

Specifications

Supply Voltage	+6vdc
Supply Current ⁽¹⁾	750 mA
Pwr Supply Connector	2.1 mm barrel, positive center
PC Connector	USB Micro-B
Motor Type	Bipolar Stepper
Number of Motors	12
Motor Connector	4-pin header, 0.1" pitch
Motor Rated Voltage	5vdc
Motor Rated Current	20 mA / Phase
Motor Resolution ⁽²⁾	Up to 4,320 Steps / Revolution
Stepper Home Signal	Switch closure
Home Connector	2-pin header, 0.1" pitch

Notes:

- (1) If multiple modules will be connected to the same power supply, the power supply must have enough current capacity for all connected modules.
- (2) Maximum resolution, including any integrated gear boxes. (i.e. 24 step motor with a 180:1 gear box)

Warranty

Thank you for your purchase of an ACES product.

This Limited Warranty applies to physical products purchased from ACES ("Products").

What does this limited warranty cover?

This Limited Warranty covers any defects in material or workmanship under normal use during the Warranty Period.

During the Warranty Period, ACES will repair or replace, at no charge, Products that prove defective because of improper material or workmanship, under normal use and maintenance.

What will we do to correct problems?

ACES will, at no charge, either repair the Product using new or refurbished replacement parts, or replace the Product. The decision to repair or replace is solely at the discretion of ACES.

How long does the coverage last?

The Warranty Period for Products purchased from ACES is 90 days from the date of purchase.

A replacement Product assumes the remaining warranty of the original Product.

What does this limited warranty not cover?

This Limited Warranty does not cover:

- any problem that is caused by conditions, malfunctions or damage not resulting from defects in material or workmanship
- any damage to any equipment, system, device or anything else connected to the Product

- any Product with damage to the case or enclosure; opening the Product case/enclosure voids the warranty

What do you have to do?

To obtain warranty service, you must first contact us to determine the problem and the most appropriate solution for you. To obtain warranty service, the following conditions must be met:

- The Product must be in its original packaging.
- The Product case/enclosure must be sealed and undamaged.
- A Return Material Authorization (RMA) number from ACES is required.
- All documents and accessories that shipped with the Product must be included in the return package.
- The return package must be sent via a trackable method.

The ACES Story

I'm a flight sim enthusiast just like you. When I decided to start building my own simpit at home, I was disappointed to find how little there was on the market that was affordable and targeted to the home enthusiast. Everything was either too expensive, too complicated or both.

From this disappointment, an idea was born. I have over a decade of experience developing high fidelity flight training systems for commercial and military use. I decided to apply my experience to make what I needed. Since I was going to make it anyway, I might as well offer it to others too. This was the beginning of ACES Affordable Cockpit Emulation Systems. At ACES the products are aimed at the home flight simulation enthusiast. I work to make all the ACES products easy to use and affordable.



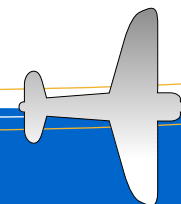
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ACES



Affordable Cockpit Emulation Systems

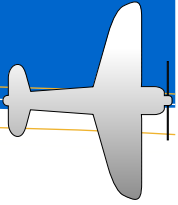


Instrument Module Mini Stepper

Instrument Module Mini Stepper

CONNECT STEPPER MOTOR INSTRUMENTS TO YOUR FLIGHT SIM.

- Designed to drive small inexpensive stepper motors like those found in many automotive gauge panels.
- Supports stepper motors and instruments with limited or full rotation. (See Cautions below.)
- Plug and play USB connectivity to the ACES Cockpit Software Suite.
- Connect up to 12 stepper motor instruments.



QUICK START GUIDE

1. Connect your stepper motor instruments to the Instrument Module. Make note of which instrument you connect to which connector on the module.
2. Connect a power supply to the Instrument Module.
3. Connect the Instrument Module to the USB port on your PC.
4. Start the ACES Cockpit Builder application.
5. ACES Cockpit Builder will recognize the Instrument Module. You can assign a nick name if you like.
6. In the My Cockpit window, configure your instruments.
7. Calibrate each instrument using the buttons in the My Cockpit window. Save your instrument configuration.
8. In the Sim Data Map window, use the wizard to generate a sim data map. Save your sim data map.
9. Exit ACES Cockpit Builder.
10. Start the ACES Cockpit Interface application.
11. Load the sim data map you just generated in ACES Cockpit Builder.
12. Start your compatible flight simulator (such as the IL-2 Sturmovik: Cliffs of Dover application or X-Plane) and fly a mission with your new instruments. (Visit www.aces-sim.com for a list of compatible flight simulators.)

