MiTek®

Machinery Division

Service Bulletin

Machinery Affected:	**BLADE™ Wood Processing System**
Document:	**SB228 rev. D**
Title:	**Installing an ACS880 Variable-Frequency Drive (VFD)**
Applicability:	**When Replacing an ACS800 VFD**
Distribution:	**Customers Upon Order**

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Purpose and Scope

The ACS800 variable-frequency drive (VFD) on the *BLADE* wood processing system is obsolete. This Service Bulletin explains how to replace it with an ACS880 VFD.

The parts included in this kit are shown in Table 1 and Table 2. Please ensure all parts are present before starting this procedure.

Table 1: SB228KIT

Qty.	Part Description	Part #
1	Service bulletin	SB228
1	ACS880 VFD (programmed)	94042-230V
1	Ethernet adapter for saw blade VFD	94041-502
1	18-gauge wire (white with blue stripe)	508003
8	3-1/2" zip ties	508700

Table 2: Parts Supplied with Ethernet Adapter (94041-502) That May Be Needed

Qty.	Part Description	Part #
1	Service bulletin for uploading PLC program	SB210
1	Removable data storage device (RDSD) with PLC program (programmed)	92280-504

Before beginning the procedure, gather the supplies listed here:

- Phillips screwdriver set
- Slotted screwdriver set
- Torx screwdriver set
- Wire cutter
- Wire stripper
- Thin permanent marker
- Multimeter

If you have any questions, call MiTek Machinery Division Customer Service at 800-523-3380.

Procedure

Checking for PLC Compatibility

	NOTICE
⊕	**The PLC (programmable logic controller) program must be compatible with the ACS880 VFD.** **If your PLC program is outdated, the *BLADE* saw does not function after installing the ACS880 VFD.**

If the PLC program is incompatible with the ACS880 VFD after the ACS880 VFD is installed, the VFD displays error code 7510.

Check for PLC compatibility with the ACS880 VFD by using the following steps.

1. Open the *BLADE* software.

2. Select *Diagnostics > Detailed Diagnostics > PLC*.

3. Verify that the PLC program is version Blade_006_000_001 or higher.

    • If the program is the correct version or higher, continue with the service bulletin. You do not need SB210 or the programmed removable data storage device to complete this service bulletin.

    • If the program is lower than the correct version, use SB210 to update your PLC program to the correct version.

Machinery Division Customer Service is available Monday through Friday at **800-523-3380.**

Figure 1: PLC Program Version Number
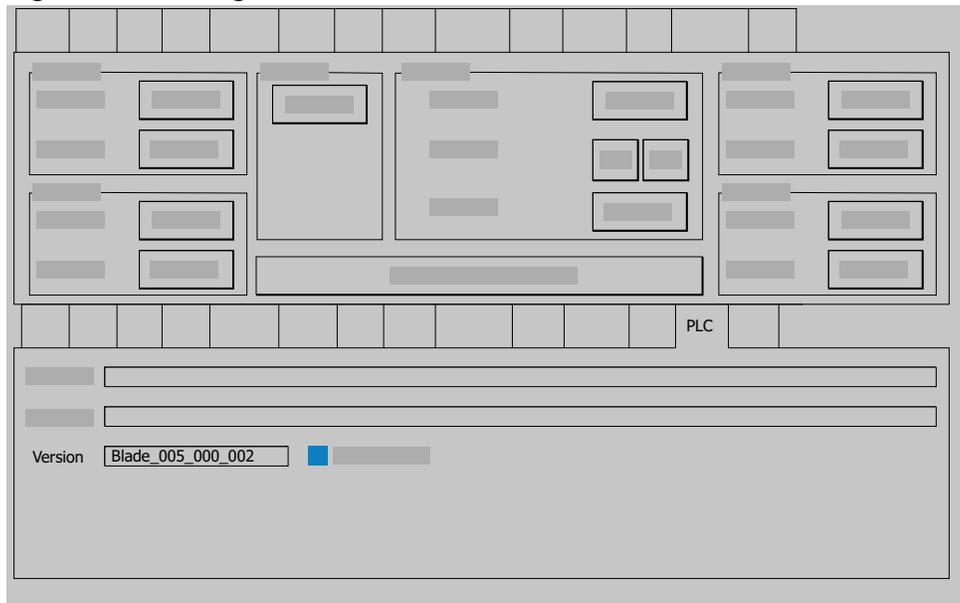
Performing Electrical Lockout/Tagout Procedures

