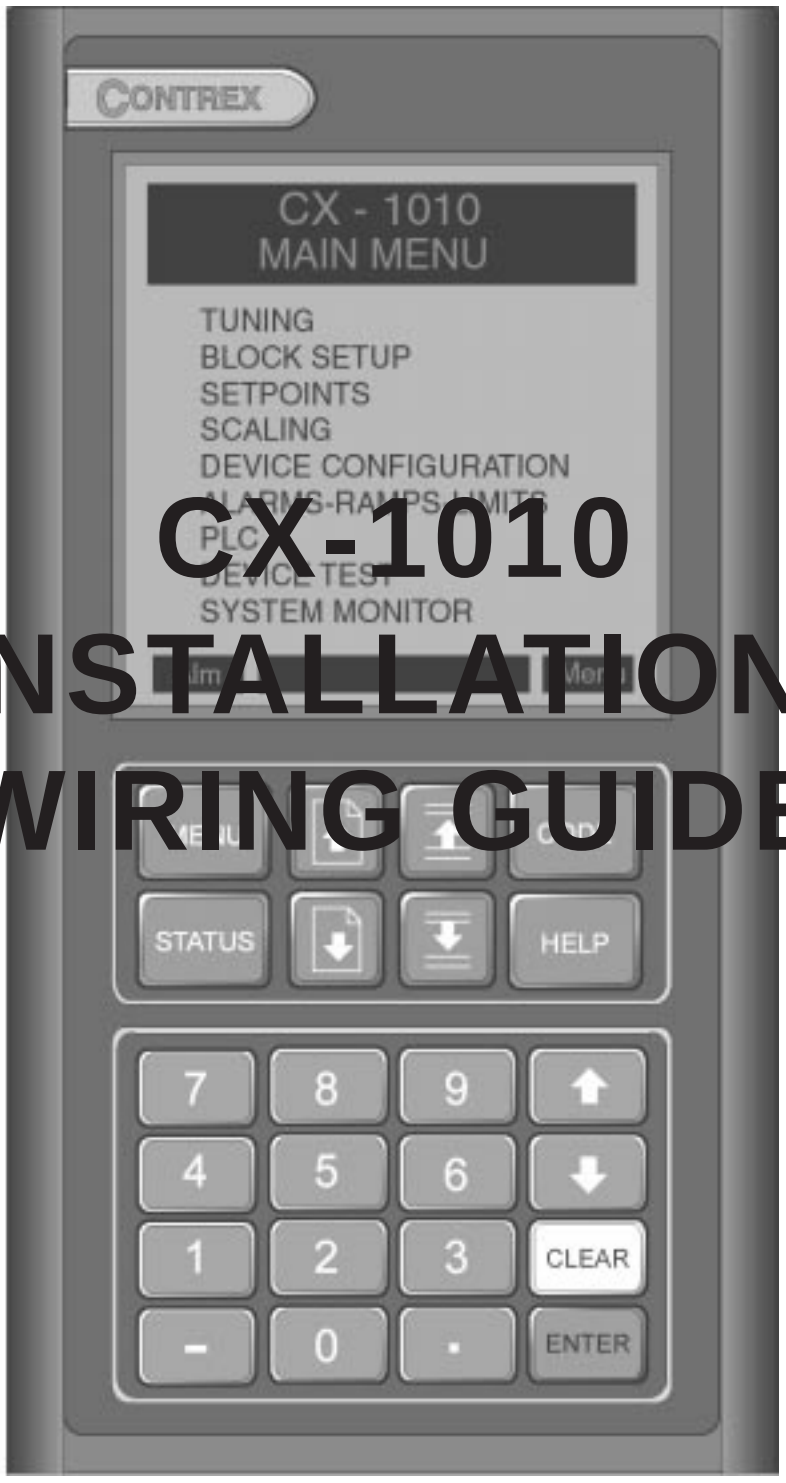


CX-1010 INSTALLATION/ WIRING GUIDE

CONTREX®

SK1659 Rev A

Installation / Wiring Guide

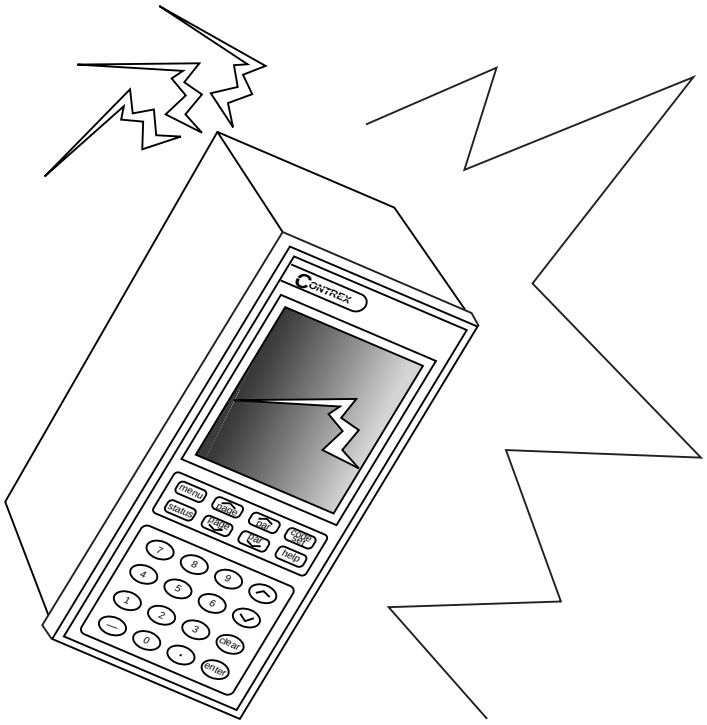
CONFIGURATION

This section will show you how to re-configure the CX-1010 for electrical compatibility. Complete this procedure prior to installation. This procedure does not require power to complete.

The area that is involved in re-configuring the CX-1010 is the AC Power Input Voltage switch. This switch is located in an external location on the CX-1010. You will not be required to access the interior of the CX-1010.

Figure 1 (page 5) illustrates the location of this switch.

WARNING



You will damage the CX-1010 if you apply 230 VAC to the AC Power input while the AC Power Input Voltage switch is in the 115 V position.

The AC Power Input Voltage switch is located on the rear of the CX-1010. The default configuration for the AC Power Input Voltage switch is 115 VAC.

To re-configure for 230 VAC Input, move the switch from the 115V position (up) to the 230V position (down).

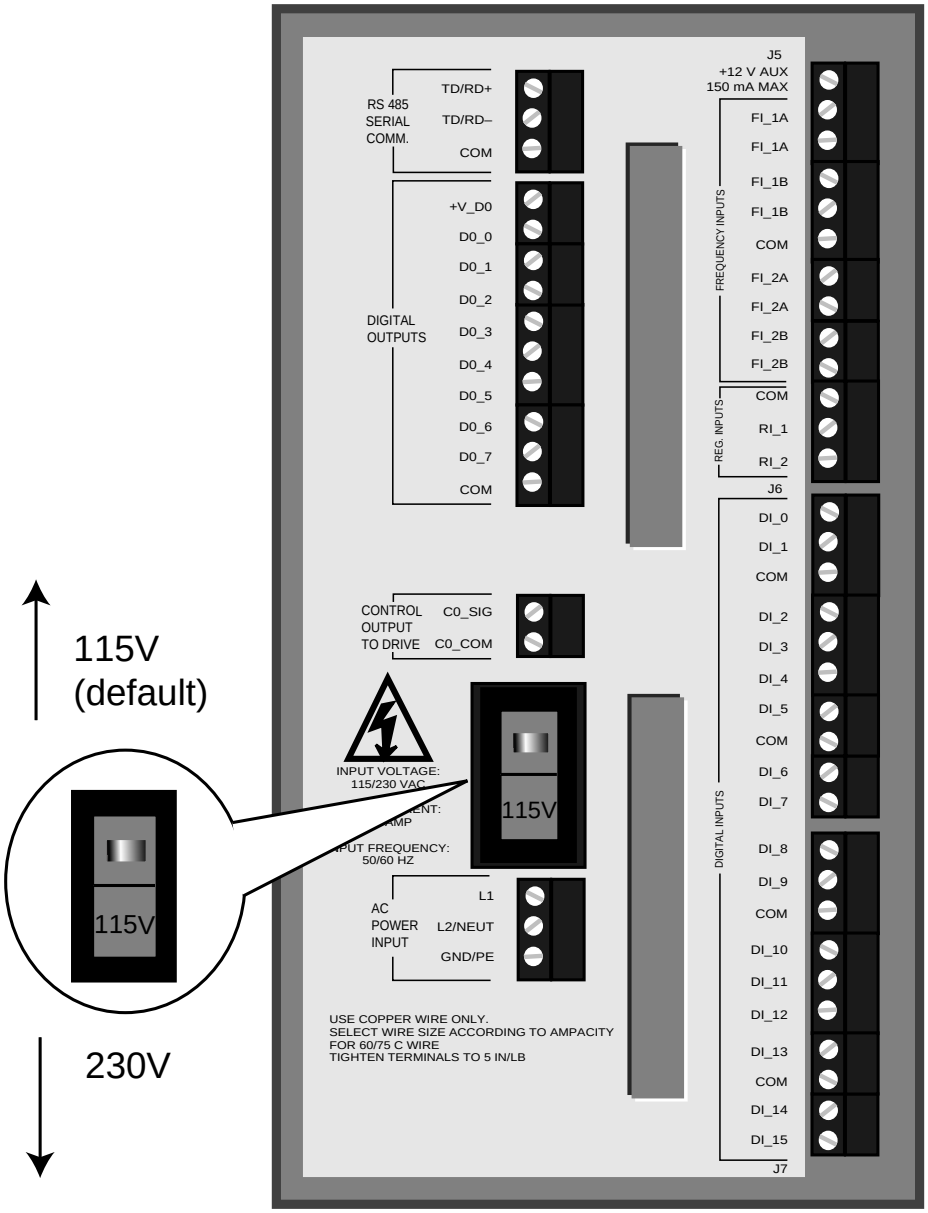
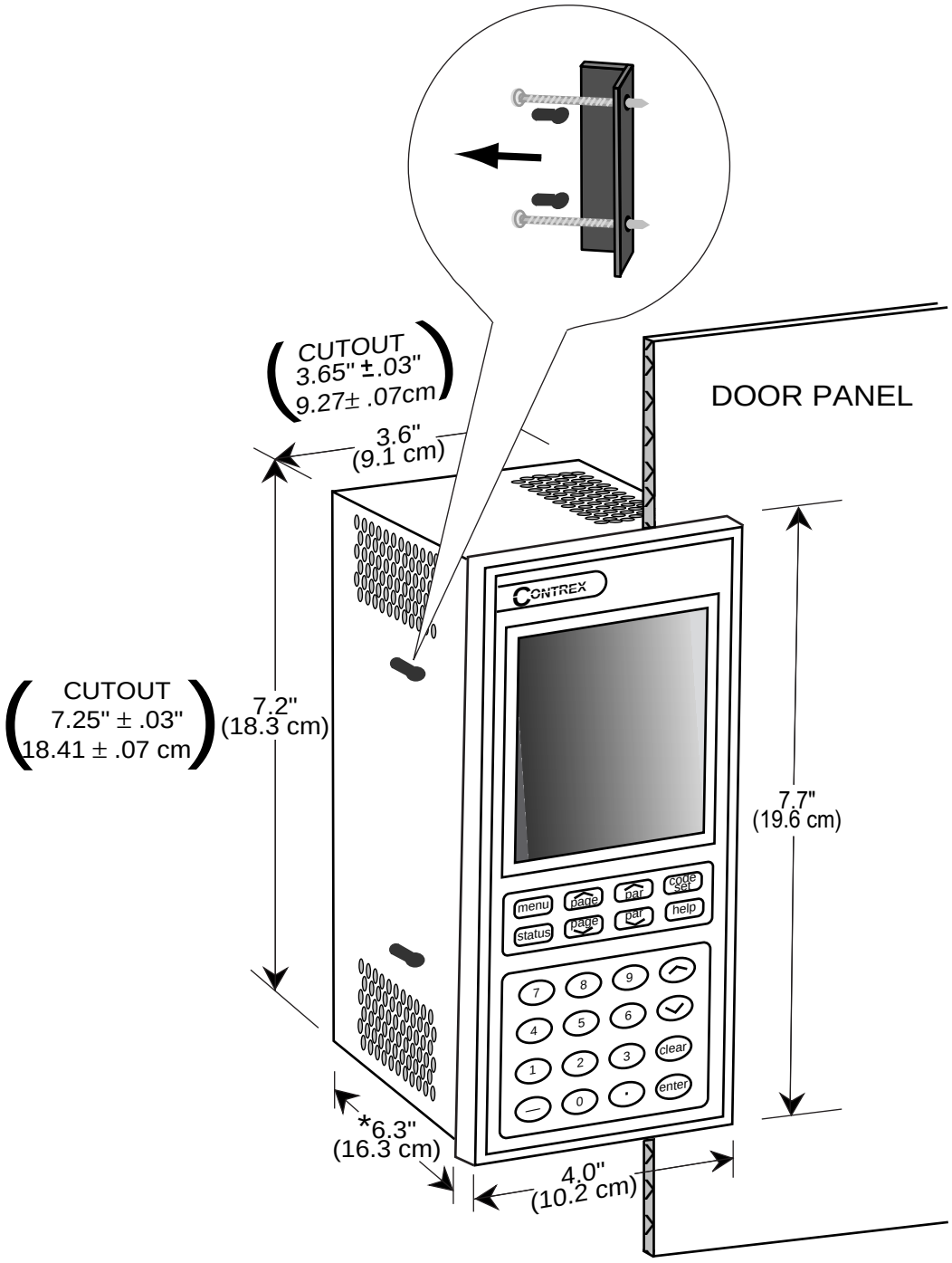


Figure 1 AC Power Input Voltage Switch



* From the rear of the door panel to the back of the connectors

Figure 2 CX–1010 Cutout Dimensions and Mounting Guide

MOUNTING

This section contains instructions for mounting the CX–1010 in the door panel of an industrial electrical enclosure. The CX–1010 is packaged in a compact 1/2 DIN vertical instrument enclosure that mounts easily in the door of your industrial electrical enclosure. The CX-1010 meets the NEMA 4 and the IP65 standards. To ensure compliance with these standards, enclose the CX-1010 in a Nema 4 or IP65 industrial electrical enclosure.

