

Important User Information

VXM-1J Jog / Autoreverse Controller
User's Guide

CAUTION:

Controller and AC power supply should be operating in a well ventilated area. Do not use in a wet, dirty, or explosive environment. In industrial environments, repackaging into a NEMA grade enclosure is required. Do not disconnect motor while running. Keep Motor and Limit cables minimum of 2" apart. Only operate with designated motor. Do not alter cables in any way without first consulting Velmex



CAUTION:
MOTOR(S) GET HOT WHEN RUNNING. Motor(s) must be mounted to a metal surface to dissipate internal heat.

Motors mounted to Velmex actuators/positioners will usually provide sufficient heat dissipation. Motor surface temperature should not exceed 152° F (70° C.) In continuous duty applications when the motor is not mounted to a suitable heat dissipating device, motor surface temperature could exceed 152° F (70° C.)

WARNING:

TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT ATTEMPT TO REMOVE COVERS ON POWER SUPPLY OR CONTROLLER. THERE ARE NO USER SERVICEABLE PARTS INSIDE. Any servicing should be done by Velmex qualified service personnel.

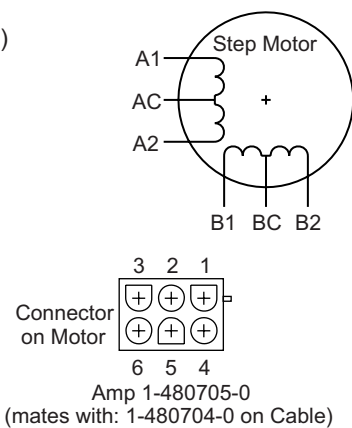
Features

- Simple Variable Speed/Direction Operation
- More Precise than Legacy AC/DC Controls
- 100% Standalone Operation (No Computer Required)
- Up to 6000:1 Speed Ratio
- Autoreverse Teach for Start Point, Reverse Point, and Speed
- Variable or Fixed Speeds each Direction
- Switchless Reversing for Longest Cycle Life & Highest Accuracy
- Automatic Referencing to Limit Switch for Absolute Repeatability
- Switchable Continuous and Momentary Jogging / Reversing
- Low Cost, Reliable Brushless, Stepping Motor Operation
- Trigger Pulse Output at Reversing Points**
- Digitally Controlled Speeds for Precision Scanning
- Can be User reconfigured for different Size Motors**
- Auto-detects presence of (N/C to run) Limit Switches

Motor Wiring (for Velmex installed step motors)

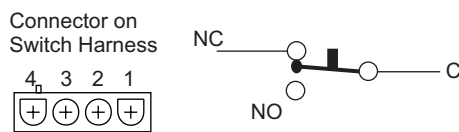
Pin	Motor	Cable (6 wire)	Slo-Syn	Vexta	Pacific Scientific*
1	BC	W	W	W	W/Y & W/R
2	B2	Gn	Gn	Bu	R
3	AC	Bk	Bk	Y	W/Bk & W/O
4	A2	Or	W/R	Bk	O
5	A1	R	R	Gn	Bk
6	B1	Bu	W/Gn	R	Y

