

R325/R325i

MICROSTEPPING DRIVER

MAIN FEATURES:

- Voltage: +15 to 48VDC
- Current: 0.3 to 3.0 Amps Peak, programmable
- Hold current: 0.3 to 3.0 Amps Peak, programmable
- Step resolution: Full Step, 2x, 4x, 8x, 16x, 32x, 64x, 128x, 256x (Programmable)
- Speed: (step frequency: 2.5MHz)
- Inputs: 3 inputs (disable pin is fixed – always functions as the disable pin)
- Outputs: 1 output (fault output)
- Pole Damping Technology (PDT™): Implemented for smooth motion

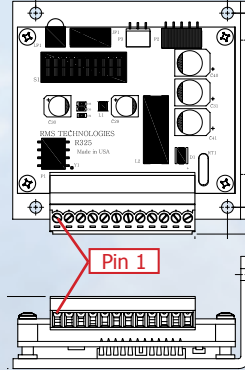
DETAILED FEATURES:

- Operating temperature: 0 to 45°C (Running above 2.6 Amps Peak requires a heat sink)
- Pole Damping Technology (PDT) Enhances step motor performance by dampening each natural full step position in order to create a more accurate and smooth motion profile. Microstepping the step motor will optimize Pole Damping™ Technology. PDT outputs the correct amount of run and hold currents to the motor. Thus, it will overcome the step motor's natural tendency to want to forcefully pull towards the full step ON position.
- Internal +5VDC output (driver version): The R325 driver contains a +5VDC output to supply the opto isolated inputs. Many drives require an additional +5VDC power supply (in addition to the main power source). The separate power supplies are for customers who want to keep the inputs isolated from the main power source. Keeping them opto isolated will reduce electrical noise. But for customers who need the convenience of using one power supply, they should connect pins 1 and 4 together to use the board's internal +5VDC output.
- Static encoder feedback available: Homes to an encoder index
Eight user preset target positions
After a position move has been made, the R325IE will compare the Absolute position register with the encoder position register. If there is a discrepancy, you can tell it to report, stop motion, or correct the error
You can set the amount of steps before the encoder feedback detects the error



CONNECTION SPECIFICATIONS:

P1 Configuration	
Pin #	Function
1	Common +ve External
2	Step (in)
3	Direction (in)
4	+5 VDC Internal
5	Disable (in)
6	Motor A+ (out)
7	Motor A- (out)
8	Motor B+ (out)
9	Motor B- (out)
10	Fault (out)
11	Power Ground
12	Power Positive



RS485 COMMUNICATION:

P3 Configuration	
Pin #	Function
1	A Input (+ve)
2	Ground



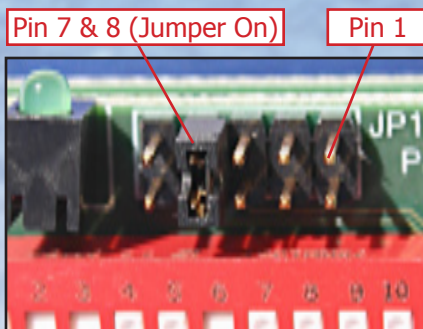
USB845 TO R325I:

Simply Match up the Pin Numbers

Pin #	Function
1	A Output
2	Ground
3	B Output

Communicating with the R325:

1. Place a jumper on pins 7 and 8 of JP1
2. Communicate via RS485 with P3
3. Set up HyperTerminal by selecting correct COM port
4. Settings for HyperTerminal is as follows: 57600, 8 bits, None, 1, None



The R325 Driver only version allows for changing the hold timeout settings, the amount of mixed decay, and to check the firmware revision level.

R325 DIP SWITCH SETTINGS:

RUN CURRENT				
Function	SW1	SW2	SW3	SW4
0.3A	ON	ON	ON	ON
0.4A	OFF	ON	ON	ON
0.5A	ON	OFF	ON	ON
0.6A	OFF	OFF	ON	ON
0.8A	ON	ON	OFF	ON
1.0A	OFF	ON	OFF	ON
1.2A	ON	OFF	OFF	ON
1.4A	OFF	OFF	OFF	ON
1.6A	ON	ON	ON	OFF
1.8A	OFF	ON	ON	OFF
2.0A	ON	OFF	ON	OFF
2.2A	OFF	OFF	ON	OFF
2.4A	ON	ON	OFF	OFF
2.6A	OFF	ON	OFF	OFF
2.8A	ON	OFF	OFF	OFF
3.0A	OFF	OFF	OFF	OFF