	⚠ **WARNING**
⚡	**ELECTROCUTION HAZARD!** **Verify that all power to the machine has been turned off and follow approved lockout/tagout safety procedures before performing any maintenance.** **All electrical work must performed by a qualified electrician.** **If it is absolutely necessary to troubleshoot an energized machine, follow NFPA 70E for proper procedures and personal protective equipment.**

When Working on a Machine Inside the Machine's Main Electrical Enclosure or in the Electrical Transmission Line to the Machine

Before opening the main electrical enclosure, or attempting to repair or replace an electrical transmission line to the machine, lockout/tagout the machine properly. Follow your company's approved lockout/tagout procedures which should include, but are not limited to the steps here.

1. Engage an E-stop on the machine. Close the *BLADE* software. Power down the touch screen monitor.

2. Go to the top half of the machine's main electrical enclosure. Turn the red disconnect switch on the right-hand door to the Off position. This is usually required to open the main electrical enclosure's door.

3. Shut the power to the machine off at the machine's power source, which is usually an electrical service entry panel on the facility wall. One example of a locked-out electrical service entry panel is shown in Figure 2.

4. Attach a lock and tag that meets OSHA requirements for lockout/tagout to the electrical service entry panel.

5. Open the door to the enclosure in which you need access, and using a multimeter, verify that the power is off.

Figure 2: Lockout/Tagout on the Power Source Panel

Removing Wires from the Obsolete VFD

	⚠ **WARNING**
⚡	**Wait five minutes after turning the disconnect switch to the Off position to start work on the VFD. Starting work without waiting five minutes may cause electric shock.**

1. Locate the ACS800 VFD in the top half of the main electrical enclosure. See Figure 3.

   Figure 3: Obsolete ACS800 VFD

2. Expose the wiring and Ethernet cable by using the following steps.

   a) Insert a slotted screwdriver into the hole located near the bottom of the cover on the VFD. See Figure 4.

   Figure 4: Removing the Cover

b) Press down on the screwdriver to unhook the latch that holds the cover in place.

c) Pull the cover slightly upward and forward to remove it.

d) Push up on the latch on the bottom right of the keypad. Pull the keypad forward by the tab on top. It will swing to the left. See Figure 5.

Figure 5: Exposing Wiring Behind the Keypad
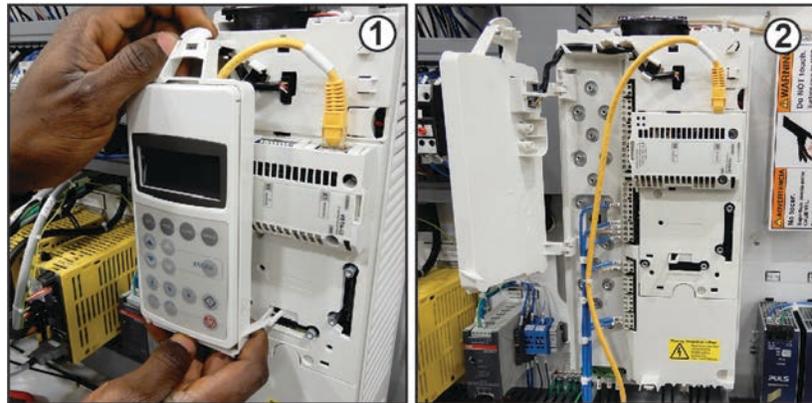
3. Use a screwdriver to depress the tab on the front of the Ethernet cable. Pull the Ethernet cable upward to remove it from its port. See Figure 6.

