

Limit Switches and Home Switches

The VXM by default recognizes normally closed (N/C to run) limit switches. The default mode is auto-detect normally closed switches. If the VXM is used with normally open or with a home switch, the limit switch mode will need to be changed. The following command sets the operating mode of the limit switch inputs.

setLmMx Set Limit Switch mode for axis *m*, *m*= motor# (1,2,3,4)

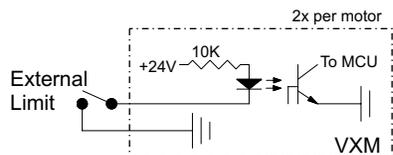
<i>x</i>
0= Auto-detect N/C to run (default)*
1= Enabled N/C to run
2= Disabled N/C for Home Switch use
-1= Enabled N/O to run
-2= Disabled N/O for Home Switch use

***NOTE:** The VXM looks for N/C limits, if not found limit inputs are disabled. To improve limit switch fault detection set *x* to 1.

NOTE: Velmex Rotary tables with home switches require *x* = -2.

getLmM Get Limit Switch mode setting for axis *m*, *m*= motor# (1,2,3,4) value returned is either -2,-1,0,1,2 (default=0)

Limit switch inputs are optically isolated, from the main control logic of the VXM, as shown in the diagram at the right.

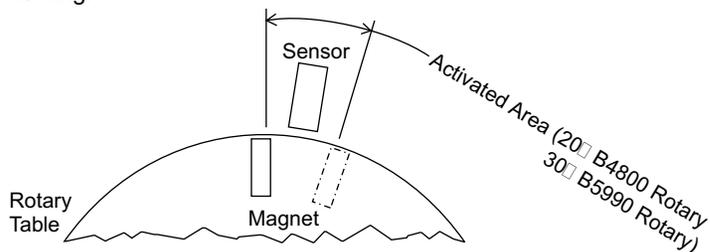


Using Home Switch on Rotary Tables

It is important to understand how a home switch works, and what programming procedure to use to get a high degree of precision and accuracy obtainable by these switches. Repeatability of 1 motor step is achievable if the proper procedures are followed when referencing to a home switch.

The most common home switch used on rotary tables is a magnetic reed type sensor. The magnetic sensor is usually connected directly to the positive and negative limit switch inputs on the VXM.

Home switches have an active area of several degrees. Because of this large area where the switch is activated, it is important to always approach the switch from the same direction when homing.



Procedure to configure the VXM for use with a home switch:

(For rotary tables only, see page 27 & 46 for linear actuator homing example)

- Determine which axis (axes) will be connected to a home switch and connect motor, limit cables, and set VXM for motor type/model attached.
- Set limit switch function to a value of -2. Example to set motor 1 for use with a normally open home switch:
setL1M-2<cr>
- Run the "rsm" command to permanently save limit setting(s)

Programming sequence for homing to the switch:

(For rotary tables only, see page 27 & 46 for linear actuator homing example)

- Set a speed for homing (maximum of 1000.) Always use this selected speed for homing to maintain repeatability.
- Set move to limit command (**ImM0**, or **ImM-0**) Pick a direction to move to the home switch. Always use this direction to maintain accuracy. **NOTE:** if the table is already in the active area of the switch the table will not move. Steps 3 and 4 below will compensate for this situation.
- Set an Index to move back from home switch area to insure table will be totally out of activated area of the switch before doing final homing. Indexing 4000 steps should be adequate to move beyond the active switch area.
- Set move to limit command (**ImM0**, or **ImM-0**) and zero motor position at this position if desired.

This example homes motor 1 moving negative direction into home switch and zeroes position:

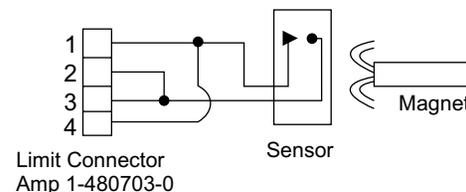
```
C S1M600, I1M-0, I1M4000, I1M-0, IA1M-0, R
```

This example homes motor 2 moving positive direction into home switch and zeroes position 1000 steps away from switch:

```
C S2M800, I2M0, I2M-4000, I2M0, I2M-1000, IA2M-0, R
```

Magnetic Reed Switch Wiring

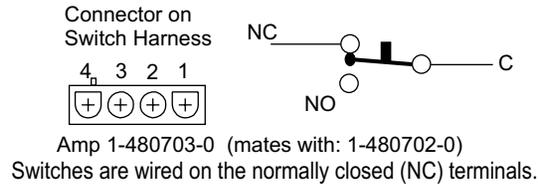
(Activated in both directions)



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

* Negative direction on VXM controllers



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

Setup

1. Connect the cables to motors and limit switches (if actuator has limit switches.) Connect the 9 pin serial cable from the VXM's rear panel connector labeled "RS-232" and your computer's serial port (usually labeled "COM" or "|O|O|".) For computers with only USB ports, use a USB to RS-232 adapter.

CAUTION: Motor cables should **never** be bundled together with the Limit Switch, or any I/O cabling. **Never** put any of the VXM's cables with power cables in a common electrical conduit or ducting. **Always** keep Limit Switch and I/O cables at least 2 inches from Motor and Power cables.

CAUTION: Motor cable length or connectors should not be altered without consulting Velmex first. Improper wiring can result in poor performance and damage to the VXM. Altered cables and resultant damage is not covered by the warranty.

IMPORTANT: The VXM can automatically detect limit switch inputs that are wired normally closed to operate (motor stops on open circuit.) Normally closed is the standard used on all Velmex products. However, Velmex rotary tables with the home switch option requires that the limit switch inputs be reconfigured in setup. Refer to the "setL" command in Appendix N.

CAUTION: Never connect or disconnect motors with the power on, this can result in severe damage to motor drive electronics.

2. Connect cable from DC power supply to VXM
3. Plug the DC power supply into a 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.
5. Initially the VXM is set for no motors selected (very low power, motors buzz but will not move.) **Use the COSMOS software included on the CDROM to set VXM for the proper motors.** If your computer is not a Windows based system, refer to the "setM" command in the reference section of this manual.