* 8 lead motor with wires combined at AC and BC for 6 lead configuration



Limit Switch Wiring

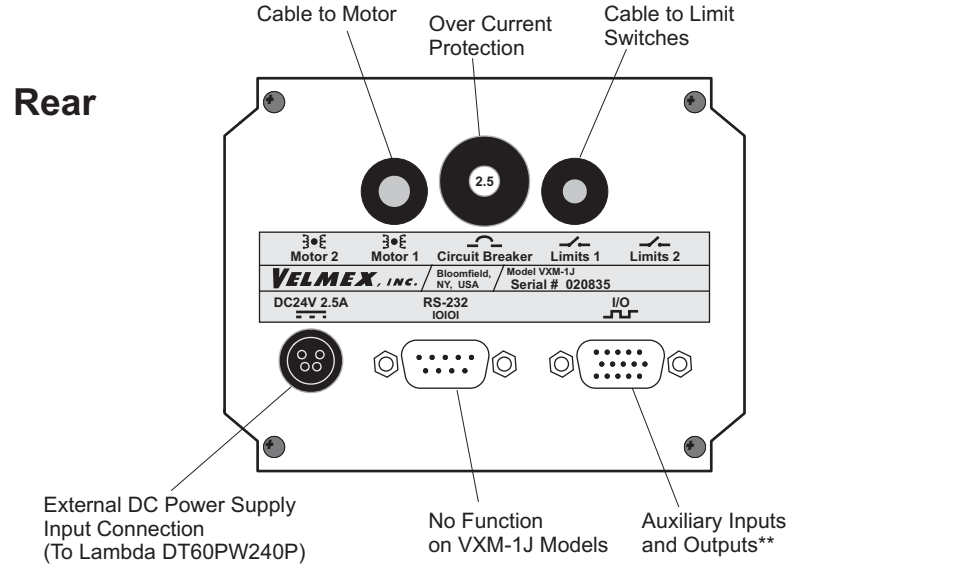
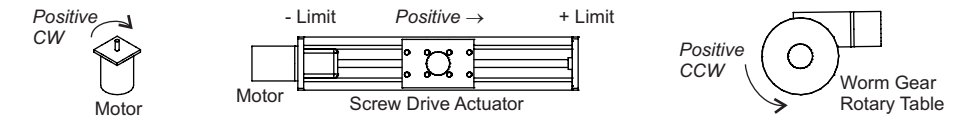
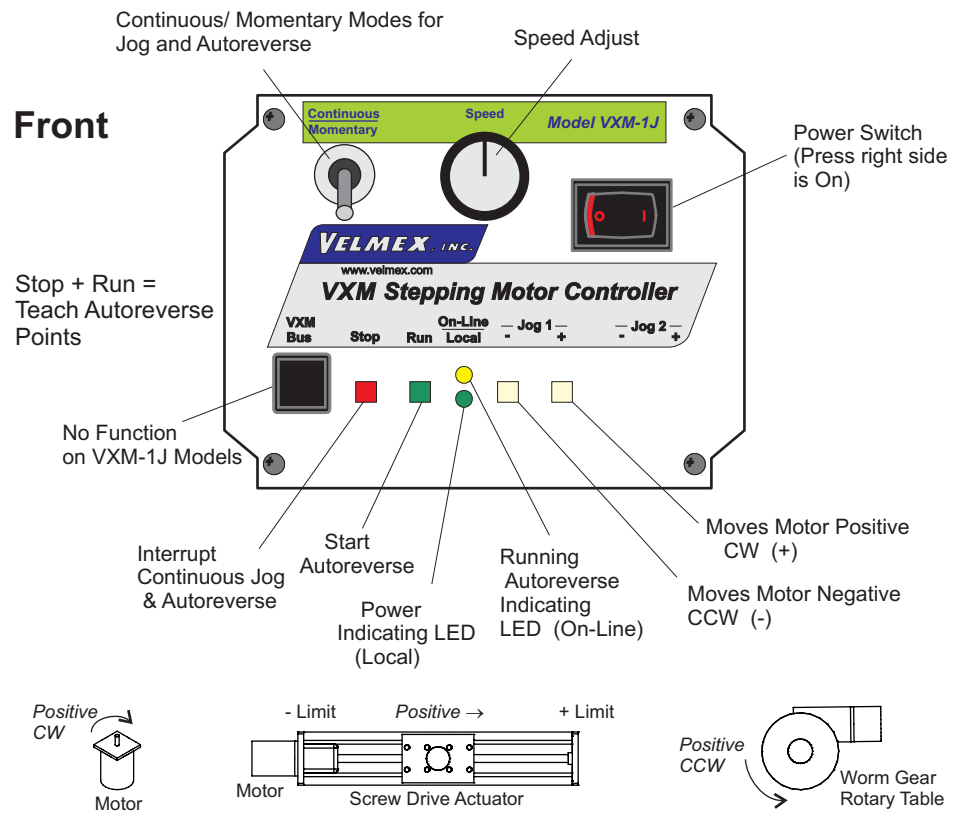
	Pin	Switch	Cable
Inner Switch (Motor End)*	1	C	W
	2	NC	R
Outer Switch (End Plate)	3	NC	Gn
	4	C	Bk



Amp 1-480703-0 (mates with: 1-480702-0) Switches are wired on the normally closed (NC) terminals.

