MiTek®
SERVICE BULLETIN

Affected machinery:

Cyber® A/T saw

Document:

SB237

Title:

Replacing Horner Analog Output Modules with GE Analog Output Modules

Applicable frame numbers:

Frames 1 through 626 with Horner Analog Output Modules

Distribution:

Customers upon order

Part # and Rev.	SB237
Date Printed	14 January 2019
Date Created	30 April 2018
Created By	G. Gaia
Approved By	M. Kanjee & V. Carroll
Date Revised	
Revised By	
Applicability	Frames 1 through 626

Overview

ⓘ	**NOTICE** If your saw does not have a GE RX3i PLC installed, call Machinery Division Customer Service and order the RX3i PLC upgrade. Install the RX3i PLC before continuing with this procedure. The saw does not function after completion of this procedure without an RX3i PLC installed.

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

The PLC (programmable logic controller) on the *Cyber*® *A/T* saw uses analog output modules to control its VFDs (variable frequency drives). The Horner analog modules on some *Cyber A/T* saws are obsolete.

This document explains how to replace the obsolete Horner analog output modules with new GE analog output modules. Unlike the Horner analog output modules, the GE analog output modules do not connect directly to the VFD. Instead, the GE analog output modules connect first with interface modules. The interface modules then connect with the VFDs.

Before beginning the procedure, gather the supplies listed here:

- Drill
- No. 29 bit and 8–32 tap
- Wire strippers
- Wire cutters
- Ruler or tape measure
- Wire labels
- Calibration key that came with your saw

- Slotted screwdriver set
- Cable ties
- Electrical tape
- Multimeter
- Camera (smartphone camera suggested)
- Heat gun for wire labels

The parts included in this kit are shown below. Please make sure all parts are present before starting this procedure.

Table 1: Parts in SB237KIT-A and SB237KIT-B
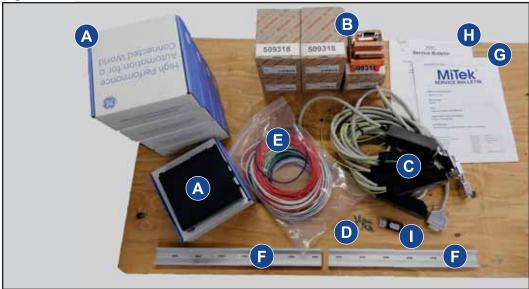
Part #	Identifier	Description	Quantity
504511	A	Analog output module	5
509318	B	Interface module	5
509317	C	PAC (pre-assembled cable)	5
341068	D	8–32 x 1/2" round head slotted screws	6
508006	E	Green / yellow wire (20')	1
508006	E	Blue wire (20')	1
508006	E	White / blue wire (20')	1
146122-9.50	F	DIN rail	2
SB237	G	Service bulletin document	1

Table 2: Additional Parts in SB237KIT-B

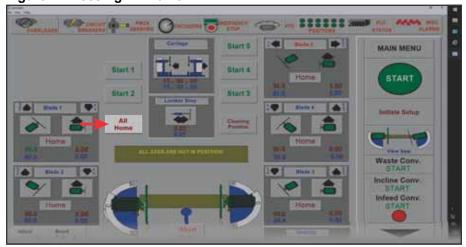| Part #	Identifier	Description	Quantity
SB210	H	Supplementary service bulletin document	1
92280-501	I	Programmed RDSD (removable data storage device)	1

Figure 1: Parts in SB237KIT

Parts may vary slightly from what is shown here.
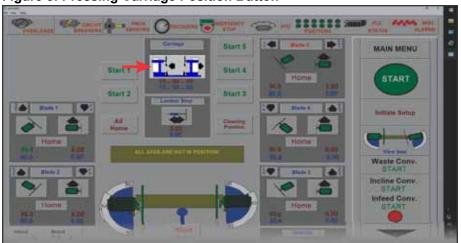
Procedure

Preparing the Saw for Shutdown

1. Start the *Cyber A/T* software.

2. Home the saw by using the following steps.

   a) From the main menu, press **Semi-Auto**.

