LAC Product
User's Manual
Firmware 5.00 and up

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Disclaimer

Zaber’s devices are not intended for use in any critical medical, aviation, or military applications or situations where a product's use or failure could cause personal injury, death, or damage to property. Zaber disclaims any and all liability for injury or other damages resulting from the use of our products.

Precautions

Zaber's motion control devices are precision instruments and must be handled with care. In particular, moving parts must be treated with care. Avoid axial loads in excess of the rated thrust load, axial and radial impact, dust and other contaminants and damage to the leadscrew thread. These will reduce the performance of the device below stated specifications.

Installation

You can mount the actuator by using the 9.5mm mounting shank. Tighten a clamp around the shank or secure the included 3/8-32 screw on the other side of the hole. See the LAC webpage for dimensions and other details. We recommend using an AMB095 or similar for mounting.

Removing Ball Tip

The LAC actuators come with a 2.5mm diameter ball tip. You can remove the ball tip and use the M3 threaded tip. To remove the tip, extend the shaft so you can grip it between your fingers. Hold the spline shaft in one hand and unscrew the ball tip with the other hand. **Caution: Do not unscrew the ball tip while holding the actuator body. This could apply too much torque to the spline and loosen its fit to the internal bushing which can increase backlash and reduce lifetime.** The ball is separate from the ball holder. Be careful not to lose the ball after you loosen the ball holder.

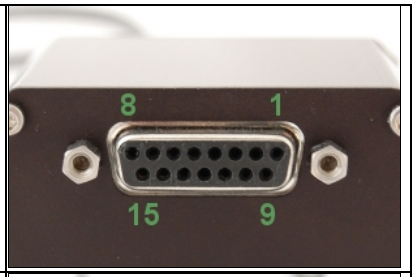
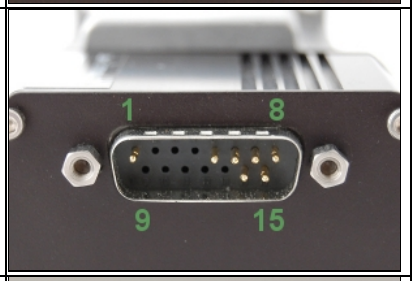
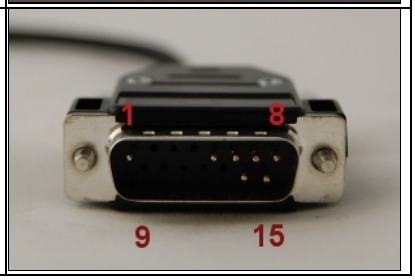
There is an adhesive on the threads of the ball tip to ensure that it does not come off accidentally, so a fair bit of force may be needed to remove the tip. Pliers can be used on the tip, but the spline shaft should only be grasped by hand or with a soft tool (plastic or rubber) to avoid damaging it.

Operation

This unit is designed to be controlled with the A-MCA series chopper drive controllers. See the manual for that device for a list of available settings and commands.

It is important to know the peripheral id of your motor. If you ever need to restore the correct settings for your device, send Set Peripheral ID (command 66) to the controller with the peripheral ID as the data. This ID can also be found on the motor label as "ID XXXXX".

Pinout for D-sub 15 Connectors (A-series controllers and peripherals)

A-series controller (female)	
T3 Peripheral (male)	
T4 Peripheral (male)	

Pin #	Function
1	+5V
2	*reserved*
3	*reserved*
4	*reserved*

5	Home Sensor
6	Ground
7	Motor B1
8	Motor A1
9	+5V *
10	Encoder A *
11	Encoder B *
12	Encoder Index *
13	Ground *
14	Motor B2
15	Motor A2

** encoder embedded peripherals only*

Motor

The LAC stage uses a size 8 stepper motor.

- 0.24 A / Phase
- 20.4 / phase
- 5.0 mH / phase

- A1 = Red and White
- A2 = Red
- B1 = Green
- B2 = Green and White

Alternate Controllers

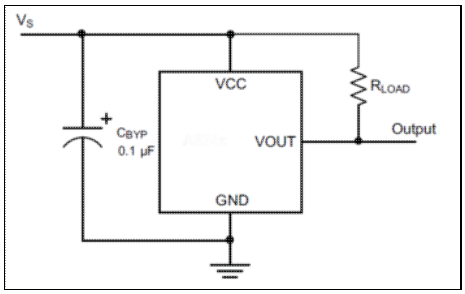
The device may be controlled by any 2-phase stepper motor controller with home sensor input. **Warning: Operating the unit without correctly wiring up the home sensor can cause permanent damage to the unit. We do not recommend using your own controller unless you are familiar with how to control a stepper motor with a hall sensor limit switch.** The following information is provided for reference only. Damage to the actuator or hall sensor due to incorrect wiring is not covered by warranty.

Home Sensor Wiring

A Hall effect sensor is mounted in the device for use as a home sensor. It is part number A1122LUA-T made by Allegro. Click here for data sheet. Your controller should be configured so the stage stops immediately (little deceleration) when the home sensor is triggered.

- Wire colour code:
  - 3.6-24 Vdc input - red
  - Home signal - yellow
  - Ground - black

The Hall sensor has an open-collector output. The default output is high impedance when the Hall sensor is not active. When the sensor detects a magnet, the Hall sensor pulls the output low to ground.



If you are not using a Zaber controller, ensure that your controller has a pull-up resistor on the output line of the Hall sensor as shown in the diagram. The bypass capacitor is optional, but may help to eliminate false triggering in noisy environments. The typical value for the pull-up resistor (R_{LOAD}) is 10k and for the bypass capacitor is 0.1uF to 1uF. The larger the capacitance, the better the noise filtering but the slower the response time.

Warranty and Repair

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

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, please sign up online at www.zaber.com (news section). Newsletters typically include a promotional offer worth at least $100.

Contact Information

Contact Zaber Technologies Inc by any of the following methods:

Phone	1-604-569-3780 (direct) 1-888-276-8033 (toll free in North America)
Fax	1-604-648-8033
Mail	1777 West 75th Ave, 1st Floor, Vancouver, BC, Canada, V6P 6P2
Web	www.zaber.com
Email	Please visit our website for up to date email contact information.

Group Specifications - LAC Series

Specification	Value	Alternate Unit
Microstep Size (Default Resolution)	0.0238125 µm	
Integrated Controller	No	
Recommended Controller	A-MCA (24 V) Recommended	
Travel Range	10 mm	0.394 "
Accuracy (unidirectional)	10 µm	0.000394 "
Repeatability	< 1.5 µm	< 0.000059 "
Backlash	< 2 µm	< 0.000079 "
Maximum Speed	12 mm/s	0.472 "/s
Minimum Speed	0.0000145 mm/s	0.00000 "/s
Speed Resolution	0.0000145 mm/s	0.00000 "/s
Encoder Type	None	
Peak Thrust	40 N	9.0 lb
Linear Motion Per Motor Rev	0.3048 mm	0.012 "
Motor Type	Stepper (2 phase)	
Motor Rated Current	240 mA/phase	
Motor Winding Resistance	20.4 ohms/phase	
Inductance	5 mH	
Motor Connection	D-sub 15	
Motor Frame Size	8	
Mechanical Drive System	Precision Lead-screw	
Limit or Home Sensing	Magnetic Home Sensor	
Axes of Motion	1	
Mounting Interface	3/8-32 nut or 3/8"(9.5mm) shank	
Vacuum Compatible	No	
Operating Temperature Range	0 to 50 degrees C	
RoHS Compliant	Yes	

CE Compliant	Yes	
Weight	0.076 kg	