Figure 6: Removing the Ethernet Cable
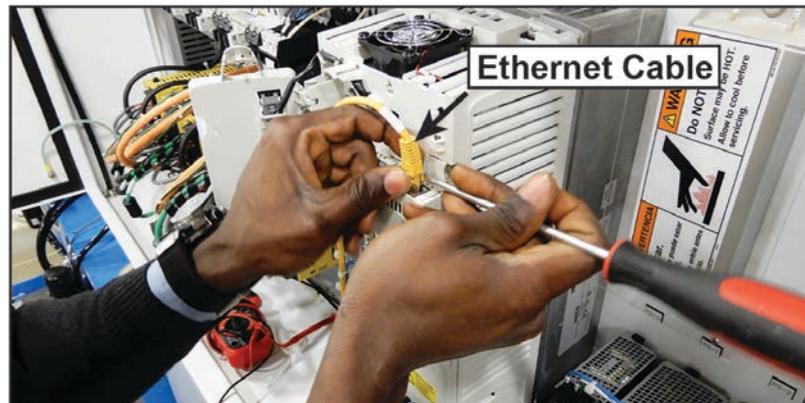
4. Use wire cutters to remove the zip ties from the blue, green, and black wires. See Figure 7.

   Do not cut the zip tie closest to the rear wall of the main electrical enclosure. That zip tie keeps the wires together while you place wires on the new VFD.

Figure 7: Cutting Zip Ties
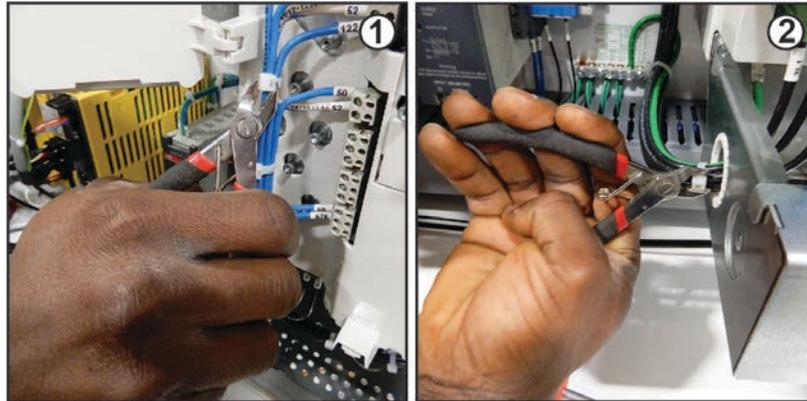
5. Check all of the wires on the VFD to see if the lettering on the wire labels is clearly visible. If it is not, use a thin permanent marker to trace the lettering on the wire labels.

6. Remove wiring from the bottom of the VFD by using the following steps.

   a) Use a slotted screwdriver to loosen screws in the terminals holding the black 3-phase wires on the bottom of the VFD. See Figure 8. Pull the wires from the terminals.

   Figure 8: Wires on the Bottom of the VFD
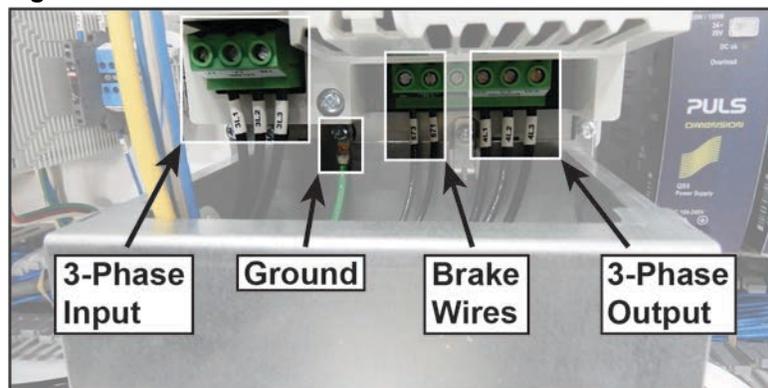
   b) Use a Torx screwdriver to remove the screw that holds the green ground wire on the bottom of the VFD. Remove the green ground wire.

c) Use a small slotted screwdriver to loosen screws in the terminals holding the blue and white-and-blue wires on the front of the VFD. See Figure 9. Pull the wires from the VFD. Discard the jumpers.

