powermaxEDGE® Set-Up Guide
Powermax
Field Service Bulletin

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Hypertherm®

The world leader in plasma cutting technology

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DANGER
ELECTRICAL SHOCK CAN KILL

All work must be performed by a qualified technician.

The line disconnect switch must be in the OFF position before making the power cable connections. In the U.S., use a "lock-out/tag-out" procedure until installation is complete. In other countries, follow appropriate national or local safety procedures.

Purpose

This document provides the basic information needed to install the Hypertherm bundled package.

EDGE Ti bundle with cables and motors – dual side drive

Item	Part number	Description	Qty
1	System dependent	G3 series mechanized plasma system	1
2	228118	EDGE Ti CNC, 4 axis enabled	1
3	228119	EDGE Ti lifter	1
4	228120	Brushless motor, NEMA-34, 250W with 15 m (50 ft) cable	3
5	**228125**	**Cable set**	1
	123896	Cable: powermax interface, 15 m (50 ft)	1
	123987	Cable: lifter interface, 15 m (50 ft)	1
	123902	Cable: lifter motor power/brake, 15 m (50 ft)	1
	123899	Cable: lifter encoder/hall 15 m (50 ft)	1
	228126	Connector kit: Edge Ti, I/O (4 connectors)	1

EDGE Ti bundle with cables and motors – single side drive

Item	Part number	Description	Qty
1	System dependent	G3 series mechanized plasma system	1
2	228118	EDGE Ti CNC, 3 axis enabled	1
3	228119	EDGE Ti lifter	1
4	228120	Brushless motor, NEMA-34, 250W with 15 m (50 ft) cable	2
5	**228125**	**Cable set**	1
	123896	Cable: powermax interface, 15 m (50 ft)	1
	123987	Cable: lifter interface, 15 m (50 ft)	1
	123902	Cable: lifter motor power/brake, 15 m (50 ft)	1
	123899	Cable: lifter encoder/hall 15 m (50 ft)	1
	228126	Connector kit: Edge Ti, I/O (4 connectors)	1

EDGE Ti bundle with no cables and motors

Item	Part number	Description	Qty
1	System dependent	G3 series mechanized plasma system	1
2	228118	EDGE Ti CNC, 3 axis enabled	1
3	228119	EDGE Ti lifter	1
4	123896	Cable: powermax interface, 15 m (50 ft)	1


WARNING
MOVING PARTS CAN CAUSE INJURY

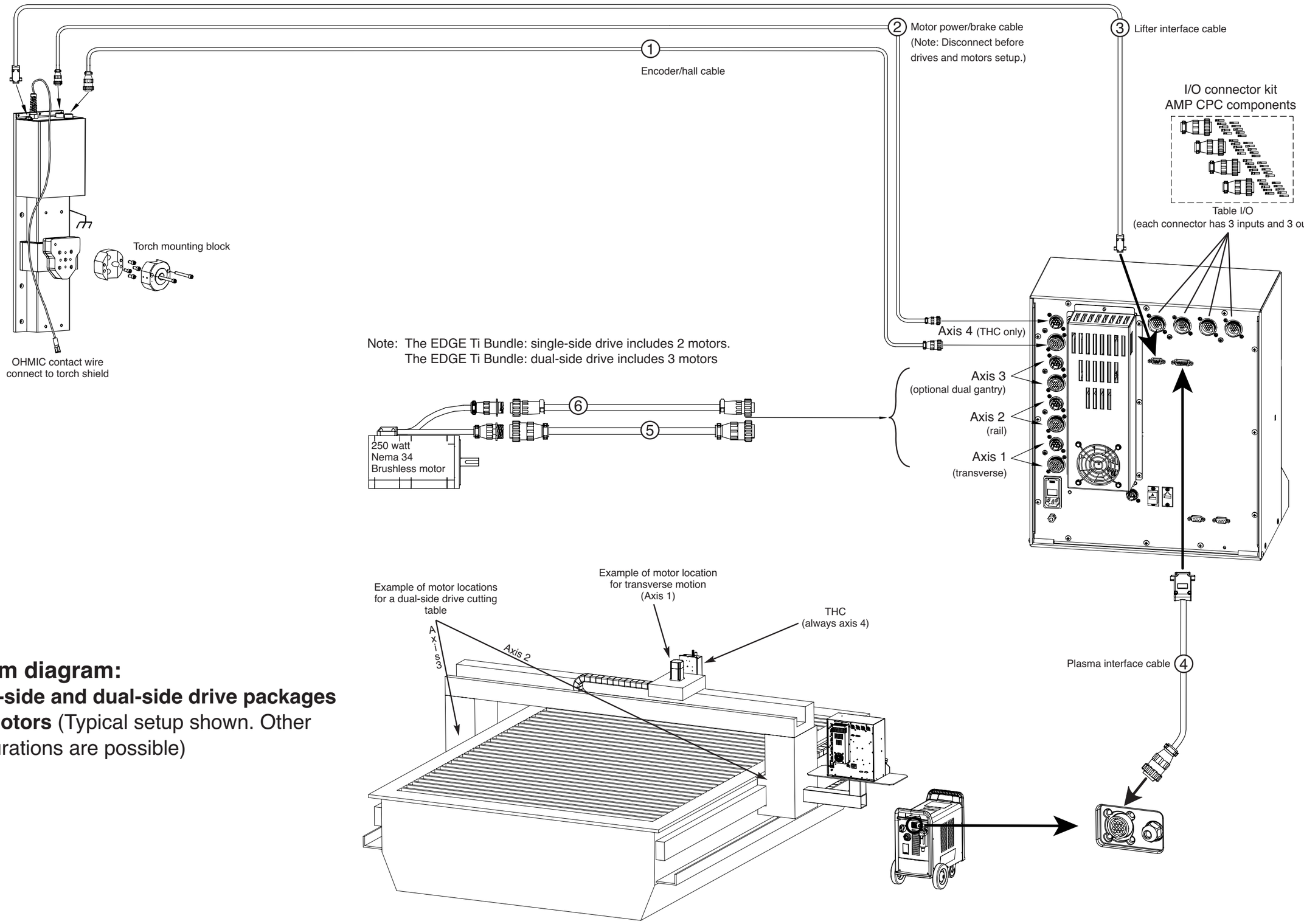
Engage the emergency stop button on the Edge Ti before you start the installation.