To mount the CX–1010:

1) The industrial electrical enclosure that will house the CX–1010 must conform to the following environmental conditions:

   Temperature: 0 - 55 degrees C
   (Internal enclosure temperature)

   Humidity: 0 - 95% RH non-condensing

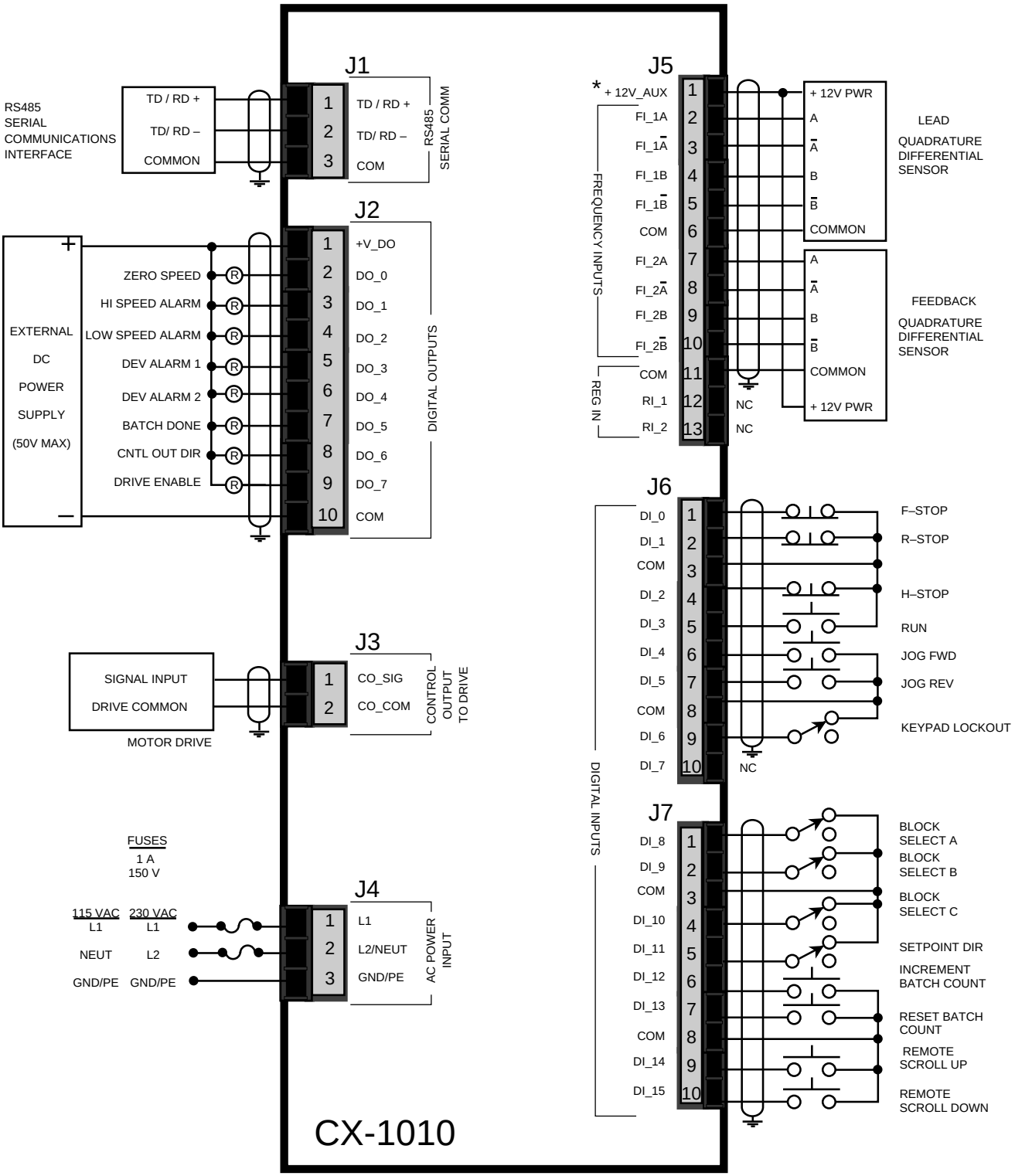
   Environment: Pollution degree 2 macro - environment

   Altitude: To 3300 feet (1000 meters)

2) The dimensions for the door panel cutout are 3.65"$\pm$ .03" x 7.25 $\pm$.03" (9.27 x 18.41cm). See figure 2. Allow two inches of clearance on both sides of the cutout and four inches of clearance on the top and bottom of the cutout for mounting clamp attachments, wire routing and heat convection.

3) Insert the CX–1010 through the door panel cutout until the gasket and bezel are flush with the door panel (see figure 2).

4) Slide the two mounting clamp bars into the slots that are located on either side of the CX–1010. See figure 2. Tighten the mounting screws until the CX–1010 is mounted securely in the electrical enclosure. Do not overtighten.



* Power for frequency input sensors may be supplied by J5, pin 1.

Total current should not exceed 150 mA .

Figure 3 CX–1010 General Wiring

WIRING

This section contains the input, output and serial communications wiring information for the CX–1010. Please read this section prior to wiring the CX–1010 to ensure that you make the appropriate wiring decisions.

NOTE: The installation of this motor control must conform to area and local electrical codes. See *The National Electrical Code* (NEC,) Article 430 published by the National Fire Protection Association, or *The Canadian Electrical Code* (CEC). Use local codes as applicable

Use a minimum wire gauge of 18 AWG.

Use shielded cable to minimize equipment malfunctions from electrical noise and terminate the shields at the receiving end only.

Keep the AC power wiring (J4) physically separated from all other wiring on the CX–1010. Failure to do so could result in additional electrical noise and cause the CX–1010 to malfunction.

Inductive coils on relay, contactors, solenoids that are on the same AC power line or housed in the same enclosure should be suppressed with an RC network across the coil.

A hand operated supply disconnect device must be installed in the final application. The primary disconnect device must meet EN requirements.

Install an AC line filter or isolation transformer to reduce excessive EMI noise, such as line notches or spikes, on the AC power line.

DANGER

Hazardous voltages.
Can cause severe injury, death
or damage the equipment.
The CX–1010 should only be installed by a qualified electrician.

INPUTS

NOTE: The installation of this motor control must conform to area and local electrical codes. Refer to page 9 before you begin wiring.

AC Power Input
(J4 pins 1, 2,3)

The CX–1010 operates on either a 115 VAC - 10% + 15%, 0.250 Amp., 50/60 Hz or a 230 VAC -10% +15%, 0.125 Amp, 50/60 Hz. Use the separate 3 pin connector (J4) for the power connection.

* Fuse L1 for 115 VAC applications. Fuse L1 and L2 for 230 VAC applications. Use 1 Amp 250 normal blow fuses.

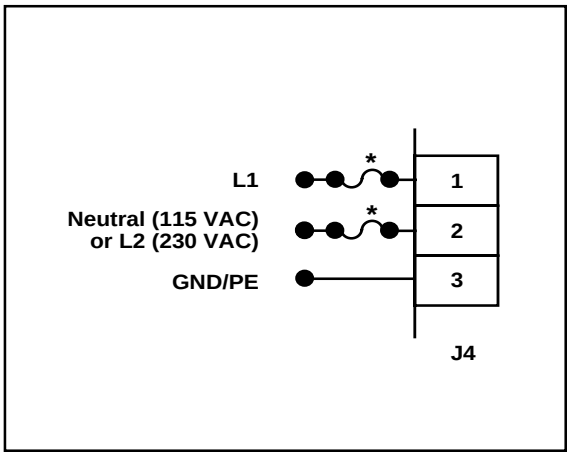


Figure 4 AC Power Input

WARNING

You will damage the CX-1010 if you apply 230 VAC to the AC Power input when the AC Power Input Voltage switch is in the 115 V position.

Lead Frequency
(J5 pins 1, 2, 4, 5, 6)
Frequency Input 1

The LEAD FREQUENCY Input acts as the lead signal when the CX–1010 is in the Follower mode. The wiring for the LEAD FREQUENCY is determined by the sensor. Figures 5 through 8 illustrate the wiring for the various sensors. For signal level and performance specifications, refer to *CX-1010 Technical Reference Manual, Appendices: Appendix A* .

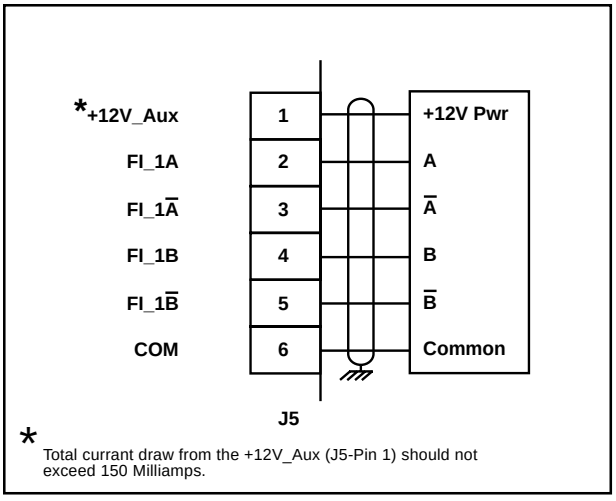
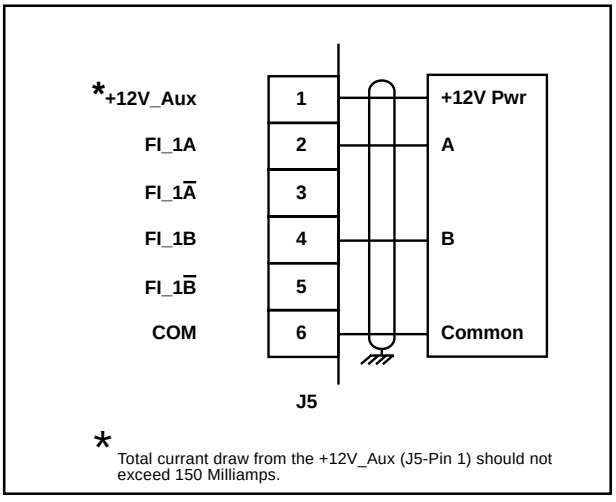


Figure 5 Lead Frequency
Quadrature Differential Sensor (Bidirectional)

Figure 6 Lead Frequency
Quadrature Single-Ended Sensor (Bidirectional)



Lead Frequency continued...

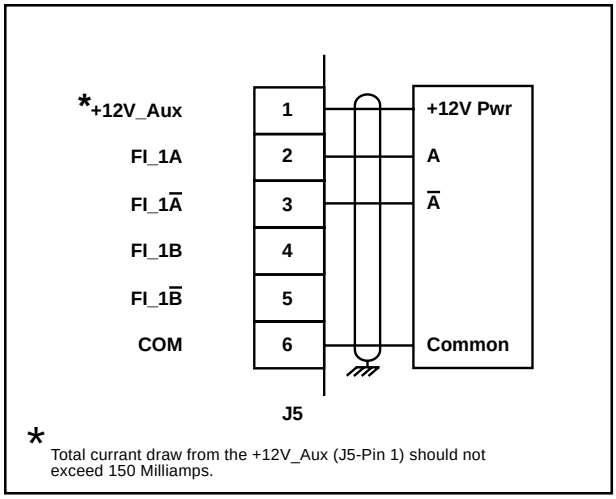
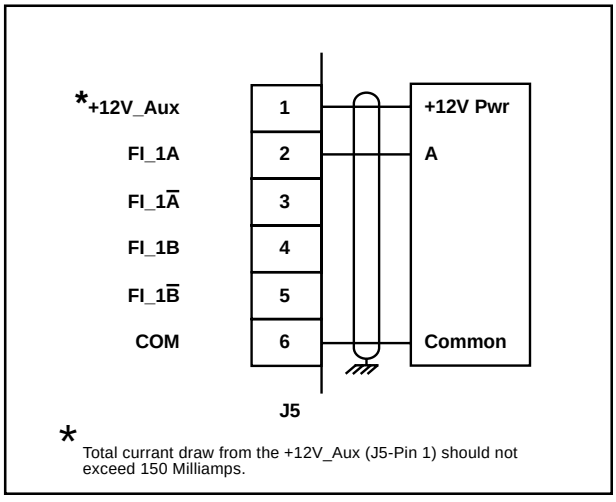


Figure 7 Lead Frequency
Single Channel Differential Sensor (Unidirectional)

Figure 8 Lead Frequency
Single Channel Single-Ended Sensor (Unidirectional)



Feedback Frequency
(J5 pins 1, 7, 8, 9, 10, 11)
Frequency Input 2

The FEEDBACK FREQUENCY detects the controlled motor speed. The wiring for FEEDBACK FREQUENCY is determined by the sensor. Figures 9 through 12 illustrate the wiring for the various sensors. For signal level and performance specifications refer to *CX-1010 Technical Reference Manual, Appendices: Appendix A*.