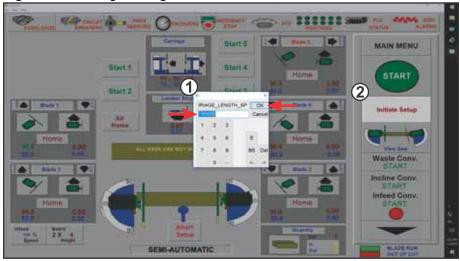   b) From the semi-auto menu, press **All Home**.

   Figure 2: Pressing All Home

   c) Press the carriage position button to access the carriage length dialog box.

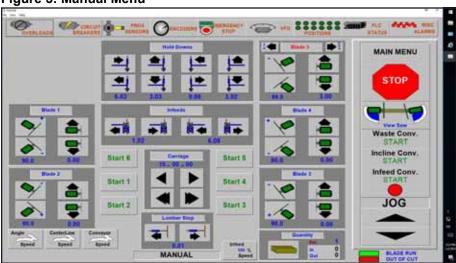   **Figure 3: Pressing Carriage Position Button**

d) Enter 200000 into the field that appears and press **OK**. Then press **Initiate Setup** to home the blades and move the carriage enclosure to the carriage end.
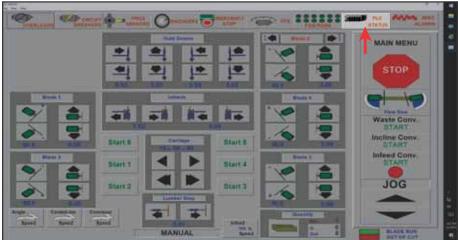
Figure 4: Entering Carriage Position

3. Press **Main Menu** to return.

4. Record important information from the manual menu and PLC status menu by using the following steps.

   a) From the main menu, press **Manual**.

   b) Take a picture of the manual menu so that the saw settings are visible.

Figure 5: Manual Menu

c) Press **PLC Status**. See Figure 6 for the location of the PLC status button.
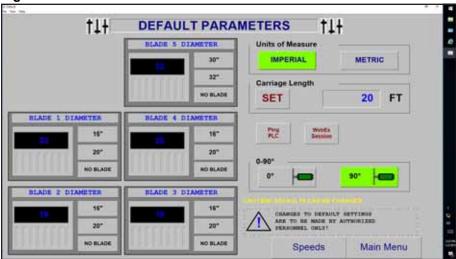
Figure 6: Accessing the PLC Status Menu

d) Take a picture of the PLC status menu so that the PLC version number is visible. Then press **Main Menu** to return.
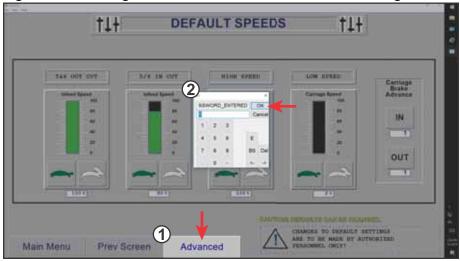
Figure 7: PLC Status Menu

5. Record important information from default screens by using the following steps.

    a) From the main menu, press **Defaults**.

    b) Take a picture of the default parameters menu to record blade sizes.

        Figure 8: Default Parameters

    c) Press **Speeds**.

    d) From the default speeds menu, press **Advanced**. When the dialog box prompts you to enter a password, press **OK** to access the advanced settings menu.