The jumpers are the short wires that connect terminals on the front of the VFD. If the jumpers are labeled, they will be labeled 52.

Figure 9: Removing Wires on the Front of the VFD
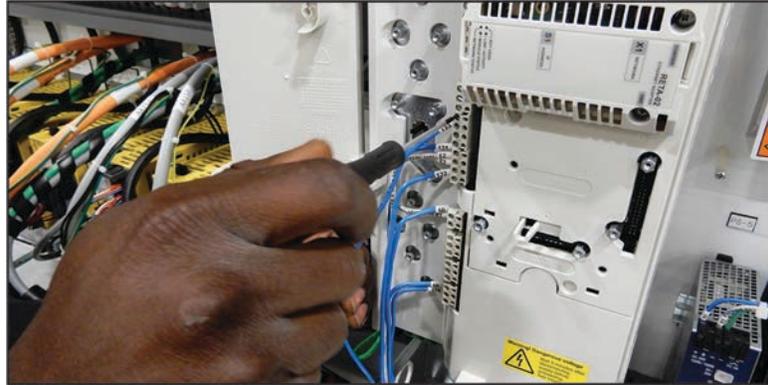
d) Pull all of the wires from the metal wire shield on the bottom of the VFD.

Removing the Obsolete VFD

1. Use a Torx screwdriver to remove the four screws holding the wire shield in place. See Figure 10. Remove the wire shield.

   Removing the wire shield makes removing the mounting screws holding the VFD easier.

Figure 10: Wire Shield Screw Locations
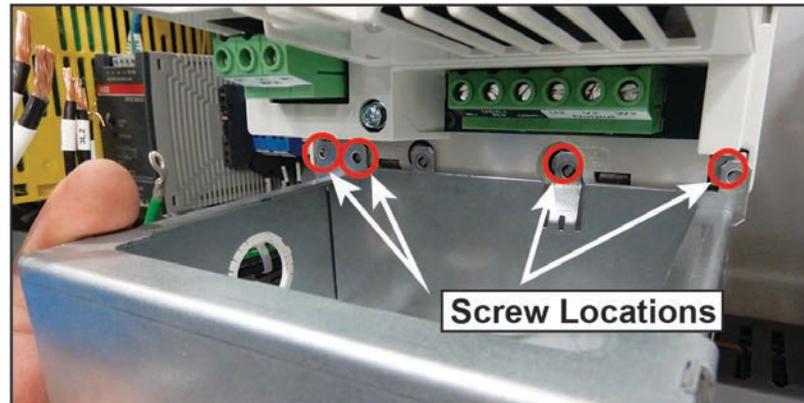
2. Use a Phillips screwdriver to loosen the two mounting screws and their washers on the underside of the VFD. See Figure 11.

Figure 11: Bottom Mounting Screw Locations
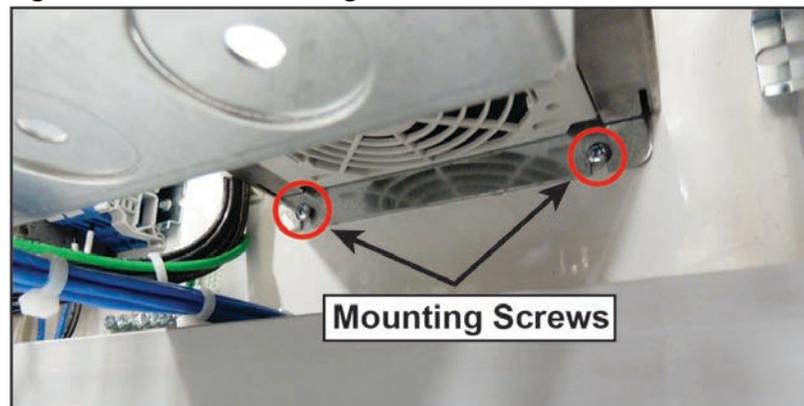
Wire shield still attached here

3. With one hand, push the VFD against the rear wall of the main electrical enclosure to hold it in place. With the other hand, use a Phillips screwdriver to remove the two mounting screws and their washers from the top of the VFD. See Figure 12. Save these screws and their washers.