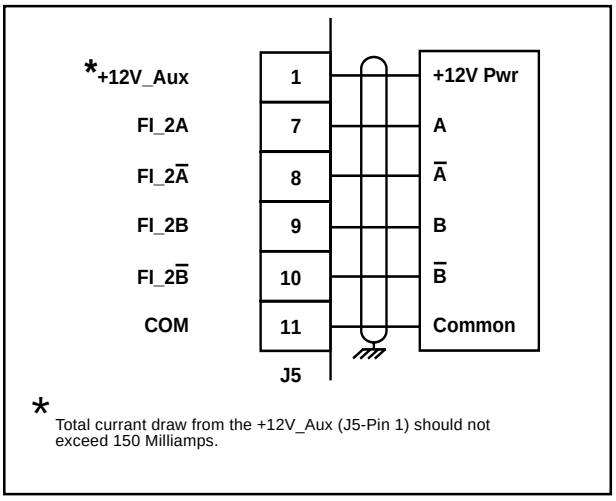
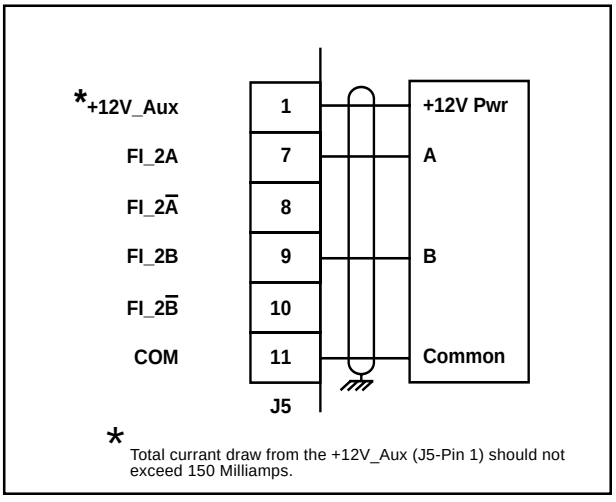


Figure 9 Feedback Frequency
Quadrature Differential Sensor (Bidirectional)

Figure 10 Feedback Frequency
Quadrature Single-Ended Sensor (Bidirectional)



Feedback Frequency continued...

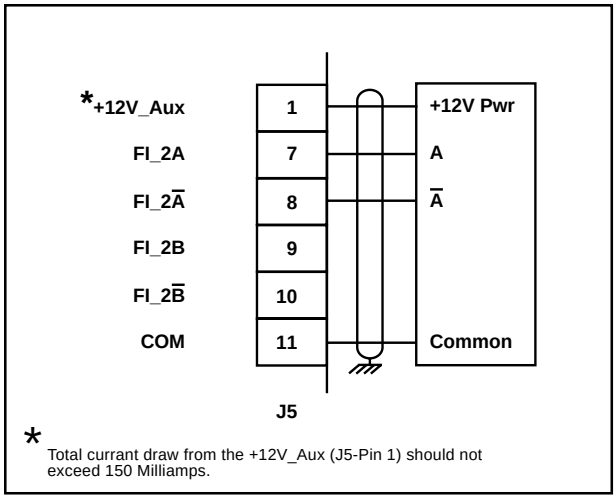
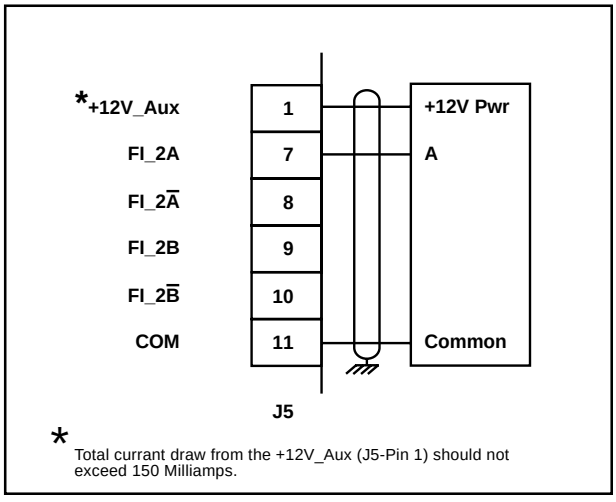


Figure 11 Feedback Frequency
Single Channel Differential Sensor (Unidirectional)

Figure 12 Feedback Frequency
Single Channel Single-Ended Sensor (Unidirectional)



F–Stop
(J6 pins 1,3)
Digital Input 0

F-STOP is a momentary input. When it is opened, the CX–1010 commands a zero speed immediately and ignores the specified deceleration rate. However, F–STOP does not hold zero speed or position (drive disabled). As a momentary input, F-STOP is internally latched and does not need to be maintained open by an operator device.

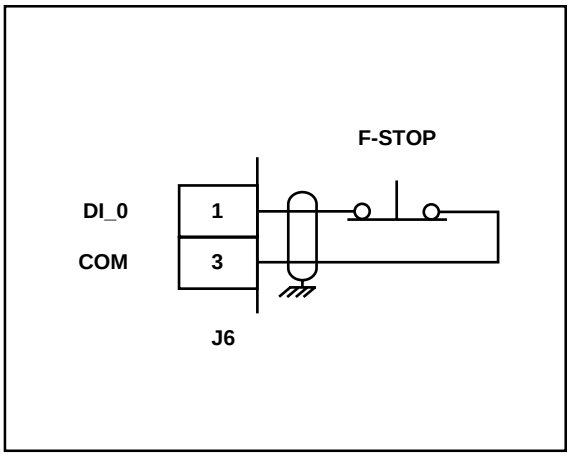


Figure 13 F–Stop

R–Stop
(J6 pins 2, 3)
Digital Input 1

R–STOP is a momentary input. When it is opened, the CX–1010 ramps to a zero speed command at the specified deceleration rate. However, R–STOP does not hold zero speed after the deceleration ramp has been completed (drive disabled) . As a momentary input, R–STOP is internally latched and does not need to be maintained open by an operator device.

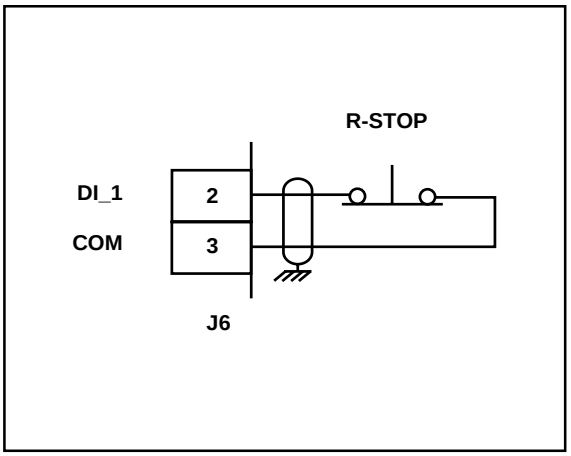


Figure 14 R–Stop

H–Stop
(J6 pins 3, 4)
Digital Input 2

H–STOP is a momentary input. When it is opened, the CX–1010 ramps to a zero speed command at the specified deceleration rate. In addition, H–STOP holds zero speed after the deceleration ramp has been completed (drive enabled). As a momentary input, H–STOP is internally latched and does not need to be maintained open by an operator device.

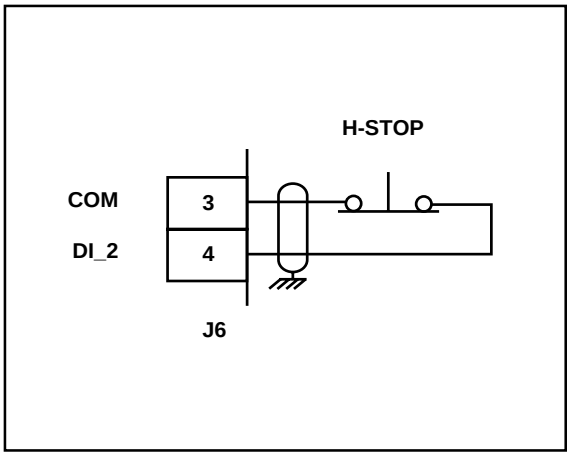


Figure 15 H–Stop

Run
(J6 pins 3, 5)
Digital Input 3

When the RUN input (J6, pin 5) is momentarily shorted to common, the CX–1010 enters the RUN state. As a momentary input, RUN is internally latched and does not need to be maintained closed by an operator device.

NOTE: Close the R–Stop, H-Stop and F–Stop inputs prior to entering the Run state. If you are only using one of the Stop inputs, wire short the other Stop inputs to the common or the CX–1010 will not enter run.

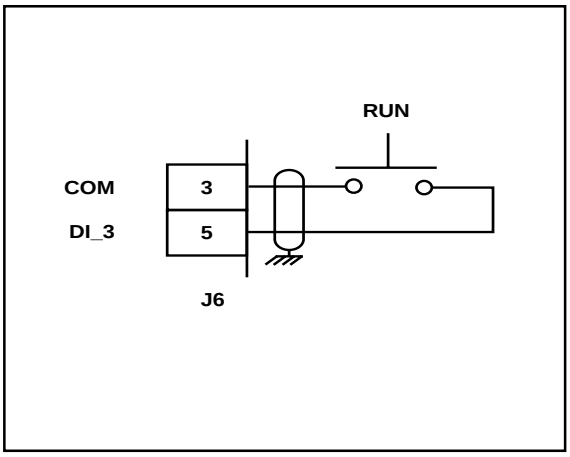


Figure 16 Run

Jog Forward
(J6 pins 6, 8)
Digital Input 4

JOG FORWARD is a maintained input. When it is closed, it sends a forward speed command signal to the drive at the selected Jog Setpoint . As a maintained input, JOG FORWARD is only active when the operator device is closed.

NOTE: Close the R–Stop, H-Stop and F–Stop inputs prior to entering the Jog state. If you are only using one of the Stop inputs, wire short the other Stop inputs to the common or the CX–1010 will not enter Jog.

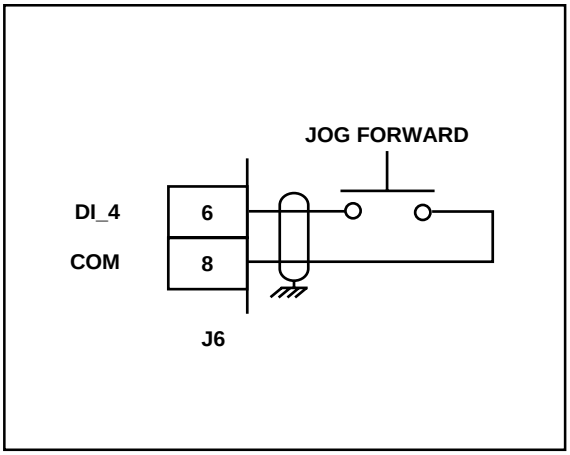


Figure 17 Jog Forward

Jog Reverse
(J6 pins 7, 8)
Digital Input 5

JOG REVERSE is a maintained input. When it is closed, it sends a reverse speed command signal to the drive at the selected Jog Setpoint . As a maintained input, JOG REVERSE is only active when the operator device is closed.

NOTE: Close the R–Stop, H-Stop and F–Stop inputs prior to entering the Jog state. If you are only using one of the Stop inputs, wire short the other Stop inputs to the common or the CX–1010 will not enter Jog.

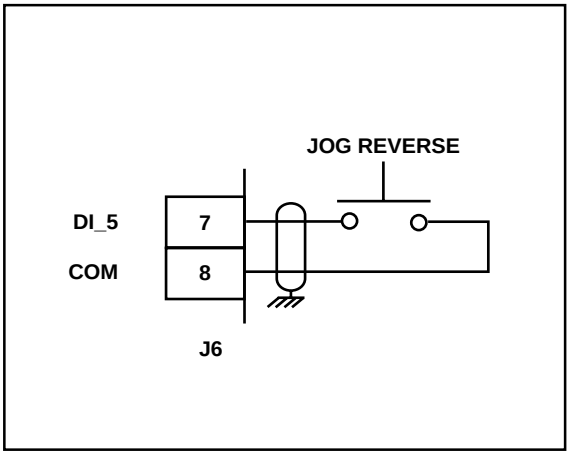


Figure 18 Jog Reverse

Keypad Lockout

(J7 pins 8, 9)

Digital Input 6

When the KEYPAD LOCKOUT input is closed, the Control Parameters that you have selected to "lock out" are inaccessible from the front keypad. All of the Monitor Parameters remain enabled.

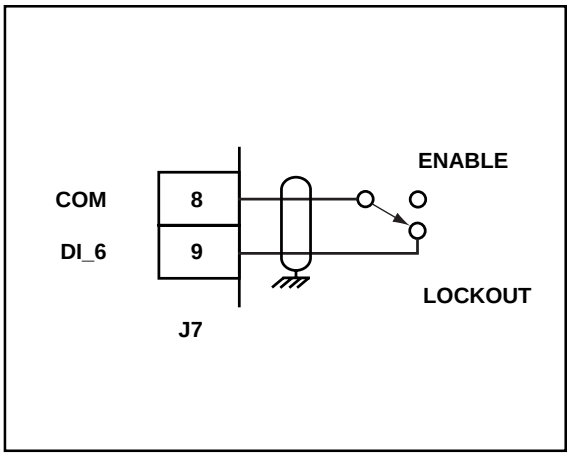


Figure 19 Keypad Lockout

Block Select A

(J7 pins 1, 3)

Digital Input 8

Use BLOCK SELECT A in conjunction with BLOCK SELECT B and BLOCK SELECT C inputs to select one of the eight Parameter Blocks. Refer to the chart on the next page.

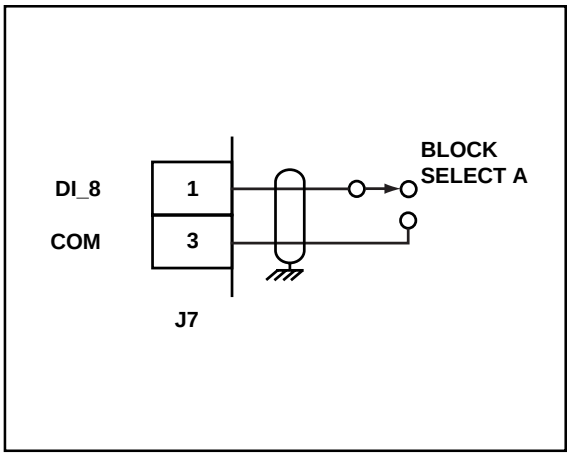


Figure 20 Block Select A

Block Select B

(J7 pins 2,3)

Digital Input 9

Use BLOCK SELECT B in conjunction with BLOCK SELECT A and BLOCK SELECT C inputs to select one of the eight Parameter Blocks. Refer to the chart below.