        *If your plant assigned a password to the saw, enter the password and press **OK**.*

        Figure 9: Accessing the Password-Protected Advanced Settings Menu

e) From the advanced settings menu, press **Speeds** to access the speed settings menu.
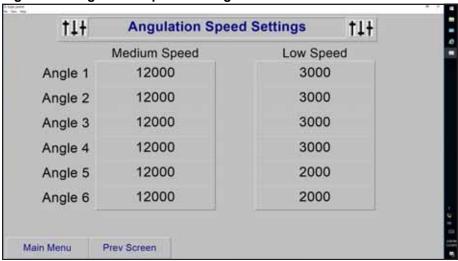
Figure 10: Selecting the Speeds Setting Menu

f) Press **Angle Speeds**.

Figure 11: Selecting Angle Speeds

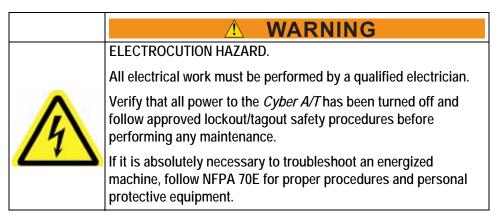g) Take a picture of the angulation speed settings menu to record your default speeds.

Figure 12: Angulation Speed Settings Menu

h) Press **Prev Screen** to return to the speed settings menu. From the speed settings menu, navigate to the menus for CL Speeds, Speed Conveyor Speeds, and Speed Zone Settings and take pictures of them as well.

6. Close the *Cyber A/T* software.

7. Shut down the PC.

Electrical Lockout/Tagout Procedure

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

Procedure for Working Inside the *Cyber A/T* Electrical Enclosures

Before opening any electrical enclosure, lockout/tagout the *Cyber A/T* 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.

2. Turn the *Cyber A/T*'s disconnect switch to the Off position. This is usually required to open the electrical enclosure's door.

3. Shut the power to the *Cyber A/T* off at the its power source, which is usually an electrical service entry panel on the facility wall. One example of a locked-out power source panel is shown in Figure 13.

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

5. Open the doors to the stationary-end electrical enclosure. Using a multimeter, verify that the power is off.

Figure 13: Lockout/Tagout on the Power Source Panel

Installing the DIN Rail

1. In the right-hand half of the stationary-end enclosure, pull the bottom drawer forward.

2. In the left-hand half of the enclosure, locate the space to mount the DIN rail. This space is labeled A in Figure 14.

   Figure 14: DIN Rail Mounting Location

3. Drill and tap holes for the DIN rail. The holes should be 3-1/2" above the bottom wire duct.

   Drilling lower than 3-1/2" may damage the drawer sliders on the other side of the enclosure wall.

4. Mount the DIN rail using the supplied screws. See Figure 15.

   Figure 15: DIN Rail Mounted to Electrical Enclosure Wall

5. Close the drawer

The slots in the DIN rail may need slight reaming for the screws to fit.

Removing Horner Analog Output Modules

1. Open the covers of the output modules and disconnect the wires from their terminals.

   • In the stationary-end electrical enclosure, the output modules are located on rack 1 in slots 5, 7, and 9. The output modules are highlighted in blue in Figure 16.

   • In the carriage-end electrical enclosure, the output modules are located on rack 3 in slots 3 and 5. The output modules are highlighted in blue in Figure 17.

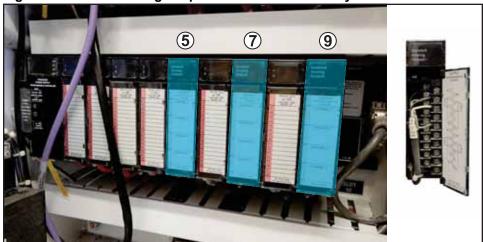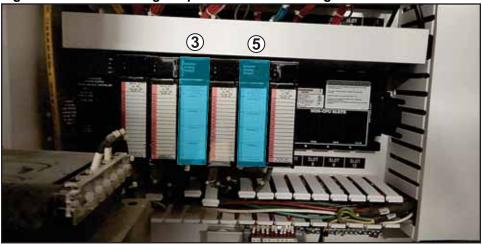**Figure 16: Horner Analog Output Modules in Stationary End**

Figure 17: Horner Analog Output Modules in Carriage End

2. Remove the output module from rack 1, slot 5 (see Figure 16 on page 12 for reference) by using the following steps.

   a) Push and hold the release lever on the bottom of the output module to unlock it from the rack. The release lever is highlighted in yellow in Figure 18.

