

CX-1102 INSTALLATION/ WIRING GUIDE

CONTREX[®]

SK1691 Rev A

Installation / Wiring Guide

Configuration

Mounting

Wiring

Inputs

Outputs

Serial Communications

DeviceNet (Optional)

Logic Control

CONFIGURATION

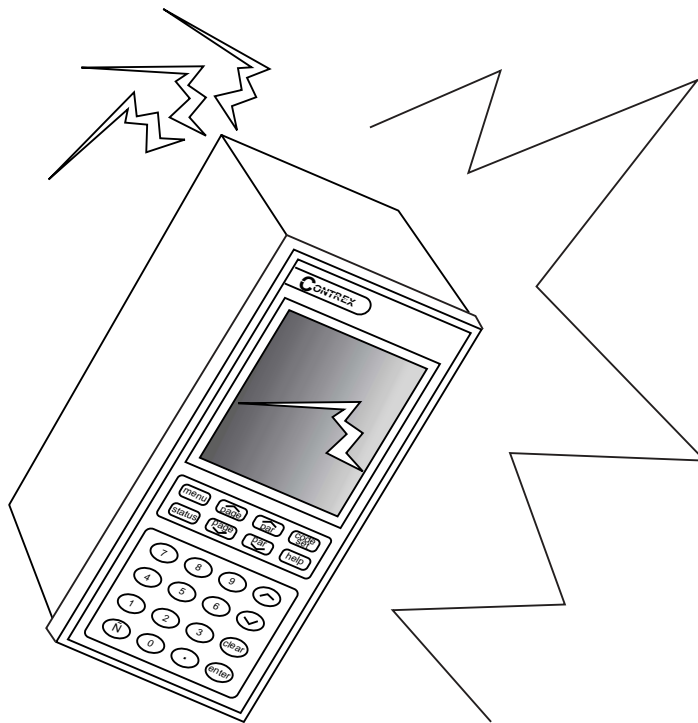
This section will show you how to re-configure the CX-1102 for electrical compatibility. Complete this procedure prior to installation. This procedure does not require power to complete.

The area that is involved in re-configuring the CX-1102 is the AC Power Input Voltage switch. This switch is located in an external location on the CX-1102. You will not be required to access the interior of the CX-1102.

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



WARNING



You will damage the CX-1102 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-1102. 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).

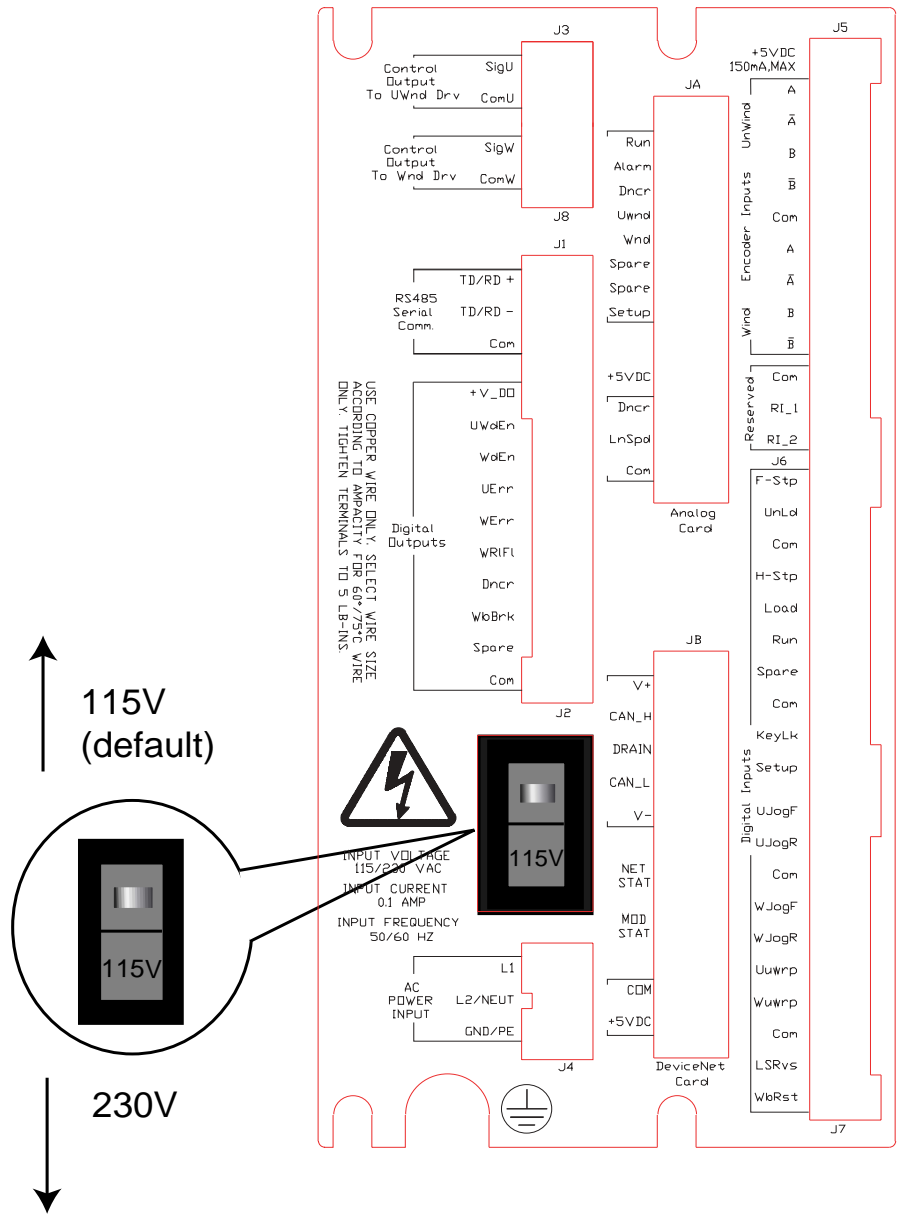
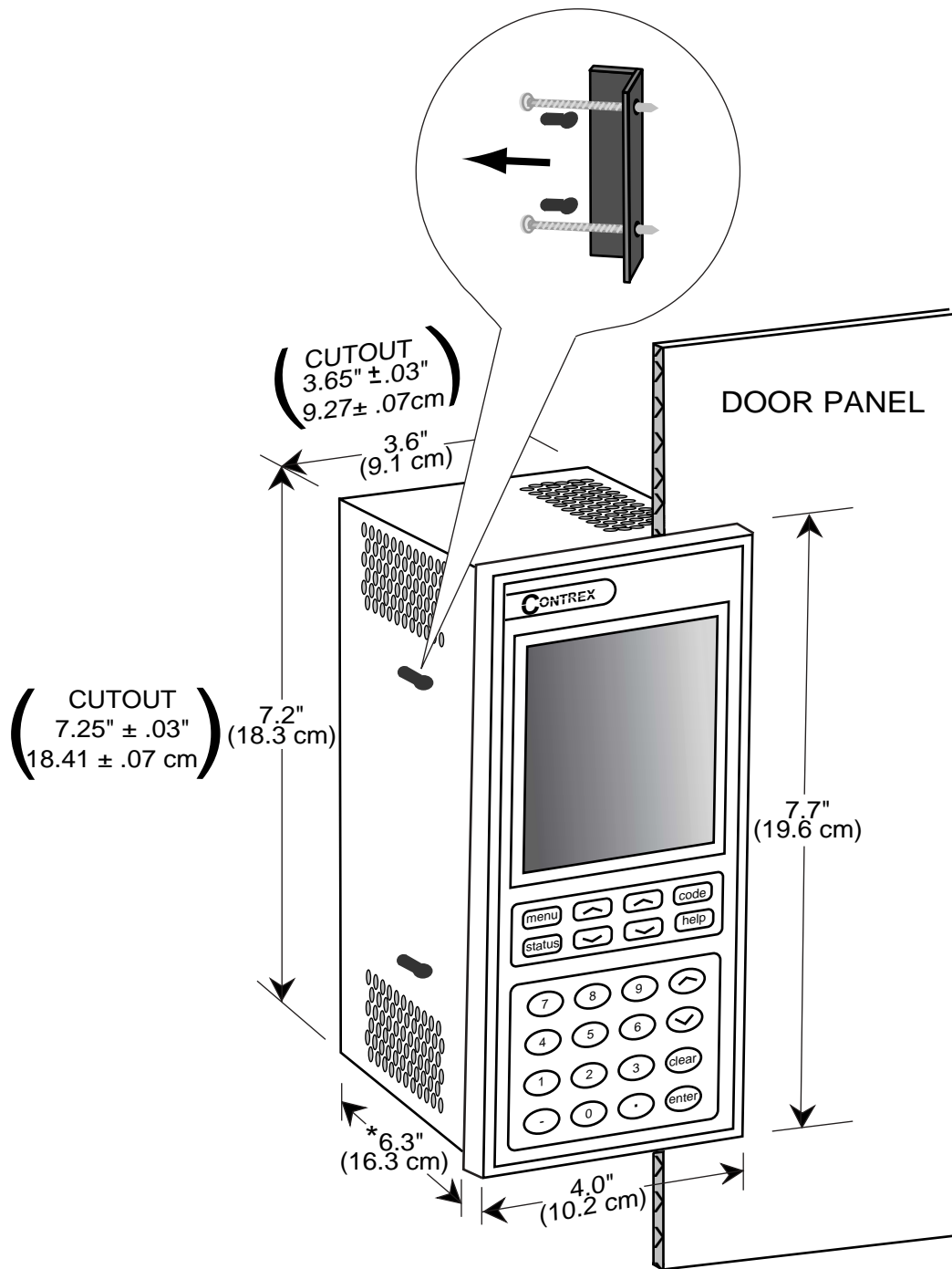