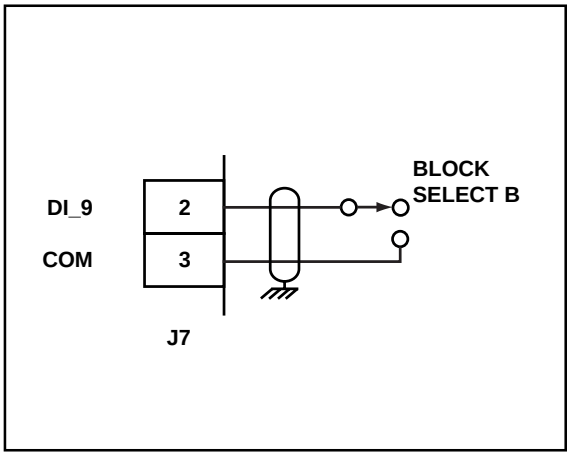


Figure 21 Block Select B

Block Select C

(J7 pins 3,4)

Digital Input 10

Use BLOCK SELECT C in conjunction with BLOCK SELECT A and BLOCK SELECT B inputs to select one of the eight Parameter Blocks. Refer to the chart below.

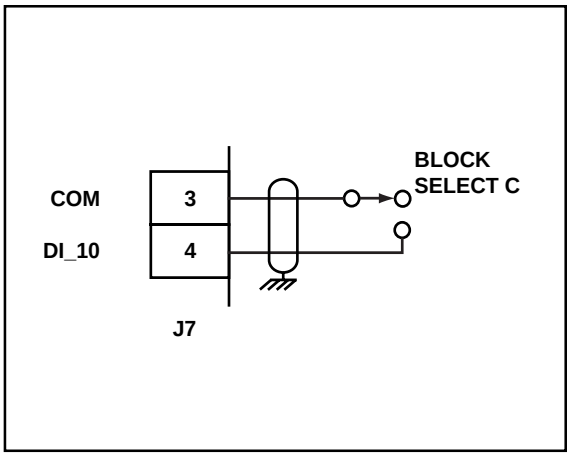


Figure 22 Block Select C

PARAMETER BLOCKS:	0	1	2	3	4	5	6	7
Block Select A	Open	Closed	Open	Closed	Open	Closed	Open	Closed
Block Select B	Open	Open	Closed	Closed	Open	Open	Closed	Closed
Block Select C	Open	Open	Open	Open	Closed	Closed	Closed	Closed

Setpoint Direction

(J7 pins 3,5)

Digital Input 11

Use SETPOINT DIRECTION in conjunction with a positive or a negative setpoint parameter value to select either a forward or reverse command direction. Refer to the chart below.

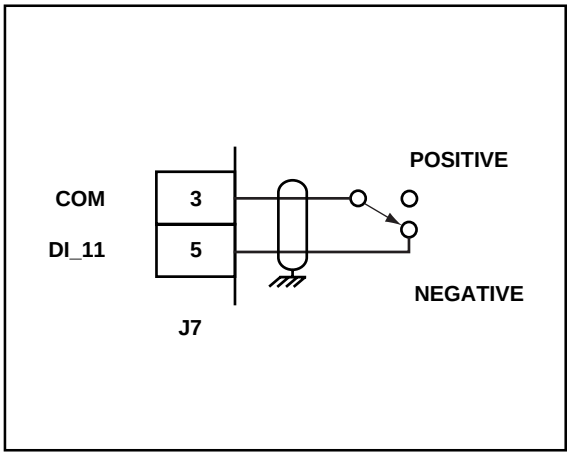


Figure 23 Setpoint Direction

	Positive Setpoint Value	Negative Setpoint Value
Setpoint Direction Open	Forward Command	Reverse Command
Setpoint Direction Closed	Reverse Command	Forward Command

Increment Batch Count

(J7 pins 6, 8)

Digital Input 12

INCREMENT BATCH COUNT is a momentary input. When it is closed, the CX–1010 increases the internal batch counter by one increment.

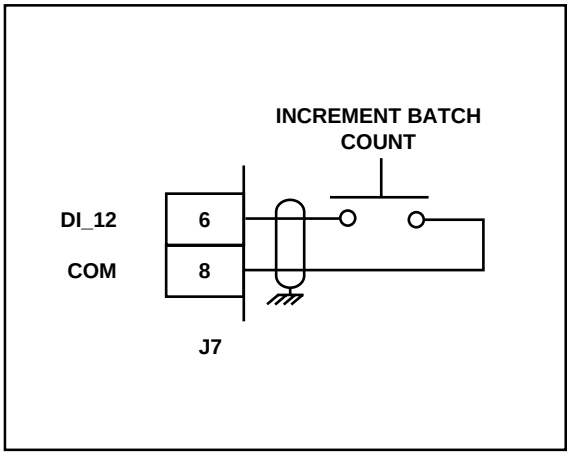


Figure 24 Increment Batch Count

Reset Batch Count

(J7 pins 7, 8)

Digital Input 13

RESET BATCH COUNT is a momentary input. When it is closed, the CX–1010 resets the internal batch counter to zero.

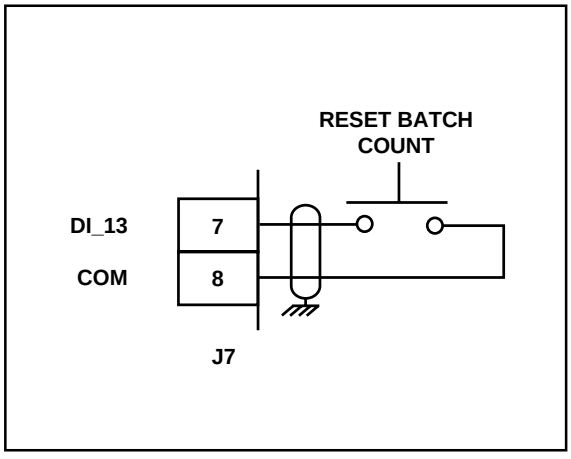


Figure 25 Reset Batch Count

Remote Scroll Up

(J7 pins 8, 9)

Digital Input 14

REMOTE SCROLL UP is a maintained input. When it is closed, any Control Parameter that you enter into the Remote Scroll Parameter (CP-300) can be incremented at the Remote Scroll Rate (CP-301). As a maintained input, REMOTE SCROLL UP is only active when the operator device is closed.

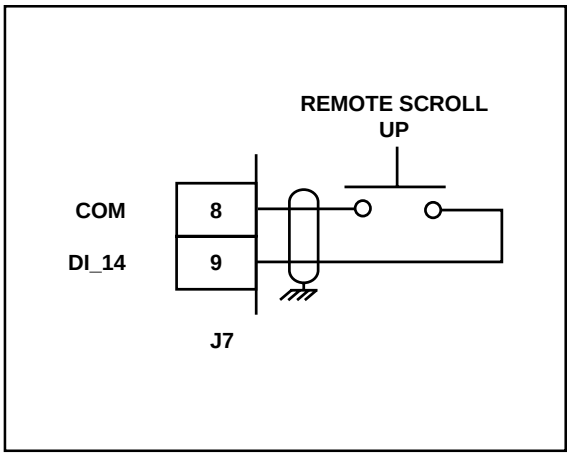


Figure 26 Remote Scroll Up

Remote Scroll Down

(J7 pins 8,10)

Digital Input 15

REMOTE SCROLL DOWN is a maintained input. When it is closed, any Control Parameter that you enter into the Remote Scroll Parameter (CP-300) can be decremented at the Remote Scroll Rate (CP-301). As a maintained input, REMOTE SCROLL DOWN is only active when the operator device is closed.

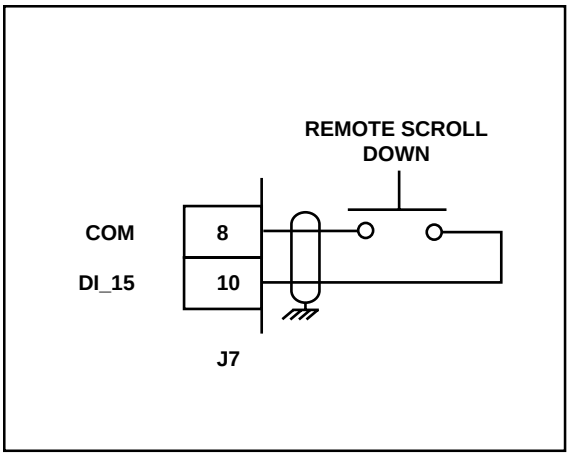


Figure 27 Remote Scroll Down

OUTPUTS

NOTE: The installation of this motor control must conform to area and local electrical codes. Refer to page 9 before you begin wiring.

Speed Command Out
(J3 pins 1, 2)

SPEED COMMAND OUT is an isolated analog output signal that is sent to the motor drive to control the speed of the motor. Wire the SPEED COMMAND OUT into the speed signal input of the drive. If the motor drive has a potentiometer speed control, remove the potentiometer connections and wire the SPEED COMMAND OUT output to the potentiometer wiper point. The CX–1010's Isolated Common should always be connected to the drive common.

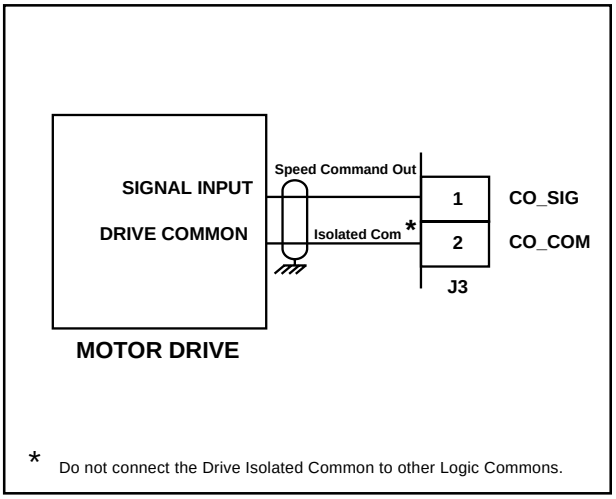


Figure 28 Speed Command Out

Zero Speed
(J2 pin 2)
Digital Output 0

The ZERO SPEED output is activated (driven low) when the feedback is less than or equal to zero speed, as determined by the value that you enter in the Zero Speed Alarm Control Parameter (CP-270).

Hi Speed Alarm
(J2 pin 3)
Digital Output 1

The HI SPEED ALARM output is activated (driven low) if the system's speed is greater than the speed alarm value that you enter in the CMPR1 Val Control Parameter (CP-292), See Figure 29.

Lo Speed Alarm
(J2 pin 4)
Digital Output 2

The LO SPEED ALARM output is activated (driven low) if the system's speed is lower than the value that you enter in the CMPR2 Val Control Parameter (CP-293). See Figure 29.

Dev Alarm 1
(J2 pin 5)
Digital Output 3

The DEV ALARM 1 output is activated (relay energized) when the Ramped Reference minus the Feedback is greater than the deviation band that you enter in the CMPR3 Val Control Parameter (CP-294). See Figure 29.

Dev Alarm 2
(J2 pin 6)
Digital Output 4

The DEV ALARM 2 output is activated (relay energized) when the difference between the Scaled Reference and Feedback is greater than the band that you enter in the CMPR4 Val Control Parameter (CP-295). See Figure 29.

Batch Done
(J2 pin 7)
Digital Output 5

The BATCH DONE output is activated (driven low) when the CX-1010's internal batch counter reaches the batch count that you enter in the Cntr1 Trig (CP-320). See Figure 29.

Control Output Dir
(J2 pin 8)
Digital Output 6

The CONTROL OUTPUT DIR is activated (driven low) when the CX-1010 commands a forward direction to the motor drive. The CONTROL OUTPUT DIR output is deactivated (driven high) when the CX-1010 commands a reverse direction to the motor drive. See Figure 29.

Drive Enable
(J2 pin 9)
Digital Output 7

The DRIVE ENABLE output is activated (driven low) when the CX–1010 signals a run command to the motor drive. The DRIVE ENABLE output is driven high (relay deactivated) after Power Up and at the completion of R–Stop and F–Stop. See Figure 29.

NOTE: The Digital Outputs are open-collector relay drivers. For specification details, see *CX-1010 Technical Reference Manual, Appendices: Appendix A* . Use an external DC power supply to power the relays. Free-wheeling diodes are incorporated internally in the CX-1010 and do not need to be added externally.

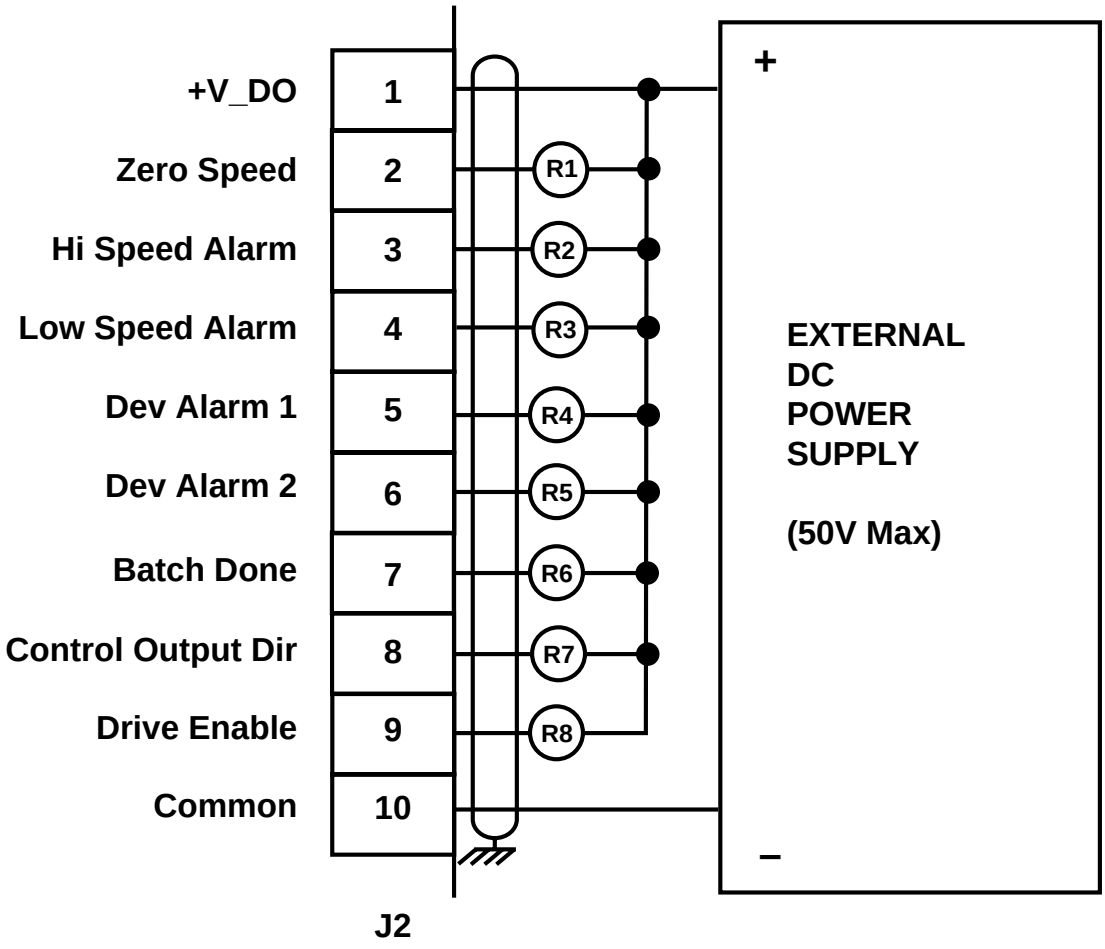


Figure 29 CX-1010 Digital Outputs

SERIAL COMMUNICATIONS

NOTE: The installation of this motor control must conform to area and local electrical codes. Refer to page 9 before you begin wiring.