Setup

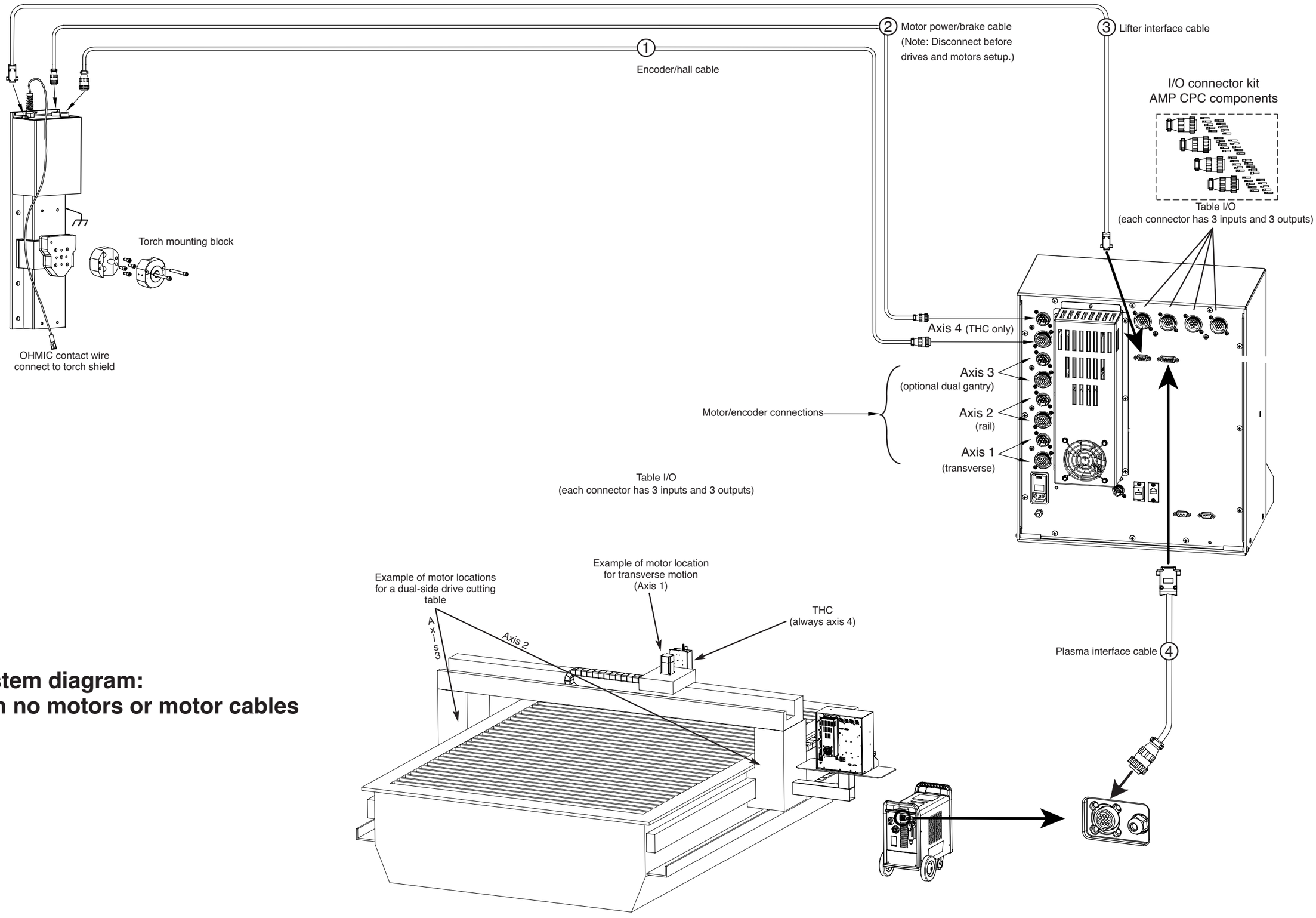
1. Verify that the contents of the package are correct.
2. Contact the manufacturer of the gear boxes that will be used and verify compatibility with the motors in this package.
3. Install all components.
4. Install all wiring.
5. Loosen motor brackets for the “X” and “Y” axis motors (or otherwise decouple the motor shaft from the machine as necessary) and move them so that the gear on the motor is NOT in contact with the rail. This will prevent unwanted movement of the table during installation and setup.
6. Disconnect the motor power/brake cable from the THC lifter.
7. Always turn off the Edge Ti CNC before cables are plugged into or unplugged from the CNC. This will prevent damage to the motors or the Edge Ti.

System diagram:

Single-side and dual-side drive packages with motors (Typical setup shown. Other configurations are possible)

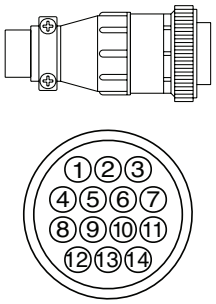


System diagram:
with no motors or motor cables



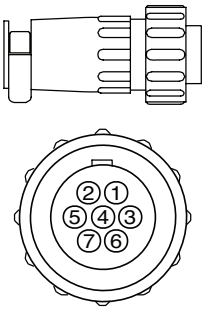
① Lifter encoder/hall cable

Signal	Pin number	Wire color
Encoder +5 VDC	1	Red
Encoder ground	2	Black
Channel A (+)	3	White
Channel A (–)	4	Black
Channel B (+)	5	Green
Channel B (–)	6	Black
Index (+)	7	Blue
Index (–)	8	Black
Hall 6V	9	Yellow
Hall ground	10	Black
Hall U	11	Brown
Hall V	12	Orange
Hall W	13	White
Shield	14	Braid



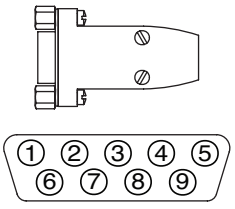
② Lifter motor (with brushes) power/brake cable

Signal	Pin number	Wire color
Motor (+)	1	Red
Motor (–)	2	Black
Not used	3	Red
Brake (+)	4	Red
Brake (–)	5	Black
Shield	6	Drain wire
Ground	7	Black

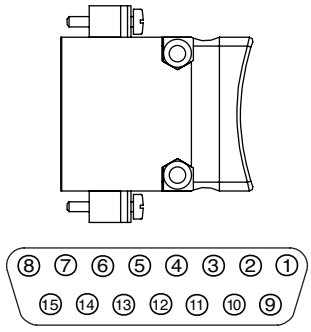


③ Lifter interface cable

Signal	Pin number	Wire color
Field +12 VDC	1	Black
Lower limit (shared with general input 11)	2	White
Upper limit (shared with general input 12)	3	Red
Breakaway (torch collision)	4	Green
Field common	5	Brown
Field common	6	Blue
Plate contact –12 VDC	7	Orange
Plate contact sensor	8	Yellow
Plate contact common	9	Purple

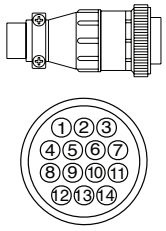


④ Plasma interface cable



CNC end

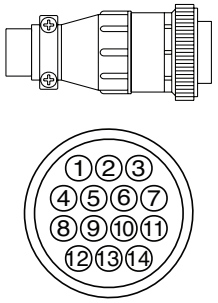
CNC signal	Pin number	Wire color	Pin number	Plasma power supply signal
12 Volt (+) to transfer +	1 4	Jumper	N/A	N/A
Start	2	Black	4	Start
Start	10	Red	3	Start
Transfer	12	Black	12	Transfer
Ground	5	White	14	Ground
Divided arc voltage (–) Divided arc voltage (+)	15 8	Black Green	5 6	Divided arc voltage (–) Divided arc voltage (+)
Shield	Shell	Drain wire	13	Shield



Plasma power supply end

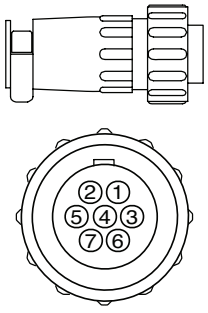
⑤ Table-motion motors encoder/hall cable

Signal	Pin number	Wire color
Encoder +5VDC Encoder ground	1 2	Red Black
Channel A (+) Channel A (–)	3 4	White Black
Channel B (+) Channel B (–)	5 6	Green Black
Index (+) Index (–)	7 8	Blue Black
Hall 6V Hall ground	9 10	Yellow Black
Hall U	11	Brown
Hall V	12	Orange
Hall W	13	White
Shield	14	Drain wire



⑥ Table-motion motors (brushless and brushed) power/brake cable

Brushless Signal	Pin number	Wire color	Brushed Signal
Phase A	1	Red	Motor (+)
Phase B	2	Black	Motor (–)
Phase C	3	Red	N/A
Not typically used	4 5	Red Black	Brake (+) Brake (–)
Shield	6	Drain wire	Shield
Ground	7	Black	Ground



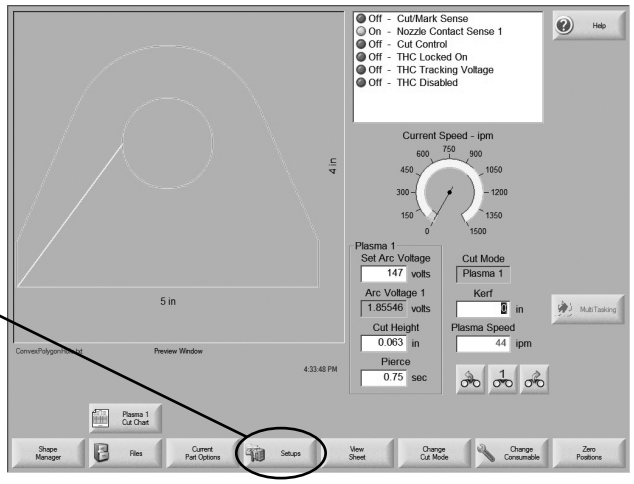
Note: See “Appendix E: Edge Ti” in the Installation and Setup Guide for brushed motor information

Verify inputs/outputs

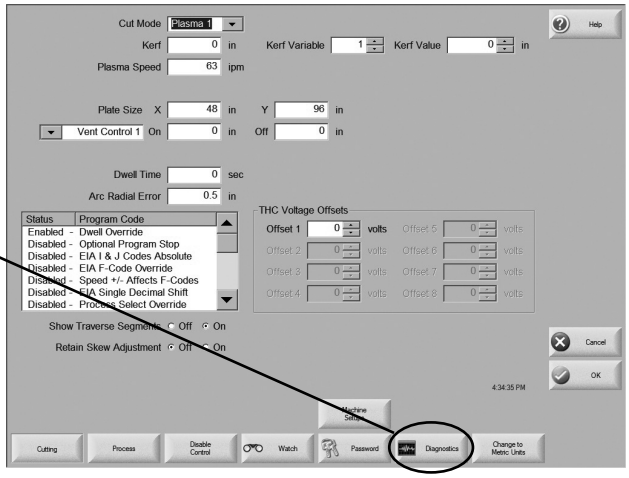
Identify all the inputs and outputs that need to be wired into the Edge Ti controller and their type (normally closed limit switches, normally open torch breakaway, normally open vent control, etc).