Figure 1 AC Power Input Voltage Switch



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

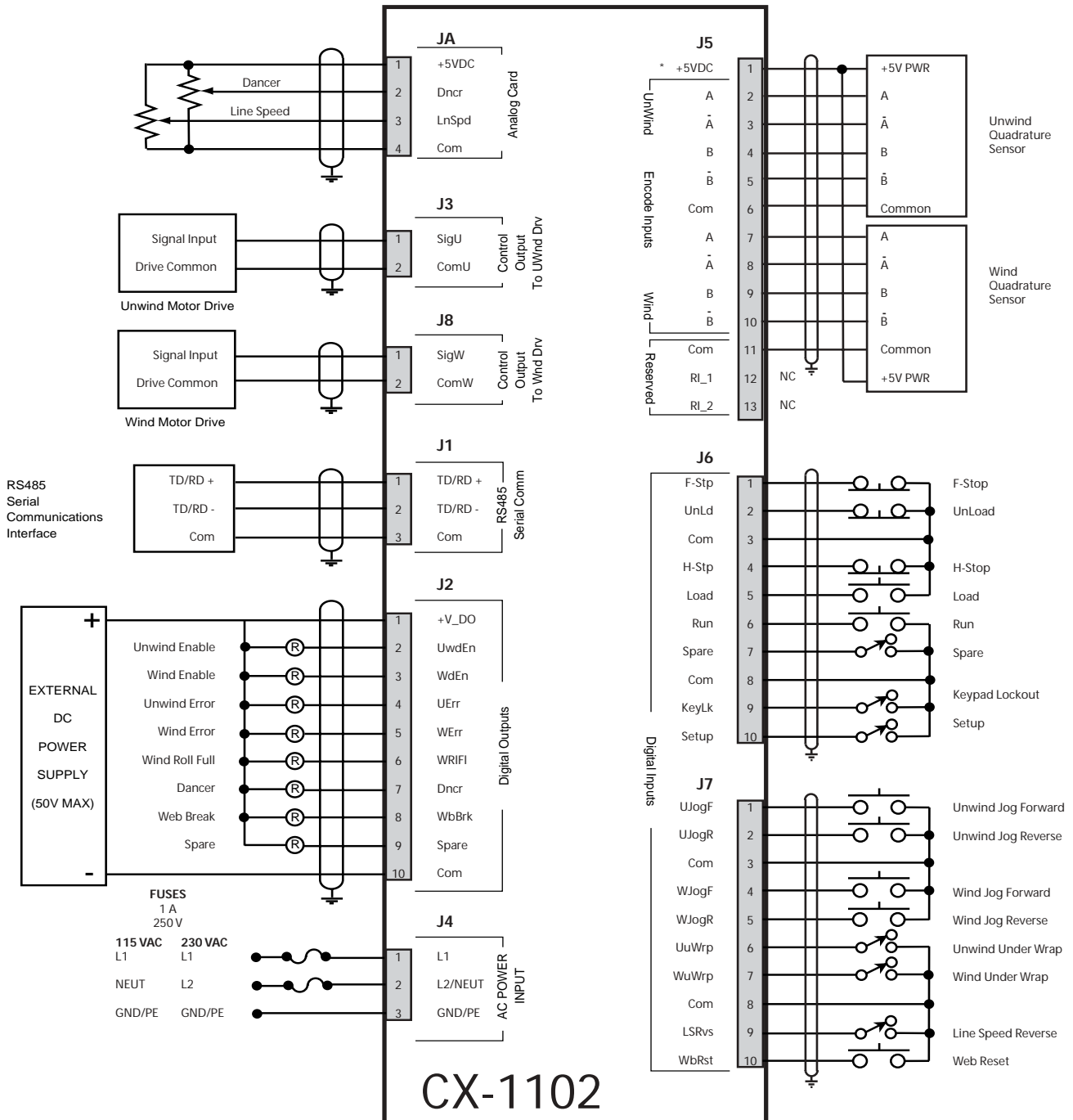
Figure 2 CX-1102 Cutout Dimensions and Mounting Guide

MOUNTING

This section contains instructions for mounting the CX-1102 in the door panel of an industrial electrical enclosure. The CX-1102 is packaged in a compact 1/2 DIN vertical instrument enclosure that mounts easily in the door of your industrial electrical enclosure. The CX-1102 meets the NEMA 4 and the IP65 standards. To ensure compliance with these standards, enclose the CX-1102 in a Nema 4 or IP65 industrial electrical enclosure.

To mount the CX-1102:

- 1) The industrial electrical enclosure that will house the CX-1102 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 $3.65" \pm .03" \times 7.25 \pm .03"$ (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-1102 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-1102. See figure 2. Tighten the mounting screws until the CX-1102 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-1102 General Wiring

WIRING

This section contains the input, output and serial communications wiring information for the CX-1102. Please read this section prior to wiring the CX-1102 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-1102. Failure to do so could result in additional electrical noise and cause the CX-1102 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.

	<p>DANGER</p> <p>Hazardous voltages. Can cause severe injury, death or damage the equipment. The CX-1102 should only be installed by a qualified electrician.</p>	
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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-1102 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.

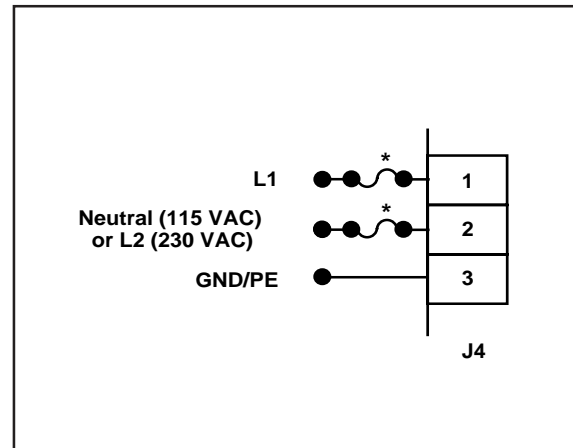


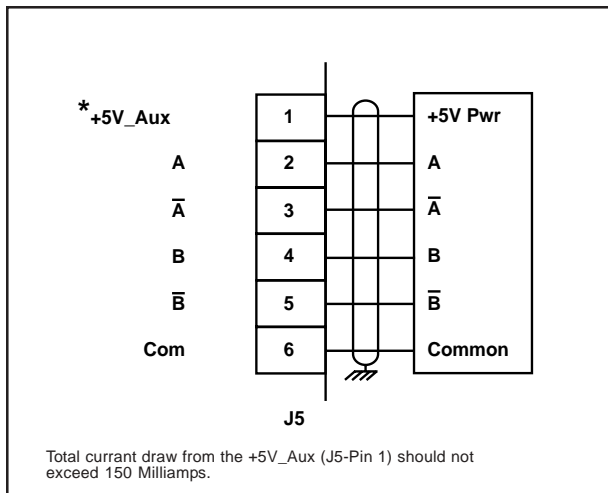
Figure 4 AC Power Input

WARNING

You will damage the CX-1102 if you apply 230 VAC to the AC Power input when the AC Power Input Voltage switch is in the 115 V position.

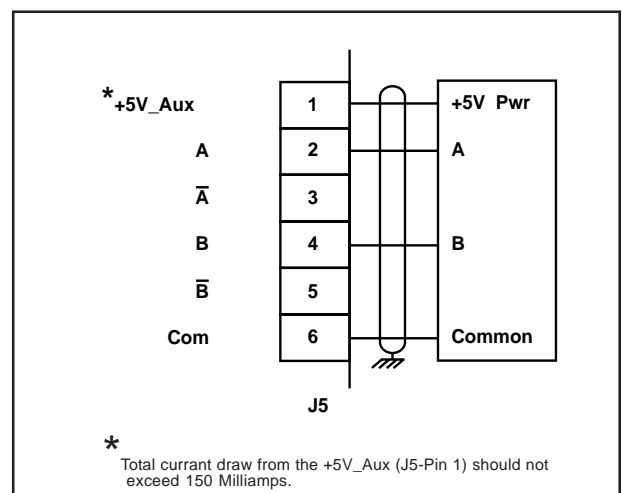
Unwind Frequency (J5 pins 1, 2, 4, 5, 6)

The wiring for the Unwind Frequency is determined by the sensor. Figures 5 and 6 illustrate the wiring for the various sensors. For signal level and performance specifications, refer to *Appendices: Appendix A*.



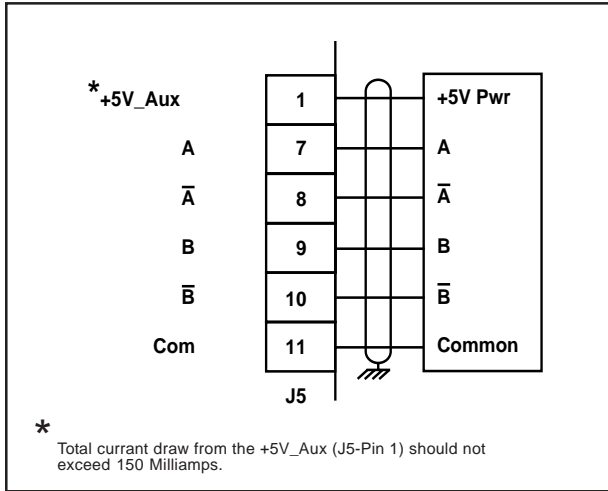
**Figure 5 Unwind Frequency
Quadrature Differential Sensor (Bidirectional)**

**Figure 6 Unwind Frequency
Quadrature Single-Ended Sensor (Bidirectional)**



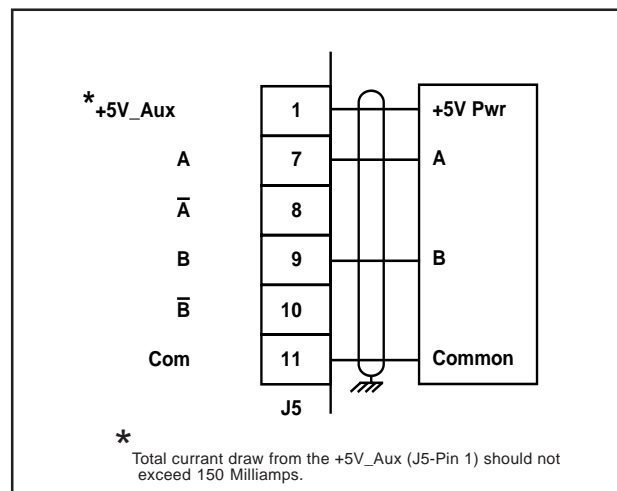
Wind Frequency (J5 pins 1, 7, 8, 9, 10, 11)

The wiring for Wind Frequency is determined by the sensor. Figures 7 and 8 illustrate the wiring for the various sensors. For signal level and performance specifications refer to *Appendices: Appendix A*.



**Figure 7 Wind Frequency
Quadrature Differential Sensor (Bidirectional)**

**Figure 8 Wind Frequency
Quadrature Single-Ended Sensor (Bidirectional)**



F-Stop (J6 pins 1,3)

F-Stop is a momentary input. When it is opened, the CX-1102 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.