   Figure 18: Release Lever Location

   Release Lever

   b) Using the hook on top of the output module, pivot the output module forward and upward to remove it.

3. Repeat steps 2a through 2b with the other output modules. Figure 19 and Figure 20 show the racks with the output modules removed.

   Figure 19: Stationary-End Output Modules Removed

   Figure 20: Carriage-End Output Modules Removed

4. Discard the output modules.
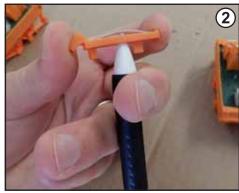   *You may want to save the modules as spares for your other machines.*

Installing the Interface Modules

Labeling the Interface Modules

1. Locate the supplied orange-and-green interface modules.

2. Remove the label plate from each interface module. See the left side of Figure 21.

Figure 21: Removing Label Plate and Label

3. Push the plastic covering and label free from the label plate. See the right side of Figure 21.

4. Label the interface modules by using Table 3.
    The labels on the interface modules show which analog output module is connected.
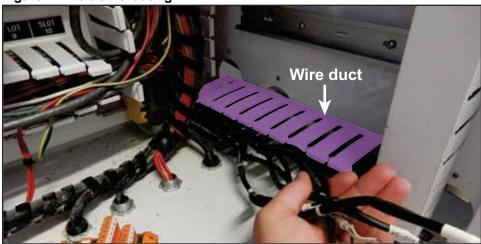
Table 3: Interface Module Labels

	Label for Module	Location of Module	Position on DIN Rail
1	R1, S5 (rack 1, slot 5)	Stationary end	Left
2	R1, S7	Stationary end	Middle
3	R1, S9	Stationary end	Right
4	R3, S3	Carriage end	Left
5	R3, S5	Carriage end	Right

5. Place the plastic coverings and labels back onto the label plates.

6. Place the label plates back onto the modules.

Wiring the Interface Modules

1. Reroute the cables that you removed from the output modules into the wire duct shown in purple in Figure 22.
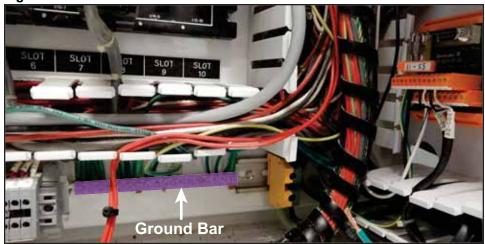
Figure 22: Cable Rerouting

2. Connect the wires of the cables rerouted in step 1 to the interface modules.

   - See page 25 for stationary-end electrical enclosure modules.

   - See page 26 for carriage-end electrical enclosure modules.

3. Place the interface modules onto the DIN rail in the position noted in Table 3 on page 14.

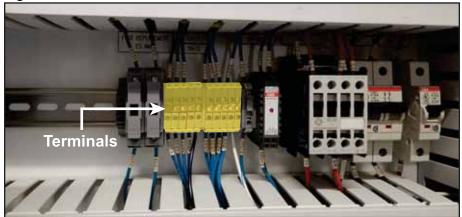4. Ground each interface module to the ground bar highlighted in purple in Figure 23 using green and yellow wire.

   The ground wire should land in the C (common) terminal in the top row of terminals on each interface module.

Figure 23: Ground Bar Location

5. Supply 24VDC to the interface modules by using the following steps.

   a) Locate the 24VDC terminals in the upper half of the enclosure. The terminals are highlighted in yellow in Figure 24.