Access the inputs screen from the main screen:

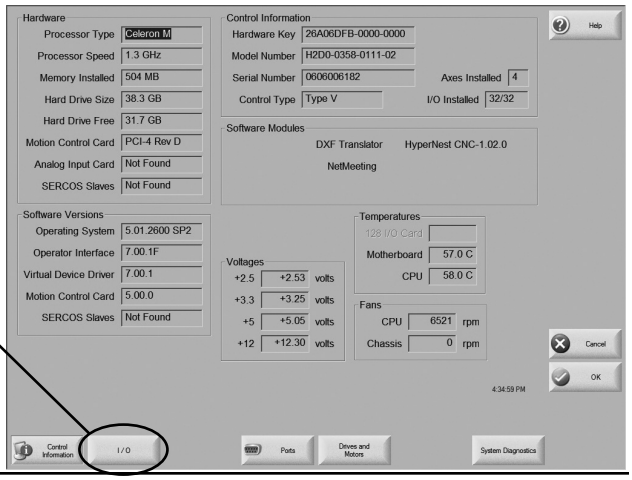
1. Press the Setups button.



2. Press the Diagnostics button.

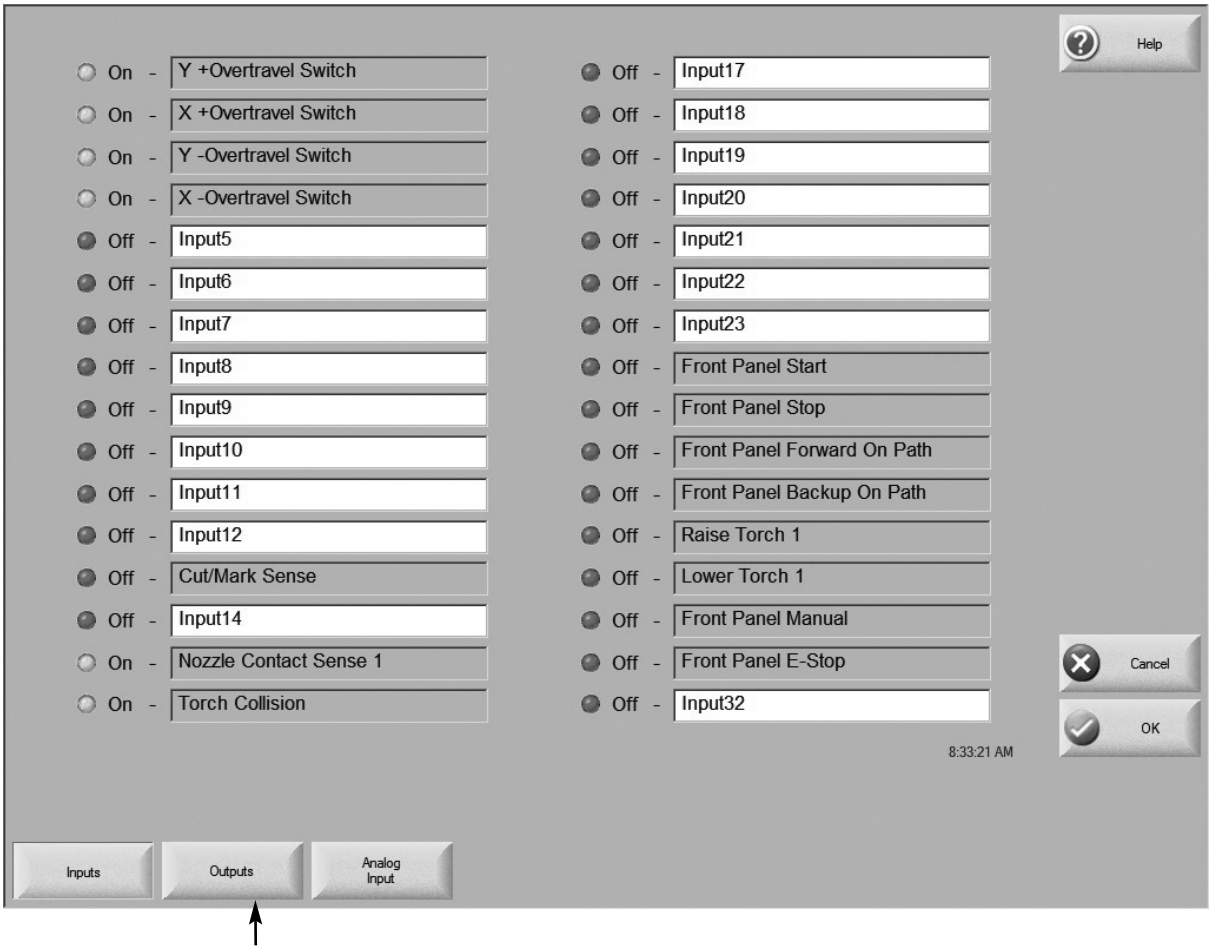


3. Press the I/O button and enter the password.



4. To test the input signals, activate the switches manually and verify that the corresponding light changes color.
   Green = an open state
   Red = a closed state.

   Note: The first 12 inputs can be assigned by the user.



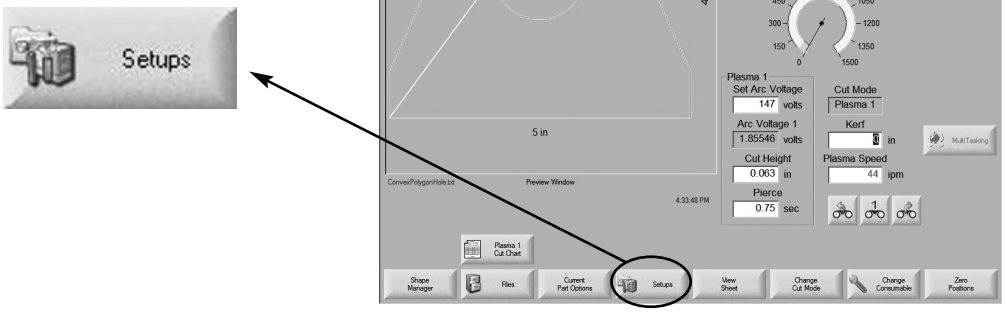
Note: Press the Outputs button to navigate directly to the Outputs screen