The Serial Communications interface on the CX–1010 complies with EIA Standard RS–485-A for balanced line transmissions. This interface allows the host computer to perform remote computer parameter entry, status or performance monitoring, and remote control of the CX–1010. See *CX-1010 Technical Reference Manual, Serial Communications* for information on using Serial Communications.

Figures 30 and 31 illustrate a multidrop installation of the Serial Communications link and Serial Communications connections.

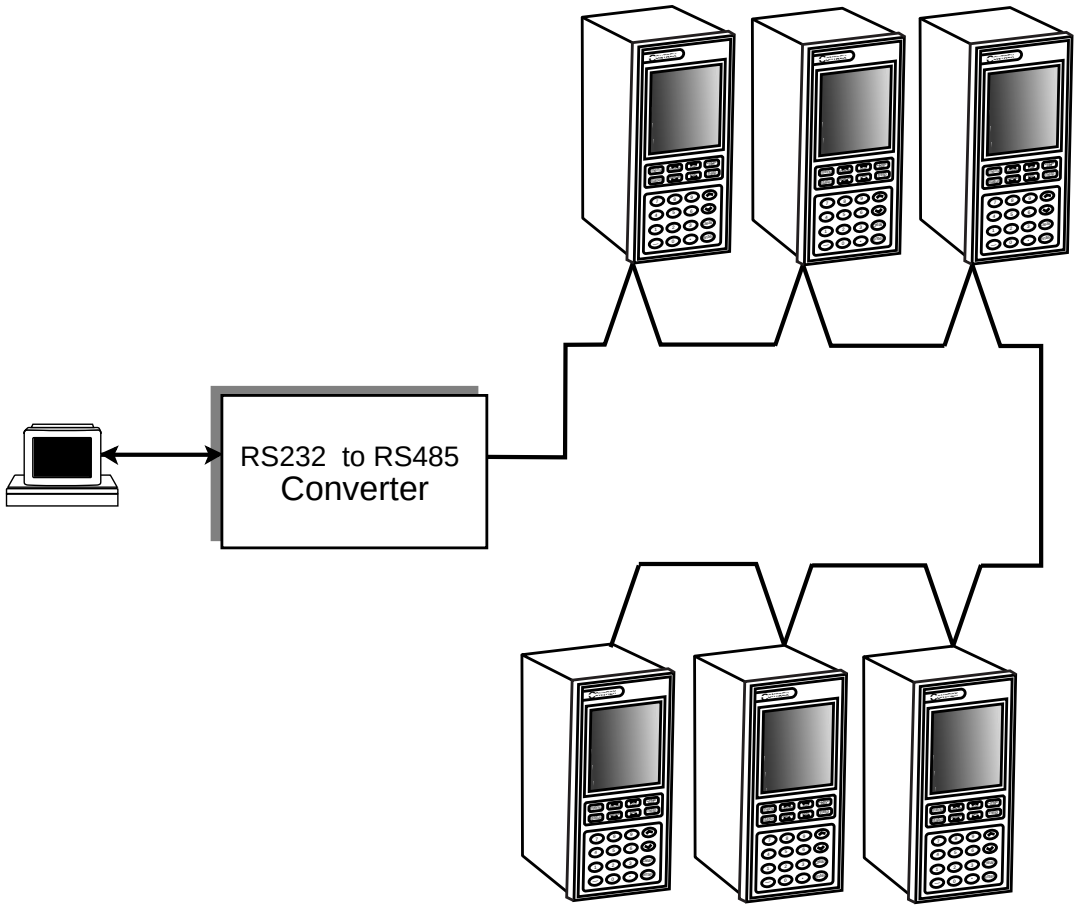
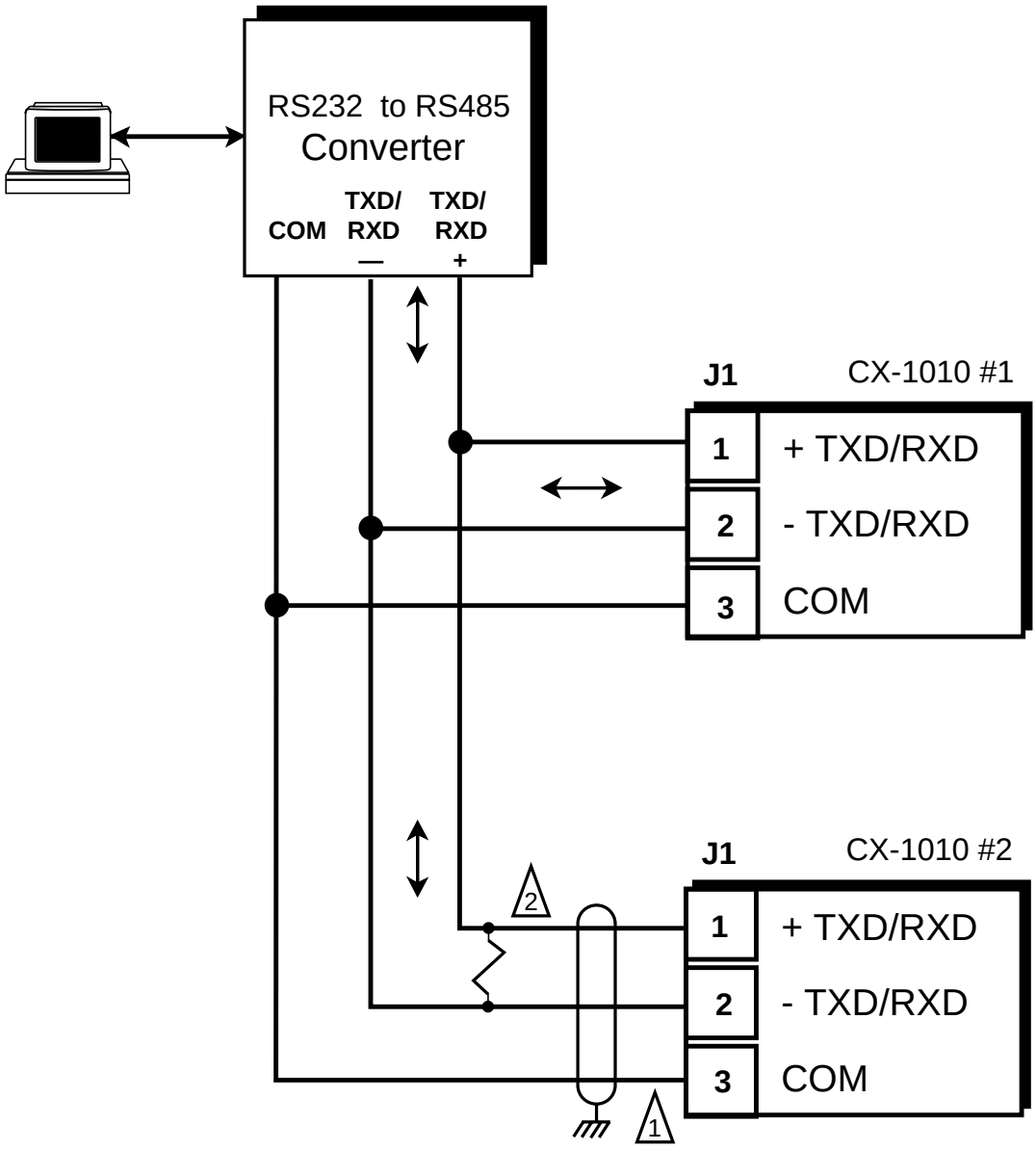


Figure 30 CX-1010 Multidrop Installation



1. Shield only at one end of the cable.

2. If you need to terminate the communication line, then terminate it at the unit which is the furthest away from the converter. A 100 ohm, 1/2 Watt resistor will usually terminate successfully. Refer to EIA Standard RS–485A, for more information.

Figure 31 CX-1010 Serial Communications Connections

—NOTES—

ANALOG I/O CARD (OPTIONAL)

This section contains the mounting and wiring information for the Analog I/O Card. Please read this section prior to mounting or wiring the Analog I/O Card to ensure that you make the appropriate decisions.

The Analog I/O Card is an auxiliary analog card with two analog inputs and one analog output. Both the inputs and output are factory calibrated for ± 12V or 0 to 20 mA signals. Some of the Monitor Parameters can be used in connection with the analog output for either auxilary control or monitoring. Analog process signals can be used in connection with the analog inputs to replace the following:

Lead Source
Offset source
V1,V2,V3,V4 Source
Feedback Source
Offset Source

—NOTES—

MOUNTING

This section contains the mounting information for the CX–1010 Analog I/O card. Please read this section as you mount the Analog I/O card to ensure that the Analog I/O card is mounted correctly. If the Analog I/O card does not function properly after installation, then verify that the mounting procedure has been completed accurately. For the specifications on the Analog I/O card, refer to *CX-1010 Technical Reference Manual, Appendices: Appendix A.*

The CX-1010 will support one Analog I/O card in either of the two available slots, however, the upper slot is preferred.

Warning

The Analog I/O Card should only be installed by a qualified technician.

Take the proper antistatic precautions.

1) If the CX-1010 unit has power connected to it, remove the power. If the CX-1010 has been mounted in your system, disable it from the system.

2) Remove the connectors on the rear of the CX-1010. Pay careful attention to the location of each connector so that you can replace them in their proper locations. It is possible to replace a connector incorrectly.

3) Remove the earth ground screw and ground connections.

4) Remove the four machine screws that hold the back plate in place, and set them aside. Carefully remove the back plate.

5) Remove the upper option card slot cover plate by removing the two machine screws.

6) Remove the CPU Board carefully - pull the CPU board straight out so that you do not bend the card guides or the CPU board, nor damage the internal backplane card-edge connector. See figure 32.

NOTE: Take the appropriate antistatic precautions when you handle the CPU board and the Analog I/O card.

7) Remove the Analog I/O card from it's antistatic bag, holding it by the edges.

8) Remove the 11-pin terminal strip plug from the 11-pin right angle terminal strip on the Analog I/O card. Make sure that the screws that hold the round standoffs and the 40-pin connector in place are secure. Tighten these screws, as needed.

9) Mount the Analog I/O card to the CPU Board by carefully inserting the three long pins of the Optional Analog connector to the three corresponding holes on the non-component side of the CPU board, and insert the 40-pin connector on the Analog I/O card into the 40-pin connector on the CPU board.

10) Verify that the standoffs are flush with the CPU board. Make sure that the 40-pin contacts are properly aligned.

11) Holding firmly to the edges of both boards to preserve the alignment, carefully flip the boards so that the component side of the CPU board faces up.

12) Insert the four screws and the attached lock washers into the round standoff holes and alternate between the screws as you tighten both screws into place snugly. Verify the alignment of the boards.