Figure 24: 24VDC Terminals

   b) Route the supplied blue wire and supplied blue / white wire from the terminals through the wire ducts to connect 24VDC to the interface module on the left. See Table 4 and Figure 25.
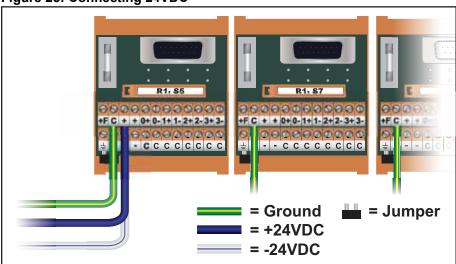
      Label the wires in case they are needed for troubleshooting later.

Table 4: Interface Module 24VDC Wiring Chart

Terminal	+F	C	+
Wire		Ground	+24VDC
Color		Green / yellow	Blue

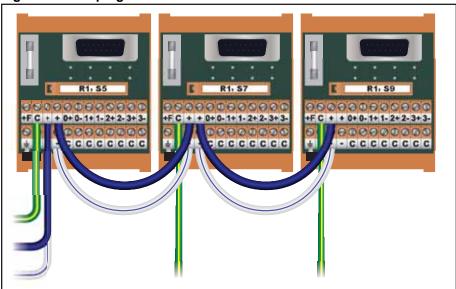| Terminal	Ground	C	–
Wire	Jumper	Jumper	–24VDC
Color	Hard plastic	Hard plastic	White / blue

Figure 25: Connecting 24VDC

Some wires removed for clarity.

c) Use the open positive and negative terminals on the first interface module to jump 24VDC to next two interface modules. See Figure 26.
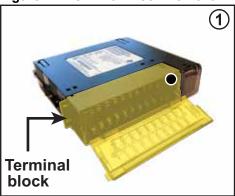
Figure 26: Jumping 24VDC from Module to Module

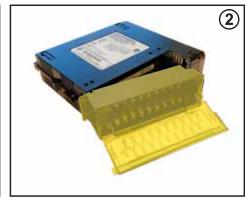## Installing the GE Analog Output Modules

1. Open the cover of a new GE analog output module.

2. Press the lever in the top left-hand corner up to unlock the terminal block. The terminal block is highlighted in yellow in Figure 27. The lever is circled in white in Figure 27.

Figure 27: Terminal Block Removal

3. Pivot the terminal block forward and down to remove it.

4. Discard the terminal block.

5. Slide the output module into one of the slots on the PLC rack from which you removed the Horner analog output modules. Hook the top rear of the output module into the trough on top of the rack.

   You may need to remove the wire duct cover above the rack.

	NOTICE
🛈	The backs of the analog output modules have male pins that fit into female connector ports on the PLC rack.
	Make sure that the male pins align with the female ports. If the pins are misaligned, they may bend or break, requiring replacement of the module.

6. Using the hook as a pivot, swing the output module down onto the rack and press it into position. See Figure 28.

Figure 28: Placing the Module onto the Rack

7. Gently press the output module down to make sure it is connected securely to the rack.

8. Repeat steps 1 through 7 with the other output modules for that rack.

Connecting the PACs (Pre-Assembled Cables)

1. Make sure the green and yellow ground wire of the PAC is connected to terminal 20, highlighted in blue in Figure 29.

2. Press the output module end of the PAC onto the front of the output module. See Figure 29. The end should click softly when connected.

Figure 29: Connecting Analog Output Module End of the PAC

3. Route the cable through the wire duct to the interface modules. Loop any slack in the vertical wire duct on the right-hand side.

4. Connect the interface module end of the PAC into the corresponding interface module. See Figure 30 for the interface module end of the PAC.

Figure 30: Connecting Interface Module End of the PAC

5. Tighten the screws on the interface module end of the PAC.

6. Repeat steps 1 through 5 to connect the other output modules to their interface modules.

7. Reinstall the wire duct covers. Figure 31 shows the completed assembly of the modules in the stationary-end electrical enclosure.