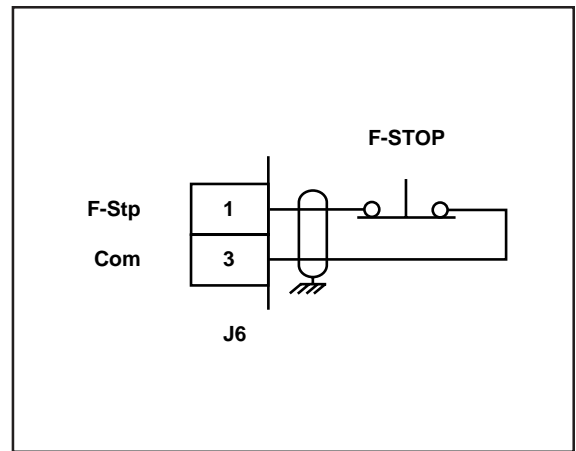


Figure 9 F-Stop

Unload (J6 pins 2, 3)

When the Unload input (J6, pin 2) is momentarily opened, the CX-1102 enters the Unload state. As a momentary input, Unload is internally latched and does not need to be maintained open by an operator device.

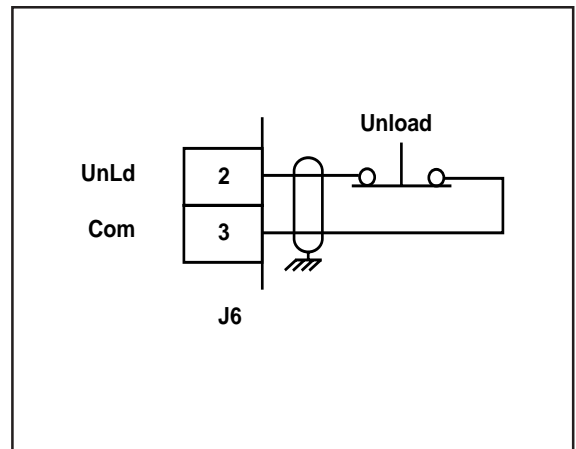


Figure 10 Unload

H-Stop (J6 pins 4, 3)

H-Stop is a momentary input. When it is opened, the CX-1102 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.

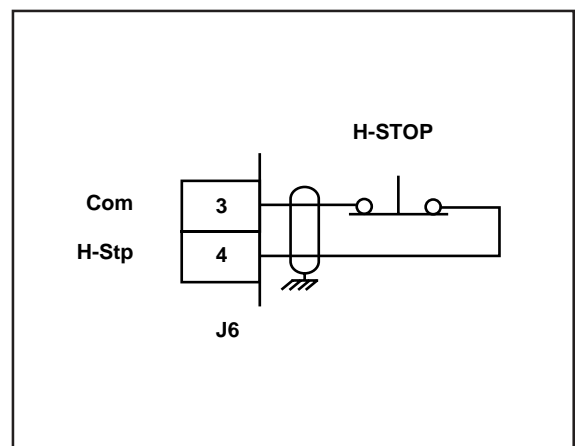


Figure 11 H-Stop

Load (J6 pins 5, 3)

When the Load input (J6, pin 5) is momentarily shorted to common, the CX-1102 enters the Load state. As a momentary input, Load is internally latched and does not need to be maintained closed by an operator device.

NOTE: Close the H-Stop, Unload and F-Stop inputs prior to entering the Load state. If you are only using one of the Stop inputs, wire short the other Stop inputs to the common or the CX-1102 will not enter load.

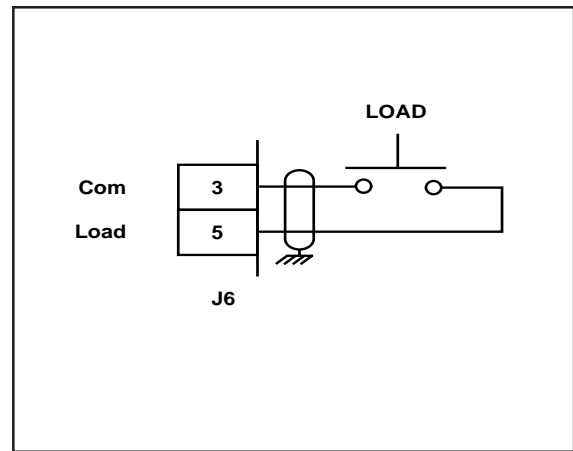


Figure 12 Load

Run (J6 pins 6, 8)

When the Run input (J6, pin 6) is momentarily shorted to common, the CX-1102 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 H-Stop, Unload 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-1102 will not enter run.

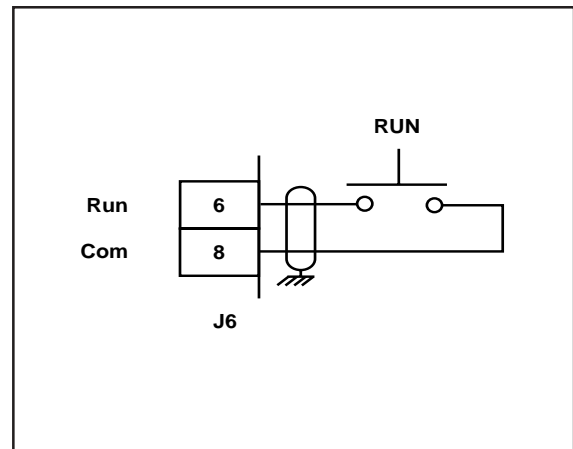


Figure 13 Run

Spare (J6 pins 7, 8)

The Spare input is not defined at this time.

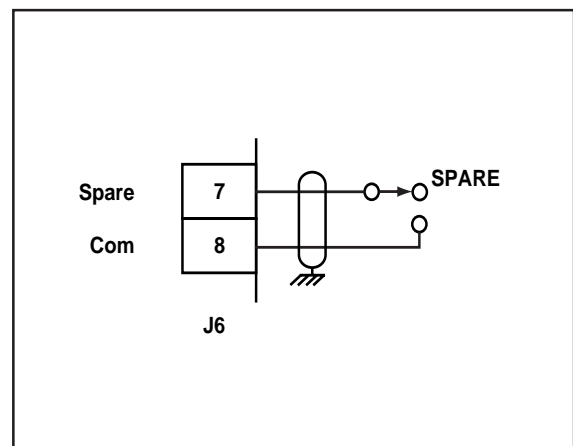


Figure 14 Spare

Keypad Lockout (J6 pins 9, 8)

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

The Keypad Lockout input is temporarily used during the system setup procedure to initiate tests for the CX-1102 system setup procedure.

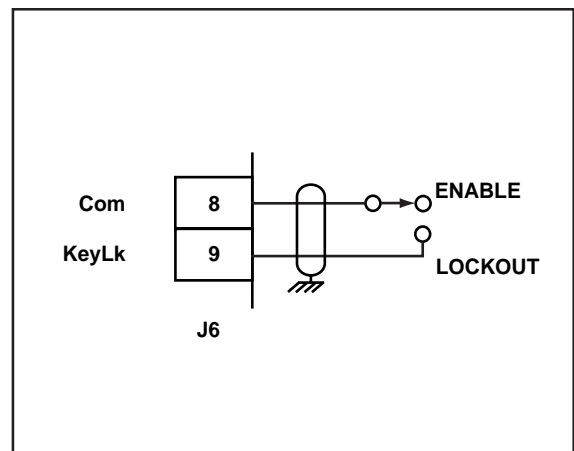


Figure 15 Keypad Lockout

Setup (J6 pins 10, 8)

Setup is a maintained input. It is used only during the system setup procedure to put the CX-1102 into "Setup State".

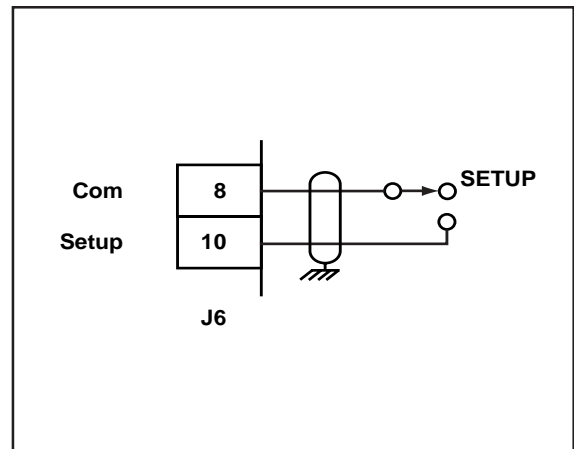


Figure 16 Setup

Unwind Jog Forward (J7 pins 1, 3)

Unwind Jog Forward is a maintained input. When it is closed, it sends a forward unwind control output signal to the drive at the selected Jog Setpoint. As a maintained input, Unwind Jog Forward is only active when the operator device is closed.

NOTE: Close the H-Stop, Unload 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-1102 will not enter Jog.

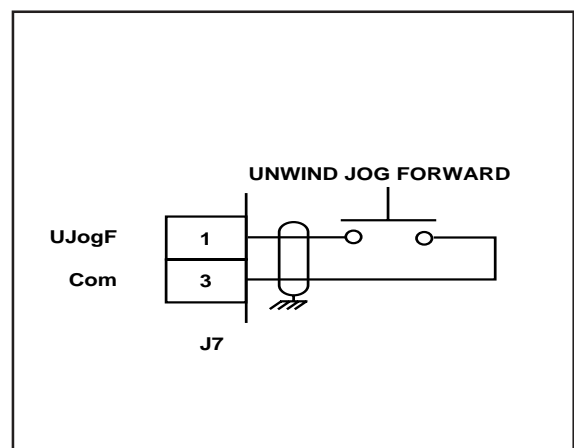


Figure 17 Unwind Jog Forward

Unwind Jog Reverse (J7 pins 2, 3)

Unwind Jog Reverse is a maintained input. When it is closed, it sends a reverse unwind control output signal to the drive at the selected Jog Setpoint. As a maintained input, Unwind Jog Reverse is only active when the operator device is closed.

NOTE: Close the H-Stop, Unload 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-1102 will not enter Jog.

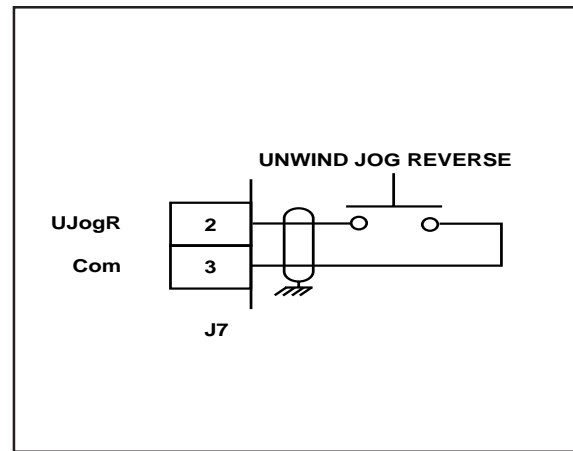


Figure 18 Unwind Jog Reverse

Wind Jog Forward (J7 pins 4, 3)

Wind Jog Forward is a maintained input. When it is closed, it sends a forward wind control output signal to the drive at the selected Jog Setpoint. As a maintained input, Wind Jog Forward is only active when the operator device is closed.