Figure 12: Top Mounting Screw Locations
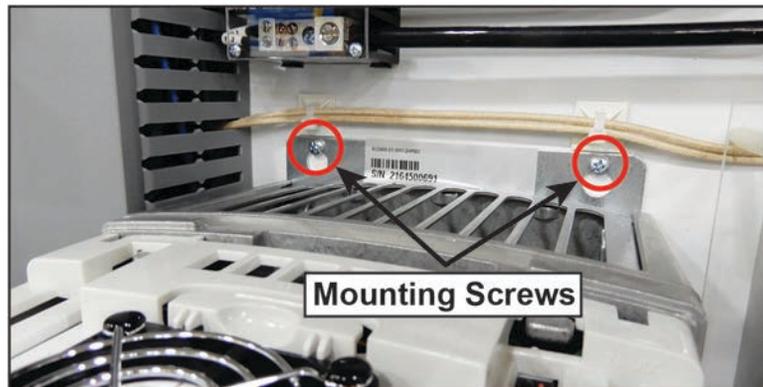
4. Remove the VFD from the main electrical enclosure.

Placing the ACS880 VFD

1. Back the two mounting screws left in the rear wall of the main electrical enclosure out far enough to fit the ACS880 VFD.
   The ACS880 VFD mount is thicker than the ACS800 mount.

2. Place the ACS880 VFD in the same place as the ACS800 VFD. Rest the ACS880 VFD on the two mounting screws left in the rear wall of the main enclosure.

3. Insert the other two mounting screws through the mounting holes in the top of the VFD and tighten them as shown in Figure 13.

Figure 13: Tightening Mounting Screws
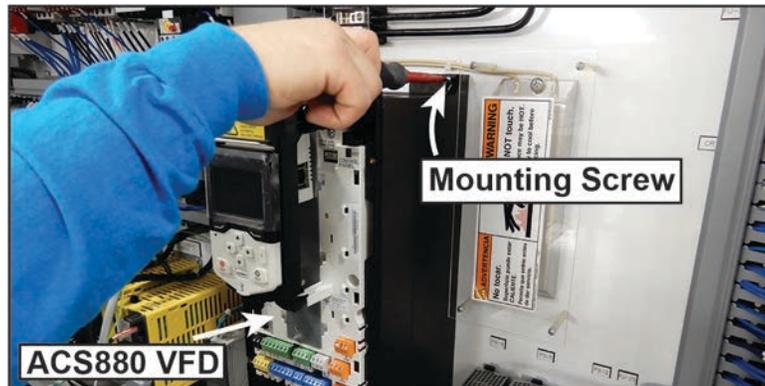
4. Tighten the two mounting screws on the bottom of the VFD.

Rewiring the ACS880 VFD

1. Place wires into the bottom of the VFD by using the following steps.
   Use a slotted screwdriver to tighten the screws on the terminals (the ground wire uses a Torx screwdriver). Tug each wire gently after tightening to make sure the wire is secure in the terminal.

   a) Use a Torx screwdriver to connect the ground wire to its ground terminal as shown in Figure 14.

Figure 14: Connecting the Ground Wire
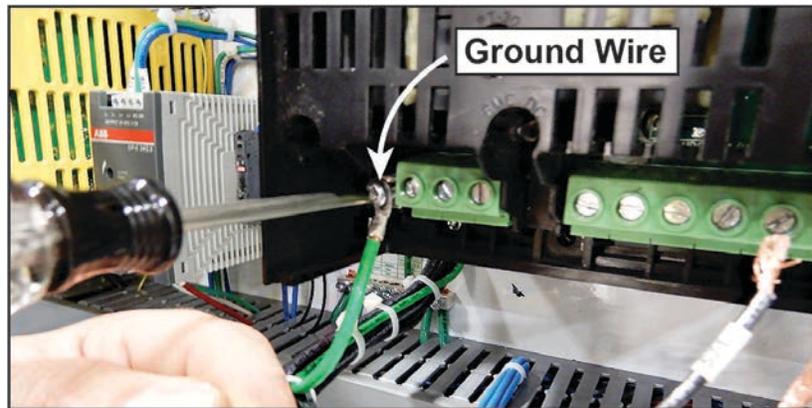
b) Place the black 3-phase wires into the three green input terminals on the left-hand side of the bottom of the VFD. See Figure 15.