Software set-up

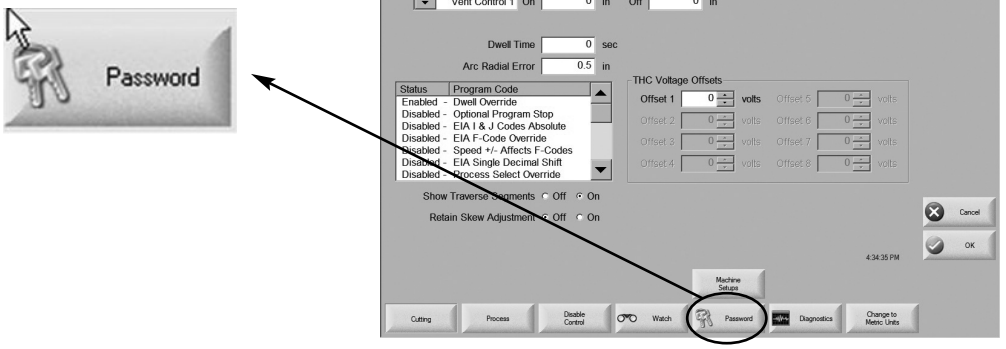
Station assignment screen

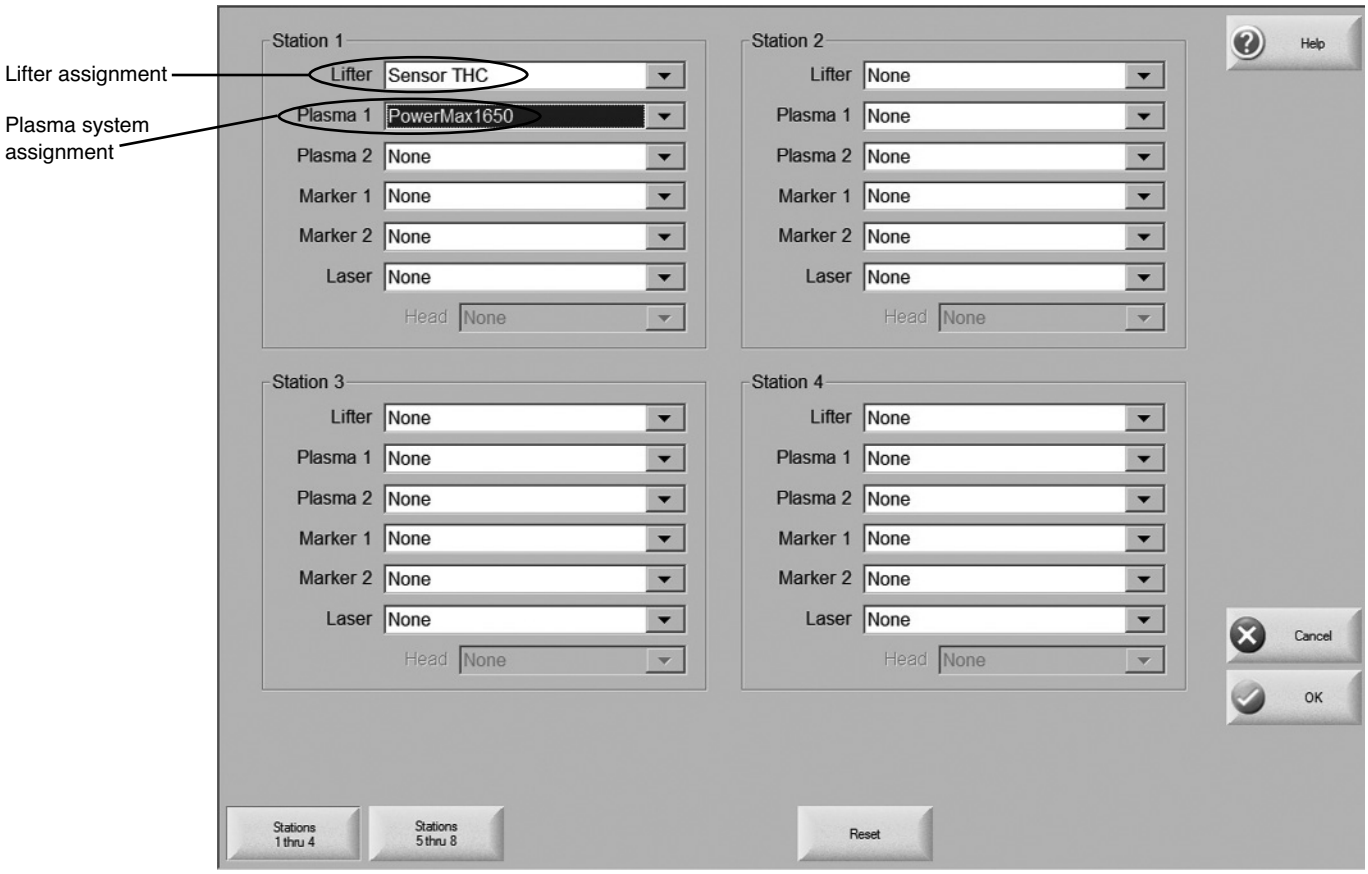
The controller is preset for the powermax1650 and the EDGE Ti lifter. Navigate to the station assignment screen as shown below if a system other than the powermax1650 or EDGE Ti lifter is being used. See section 4: Password Setup in the Installation and Setup Guide for Touch Screen CNCs for detailed information.

1. Press the Setups button on the touch screen.



2. Press the Passwords button and enter the password.

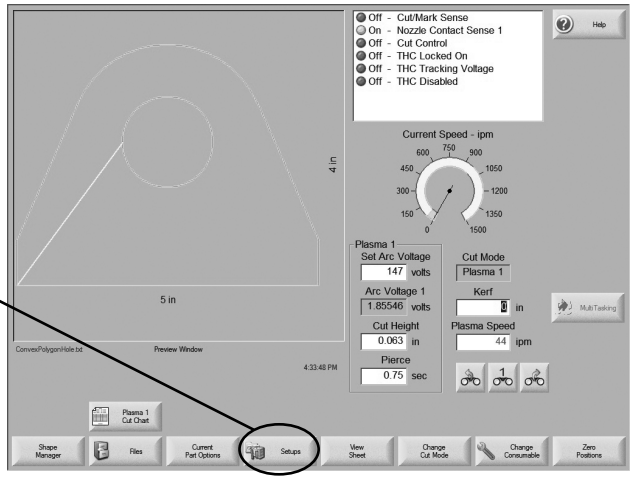



Lifter assignment
Plasma system assignment
Station 1
Lifter Sensor THC
Plasma 1 PowerMax1650
Plasma 2 None
Marker 1 None
Marker 2 None
Laser None
Head None
Station 2
Lifter None
Plasma 1 None
Plasma 2 None
Marker 1 None
Marker 2 None
Laser None
Head None
Station 3
Lifter None
Plasma 1 None
Plasma 2 None
Marker 1 None
Marker 2 None
Laser None
Head None
Station 4
Lifter None
Plasma 1 None
Plasma 2 None
Marker 1 None
Marker 2 None
Laser None
Head None
Help
Cancel
OK
Stations 1 thru 4
Stations 5 thru 8
Reset

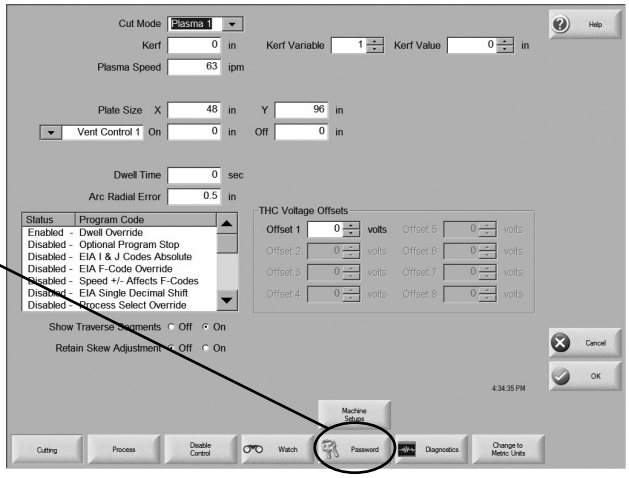
Software set-up

Assign inputs/outputs (I/O)

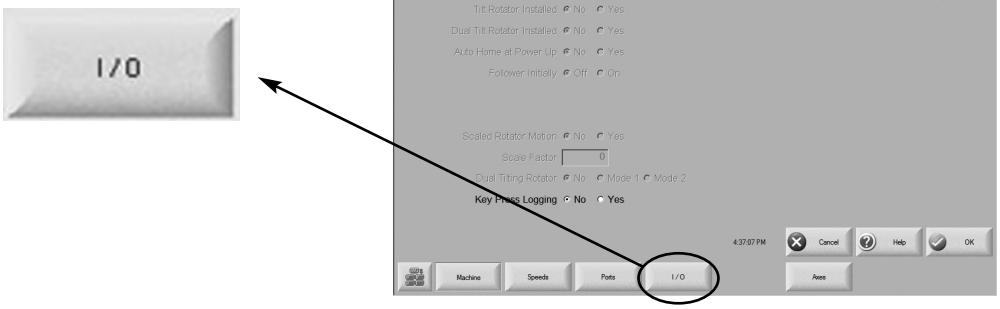
1. Turn ON the EDGE Ti controller.
2. Identify all the inputs and outputs that need to be wired into the Edge Ti controller and their type (normally closed limit switches, normally open torch breakaway, normally open cut-sense, etc).
3. As shipped, the Edge Ti is configured for “dry contact” inputs. Refer to appendix E “I/O configuration” if sourcing inputs are required.
4. Navigate to the I/O screen:
   a. Press the Setups button on the touch screen.



   b. Press the Passwords button and enter the password.



c. Press the I/O button.