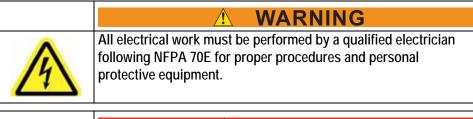**Figure 31: Stationary-End Electrical Enclosure Modules Installed**

Replacing the Remaining GE Analog Output Modules

1. Install the remaining GE analog output modules and interface modules in the carriage-end electrical enclosure using the same process described in pages 15 through 20.

2. Continue based on the hardware of your saw.

   • If you had to install the GE RX3i PLC prior to replacing the modules, MiTek programmed your PLC prior to shipping it. Skip to Completing the Installation below.

   • If you did not have to install the GE RX3i PLC prior to replacing the modules, you need to download the PLC software from the RDSD (removable data storage device, commonly called a flash drive) to the PLC. Continue with the procedure.

Downloading the PLC Software

1. Remove the lock and tag. Restore power to the saw.

	⚠ **WARNING**
⚡	All electrical work must be performed by a qualified electrician following NFPA 70E for proper procedures and personal protective equipment.

	⚠ **DANGER**
⚡	Do NOT make contact with wires or components in the electrical enclosure, other than the PLC, while the saw is energized. Touching an energized circuit may result in severe injury or death.

2. Open the left-hand stationary-end electrical enclosure door.

3. Use the Downloading the Software to the PLC section in Service Bulletin SB210 to place the correct software on your PLC.

4. Once you have completed the downloading of the PLC software from the RDSD, close the electrical enclosure door.

5. Cycle power to the saw.

Completing the Installation

If you skipped the Downloading the PLC Software section above, close the electrical enclosure doors, remove the lock and tag, and restore power to the saw before continuing to step 1 of this section.
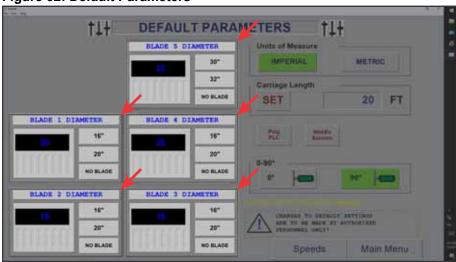
1. Start the PC. Start the *Cyber A/T* saw software.

2. Continue based on whether you had to download software to the PLC.

   • If you did not have to download software to the PLC, skip to step 5 on page 22.

   • If you downloaded software to the PLC, continue to step 3.

3. Press **PLC Status**. Use your photograph of the PLC status menu to verify that the PLC version changed. Figure 7 on page 6 shows the location of the PLC version on the PLC Status menu.
   If the PLC version did not change, the download of the PLC software failed. Attempt to download the PLC software again.

4. Press **Main Menu** to return.

5. Set default settings on the saw.

   a) Verify that the calibration key is inserted and turned to the On position.

   b) From the main menu, press **Defaults**.

   c) Use your photograph of the default parameters menu to set the blade sizes.
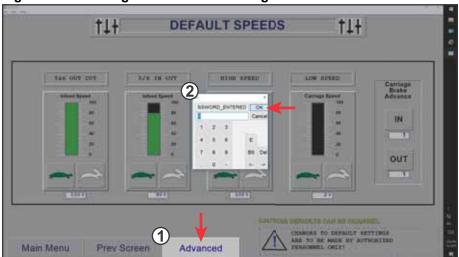   *Some saws have a sixth blade.*

Figure 32: Default Parameters

   d) After entering the blade sizes, press **Speeds**.

   e) From the default speeds menu, press **Advanced**. When the dialog box prompts you to enter a password, press **OK** to access the advanced settings menu.
      *If your plant assigned a password to the saw, enter the password and press **OK**.*