(continued)

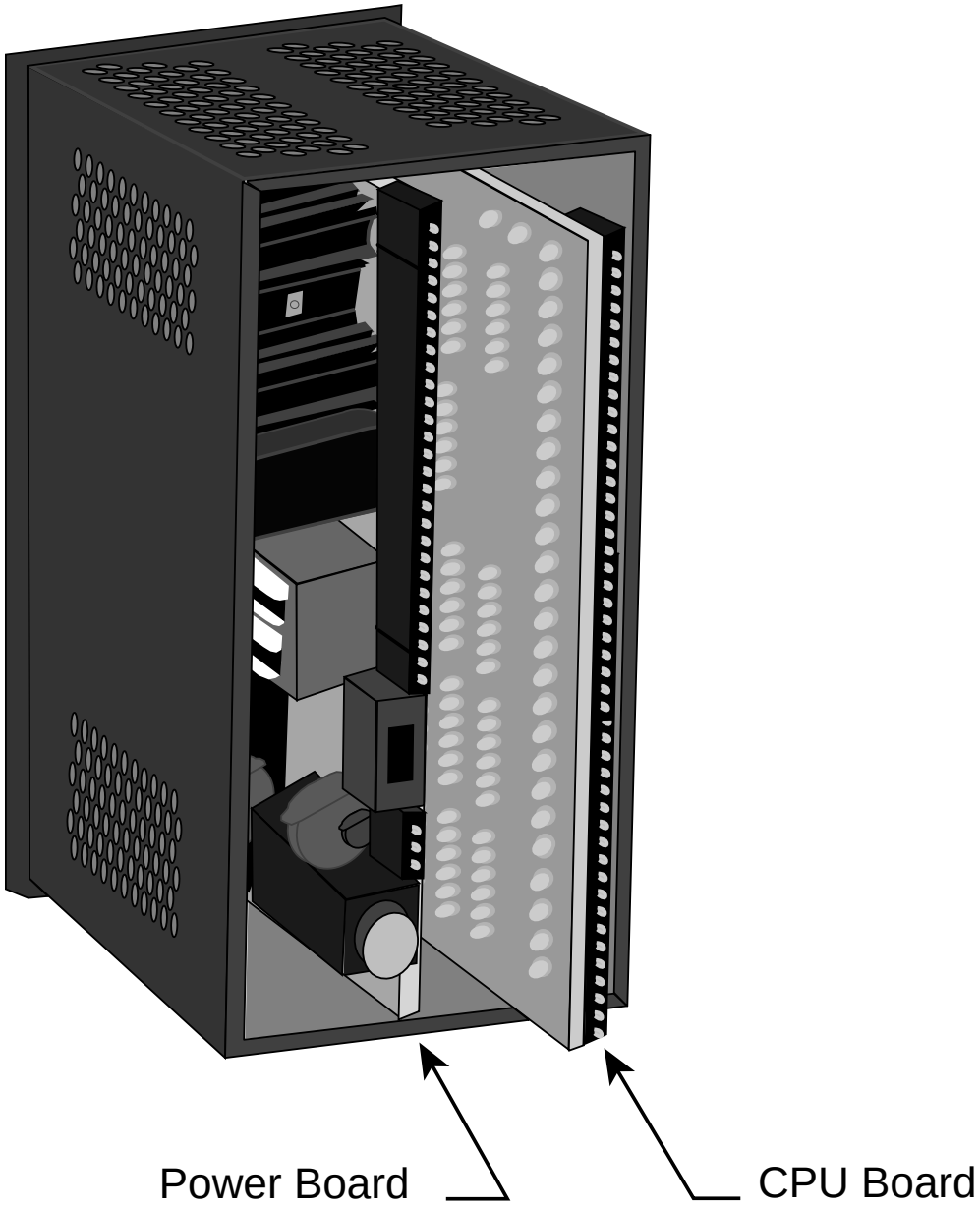


Figure 32 Removing the CPU Board

13) Reinsert the CPU Board into the CX-1010 unit by aligning the CPU board with the top and bottom card edge connectors and gently push the board straight back until the CPU board card edge connector tab seats fully into the internal backplane card-edge connector.

14) Replace the back plate, making sure that it seats properly and the connectors are all properly aligned in their slots.

15) Screw the back plate into place with the four machine screws.

16) Screw the ground screw back into place snugly. Replace the connectors. Replace the power connector.

NOTE: Be sure to follow the calibration procedure before engaging the CX-1010. Refer to *CX-1010 Technical Reference Manual, Drive Setup / Calibration: Calibration.*

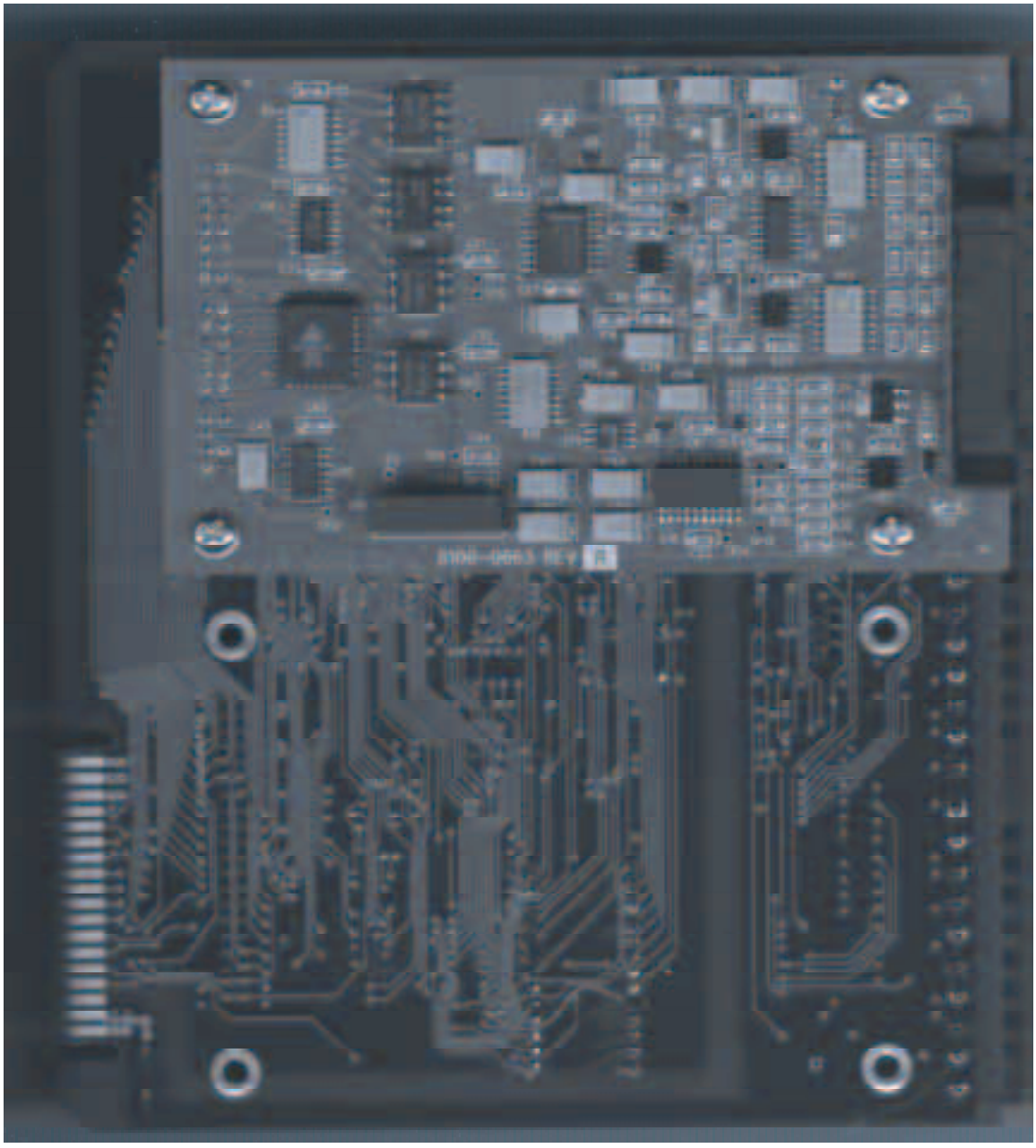


Figure 33 Mounting the Analog I/O Card on the CPU Board

—NOTES—

WIRING

This section contains the input and output wiring information for the CX–1010 Analog I/O Card. Please read this section prior to wiring the Analog I/O Card to ensure that you make the appropriate wiring decisions.

The CX-1010 will support one Analog I/O Card in either of the two available slots. The factory calibrated Analog I/O Card has two inputs and one output available. Both the inputs and output are calibrated for ± 12V or 0 to 20 mA signals. The Analog I/O Card is fully isolated from the CPU core. For the specifications for the Analog I/O Card, refer to *CX-1010 Technical Reference Manual, Appendices Appendix A.*

Warning

The Analog I/O Card should only be installed by a qualified technician.

Take the proper antistatic precautions.

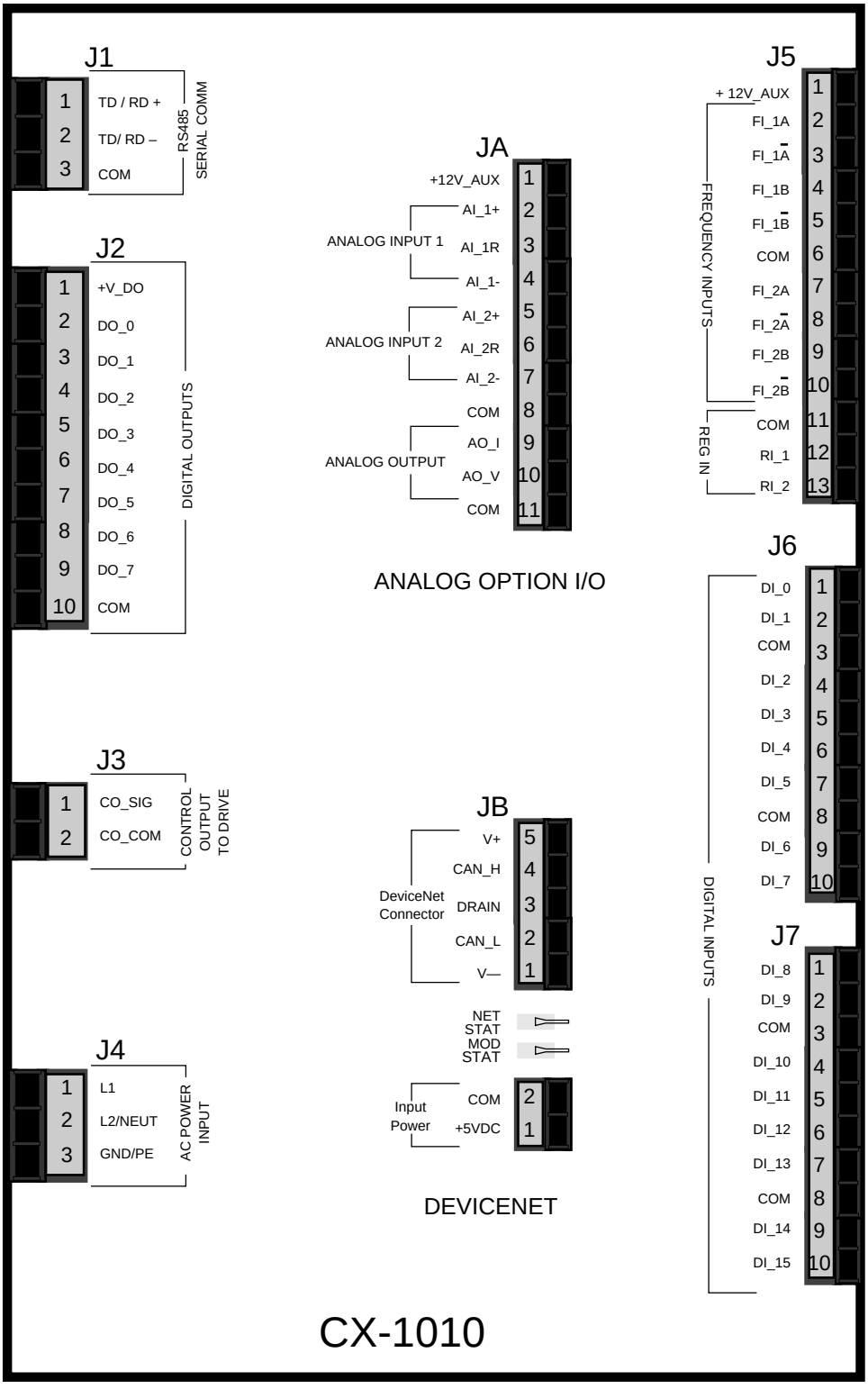


Figure 34 CX–1010 Analog I/O Card

INPUTS

NOTE: Refer to pages 9 and 35 before you begin wiring.

Analog Input 1: Voltage Input Wiring
(JA, Pins 2, 4, 8)

The Analog Input 1 can be used with either ±12 VDC or 0-20 mA inputs. Figure 35 displays the ±12 VDC option.

For the differential inputs:
- Connect JA pin 2 to the positive differential signal source.
- Connect JA pin 4 to the negative differential signal source.
- Connect JA pin 8 to the common of the differential signal source.

For the non-differential inputs:
- Connect JA pin 2 to the signal voltage source.
- Connect JA pin 4 and JA pin 8 to the common of the signal source.

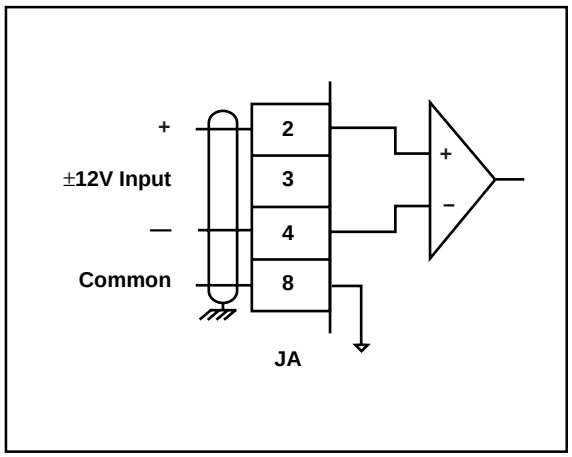


Figure 35 Analog Input 1: Voltage Input

Analog Input 2: Voltage Input Wiring
(JA, Pins 5, 7, 8)

The Analog Input 2 can be used with either ±12 VDC or 0-20 mA inputs. Figure 36 displays the ±12 VDC option.

For the differential inputs:
- Connect JA pin 5 to the positive differential signal source.
- Connect JA pin 7 to the negative differential signal source.
- Connect JA pin 8 to the common of the differential signal source.

For the non-differential inputs:
- Connect JA pin 5 to the signal voltage source.
- Connect JA pin 7 and JA pin 8 to the common of the signal source

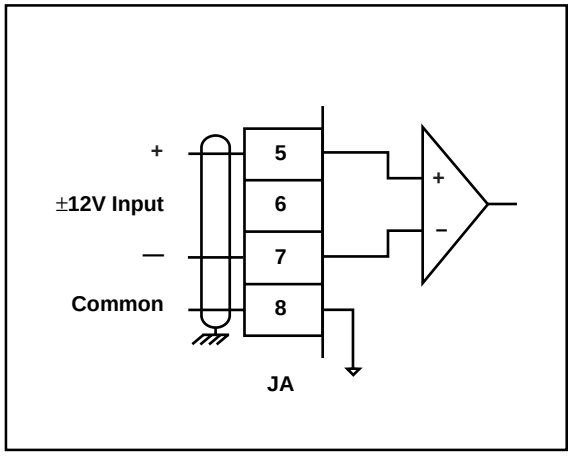


Figure 36 Analog Input 2: Voltage Input

Analog Input 1: Current Input Wiring
(JA, Pins 2,3,4)

The Analog Input 1 can be used with either ±12 VDC or 0-20 mA inputs. Figure 37 displays the 0-20 mA option.