Terminal	Input		
	L1	L2	L3
Terminal	L1	L2	L3
Wire	3L1	3L2	3L3

Figure 15: 3-Phase Input Wires
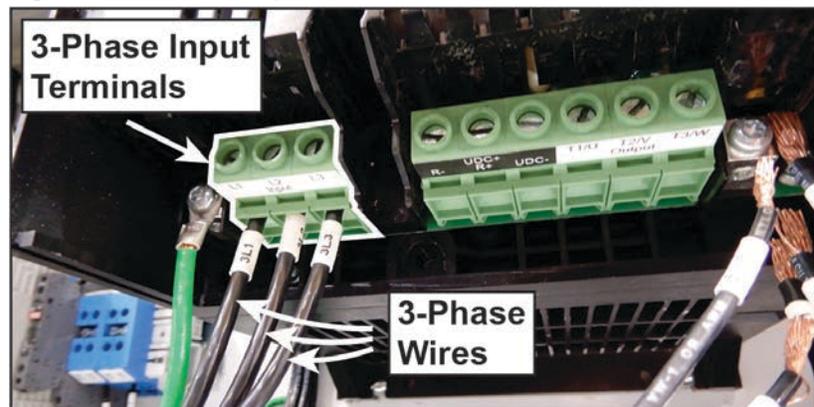
c) Place the two brake wires into the terminals on the center right-hand side of the VFD. See Figure 16.

Brake wires are either black or blue.

Terminal	UDC+			Output		
	R-	R+	UDC-	T1/U	T2/V	T3/W
Wire	573	571				

Figure 16: Brake Wires
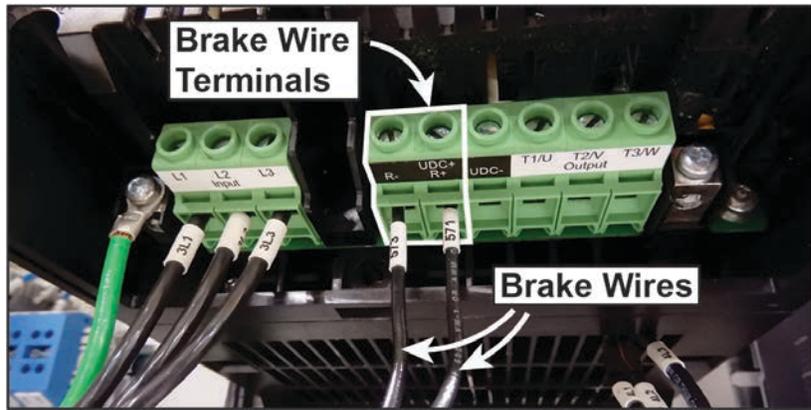
d) Place the remaining three 3-phase wires into the output terminals on the right-hand side of the VFD. See Figure 17.

Terminal	UDC+			Output		
	R-	R+	UDC-	T1/U	T2/V	T3/W
Wire	573	571		4L1	4L2	4L3

Figure 17: 3-Phase Output Wires.