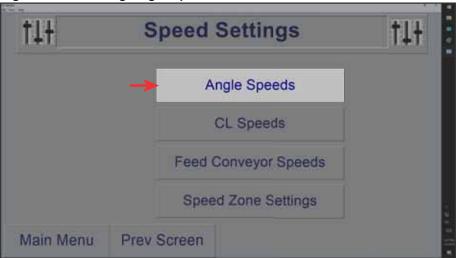**Figure 33: Reaching the Advanced Settings Menu**

f) From the advanced settings menu, press **Speeds** to access the speed settings menu.
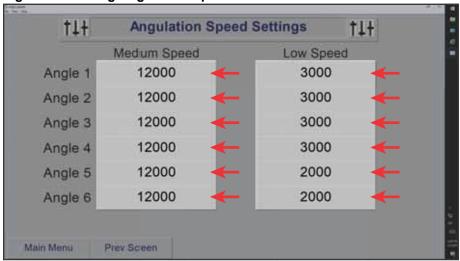
Figure 34: Selecting the Speed Setting Menu

g) Press **Angle Speeds**.

Figure 35: Selecting Angle Speeds

h) Use your photograph to enter the default medium and low speed settings for all angles.

Figure 36: Setting Angulation Speed Defaults

i) Press **Prev Screen** to return to the speed settings menu.

j) Set the defaults for CL Speeds, Feed Conveyor Speeds, and Speed Zone Settings using the process described in steps h and i.

k) Press **Main Menu**.

6. Restore calibration to your saw.

a) From the main menu, press **Calibrate**.

b) Use your photograph of the manual menu to enter values for the following:

- blade angles
- horizontal hold-downs
- carriage length
- infeeds
- blade centerlines
- vertical hold-downs
- lumber stop

7. Verify the function of all E-stops by using the safety test found in any volume of the *Cyber A/T* equipment manual.

8. Resume operation.

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

Interface Module Wiring Charts for Stationary End

Table 5: Interface Module Connected to Rack 1, Slot 5

Terminal	0+	0-	1+	1-	2+	2-	3+	3-
Wire	AQ-003	AQ-003	AQ-004	AQ-004	AQ-005	AQ-005		
Color	Black	White	Black	White	Black	White		

Terminal	C	C	C	C	C	C	C	C
Wire		Shield		Shield		Shield		
Color		Clear		Clear		Clear		

Table 6: Interface Module Connected to Rack 1, Slot 7

Terminal	0+	0-	1+	1-	2+	2-	3+	3-
Wire	AQ-014	AQ-014	AQ-015	AQ-015	AQ-016	AQ-016	AQ-017	AQ-017
Color	Black	White	Black	White	Black	White	Black	White

Terminal	C	C	C	C	C	C	C	C
Wire		Shield		Shield		Shield		Shield
Color		Clear		Clear		Clear		Clear

Table 7: Interface Module Connected to Rack 1, Slot 9

Terminal	0+	0-	1+	1-	2+	2-	3+	3-
Wire	AQ-022	AQ-022	AQ-023	AQ-023				
Color	Black	White	Black	White				

Terminal	C	C	C	C	C	C	C	C
Wire		Shield		Shield				
Color		Clear		Clear				

Interface Module Wiring Charts for Carriage End

Table 8: Interface Module Connected to Rack 3, Slot 3

Terminal	0+	0-	1+	1-	2+	2-	3+	3-
Wire	AQ-007	AQ-007	AQ-008	AQ-008	AQ-009	AQ-009	AQ-010	AQ-010
Color	Black	White	Black	White	Black	White	Black	White

Terminal	C	C	C	C	C	C	C	C
Wire		Shield		Shield		Shield		Shield
Color		Clear		Clear		Clear		Clear

Table 9: Interface Module Connected to Rack 3, Slot 5

Terminal	0+	0-	1+	1-	2+	2-	3+	3-
Wire	AQ-018	AQ-018	AQ-019	AQ-019	AQ-020	AQ-020	AQ-021	AQ-021
Color	Black	White	Black	White	Black	White	Black	White

Terminal	C	C	C	C	C	C	C	C
Wire		Shield		Shield		Shield		Shield
Color		Clear		Clear		Clear		Clear