NOTE: Close the H-Stop, Unload 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-1102 will not enter Jog.

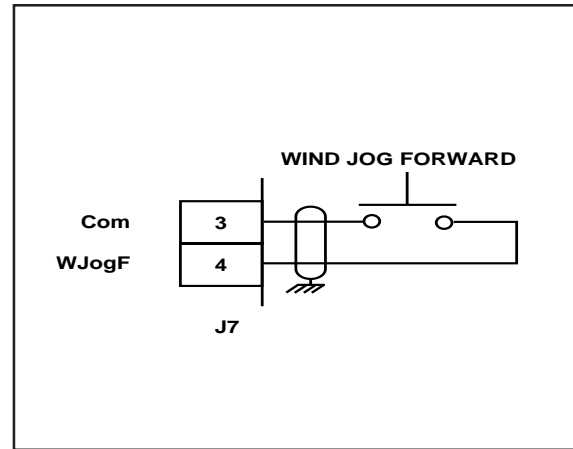


Figure 19 Wind Jog Forward

Wind Jog Reverse (J7 pins 5, 3)

Wind Jog Reverse is a maintained input. When it is closed, it sends a reverse wind control output signal to the drive at the selected Jog Setpoint. As a maintained input, Wind Jog Reverse is only active when the operator device is closed.

NOTE: Close the H-Stop, Unload 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-1102 will not enter Jog.

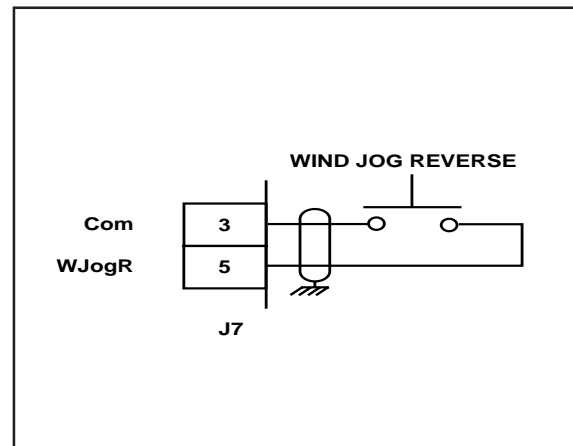


Figure 20 Wind Jog Reverse

Unwind Under Wrap (J7 pins 6, 8)

When the Unwind Under Wrap input is closed, then the unwind axle has web material fed off the roll from the bottom rather than the top of the roll.

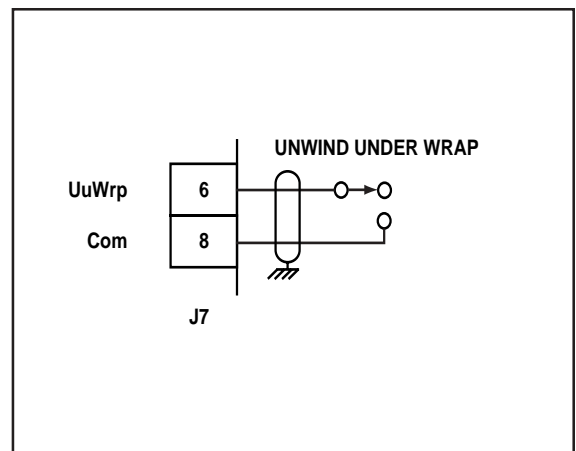


Figure 21 Unwind Under Wrap

Wind Under Wrap (J7 pins 7, 8)

When the Wind Under Wrap input is closed, then the wind axle has web material fed off the roll from the bottom rather than the top of the roll.

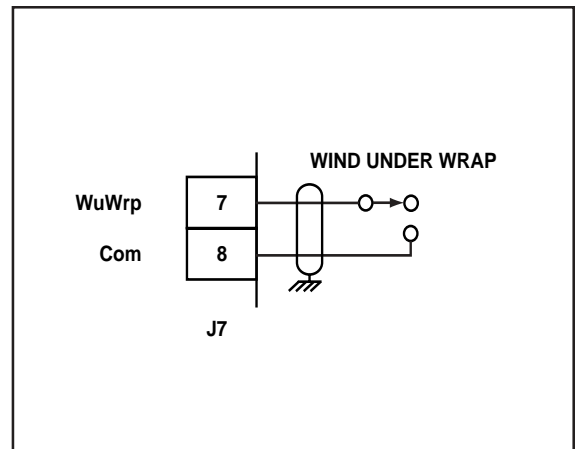


Figure 22 Wind Under Wrap

Line Speed Reverse (J7 pins 9, 8)

When the Line Speed Reverse input is closed, the Line Speed command is negated to be opposite the Line Speed Setpoint.

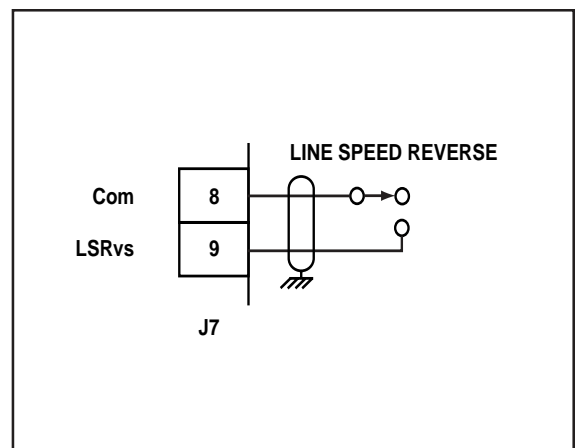


Figure 23 Line Speed Reverse

Web Reset
(J7 pins 10, 8)

Web Reset is a maintained input. When it is closed. As a maintained input, Web Reset is only active when the operator device is closed.

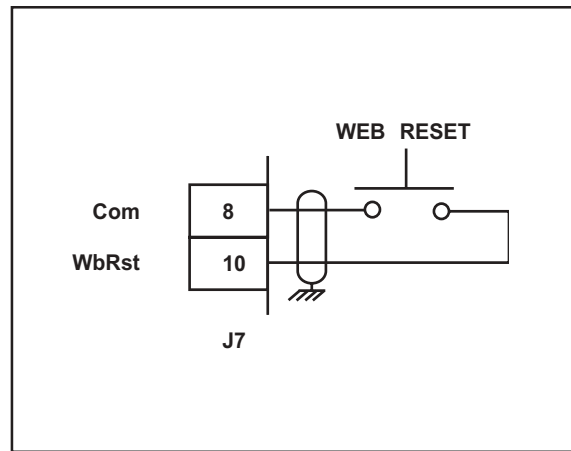


Figure 2-24 Web Reset

Dancer
(JA, Pins 1, 2, 4)

The Dancer Input can be used with a potentiometer (e.g., dancer pot).

- * The total current from JA pin 1 and J5 pin 1 (+5V_Aux) must not exceed 150 mA.

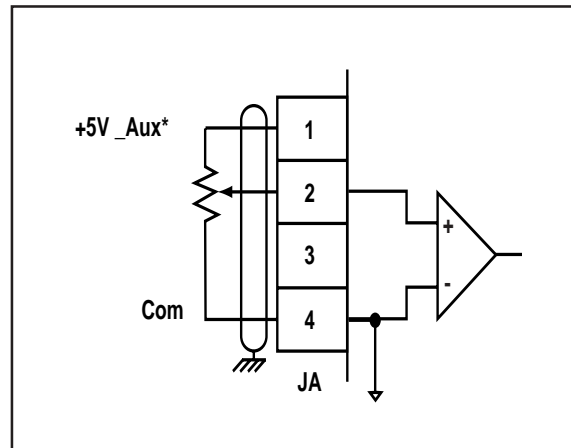


Figure 2-25 Dancer Input

Line Speed Potentiometer
(JA, Pins 1, 3, 4)

The Line Speed Input can be used with a potentiometer (e.g., line speed pot).

- * The total current from JA pin 1 and J5 pin 1 (+5V_Aux) must not exceed 150 mA

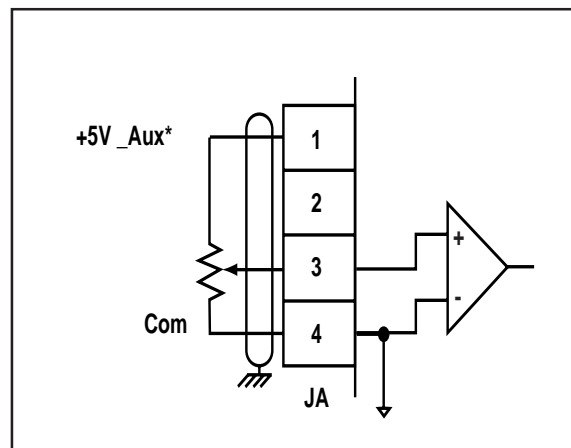


Figure 2-26 Line Speed Potentiometer

OUTPUTS

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

Unwind Control Output (J8 pins 1, 2)

Unwind Control Output is an isolated analog output signal that is sent to the motor drive to control the speed of the motor. Wire the Unwind Control Output into the speed signal input of the drive. If the motor drive has a potentiometer speed control, remove the potentiometer connections and wire the Unwind Control Output to the potentiometer wiper point. The CX-1102's Isolated Common should always be connected to the drive common.

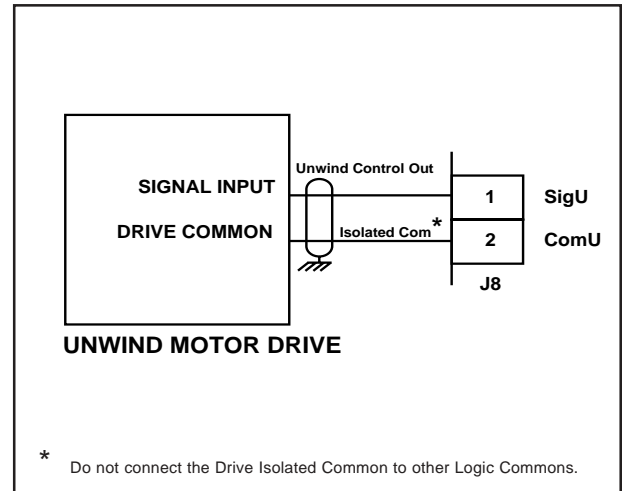


Figure 27 Unwind Control Output

Wind Control Output (J3 pins 1, 2)

Wind Control Output is an isolated analog output signal that is sent to the motor drive to control the speed of the motor. Wire the Wind Control Output into the speed signal input of the drive. If the motor drive has a potentiometer speed control, remove the potentiometer connections and wire the Wind Control Output to the potentiometer wiper point. The CX-1102's Isolated Common should always be connected to the drive common.