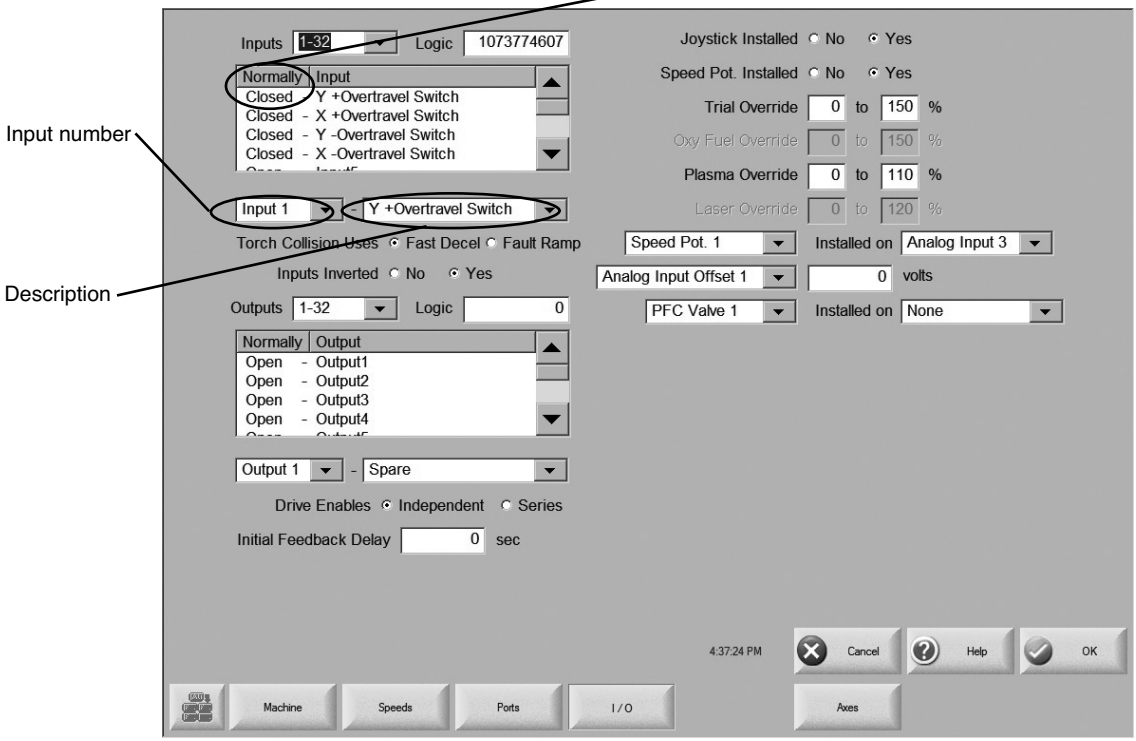


Note: Input assignments are dependent on the incoming signals for a specific set-up. In the example below Input 1 is "X – Over-travel." This may be different from what is seen in your application.

d. Select the appropriate input number and description for each input.

Caution: Over-travel (limit) switches should be set as normally closed for safety.

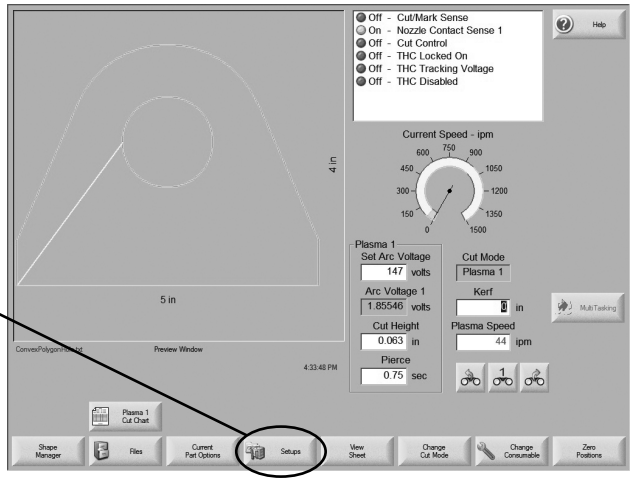
Signals can be changed from normally open to normally closed by double tapping the touch screen.



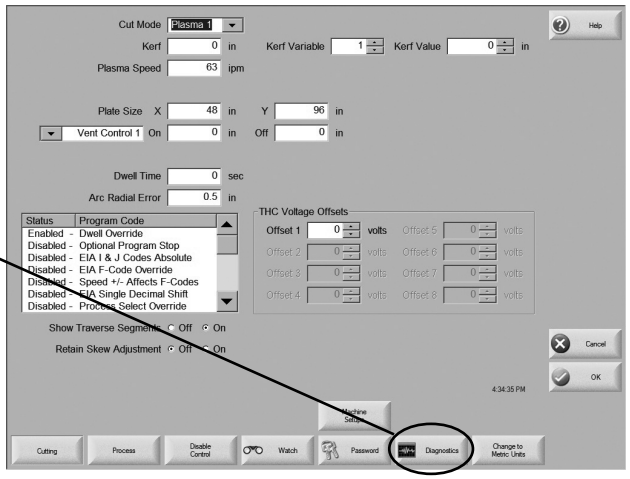
Outputs

Access the outputs screen from the main screen:

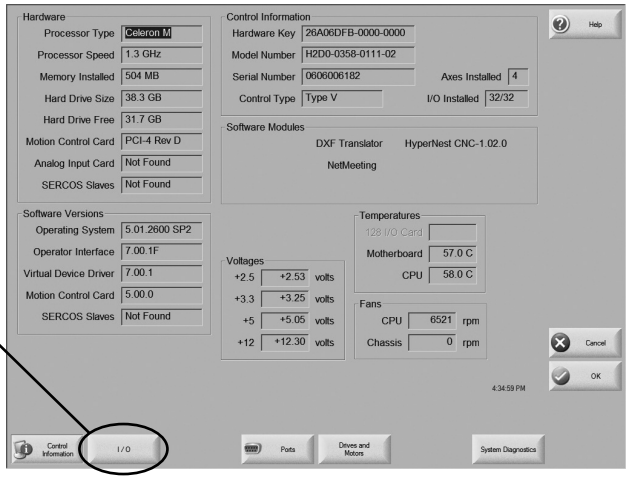
1. Press the Setups button.



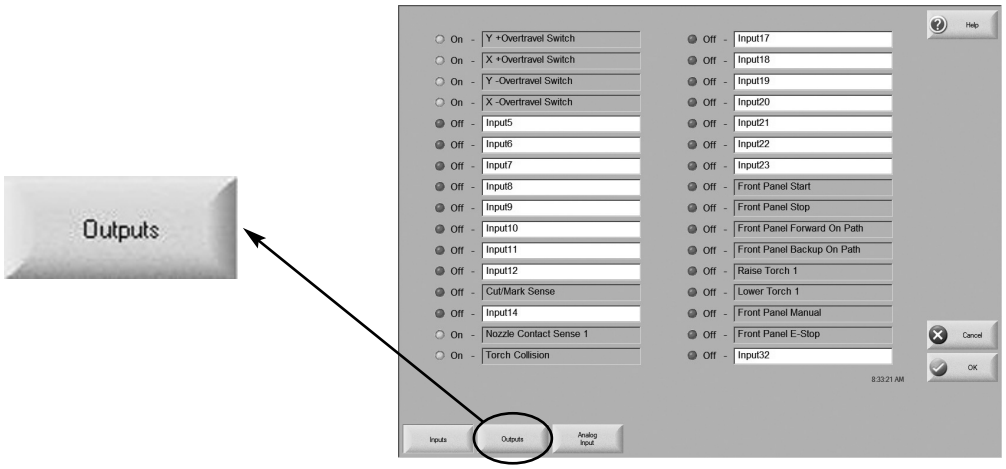
2. Press the Diagnostics button.