You may use zip ties to bundle the wires on the bottom of the VFD.
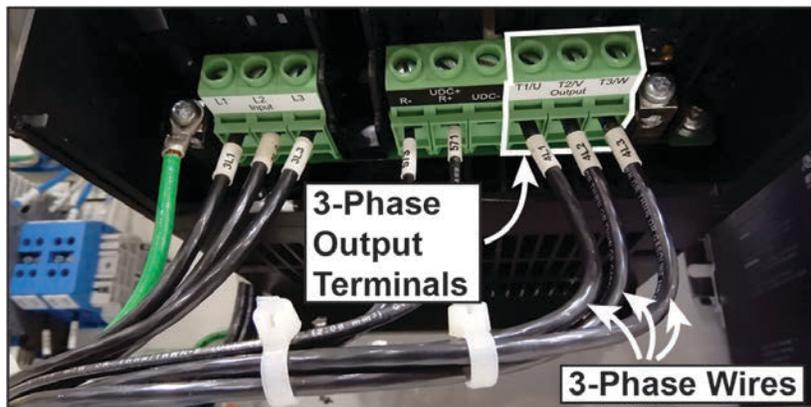
2. Place wires into the front of the VFD by using the following steps.

    a) Locate the terminal blocks on the front of the VFD. The terminal blocks have labels that are outlined in red in Figure 18.

    Figure 18: Terminal Blocks
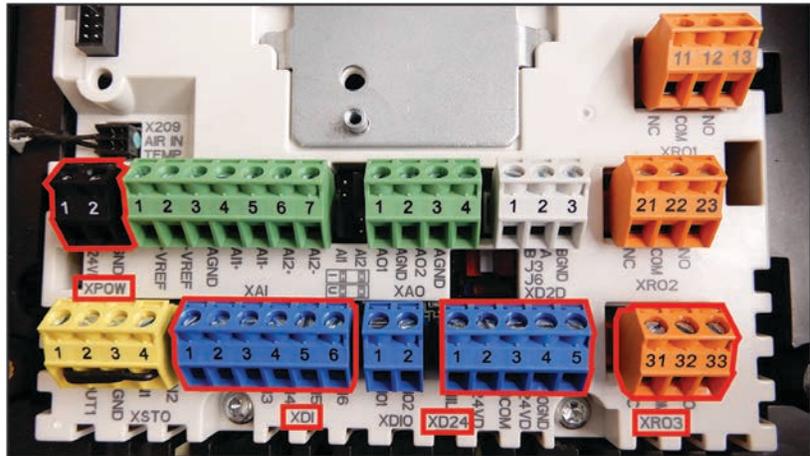
    b) Use wire cutters to cut a new 5" jumper from the 18-gauge white-and-blue wire and strip 1/4" of insulation at both ends to expose the wire.

    c) Locate the black XPOW terminal block. Run wires as shown here.

Terminal	1	2
Wire	50	Jumper
	XPOW	

    d) Locate the blue XDI terminal block. Run a single wire as shown here.

Terminal	1	2	3	4	5	6
Wire					123	
	XDI					

    e) Locate the blue XD24 terminal block. Run wires as shown here.

Terminal	1	2	3	4	5
Wire	122	121	52 & Jumper		
	XD24				

    f) Locate the orange XRO3 terminal block. Run wires as shown here.

Terminal	31	32	33
Wire		50	576
	XRO3		

You may use zip ties to bundle the wires on the front of the VFD.

Figure 19: Wires Connected to Terminal Blocks
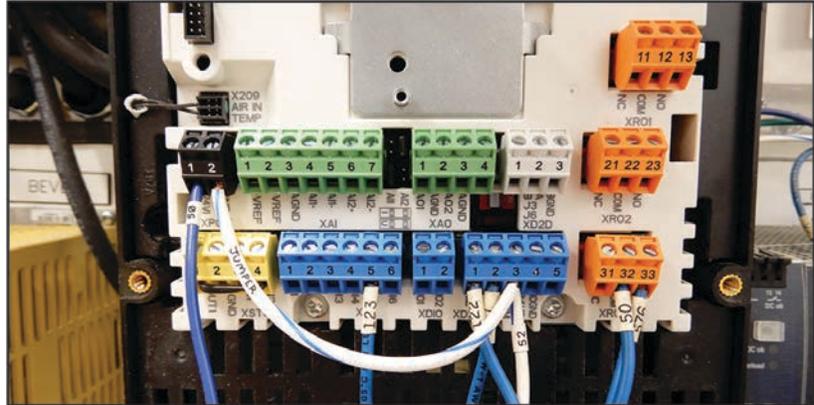
3. Connect the Ethernet cable to the VFD by using the following steps.

    a) Pull the tab on the bottom of the keypad forward to lift it. See Figure 20.