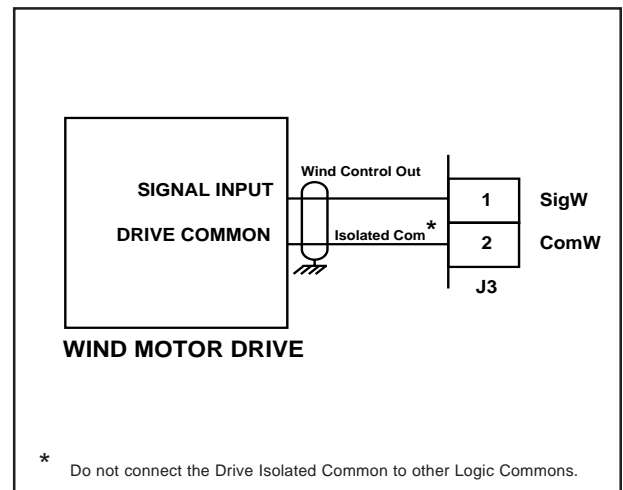


Figure 28 Wind Control Output

NOTE: All Digital Outputs are activated via the PLC and so are subject to the active PLC program.

Unwind Enable
(J2 pin 2)

The Unwind Enable output is activated (driven low) when the CX-1102 signals a run command to the motor drive. The Unwind Enable output is driven high (relay deactivated) after Power Up and at the completion of F-Stop. See Figure 29.

Wind Enable
(J2 pin 3)

The Wind Enable output is activated (driven low) when the CX-1102 signals a run command to the motor drive. The Wind Enable output is driven high (relay deactivated) after Power Up and at the completion of F-Stop. See Figure 29.

Unwind Error
(J2 pin 4)

The Unwind Error output is activated (driven low) when UwndRR Err (MP-22) is greater than E200 RPM. See Figure 29.

Wind Error
(J2 pin 5)

The Wind Error output is activated (driven low) when WindRR Err (MP-32) is greater than E200 RPM. See Figure 29.

Wind Roll Full
(J2 pin 6)

The Wind Roll Full output is activated (driven low) when WindEstDia (MP-17) is greater than or equal to 72 (Diameter EU). See Figure 29.

Dancer
(J2 pin 7)

The Dancer output is activated (driven low) when the dancer content is greater than or equal to 95% of DncrCntFull (CP-272) or less than or equal to 5% of DncrCntFull (CP-272). See Figure 29.

Web Break
(J2 pin 8)

The Web Break output is activated (driven low) when the dancer content is greater than or equal to 95% of DncrCntFull (CP-272) and LineSpdRRef (MP-42) is greater than zero and the non-Dancer Trimmed Roll is rotating at a speed greater than Zero Speed (CP-370). See Figure 29.

Spare
(J2 pin 9)

The Spare output is activated (driven low) when the dancer content is within a band that is E5% of DncrCntFull (CP-272) above or below the Dancer SP (CP-250). See Figure 29.

NOTE: The Digital Outputs are open-collector relay drivers. For specification details, see *Appendices: Appendix A*. Use an external DC power supply to power the relays. Free-wheeling diodes are incorporated internally in the CX-1102 and do not need to be added externally.

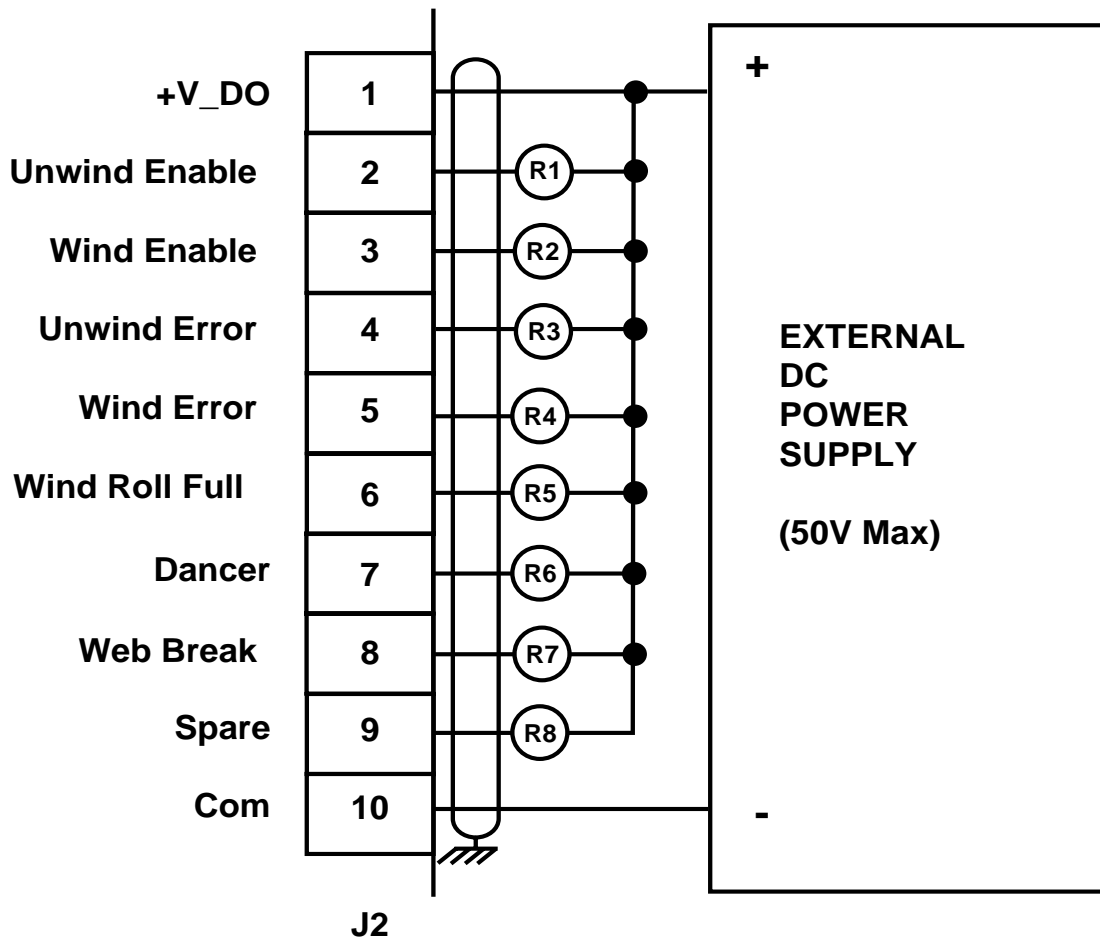


Figure 29 CX-1102 Digital Outputs

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-1102 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-1102. See *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.