3. Press the I/O button and enter the password.

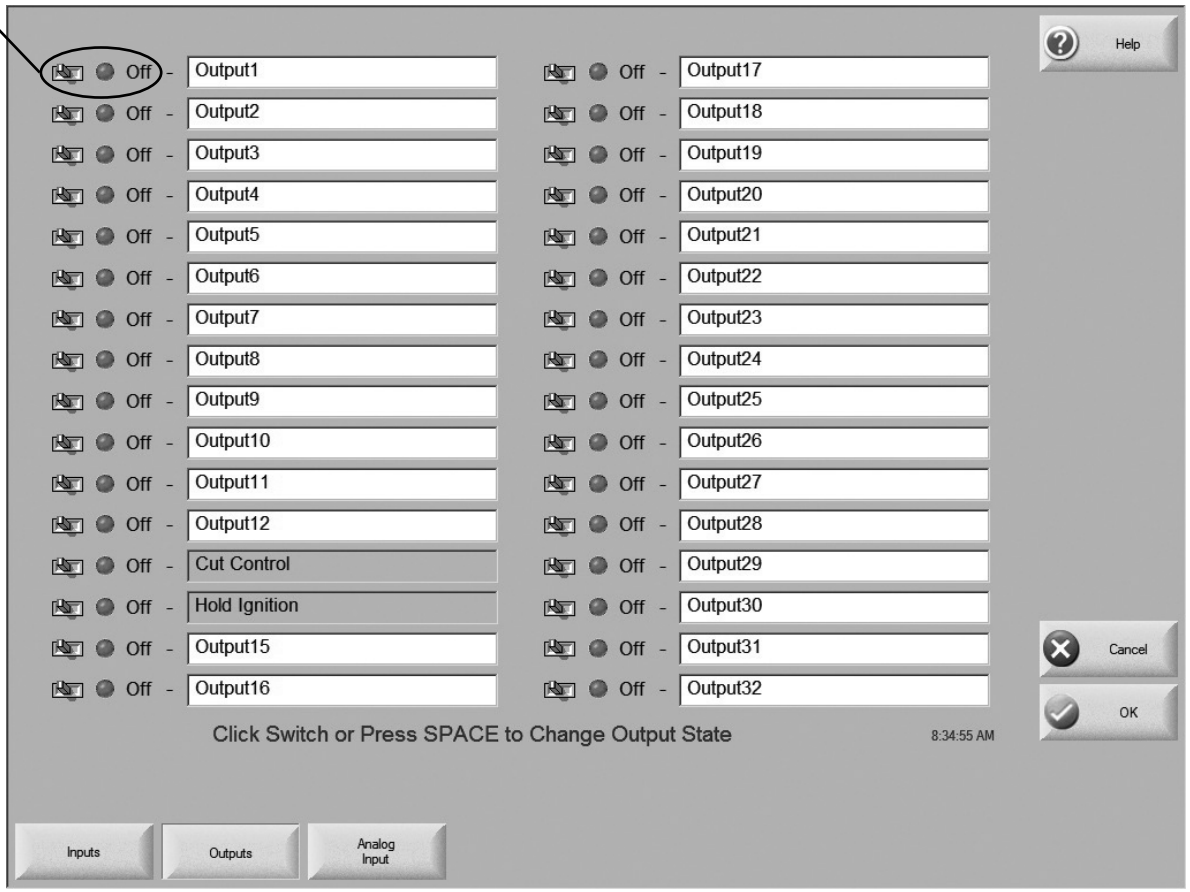


4. Press the Outputs button.



5. Test each output signal by activating the switch on the screen and verifying that the correct output device or action is initiated.

   Note: The first 12 outputs can be assigned by the user.



Drives and motors set-up

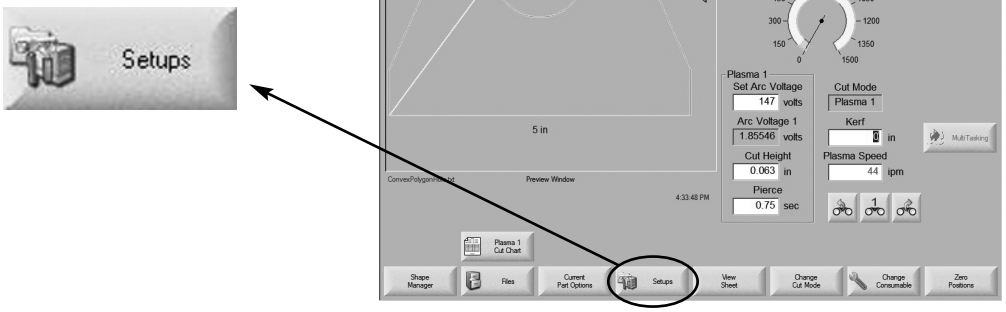
The purpose of the Drives and Motors screen is to verify that the rail and transverse motors spin smoothly, and in the desired direction of travel. Polarities for the DAC (Digital to Analog Converter) and Encoder must be set individually to positive or negative as required. The polarity drives the motor in the desired direction. DAC Polarity refers to the analog command voltage sent from the Motion Control Card to the Servo Amplifier and motor. Encoder polarity refers to how the Motion Control Card views the encoder pulses received. This is also the screen where the encoder counts per inch (or millimeter) are entered so each axis moves as anticipated.

Caution: **Loosen motor brackets for the transverse and Rail motors and move them so that the pinion gear on the motor is NOT in contact with the rack. For tables that do not use a rack and pinion, disconnect motor shaft. This will prevent unwanted movement of the table during installation and setup.**

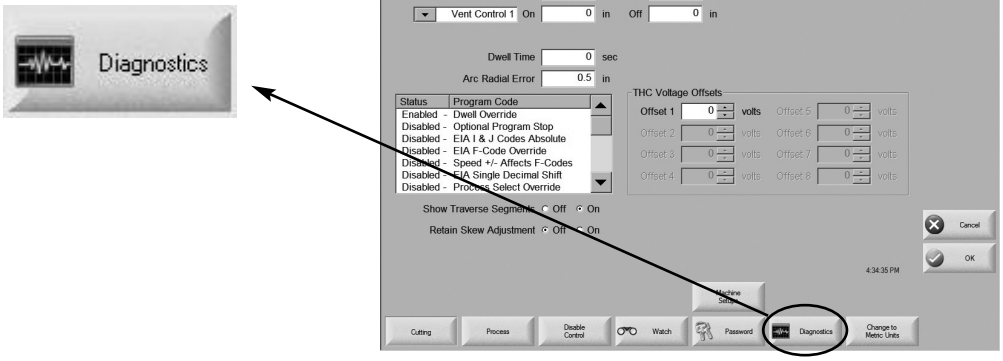
Note: with the CNC turned off, disconnect the lifter cables (axis 4) before navigating to the diagnostic screen to avoid unwanted lifter movement.

Access the Drives and Motors screen from the main screen:

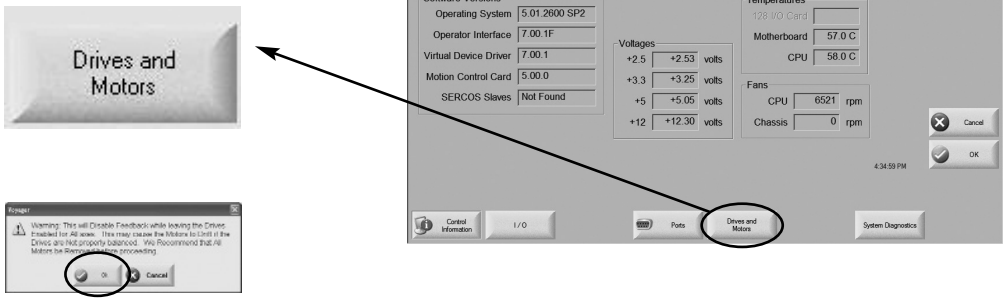
1. Press the Setups button.