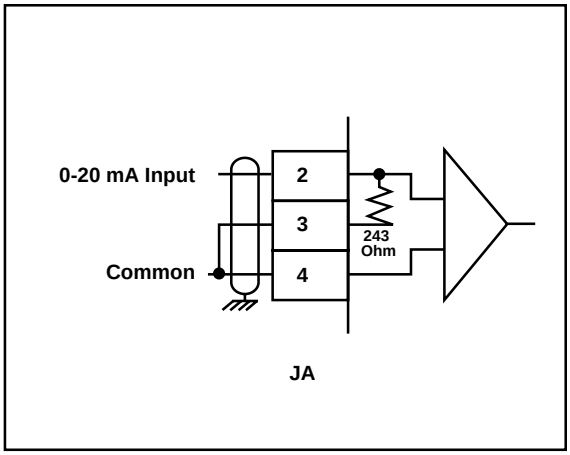


Figure 37 Analog Input 1: Current Input

Analog Input 2: Current Input Wiring
(JA, Pins 5,6,7)

The Analog Input 2 can be used with either ±12 VDC or 0-20 mA inputs. Figure 38 displays the 0-20 mA option.

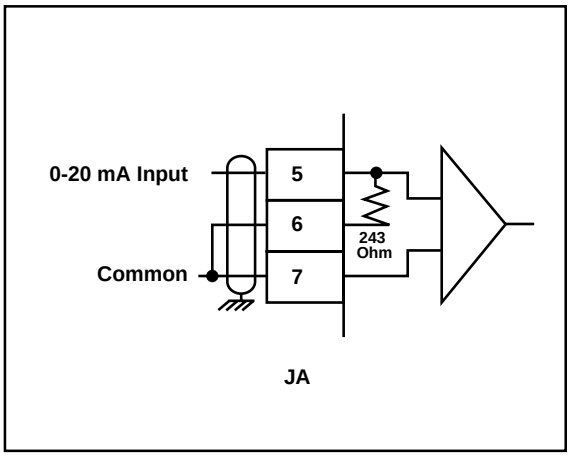


Figure 38 Analog Input 2: Current Input

Analog Input 1:
Potentiometer Input Wiring
(JA, Pins 1, 2, 4, 8)

The Analog Input 1 can be used with a potentiometer (e.g., dancer pot). Figure 39 displays this option.

* The total current from JA pin 1 and J5 pin 1 (+12V_Aux) must not exceed 150 mA.

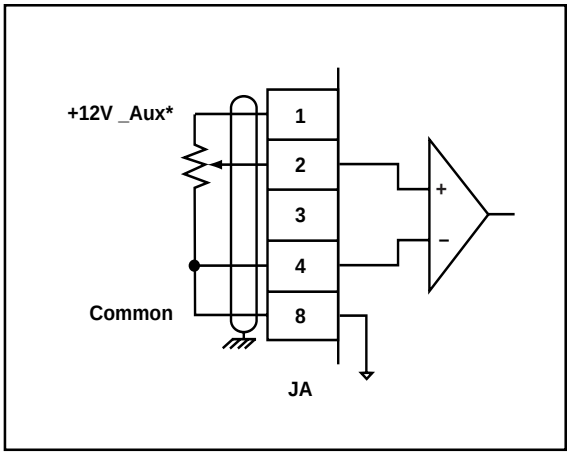


Figure 39 Analog Input 1: Potentiometer Input

Analog Input 2:
Potentiometer Input Wiring
(JA, Pins 1, 5, 7, 8)

The Analog Input 1 can be used with a potentiometer (e.g., dancer pot). Figure 40 displays this option.

* The total current from JA pin 1 and J5 pin 1 (+12V_Aux) must not exceed 150 mA

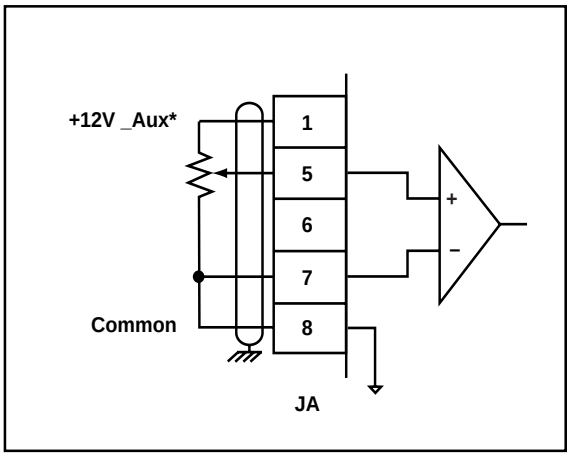


Figure 40 Analog Input 2: Potentiometer Input

OUTPUTS

NOTE: Refer to pages 9 and 35 before you begin wiring.

Analog Output: Voltage Output Wiring
(JA, Pins 9, 10, 11)

The Analog Output produces either an isolated ± 12V output signal or a 0-20 mA current source analog output signal into a load resistance of 0-500 Ohms.
Figure 41 displays the ±12V option.

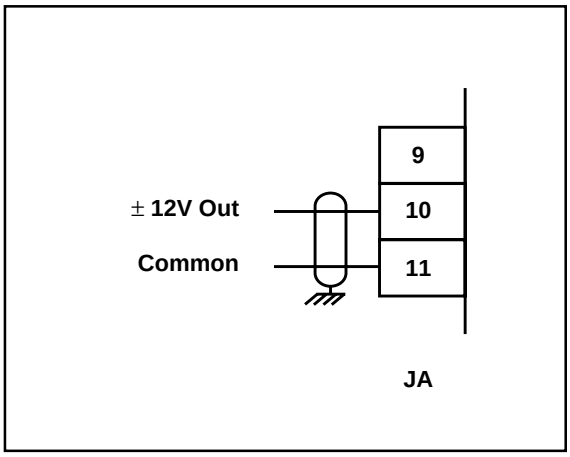


Figure 41 Analog Output: Voltage Output

Analog Output: Current Output Wiring
(JA, Pins 9, 10, 11)

The Analog Output produces either an isolated ± 12V output signal or a 0-20 mA current source analog output signal into a load resistance of 0-500 Ohms.
Figure 42 displays the 0-20 mA option.

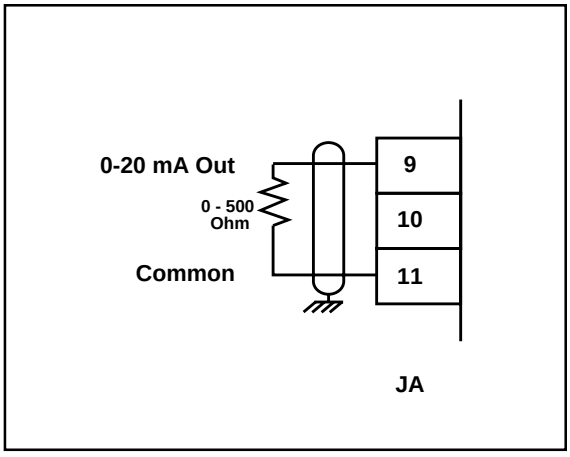


Figure 42 Analog Output: Current Output

DEVICENET CARD (OPTIONAL)

For the installation, wiring and operation of the optional DeviceNet card, refer to the *CX-Series DeviceNet Card Technical Manual*, # 0001-0132.

—NOTES—

LOGIC CONTROL

This section addresses the six digital inputs that control the CX-1010's operating state.
The six digital inputs (listed in by priority) are:

F–Stop
R–Stop
H-Stop
Run
Jog Forward
Jog Reverse

When the CX-1010 is powered up, it defaults to R–Stop. If either Run or Jog have been hardwired, the CX-1010 will operate in either Run or Jog instead of R–Stop. Run is hardwired by shorting Run, R–Stop and F–Stop to common. Jog Forward or Jog Reverse are hardwired by shorting Jog, R–Stop, and F–Stop to common.

Run is terminated by activating F-Stop, R-Stop, or H-Stop. The operating state changes to the input that terminated Run, provided that another input is not subsequently activated. Jog Forward or Jog Reverse are terminated by deactivating the Jog Forward or Jog Reverse inputs. Jog Forward or Jog Reverse can also be terminated by activating F-Stop, R-Stop, or H-Stop. The operating state automatically changes to R-Stop after the Jog ramp is completed. You can not enter Run from Jog with the Jog inputs active. However, you can enter Run during a deceleration from Jog after the Jog input is deactivated. You can not enter Jog Forward or Jog Reverse from Run. If two or more inputs become active at the same time, the input with the highest priority will dictate the operating state.

The sections that follow demonstrate how to use the digital inputs.

Caution

Do not use the AC line power to start or stop the system.

Use the Digital Inputs to start or stop the system.

Logic Inputs

F–Stop (Fast Stop) has priority over the other operating states. F-Stop forces the CO signal to “0” volts and monitors the feedback. When the feedback is less than the Zero Speed (CP-270), the Drive En (PLC bit 41) resets to “0”. This PLC bit is routed by the PLC program to an output that disables the drive. If the feedback does not reach Zero Speed within 1/2 second, the Drive En (PLC bit 41) automatically resets to “0”. The integral, trim and feedforward are also set to “0” and the loop is set to Open Loop (OL).

To activate F–Stop:

- Activate High (Open), Level Sensitive, Latched
- Wire to F-Stop interconnect
- Use momentary contact - does not need to be maintained to remain active

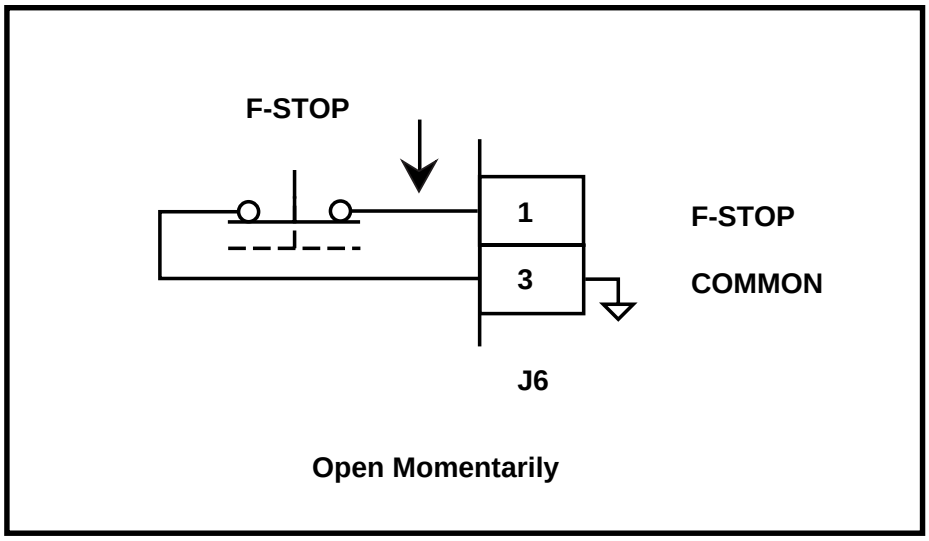


Figure 43 F-Stop Input

R–Stop (Ramp Stop) has the second highest operating priority. Use R-Stop to stop the drive with a deceleration ramp. The velocity command is ramped down to “0”. If the loop is “Closed”, the ramp is executed with velocity loop control (with feedforward, using Kff). If the loop is “Open”, the ramp is executed with feedforward only (using Kff). The deceleration rate for the ramp is determined by Dcl Tm RStp (CP-211) and Ref StopRmp (CP-210) or by the Dcl Rt RStp (CP-212). Once the ramp reaches “0”, the feedback is monitored. When the feedback is less than the Zero Speed (CP-270), the Drive En (PLC bit 41) resets to “0”. The PLC program routes the PLC bit to an output that is disables the drive. If the feedback does not reach the Zero Speed (CP-270) within 1/2 second, then the Drive EN PLC bit automatically resets to “0”. The integral, trim and feedforward set to “0” and the loop sets to “Open Loop” (OL).

To activate R–Stop:

- Activate High (Open), Level Sensitive, Latched
- Use momentary contact - does not need to be maintained to remain active

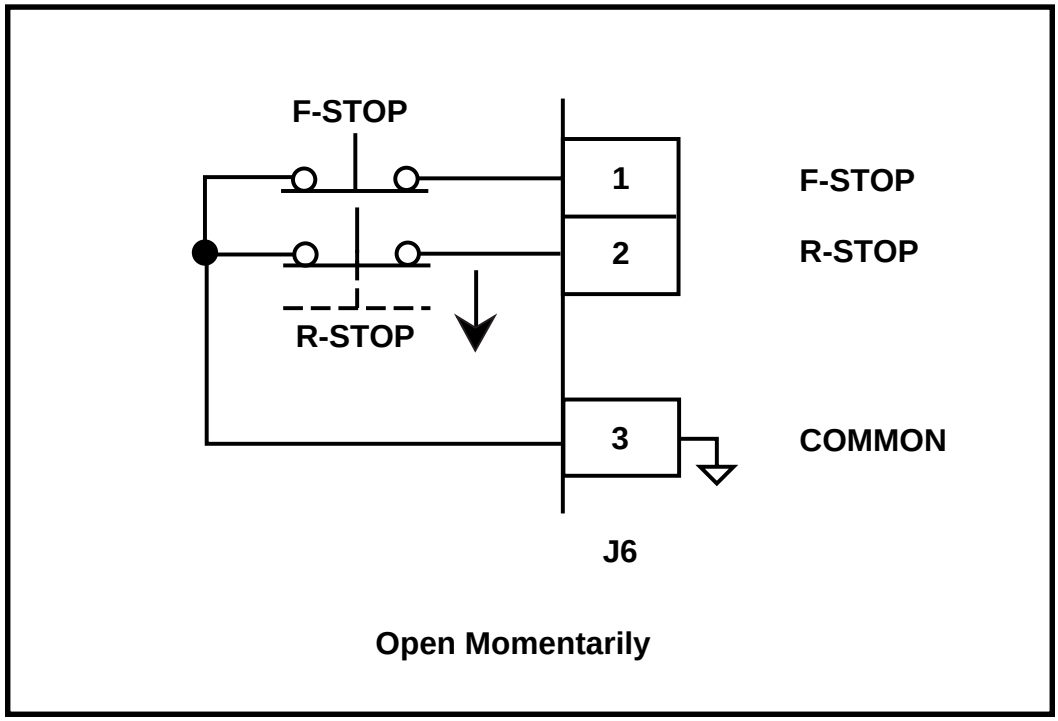


Figure 44 R-Stop Input

H–Stop (Stop and Hold) has the third highest operating priority. Use H-Stop to stop the drive with a deceleration ramp. The velocity command is ramped down to “0”. If the loop is “Closed”, the ramp is executed with velocity loop control (with feedforward, using Kff). If the loop is “Open”, the ramp will be executed with feedforward only (using Kff). The deceleration rate for the ramp is determined by Dcl Tm HStp (CP-213) and Ref StopRmp (CP-210) or by the Dcl Rt RStp (CP-214). H-Stop differs from R-Stop in its operation after the deceleration ramp. The operation of the “Hold” function is dictated by Hstp LoopMode (CP-230). In quadrature feedback, when the velocity command reaches “0” and the feedback is less than the Zero Speed (CP-270), then H-Stop will; hold the CO Signal to “0” volts (Open Loop), hold the feedback velocity to Zero Speed (Closed Velocity Loop) or hold the feedback position to the position where the drive stopped (Closed Zero Error or Position Loop).