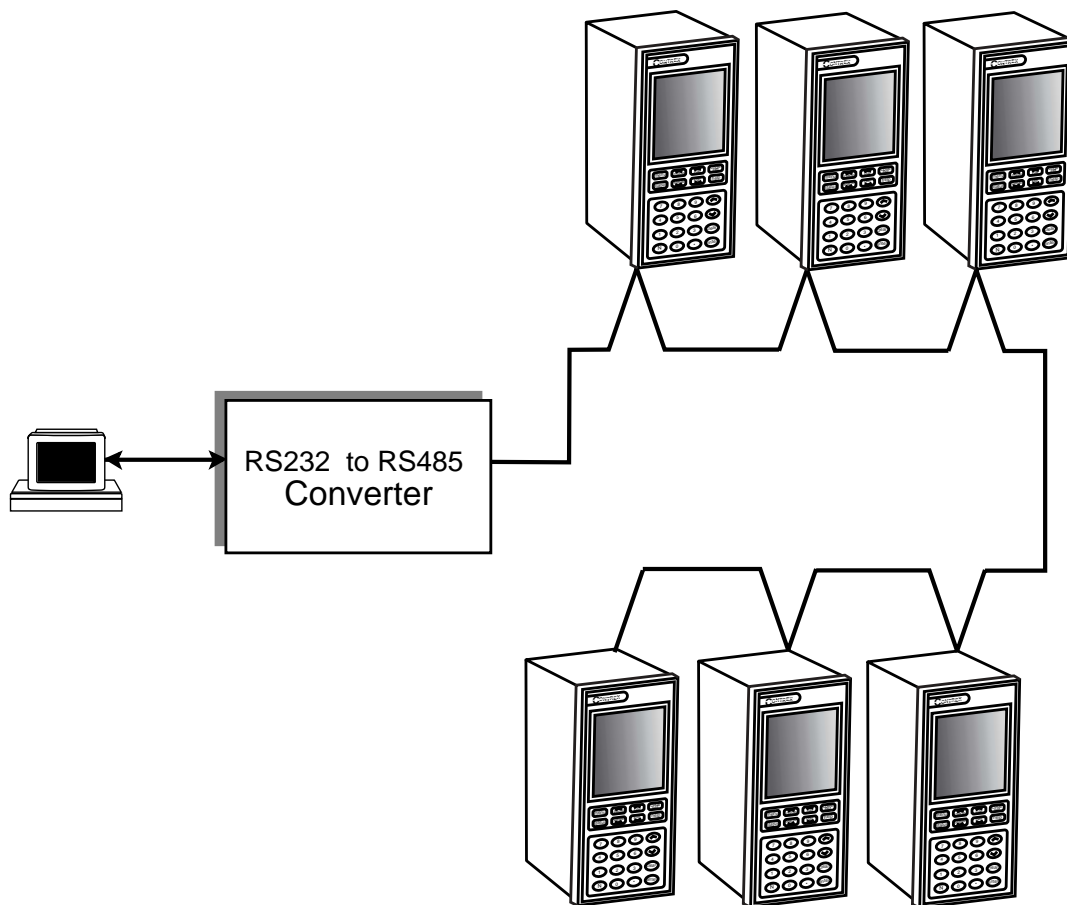
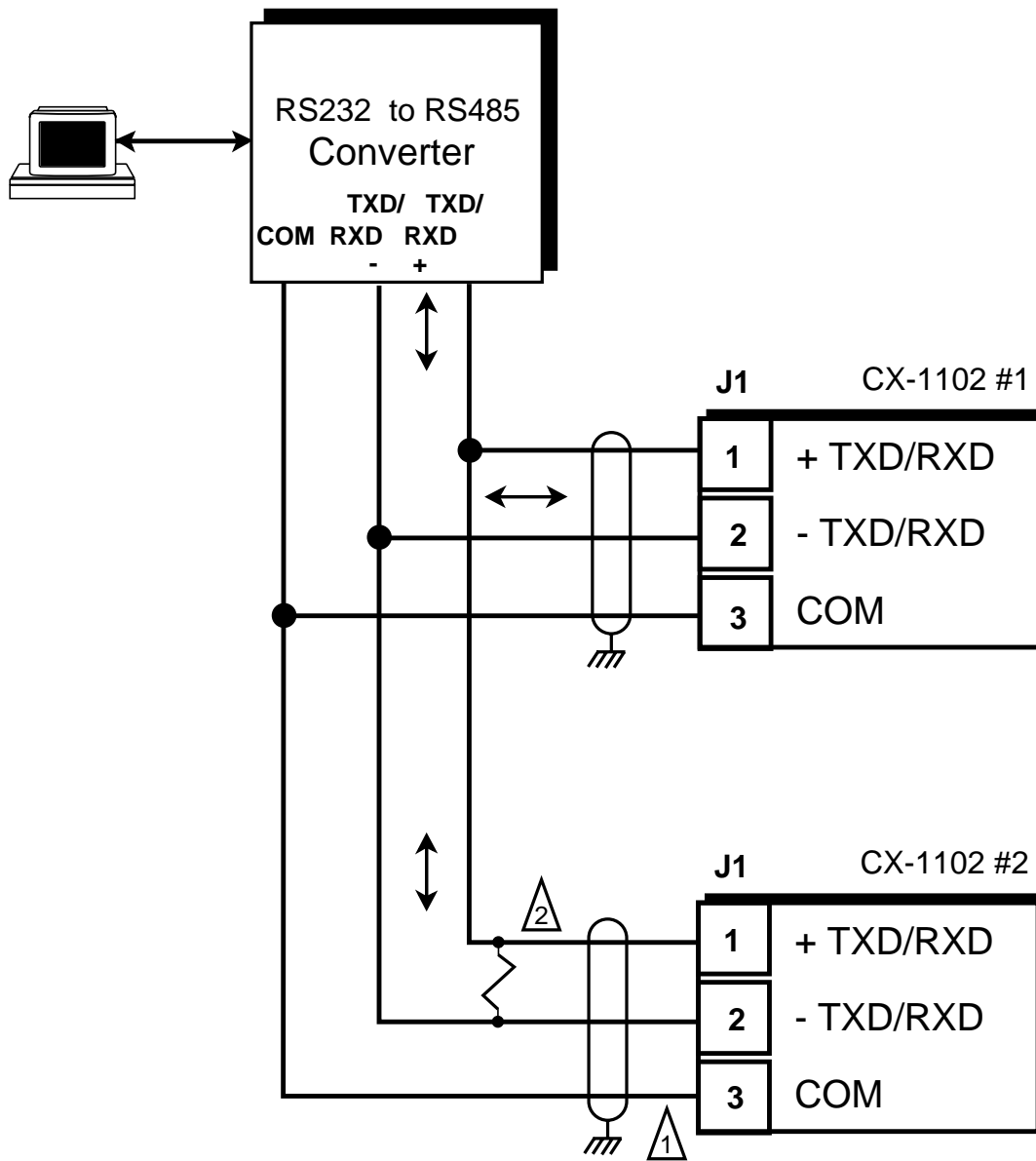


Figure 30 CX-1102 Multidrop Installation



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-1102 Serial Communications Connections

—NOTES—

DEVICENET CARD (OPTIONAL)

For the installation, wiring and operation of the optional DeviceNet card, refer to the *CX-Series DeviceNet Card Technical Manual*, # 0001-0134.

—NOTES—

LOGIC CONTROL

This section addresses the seven digital inputs that control the CX-1102's operating state. The seven digital inputs (listed by priority) are:

- F-Stop
- Unload
- H-Stop
- Run
- Load
- Jog Forward (Unwind and Wind)
- Jog Reverse (Unwind and Wind)

When the CX-1102 is powered up, it defaults to F-Stop. Run is terminated by activating F-Stop, Unload 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 or H-Stop. The operating state automatically changes to F-Stop or H-Stop after the Jog deceleration 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.

	<p>Caution</p> <p>Do not use the AC line power to start or stop the system.</p> <p>Use the Digital Inputs to start or stop the system.</p>	
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Logic Inputs

F-Stop (Fast Stop) has priority over the other operating states. F-Stop forces the Control Output SigU and SigW signals to “0” volts and monitors the feedback. When the feedback is less than the Zero Speed (CP-370), the UwndDrvEn (PLC bit 41) and WindDrvEn (PLC bit 51) 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 UwndDrvEn (PLC bit 41) and WindDrvEn (PLC bit 51) automatically resets to “0”. The integral, trim and feedforward are also set to “0”.

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

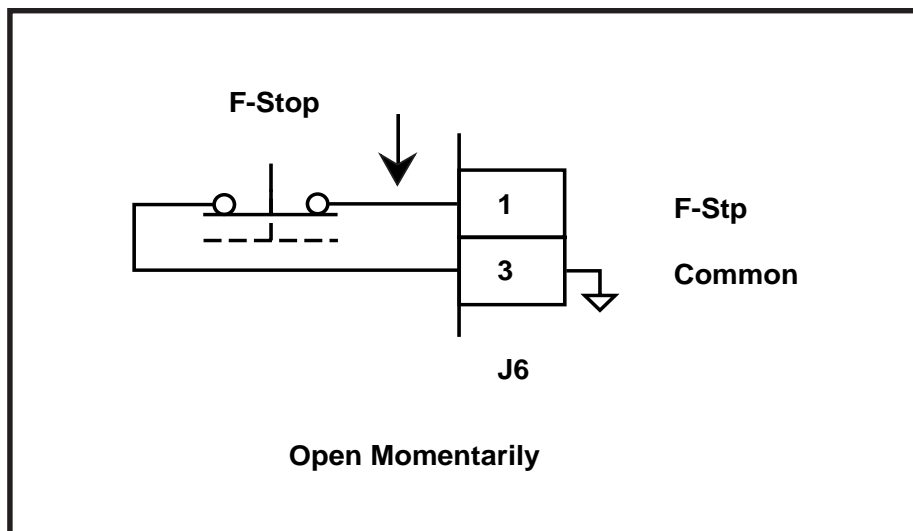


Figure 32 F-Stop Input

Unload has the fourth highest operating priority. Only from Run, H-Stop, Load, or F-Stop states, but not from Direct Setpoint Application. Normal operation is from H-Stop with the dancer loaded. If Unload is requested from Run, the roll(s) ramp to zero speed before starting the Unload sequence below. Unload has a ten second (10s) timer. If the Dancer is not unloaded within 10 seconds after the Unload input is latched, the CX-1102 automatically reverts to the F-Stop operating state. The Unload input may be held open to keep the CX-1102 from changing to F-Stop and therefore complete the Unload.

To activate Unload:

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

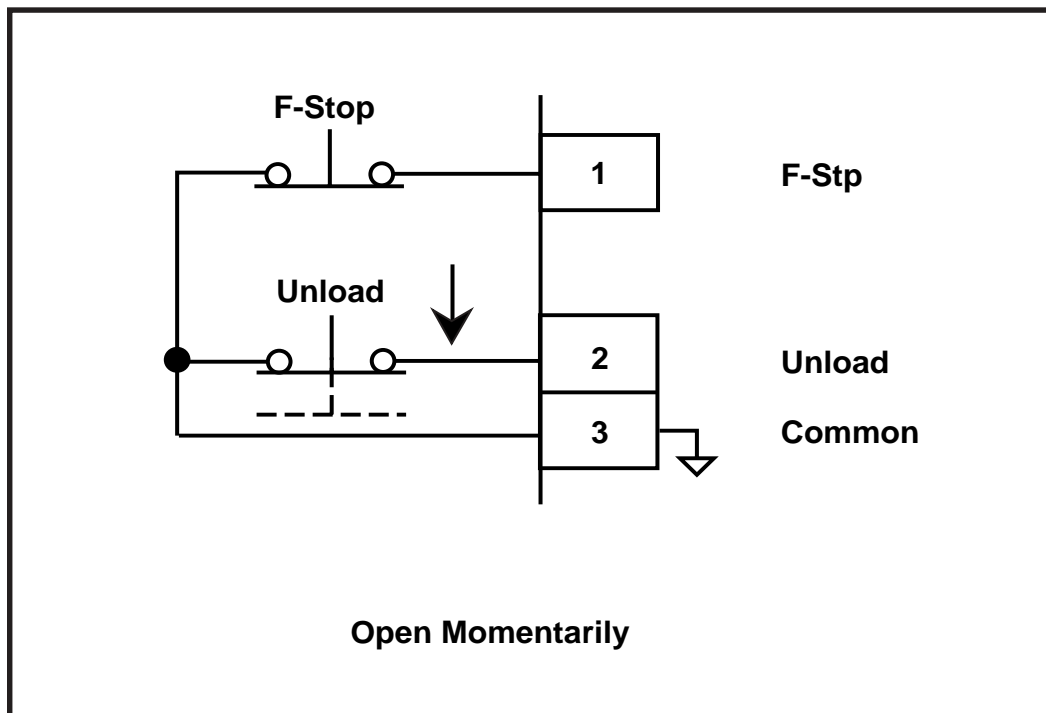


Figure 33 Unload Input

App Select (CP-202) = 1: The CX-1102 controls both rolls with Dancer Trimmed Unwind

- 1) The unwind is a bipolar or a unipolar reversible or a unipolar drive:
 - a) The wind roll is put into H-Stop.
 - b) The unwind roll jogs forward until the dancer is in the Full position.
 - c) The unwind roll goes into Jog Stop until the unwind roll stops.
 - d) Then the unwind roll transitions to F-Stop.
 - e) The wind roll transitions to F-Stop.
 - f) The system state transitions to F-Stop State.