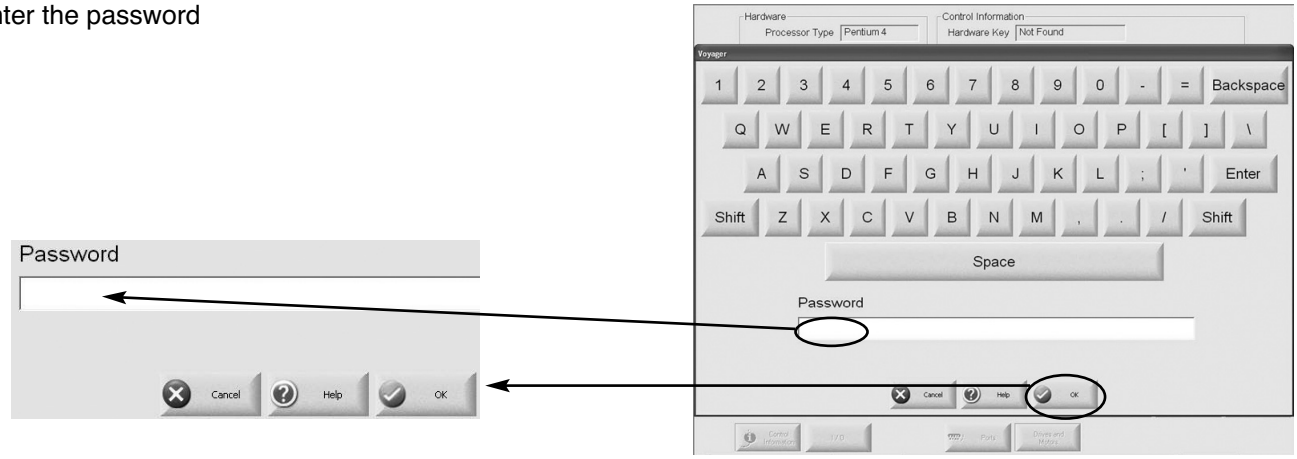
2. Press the Diagnostics button.



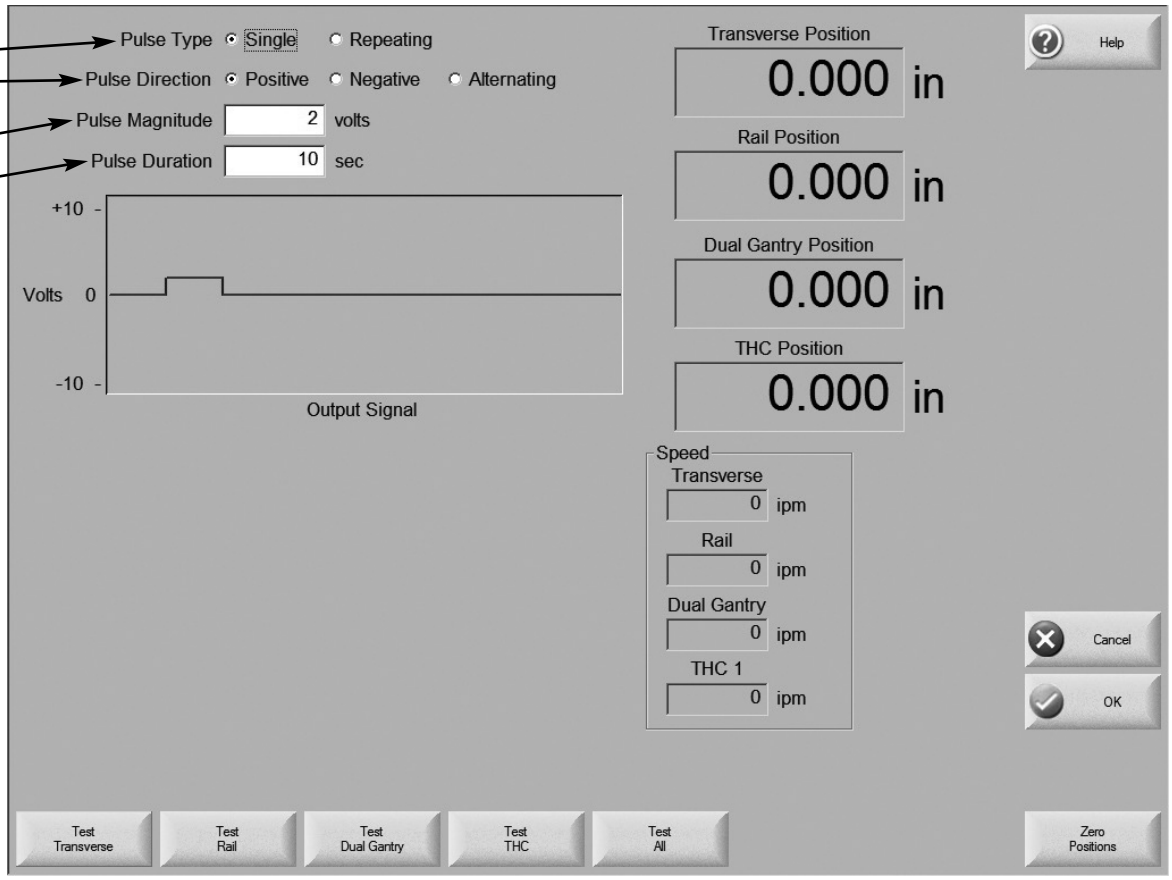
3. Press the Drives and Motors button, read the warning and press OK.



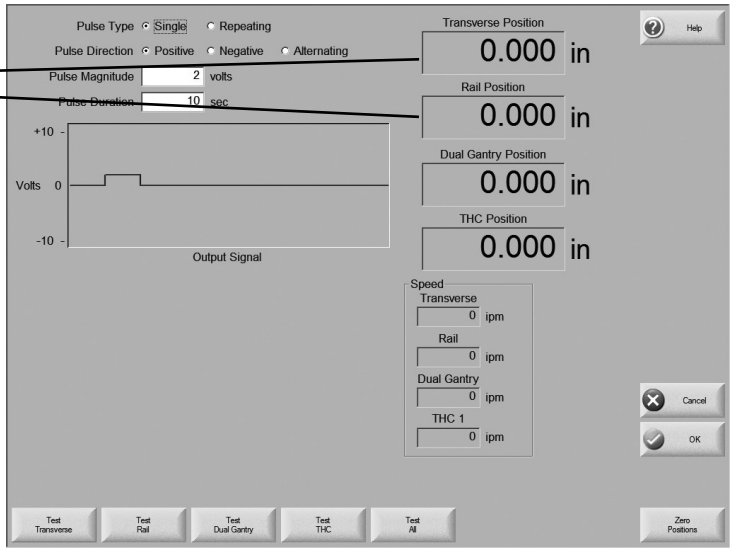
4. Enter the password



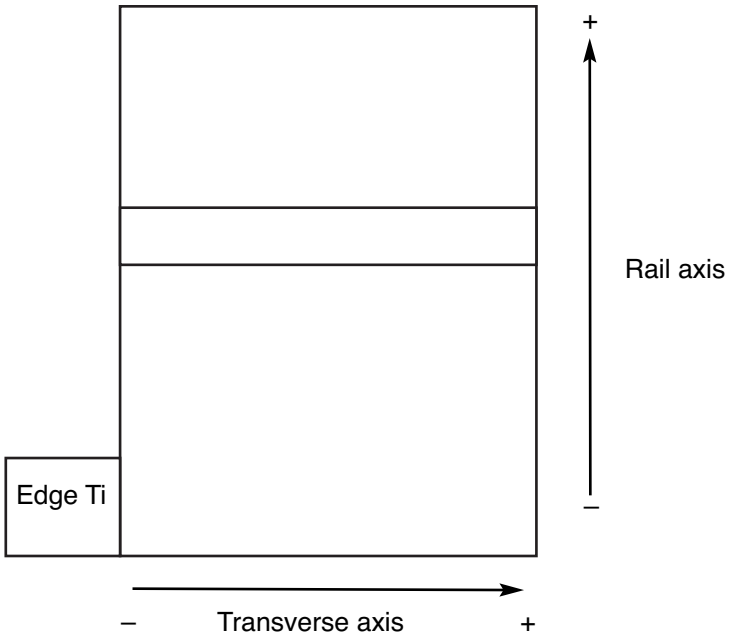
5. Select:
   Single pulse
   Positive direction,
   2 volts
   10 seconds