HOLD CURRENT (Percent of Run Current)		
Function	SW5	SW6
0%	ON	ON
33%	OFF	ON
66%	ON	OFF
100%	OFF	OFF

STEP RESOLUTION				
Function	SW7	SW8	SW9	SW10
Full Step*	OFF	OFF	OFF	OFF
2X	ON	OFF	OFF	OFF
4X	ON	ON	OFF	OFF
8x	ON	OFF	ON	OFF
16x	ON	ON	ON	OFF
32X	ON	OFF	OFF	ON
64X	ON	ON	OFF	ON
128X	ON	OFF	ON	ON
256X	ON	ON	ON	ON

* The Power must be turned OFF when switching in and out of Full Step mode.

Warning: Current of 2.7 Amp and above REQUIRES an additional heatsink, make sure the temperature of the bracket does not exceed 45° C

COMMANDS:

Protocol Syntax

Command Format: #<Address><Command><value><CR><LF>

Example: #AHT1000<CR><LF>

Sets the Hold Timeout for Driver A to 1000

To query a command use the following format

Query Format: #<Address><Command><CR><LF>

Example: #AFR<CR><LF>

Queries Driver A for the current Firmware Revision

The response would be in the following format

Response Format: *<Address><value>

Example: *AFR325100

PROGRAMMING THE R325I:

The command syntax is as follows: #<Board Address><Command><Value><CR><LF>

The reply syntax is: #<Board Address><Command> <Value><CR><LF>

Note: Not all commands will return a value.

Example: Setting the Run Current (RI) to 1500mA (1.5A)

#ARI1500 //Sent Command

#ARI1500 //Received Reply

The USB485 comes with a 3-pin to 3-pin cable for connecting to the R325I board. Also comes with a 6ft USB cable.

KEY SELLING FEATURES:

- Can run a program stand alone (no PC connection needed)
- Simple programming
- Two designer's kits available for the RS232 or USB user

R325I KEY SELLING FEATURES:

- PDT – Pole Damping Technology – used for smooth motion
- Maximum step resolution of 256x
- Internal +5VDC supply – single power supply needed for the whole unit (needs only main power source 15 to 48VDC)

NOTES:

- A GUI interface through LABView or Visual Basic is needed to do more extensive programming with the R325I (to run more than one command after another, loops, etc.)
- Without a software interface, commands can only be executed by HyperTerminal line by line, one command at a time.
- No scripting or storing of programs.
- Only storage of parameters (velocity, microstepping, currents, step resolution...)

COMMON TECH SUPPORT QUESTIONS / RMA ISSUES:

• BURNED OR BLOWN DRIVER (LOW INDUCTANCE):

Motors with inductance levels of 1.5 mH or less will cause the drivers to blow or not work as expected. Torque will drop because the output current is less than expected. (A limitation of the driver chip)

• MOTORS ARE HOT:

Check holding current. It could be too high.

Check wiring. Motor phases could be crossed (A is in B or B Bar, etc)

• MOTORS DO NOT ROTATE:

Check connection between motor and drive. If for example the "A" and "A Bar" connection is actually connected to an "A" phase wire and a "B" phase wire, then the driver will not run. (CAUTION: Doing this could burn the driver)

Be sure the dipswitches number 8, 9, and 10 are turned OFF

Be sure there is a jumper on JP1 on pins 7 and 8 (see above).

• POWER SUPPLY IS DRAWING EXCESSIVE CURRENT:

Check if the polarity is switched on the main power supply. See connection chart above.

Hot plugging the motor from the drive will burn the driver chips. (Hot plugging means to unplug a motor from the driver while power is still on). The motor has Back EMF voltage and when disconnecting the motor from the driver, it could send voltage back into the driver. Once they are burned, something is short-circuited on the driver board and will draw excessive current from power supply

• MOTOR ROTATES, BUT IRRATICALLY, NOT SMOOTHLY:

Check resistance of motor, ensure that Phase A and Phase B are equal

If one of the two drivers are blown, then only half of the driver works. If this is the case, turning on and off the pulses to move and stop the motor might cause the motor to rotate CW and CCW at random times, when it should only rotate in one direction. Half the torque is available too.

Acceleration or speed is too fast for the motor. Lower the speed until it steps smoothly

You could be hitting a resonant spot, microstep the unit to see smoother results

Check correct wiring.

• WHAT DECAY MODE WILL WORK BEST FOR MY MOTOR?

For motors with 2mH or less it is recommended to use 15% decay mode. For motors of 2mH or higher, use 35% decay mode. This will optimize the motor and driver combination.