Figure 20: Lifting the Keypad
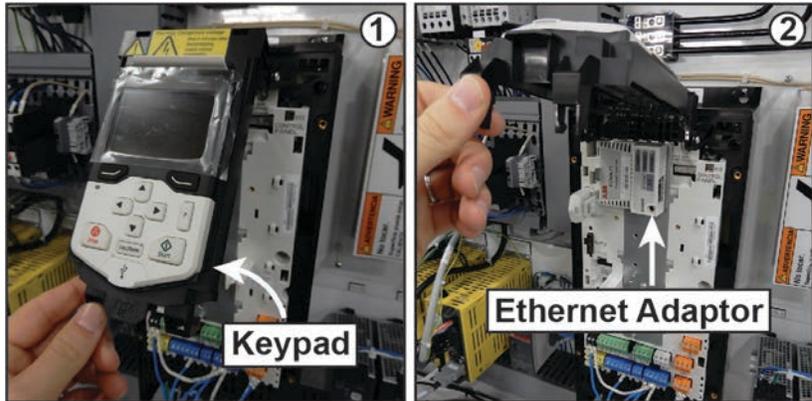
b) If the Ethernet adapter is not installed, install it by using the following steps.

1) Align the connector on the rear of the Ethernet adapter with the pins in Slot 1. See Figure 21 for slot location.

Figure 21: Ethernet Adapter Slot and Screw Locations

2) Check to make sure the screw on the bottom right corner of the Ethernet adapter aligns with the protruded screw hole. Turn the screw to start it.

3) Press the Ethernet adapter into place. The tab on the left of the Ethernet adapter should click when the adapter is installed correctly.

4) Use a Torx screwdriver to tighten the screw on the Ethernet adapter.
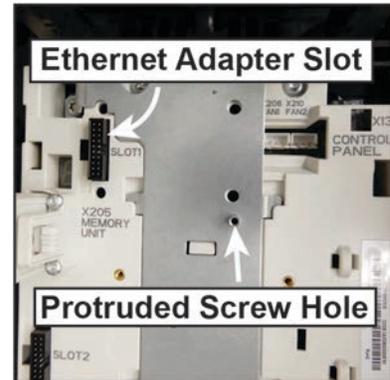
c) Insert the Ethernet cable into the port on the right side of the Ethernet adapter as shown in Figure 22. It should click when installed correctly. *The Ethernet cable is either yellow or white.*

Figure 22: Inserting Ethernet Cable
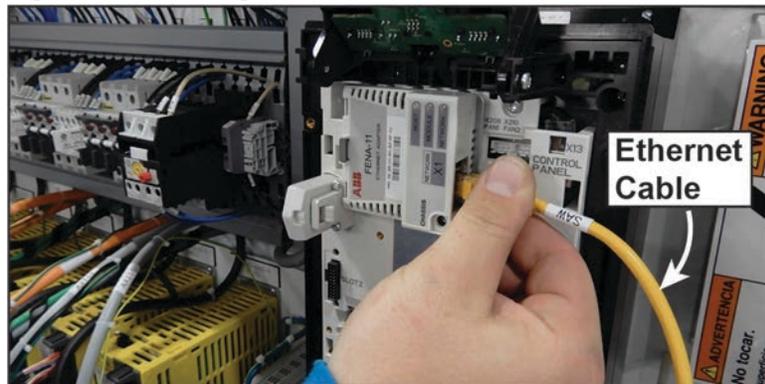
d) Close the keypad.

4. Place the front cover on the VFD. Use a Torx screwdriver to tighten the two screws that hold it in place as shown in Figure 23.

Figure 23: Replacing the Front Cover

Preparing the Saw

1. Close the doors on the top half of the main electrical enclosure.

2. Turn the red disconnect switch on the right-hand door of the main electrical enclosure to the On position.

3. Remove the lock and tag, and restore power at the electrical service entry panel.

4. Resume operation of the saw.