- 2) The unwind is a unipolar brake and the wind is bipolar or unipolar reversible:
 - a) The unwind roll is put into H-Stop.
 - b) The wind roll jogs in reverse until the dancer is in the Full position.
 - c) The wind roll goes into Jog Stop until the wind roll stops.
 - d) Then the unwind roll transitions to F-stop.
 - e) The wind roll transitions to F-Stop.
 - f) The system state transitions to F-Stop State.

- 3) The unwind is a unipolar brake and the wind is unipolar:
 - a) The wind roll is put into F-Stop.
 - b) The unwind roll is put into F-Stop.
 - c) The system state transitions to F-Stop State.

App Select (CP-202) = 2: The CX-1102 controls both rolls with Dancer Trimmed Wind

- 1) The wind is a bipolar or a unipolar reversible drive:
 - a) The unwind roll is put into H-Stop.
 - b) The wind roll jogs in reverse until the dancer is in the Full position.
 - c) The wind roll goes into Jog Stop until the wind roll stops.
 - d) Then the wind roll transitions to F-Stop.
 - e) The unwind roll transitions to F-Stop.
 - f) The system state transitions to F-Stop State.

- 2) The wind is a unipolar drive:
 - a) The wind roll is put into H-Stop.
 - b) The unwind roll jogs forward until the dancer is in the Full position.
 - c) The unwind roll goes into Jog Stop until the unwind roll stops.
 - d) Then the unwind roll transitions to F-Stop.
 - e) The wind roll transitions to F-Stop.
 - f) The system state transitions to F-Stop State.

- 3) The wind is a unipolar drive and the unwind is a unipolar brake:
 - a) The wind roll is put into F-Stop.
 - b) The unwind roll is put into F-Stop.
 - c) The system state transitions to F-Stop State.

App Select (CP-202) = 3: The CX-1102 controls only the Dancer Trimmed Unwind roll

- 1) The unwind is a bipolar or a unipolar reversible or a unipolar drive:
 - a) The unwind roll jogs forward until the dancer is in the Full position.
 - b) The unwind roll goes into Jog Stop until the unwind roll stops.
 - c) Then the unwind roll transitions to F-Stop.
 - d) The system state transitions to F-Stop State.

- 2) The unwind is a unipolar brake and the wind is bipolar or unipolar reversible:
 - a) The unwind roll is put into H-Stop.
 - b) The unwind roll waits until the dancer is in the Full position.
 - c) Then the unwind roll transitions to F-stop.
 - d) The system state transitions to F-Stop State.

- 3) The unwind is a unipolar brake and the wind is unipolar:
 - a) The unwind roll is put into F-Stop.
 - b) The system state transitions to F-Stop State.

App Select (CP-202) = 4: The CX-1102 controls only the Dancer Trimmed Wind roll

- 1) The wind is a bipolar or a unipolar reversible drive:
 - a) The wind roll jogs in reverse until the dancer is in the Full position.
 - b) The wind roll goes into Jog Stop until the wind roll stops.
 - c) Then the wind roll transitions to F-Stop.
 - d) The system state transitions to F-Stop State.

- 2) The wind is a unipolar drive:
 - a) The wind roll is put into H-Stop.
 - b) The wind roll waits until the dancer is in the Full position.
 - c) Then the wind roll transitions to F-Stop.
 - d) The system state transitions to F-Stop State.

- 3) The wind is a unipolar drive and the unwind is a unipolar brake:
 - a) The wind roll is put into F-Stop.
 - b) The system state transitions to F-Stop State.

H-Stop (Stop and Hold) has the fifth 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, and Trim). If the loop is “Open”, the ramp will be executed with feedforward only. The deceleration rate for the ramp is determined by Dcl Tm HStp (CP-307) and Ref Ramps (CP-300) or by the Dcl Rt RStp (CP-308). When the velocity command reaches “0” and the feedback is less than the Zero Speed (CP-370), then H-Stop will; hold the Control Output (SigU/SigW) to “0” volts (Open Loop) or the dancer trimmed roll will hold the dancer in position near the Dancer SP (CP-250) (Closed Loop) and the non-dancer trimmed roll's position (Closed Loop position hold).

To activate H-Stop:

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

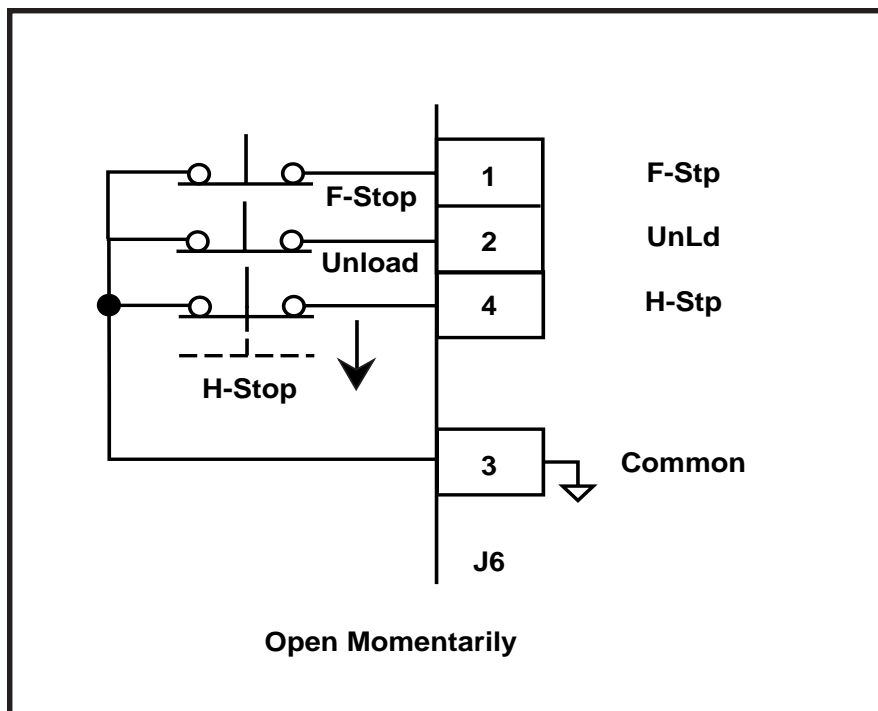


Figure 34 H-Stop Input

Run has the sixth highest operating priority. Run is the primary operating state. App Select (CP-202) determines the operation for Run, using either the applications 1 through 4 or the direct mode. The corresponding setpoint for the selected mode determines the operating speed. The direct mode will only operate as open loop. The applications 1 through 4 will “Run” in closed 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-301), Dcl Tm RUN (CP-303) and Ref Ramps (CP-300). The direct mode ramps are determined by Acl Tm Drct (CP-311), Dcl Tm Drct (CP-312) and UwndCOMaxVolts (CP-281) and WindCOMaxVolts (CP-286).

To activate Run:

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

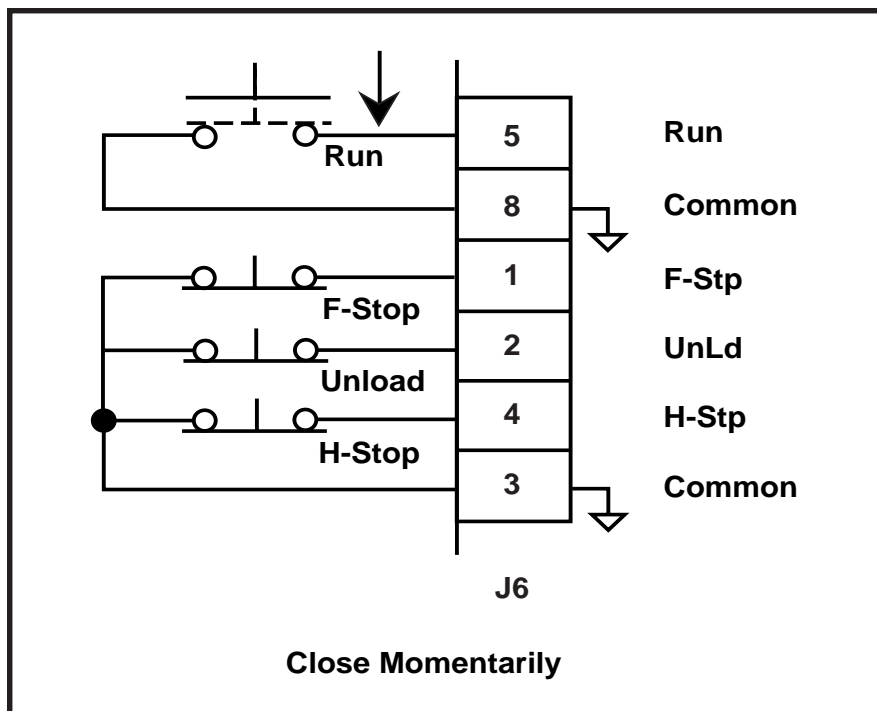


Figure 35 Run Input

Load has the seventh highest operating priority. Only from F-Stop or Unload states. Normal operation is from F-Stop with the dancer in the full position. Load can also be initiated from Unload state with positive Dancer Error. Load has a ten second (10s) timer. If the Dancer is not loaded within 10 seconds after the Load input is latched the CX-1102 automatically reverts to the F-Stop operating state. The Load input may be held closed to keep the CX-1102 from changing to F-Stop and therefore complete the Load.