CAUTION: The VXM puts 24VDC on the limit switches, do not connect limit inputs to any +5V logic devices

* Negative direction on VXM controllers



Warranty

Stepping Motor Controllers manufactured by Velmex are warranted to be free from defects for a period of two (2) years on all parts. Velmex's obligation under this warranty does not apply to defects due, directly or indirectly, to misuse, abuse, negligence, accidents, or unauthorized repairs, alterations, or cables/connectors that require replacement due to wear. Claims must be authorized, and a return authorization number issued before a product can be returned. The warranty does not cover items which are not manufactured or constructed by Velmex, Inc. These components are warranted by their respective manufacturer. Under the above warranty, Velmex will, at its option, either repair or replace a nonconforming or defective product.

The above warranty is the only warranty authorized by Velmex. Velmex shall in no event be responsible for any loss of business or profits, downtime or delay, labor, repair, or material costs, injury to person or property or any similar or dissimilar incidental or consequential loss or damage incurred by purchaser, even if Velmex has been advised of the possibility of such losses or damages.

Inasmuch as Velmex does not undertake to evaluate the suitability of any Velmex product for any particular application, the purchaser is expected to understand the operational characteristics of the product, as suggested in documentation supplied by Velmex, and to assess the suitability of Velmex products for this application.

This limited warranty give you specific legal rights which vary from State to State.

Record Controller and Motor information here for future reference:

Model#: VXM-1J

Serial #: _____

This Controller was Factory set to run the following Motor:

- Vexta PK245
- Vexta PK264
- Vexta PK266
- Vexta PK268
- Vexta PK296

For more information on setting for a motor go to www.velmexcontrols.com

Contact Information

By Phone: 585-657-6151 and 800-642-6446
 By Fax: 585-657-6153
 Email: info@velmex.com
 On the Internet: www.velmex.com and www.velmexcontrols.com
 By mail: Velmex, Inc.
 7550 State Route 5 & 20
 Bloomfield, NY 14469 USA

Setup

1. Connect the cables to motor and limit switches (if actuator has limit switches.)
2. Connect cable from DC power supply to VXM
3. Plug the DC power supply into an AC outlet.
4. Turn on the VXM by pushing the right side of the rocker switch located on the front panel. Both On-Line and Power LEDs will light for 1 second, the On-Line will go out, then the Power LED will flash 6 times.

Jog



Hold or

Jog + Continuous



Press To Stop or or

Jog - Continuous



Press To Stop or or

Speed Change



Speed Range (0.9 Deg Steps/Sec)**
 PK245,PK264,PK266 Motors... 1-6000*
 PK268 Motors..... 1-5000*
 PK296 Motors..... 1-3000*
 *NOTE: Motors may stall at top speed under load.

Autoreverse (Variable Speed Both Directions)

Jog - Jog +
 Hold & Press Until Flashes 2x
 To Start Point

Jog - Jog +
 Hold & Press Until Flashes 3x
 To 2nd Point

Press To Start Lights when Running
 Down Up
 Speed is read prior to moves

Autoreverse (Referencing Negative Limit Switch)

Continuous
 Set Speed To 1/4 or Less Set Speed
 Press Jog - Wait for Motor to Stop at Limit (Motor will move to Limit Switch and stop)

Hold & Press Until Flashes 1x

Momentary
Jog +
 To Start Point Hold & Press Until Flashes 2x

Jog - Jog +
 To 2nd Point Hold & Press Until Flashes 3x

Press To Start Motor will run to limit and then to Start point. Subsequent runs move between Start and 2nd point. First run after power-up will reference from the limit again.

Autoreverse (Referencing Positive Limit Switch)

Continuous
 Set Speed To 1/4 or Less Set Speed
 Press Jog + Wait for Motor to Stop at Limit (Motor will move to Limit Switch and stop)

Hold & Press Until Flashes 1x

Momentary
Jog -
 To Start Point Hold & Press Until Flashes 2x

Jog - Jog +
 To 2nd Point Hold & Press Until Flashes 3x

Press To Start Motor will run to limit and then to Start point. Subsequent runs move between Start and 2nd point. First run after power-up will reference from the limit again.