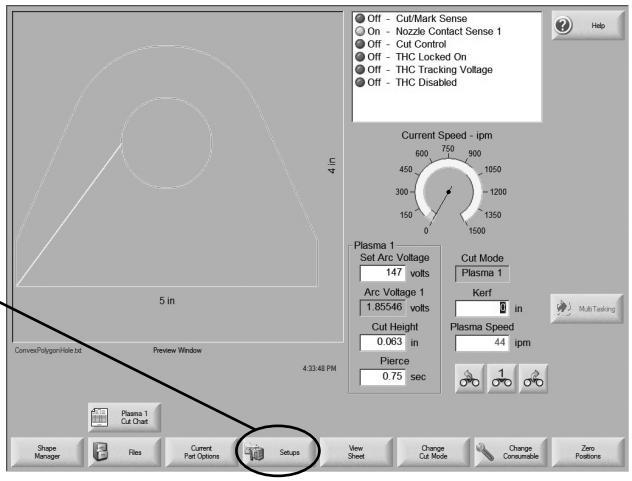
6. Press the test button for the axis you want to test and note the value that is displayed in the position box.

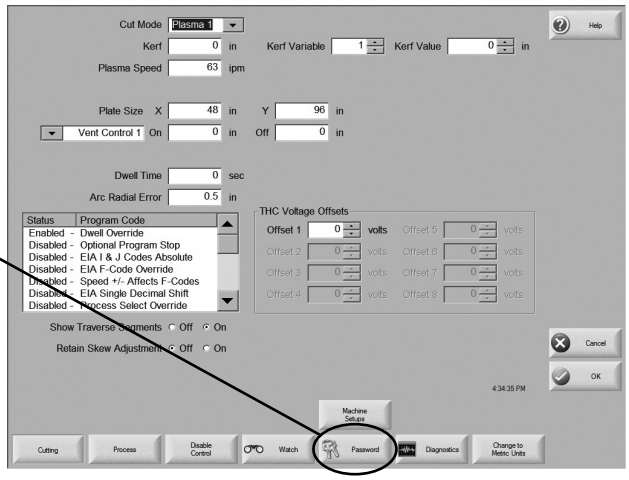


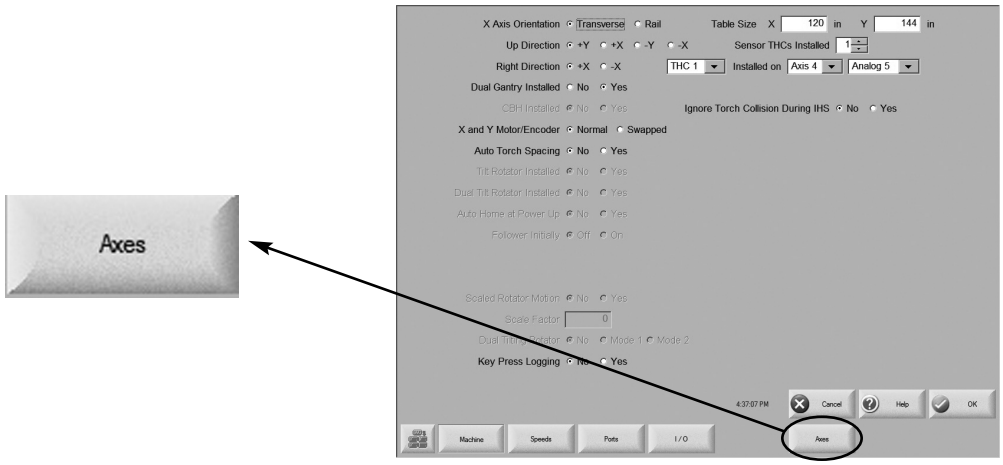
Note: This figure is a simplified table that is shown for reference only



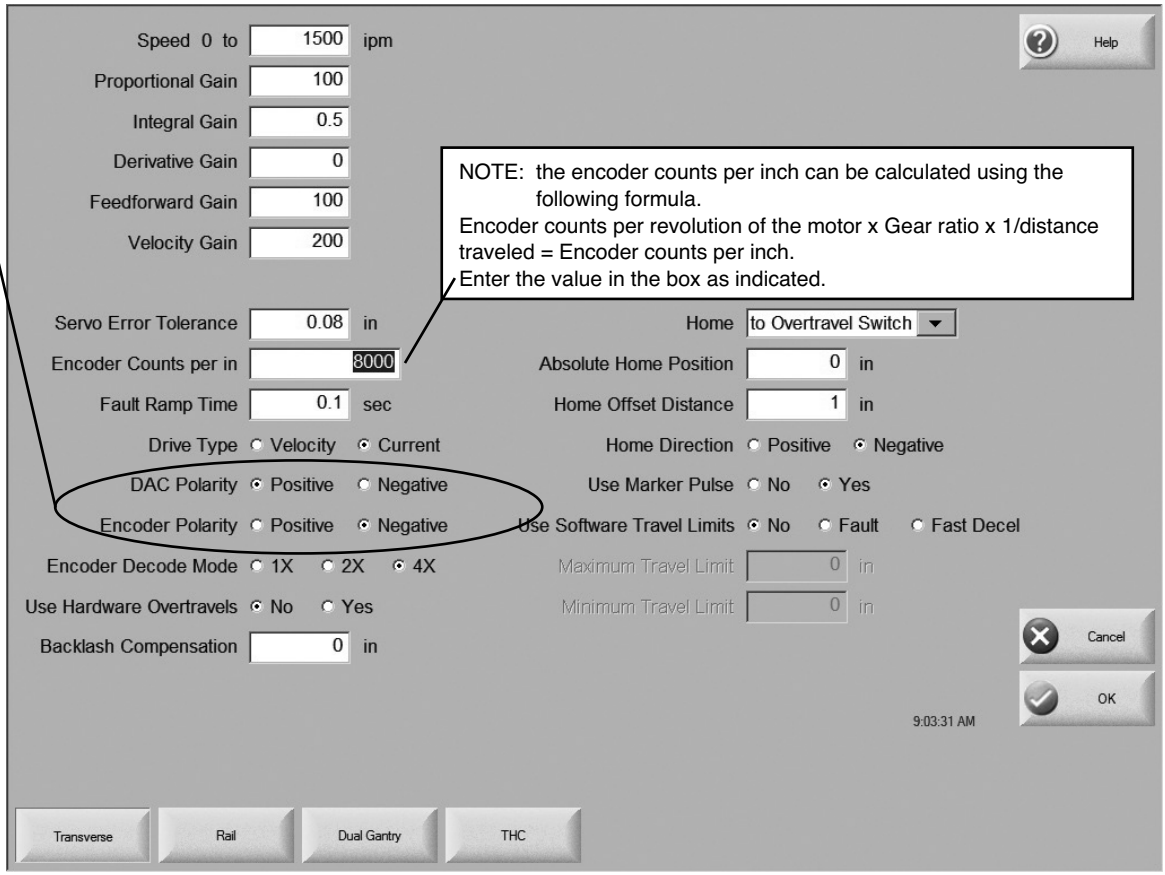
7. If the value is negative, navigate to the axes setup screen as shown. If the value is positive, no further adjustment is needed.







8. Change the encoder and DAC polarities. It is possible that “negative” will have to be selected for the value in the position box to read positive.



9. Return to the Drives and Motors screen and repeat the process for the next axis. Note the direction of the gear as you repeat the previous test.

10. After the direction and encoder are properly set, put the motors back in place and verify table motion.

Post installation

1. Save a back-up copy of the settings to the CNC hard drive and also to a removable storage device.

2. Run the Norton Ghost Utility. See section 3 of the Installation and Setup Guide for Touch Screen CNCs for more information.