For more detailed information see the Getting Started topic in the ACES Cockpit Builder Help Center.

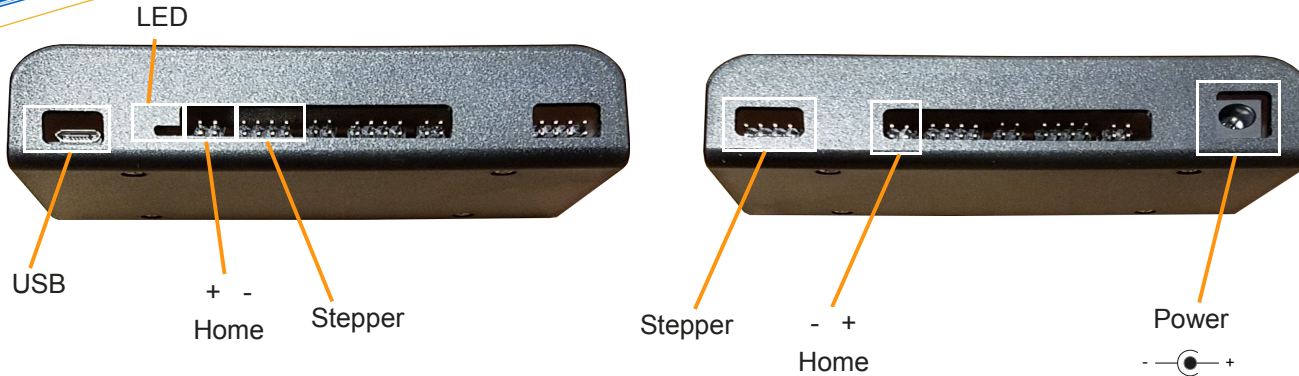
CAUTION

• NEVER CONNECT OR DISCONNECT A MOTOR WITH POWER APPLIED TO THE INSTRUMENT MODULE. THIS MAY DAMAGE THE MODULE AND/OR THE MOTOR.

• WHEN CONNECTED TO A MOTOR/INSTRUMENT WITH PHYSICAL STOPS (MOTOR/INSTRUMENT DOES NOT ROTATE THROUGH 360 DEGREES) THE MODULE FINDS THE STOPS BY ATTEMPTING TO ROTATE THE POINTER PAST THE STOPS. THE MOTOR/INSTRUMENT MUST WITHSTAND BEING DRIVEN INTO THE STOPS WITHOUT DAMAGE.

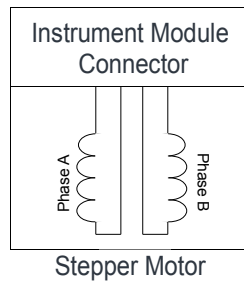
• DON'T CONNECT A MOTOR RATED FOR LESS THAN MIN CURRENT REQUIREMENT. THIS MAY DAMAGE THE MOTOR.

• DON'T CONNECT A MOTOR RATED FOR HIGHER THAN MAX VOLTAGE REQUIREMENT. THE MOTOR MAY NOT MOVE CONSISTENTLY OR RELIABLY.



STEPPER MOTOR CONNECTION

Each stepper motor connection consists of 4 pins. Two pins for each phase (or coil) in the stepper motor. The first two pins are for phase A, the next two pins are for phase B.



STEPPER HOME SIGNAL

For full rotation instruments, the home signal tells the module when the instrument pointer is at a known reference position. The module uses this reference position as a basis for all instrument pointer movements. The home position is signaled by a switch closure across the two home pins.

For instruments with limited rotation ability (the instrument has stops and will not rotate through 360 degrees), the home signal is not used. (See Cautions.)

AT ACES, WE'RE ENTHUSIASTS TOO.

If you have a problem, contact us at support@aces-sim.com. We'll be glad to help.