Autoreverse (Variable Speed Out, Fixed Speed Back)

Jog - Jog +
 To Start Point Momentary Hold & Press Run Until On-Line Flashes 2x

Jog - Jog +
 To 2nd Point Continuous Set Speed Hold & Press Run Until On-Line Flashes 3x

Momentary Press Run To Start On-Line Lights when Running

Autoreverse (Fixed Speed Out, Variable Speed Back)

Jog - Jog +
 To Start Point Continuous Set Speed Hold & Press Run Until On-Line Flashes 2x

Momentary **Jog - Jog +**
 To 2nd Point Hold & Press Run Until On-Line Flashes 3x

Press Run To Start On-Line Lights when Running

Autoreverse (Stop at 2nd Point / Wait for Run)

Jog - Jog +
 Hold & Press Run Until On-Line Flashes 2x
 To Start Point

Jog - Jog +
 Hold & Press & Press Jog - Until On-Line Flashes 4x Local Flashes 1x
 To 2nd Point

Press Run To Start When Stopped at 2nd Point Press Run To Continue

Autoreverse Continuous

Continuous
 Press Run To Start To Stop Momentary or Stop

Autoreturn from Jogging (Run To Set Point)

Jog - Jog +
 Hold & Press Run Until On-Line Flashes 2x
 Run to Point

At The Same Location Hold & Press Run Until On-Line Flashes 3x

Jog - Jog +
 Press Run To move Motor back to Point
 Jog off Point

NOTE: Pressing Stop ends autoreverse program in progress. Next Run will start from first move not the last. Since the VXM maintains absolute position, all moves will still end on the correct Start and Stop points.

NOTE: The default Start point after power-up is the current position. For highest repeatability it is recommended that **Autoreversing Referencing Limit Switch** be used.

Specifications

Physical:
 Weight.....2.7 lbs (1.2 kg)
 Height3.27" (83 mm)
 Width4.37" (111 mm)
 Length7.39" (188 mm)

AC Power Supply
 Weight.....1.0 lbs (0.45kg)
 Height1.57" (40 mm)
 Width2.72" (69 mm)
 Length5.14" (131 mm)

Electrical Requirements:
 AC Power Supply..... 100-240VAC 2A
 50-60Hz
 VXM Controller 24VDC 2.5A

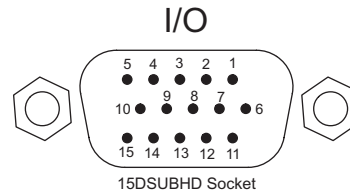
Environmental:
 Operating Temperature 35°-95° F
 (2°-35° C)
 Relative Humidity..... 10%-90%
 (noncondensing)

VXM-1J Jog / Autoreverse Controller

Auxiliary Inputs and Outputs (I/O)

Auxiliary I/O Connection

The I/O connections can be used for selecting optional internal settings, signaling external equipment, or duplicating the front panel button inputs for remote operation.



View looking at back of VXM

NOTE: All inputs and outputs are TTL levels (0 to +5VDC.) Inputs have resistive pull-ups, and are activated by connecting to 0V. Outputs are normally low, and can sink and source 20 mA max. For more information refer to I/O Electrical Specifications on the last page of this document.

Pin#	Name	Function
1	0V	Logic reference ground for inputs and outputs
2	+5V	+5VDC for external Speed potentiometer (75mA max. output)*
3	Ain	Analog input for external Speed potentiometer*
4	Run	Run input to start program, same input as Run button (active low)
5	I1	Input 1 for 2x Acceleration (active low)
6	I2	Input 2 (Same as Momentary/Continuous switch on front panel) (low=Continuous)
7	I3	Input 3 for 100% motor power (active low) (default = 70% power)
8	I4	Stop (Same as Stop button on front panel) (active low)
9	0V	Logic reference ground for inputs and outputs
10	J1-	Jog Motor CCW (Same as front panel button) (active low)
11	J1+	Jog Motor CW (Same as front panel button) (active low)
12	Range B	Override Speed Range Input B (active low)
13	Range A	Override Speed Range Input A (active low)
14	O1	Output 1 signal pulse at each end of autoreverse (normally 0.1 sec high pulse)
15	O2	Output 2 (Not Used on VXM-1J)

* **NOTE:** Internal Speed potentiometer must be disconnected before attempting to connect an external Speed potentiometer. Consult Velmex, Inc. for more information.

Input Overrides (Ver 2.71 & up)

All I/O inputs are normally high (1). A single jumper wire from input to pin 1 or 9 (0V) will make the input low (0). Velmex part # 4-2120 Breakout Module has terminal strips for easy wire connection to the I/Os.

Range inputs will override the normally set speed range. Jog reads the override immediately. Autoreverse-teaches read range override at teach time, not at runtime.