To activate Load:

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

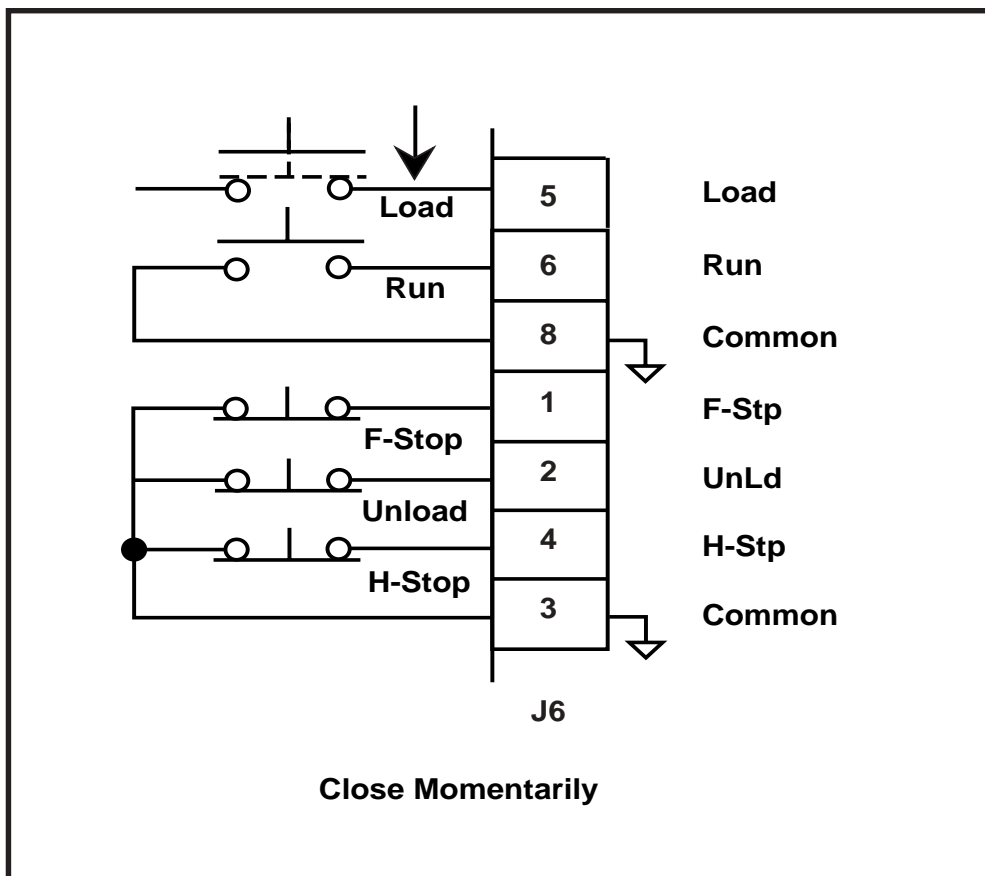


Figure 36 Load Input

App Select (CP-202) = 1: The CX-1102 controls both rolls with Dancer Trimmed Unwind

- 1) If the unwind is a bipolar or a unipolar reversible drive:
 - a) The wind roll is put into H-Stop.
 - b) The unwind roll Jogs in reverse to pull material out of the dancer until the dancer error changes from positive to negative.
 - c) The unwind roll goes into Jog Stop until the unwind roll stops.
 - d) Then the unwind roll transitions to Run with Dancer Trim.
 - e) The wind roll remains in H-Stop.
 - f) The system state transitions to H-Stop State.

- 2) If the unwind is a unipolar drive or a unipolar brake:
 - a) The unwind roll is put into H-Stop.
 - b) The wind roll jogs forward to pull material out of the dancer until the dancer error changes from positive to negative.
 - c) The wind roll goes into Jog Stop until the wind roll stops.
 - d) Then the unwind roll transitions to Run with Dancer Trim.
 - e) The wind roll transitions to H-Stop.
 - f) The system state transitions to H-Stop State.

App Select (CP-202) = 2: The CX-1102 controls both rolls with Dancer Trimmed Wind

- 1) If the wind is a bipolar or a unipolar reversible or a unipolar drive or a unipolar brake:
 - a) The unwind roll is put into H-Stop.
 - b) The wind roll jogs forward to pull material out of the dancer until the dancer error changes from positive to negative.
 - c) The wind roll goes into Jog Stop until the wind roll stops.
 - d) Then the wind roll transitions to Run with Dancer Trim.
 - e) The unwind roll remains in H-Stop.
 - f) The system state transitions to H-Stop State.

App Select (CP-202) = 3: The CX-1102 controls only the Dancer Trimmed Unwind roll

- 1) If the unwind is a bipolar or a unipolar reversible drive:
 - a) The unwind roll jogs in reverse to pull material out of the dancer until the dancer error changes from positive to negative.
 - b) The unwind roll goes into Jog Stop until the unwind roll stops.
 - c) Then the unwind roll transitions to Run with Dancer Trim.
 - d) The system state transitions to H-Stop State.

- 2) If the unwind is a unipolar drive or a unipolar brake :
 - a) The unwind roll is put into H-Stop.
 - b) The unwind roll waits until the dancer error changes from positive to negative.
 - c) Then the unwind roll transitions to Run with Dancer Trim.
 - d) The system state transitions to H-Stop State.

App Select (CP-202) = 4: The CX-1102 controls only the Dancer Trimmed Wind roll

- 1) If the wind is a bipolar or a unipolar reversible or a unipolar drive:
 - a) The wind roll jogs forward to pull material out of the dancer until the dancer error changes from positive to negative.
 - b) The wind roll goes into Jog Stop until the wind roll stops.
 - c) Then the wind roll transitions to Run with Dancer Trim.
 - d) The system state transitions to H-Stop State.

Jog Forward has the eighth highest operating priority. Use UJogF to “Jog” the unwind drive Forward or use WJogF to “Jog” the wind drive Forward at the rate indicated in Jog SP (CP-240). The acceleration and deceleration ramps are dictated by Acc Tm Jog (CP-241), Dec Tm Jog (CP-243) and Jog SP (CP-240). After the UJogF or WJogF input is deactivated and the ramped reference has reached “0”, the CX-1102 automatically reverts to the F-Stop or H-Stop operating state.

To activate Jog Forward:

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

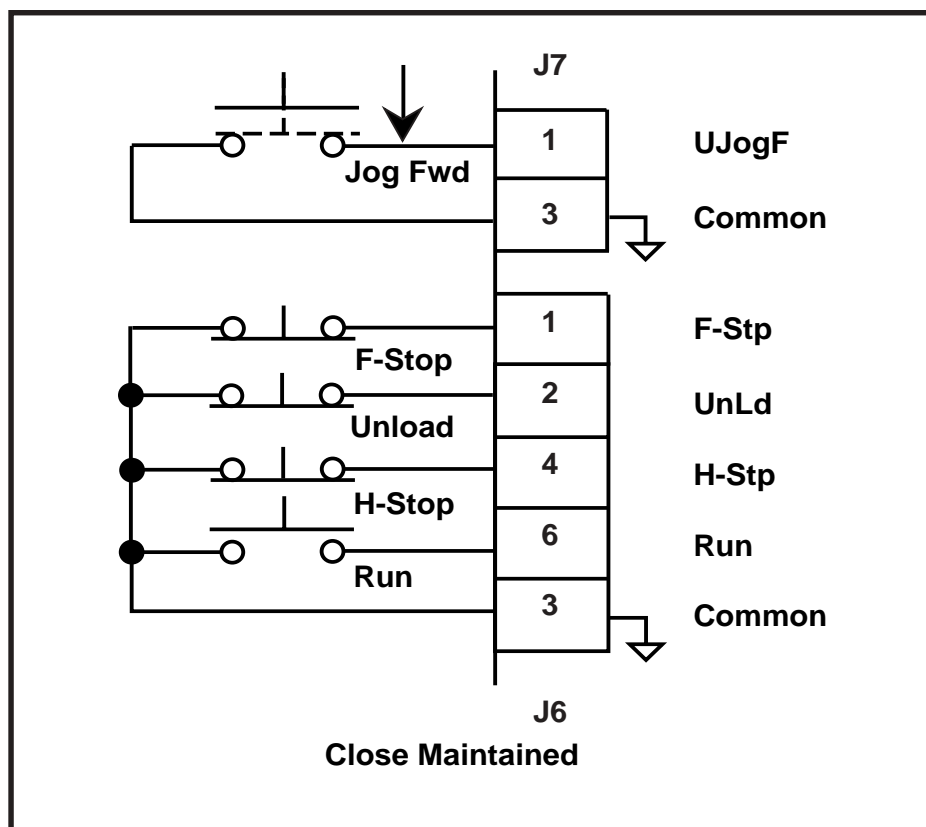


Figure 37 Jog Forward Input

Jog Reverse has ninth (the least) operating priority. Use UJogR to “Jog” the unwind drive Reverse or use WJogR to “Jog” the wind drive Reverse at the rate indicated in Jog SP (CP-240). The acceleration and deceleration ramps are dictated by Acl Tm Jog (CP-241), Dcl Tm Jog (CP-243) and Jog SP (CP-240). After the UJogR or WJogR input is deactivated and the ramped reference has reached “0”, the CX-1102 automatically reverts to the F-Stop or H-Stop operating state.

To activate Jog Reverse:

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

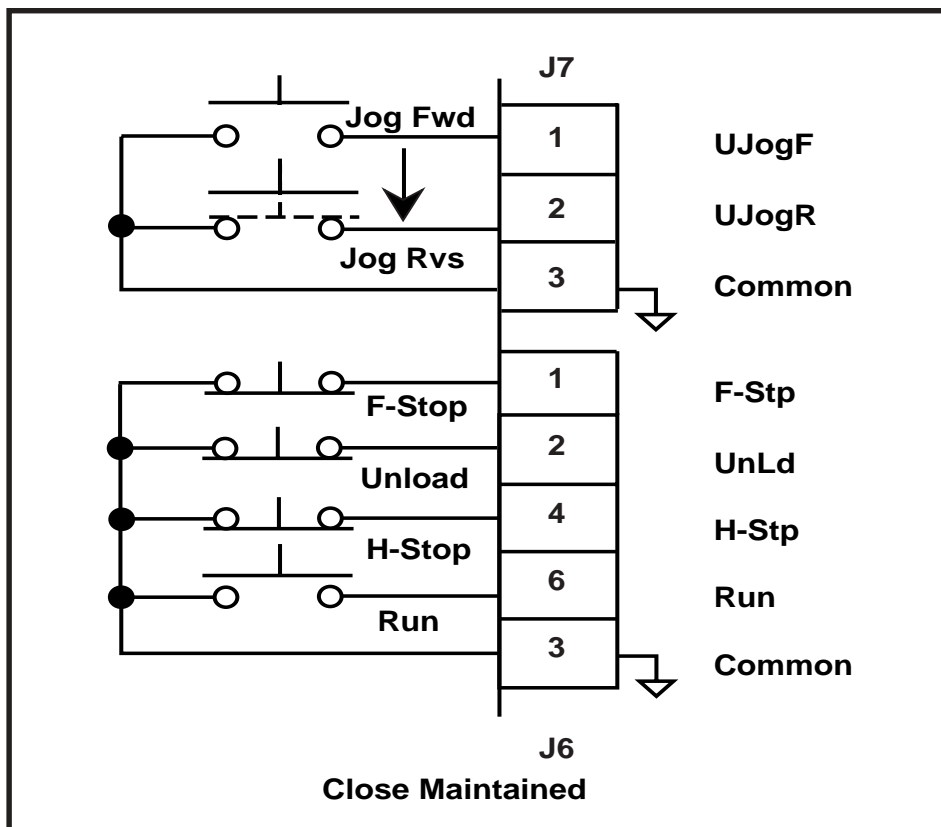


Figure 38 Jog Reverse Input

—NOTES—



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