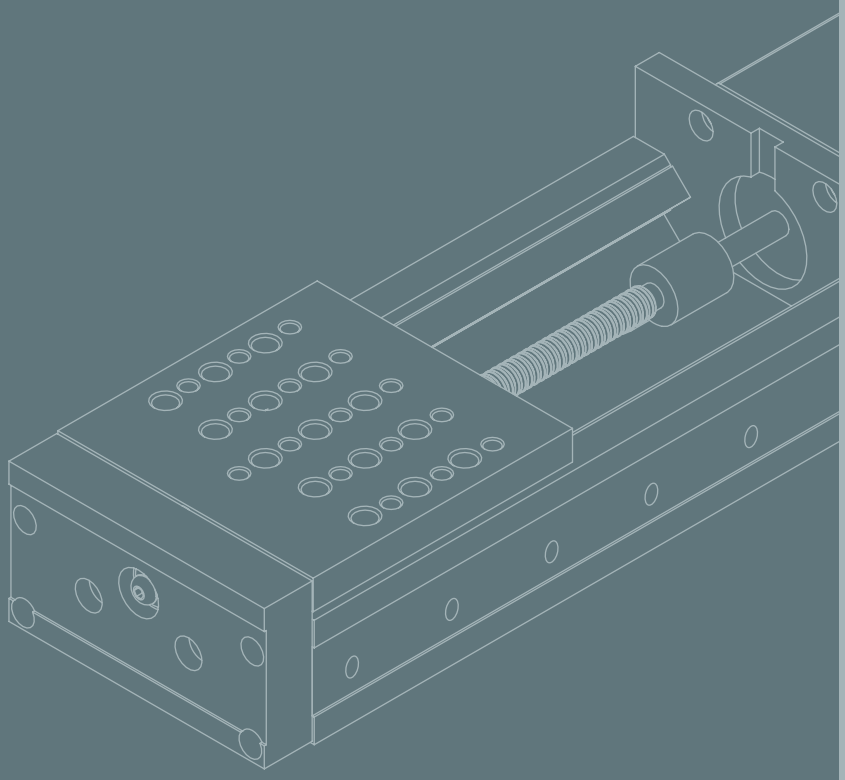
In the case of a linear or rotary stage or slide, this represents the maximum vertical deviation of a point on the stage surface as the device is moved through its full range of motion.

Repeatability

The deviation in actual final position when repeatedly instructing a device to move to a target position, approaching from the same direction every time.







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