Range B (I/O pin #12)	Range A (I/O pin # 13)	Speed Range (steps/sec)
1 (high/no connection)	1	Current set internal value
1	0 (low)	1-4000
0	1	1-3000
0	0	1-2000

Input 3 effects applied motor power dynamically (updated every step)

Input 3 (I/O pin # 7)	Motor power output
1 (high/ no connection)	70%
0 (low)	100%

Input 1 doubles acceleration value. This applies to all autoreverse moves (not jog) and is set at start of each Run.

Input 1 (I/O pin # 5)	Acceleration Double
1 (high/ no connection)	Current acceleration value
0 (low)	2x current acceleration value

I/O Electrical Specifications

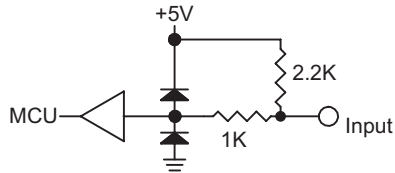
All User I/O inputs and outputs (except limit switch inputs) are TTL levels (0 to +5VDC.)

Inputs have a 2200 ohm resistor to +5VDC, and are activated by connecting to 0V.

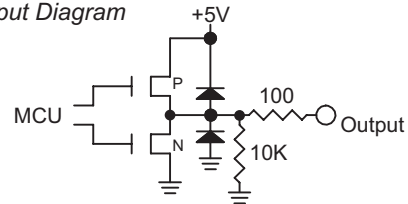
NOTE: When Input 4 (Stop) is held low (0V) and Run is pressed autoreverse points are stored.

Outputs are normally low, and can sink and source 20 mA max.

Input Diagram



Output Diagram



Limit switch inputs are optically isolated. Limit inputs operate on 24VDC through a 10K ohm resistor to power the LED in the optical isolator.

The +5VDC on I/O,2 is intended for use with an external Speed potentiometer when there is not a front panel one installed.

CAUTION:

Optically isolated relays may be required on all user I/Os to insure long term reliable operation.

Never directly connect a VXM I/O to an inductive load, any device that is not within 10 feet of the VXM, or anything not powered at the same AC source.

Damage due to improperly interfacing VXM controllers to other devices is not covered under the warranty.

As a minimum precaution against electrostatic discharge (ESD) damage follow these guidelines:

1. Provide the shortest conductive path possible to earth ground from user designed panels or enclosures that have switches or buttons the operator will come in contact with.
2. Use metal panels and enclosures to house buttons or switches electrically bonded to a protective earth ground.
3. Use shielded cables on all VXM I/O.
4. If no other protective earth ground is available, use the earth ground on the VXMs Auxiliary I/O connector shell or connector shell on shielded cable.

www.velmex.com and www.velmexcontrols.com

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VXM-1J Jog / Autoreverse Controller

Clearing Autoreverse From Memory

The VXM-1J incorporates a push-button input method to remove an existing autoreverse program from memory. Not having an autoreverse stored would be important when only jog movements are wanted and any program, that may accidentally be run, would be undesirable and unwanted motion.

Below is the front panel button input procedure to remove the existing program.

Clearing Program From Memory

(Program will be completely erased, all other settings will stay intact)

Hold **Stop**  & Press **Run**  & Press **Jog +**  Until **Local**  Goes Out

VXM-1J Jog / Autoreverse Controller

Motor Setting (Front Panel)

1. Turn On Power to VXM while holding both **Stop** & **Jog +** down
2. Wait Until **On-Line** Is on and **Local** Turns off, then release **Stop** & **Jog +**

3. VXM will flash **Local** number of times = Motor setting

VXM Motor (Flash) Setting

# Flashes	Motor Model (Amps)	Knob Speed Range (SPS)*
0	Default (0.4A to 0.7A)	1-6000
1	Vexta PK245 (1.2A)	1-6000
2	Slo-Syn M061 (3.8A)	1-6000
3	Slo-Syn M062 (4.7A) Vexta PK264 (3A)	1-6000
4	Slo-Syn M063 (4.6A) Vexta PK266 (3A)	1-6000
5	Slo-Syn M091 (4.7A) Vexta PK268 (3A)	1-5000
6	Slo-Syn M092 (4.6A) Vexta PK296 (4.5)	1-3000

4. Do A or B
 - A. **To accept/save current setting:** Press **Jog -** or **Jog +** (setting saved, & continues start-up)
 - B. **To change setting:** Press and release **Run** = desired motor setting (0 to 6)

To end change: Press and release **Stop**

← Repeats from Step 4

* These ranges will be set based on entered motor setting.
NOTE: Motors may stall at upper speeds under load