To activate H–Stop:

- Activate High (Open), Level Sensitive, Latched
- Use momentary contact - does not need to be maintained to remain active

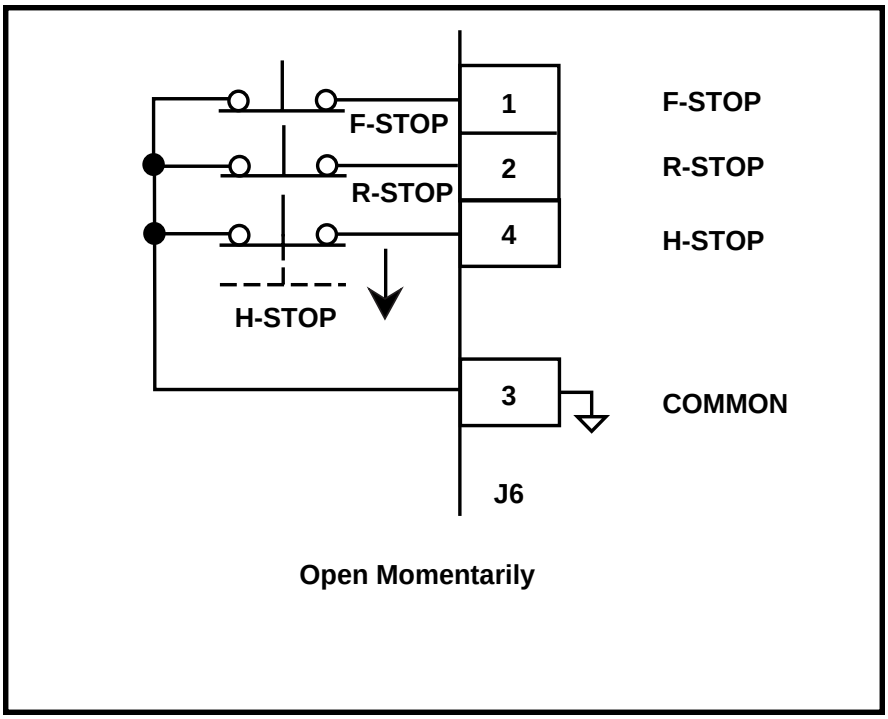


Figure 45 H-Stop Input

Run has the fourth highest operating priority. Run is the primary operating state. Setpoint Mode (CP-102) determines the mode of operation for Run, using either the master mode, the follower mode, the direct mode or the custom setpoint mode. The corresponding setpoint for the selected mode determines the operating speed. RUN Loop Mode (CP-220) determines the control loop that is used during Run. At times, the selected RUN Loop Mode is overridden. The direct mode will only operate in an open loop. The master mode and the custom setpoint mode will "Run" in velocity loop if the RUN Loop Mode (CP-220) is set to either "ZE Pos" or "Pos". Therefore, the follower mode is the only mode that can "Run" with the "ZE Pos" or the "Pos loop".

With the exception of the direct mode, the acceleration and deceleration ramps for the modes of operation are determined by Acl Tm RUN, (CP-201), Dcl Tm RUN (CP-203) and Ref RUN Rmp (CP-200). The direct mode ramps are determined by Acl Tm Drct (CP-206), Dcl Tm Drct (CP-208) and Ref Drct Rmp (CP-205).

To activate Run:

- Activate Low (closed to common), Level Sensitive, Latched
- Use momentary contact - does not need to be maintained to remain active

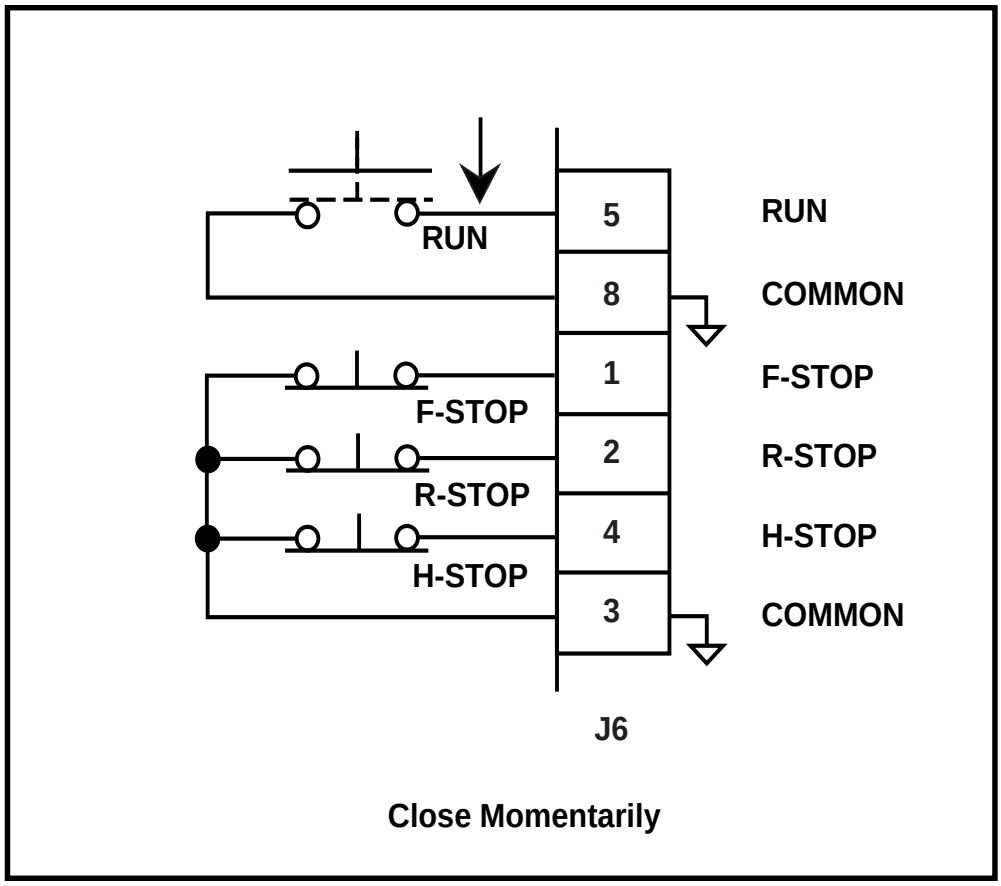


Figure 46 Run Input

Jog Forward has the fifth highest operating priority. Use Jog Fwd to "Jog" the drive Forward at the rate indicated in Jog SP (CP-215). The acceleration and deceleration ramps are dictated by Acl Tm Jog (CP-216), Dcl Tm Jog (CP-218) and Jog SP (CP-215). After the Jog FWD input is deactivated and the ramped reference has reached "0", the CX-1010 automatically reverts to the R-Stop operating state.

To activate Jog Forward:

- Activate Low (closed to common), Level Sensitive, Not-Latched
- Use momentary contact - does not need to be maintained to remain active

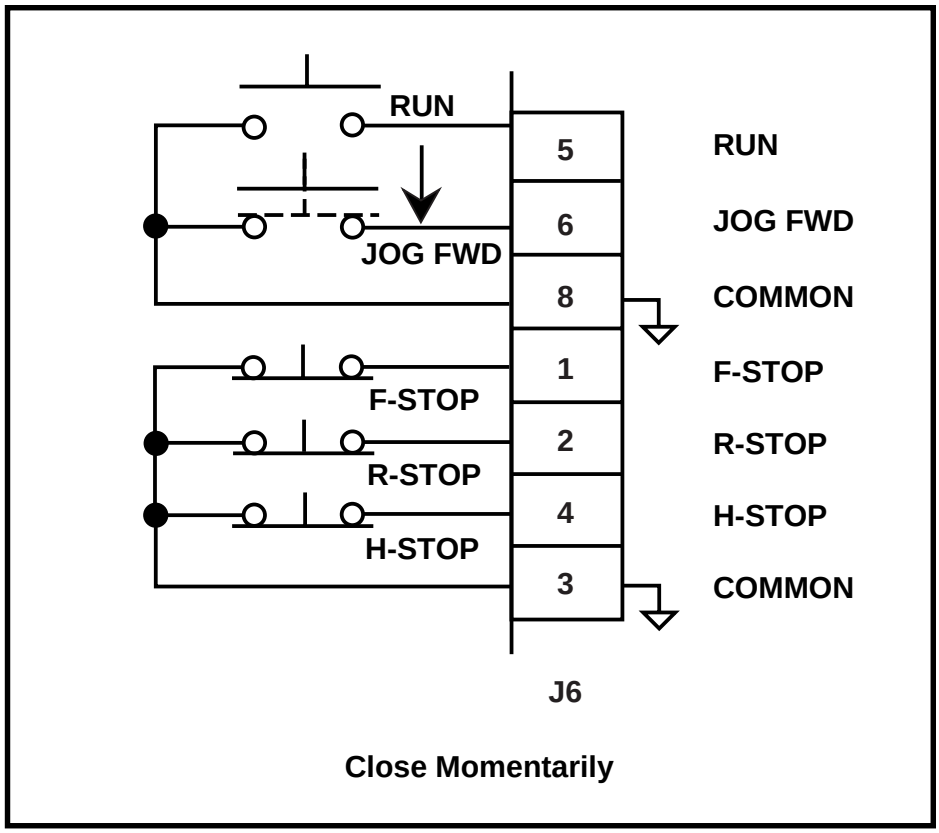


Figure 47 Jog Forward Input

Jog Reverse has sixth (the least) operating priority. Use Jog Revs to "Jog" the drive Forward at the rate indicated in Jog SP (CP-215). The acceleration and deceleration ramps are dictated by Acl Tm Jog (CP-216), Dcl Tm Jog (CP-218) and Jog SP (CP-215). After the Jog Revs input is deactivated and the ramped reference has reached "0", the CX-1010 automatically reverts to the R-Stop operating state.

To activate Jog Reverse:

- Activate Low (closed to common), Level Sensitive, Not-Latched
- Use momentary contact - does not need to be maintained to remain active

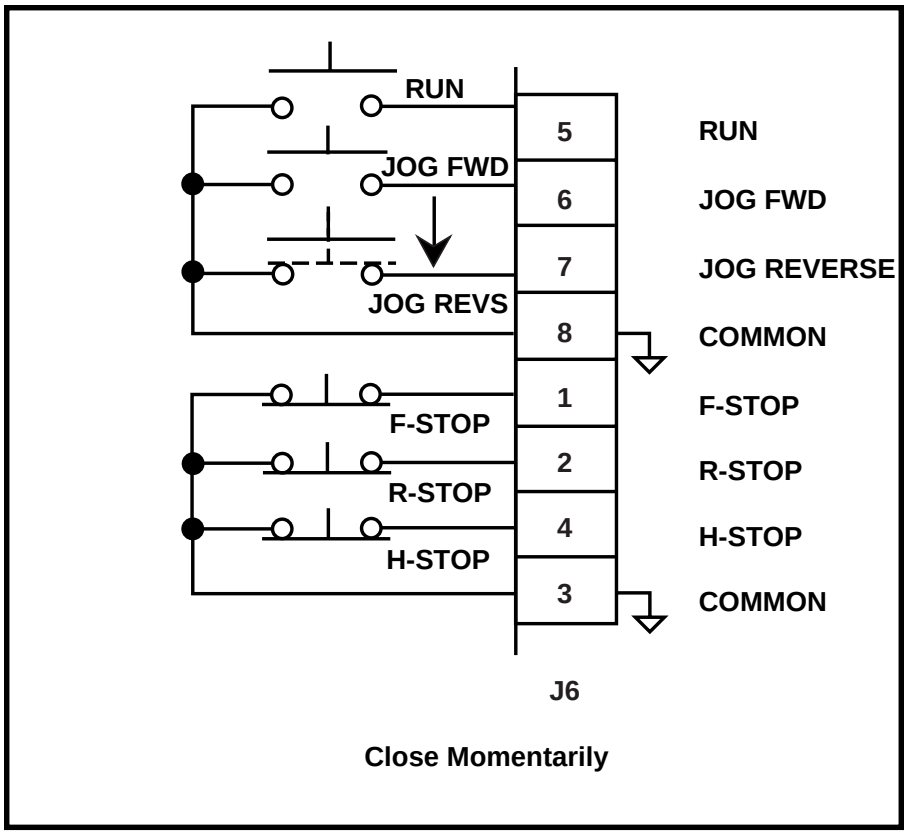


Figure 48 Jog Reverse Input

—NOTES—

—NOTES—

CONTREX, INC.
8900 Zachary Lane North
Maple Grove, MN 55369 USA
Phone (763) 424-7800 Fax (763) 424-8734