

Service Bulletin

Machinery Affected: *Cyber A/T®*, *Cyber*, and *SmartSet Pro®* Saws
Document: SB193
Title: Installing a Relay to Automatically Operate Waste Conveyor
Applies To: All Saws Currently Without This Feature
Distribution: Customers, Upon Order



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Applicability	All saws listed
Effectivity	1 March 2011

Purpose



For purposes of this document, the programmable relay being discussed will be called the ZEN relay.

An optional feature is now available for MiTek automated saws that allows a programmable relay (ZEN relay) to automatically turn the waste conveyor on and off, in relation to the saw blade status. When the saw blade brakes release (saw blades begin spinning), the waste conveyor automatically turns on. A few seconds after the saw blade brakes engage, the waste conveyor turns off.

The waste conveyor can still be turned on and off manually, using the touch screen. If the waste conveyor is turned on manually prior to starting the saw blades, this new feature will do nothing. If the operator fails to turn the waste conveyor on before starting the saw blades, the programmable relay will automatically complete that step.

Overview

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

Table 1: Parts in SB193 Kit

Qty.	Part Description	Part #
1	Programmable relay, 6i/4o, Zen	92198-501
1	Fuse, 2.5 amp	516540
1	Terminal, fuse holder	518207
1	Schematic, saw waste conveyor	90620
1	Service Bulletin 193 document	SB193

Before beginning the procedure, gather the supplies listed in Table 2.

Table 2: Customer-Supplied Items

Qty.	Part Description
Depends placement of relay	Wire, 16 gauge, appropriate colors
1	Alerting device, see page 6
1 ea.	Basic electrician's tools

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

Procedure



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.
2. Turn the machine's disconnect switch 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 power source panel is shown in Figure 1.
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 1: Lockout/Tagout on the Power Source Panel



Pneumatic System Lockout/Tagout Procedure

	 WARNING
	MOVING PARTS CAN CRUSH AND CUT. Always verify that power to the machine has been turned off and follow approved lockout/tagout procedures. Turn off the air switch or shutoff valve before performing any maintenance on the equipment.

	 WARNING
	HIGH PRESSURE HAZARD. Bleed pneumatic lines before performing any maintenance.

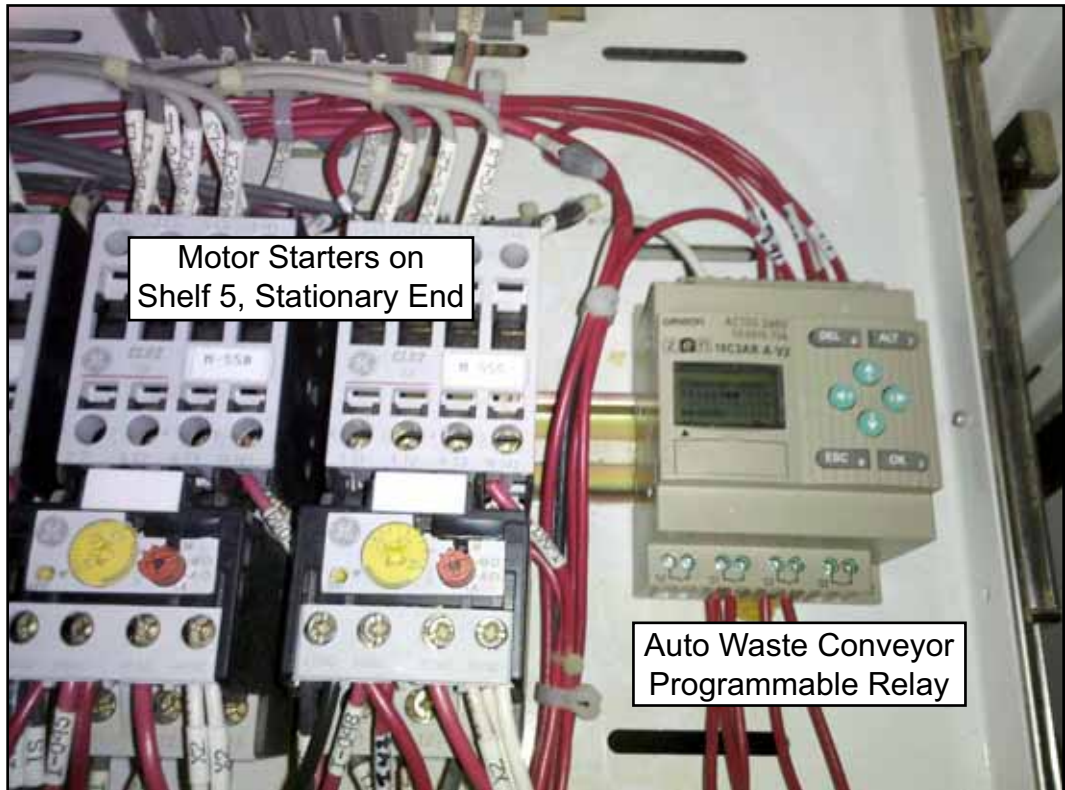
Connecting the Wires



1. Gather the items listed in Table 2.
2. Mount the ZEN relay on an existing DIN rail.

The ideal location is on the stationary end of the saw on shelf 5, as shown in Figure 2.

Figure 2: Location of ZEN Relay, Stationary End, Shelf 5



3. Remove the original PLC outputs (Waste Conveyor and Incline Conveyor) from the motor starter and redirect them to the ZEN relay. Connect the ZEN outputs Q1 and Q2 to the A1 control of the motor starter contactor.
4. Referring to the schematic, make the wire connections as shown in Table 3.

	 CAUTION
	Always use the appropriate wire colors as dictated by electrical regulations.

Table 3: Terminal Numbers for Wire Connections

ZEN V2	Cyber A/T	Cyber	SS Pro	Function
	90507	92034	90129	Electrical schematic part number
I 0	Q28	Q28	Q21	Original MS Incline conveyor signal ON
I 1	Q2	Q2	Q25	Original Brake Release signal ON
I 2	I 45/I 48	I 45/I 48	I 14/I 15	MS Overload signal
I 3	Q27	Q27	Q20	Original MS Waste Conveyor signal ON
I 4	9S	9S	10	Stationary Power enabled
I 5	9T	9T	10	Carriage Power enabled
Q 0				Alert Signal-conveyor is about to move
Q 1	MS_5B	MS_5B	MS_W1	New MS Waste Conveyor ON
Q 2	MS_5C	MS_5C	MS_W2	New MS Incline Conveyor ON

- The remaining inputs (I1, I2, I4, & I5) on the ZEN relay are just monitoring existing points in the saw system. Connect a wired signal to these inputs without disconnecting them from their original points.



The overload detection must monitor at least one of the original connections. These can not be disconnected from the saw and placed in series. They must maintain their inputs to the current PLC input. However, one or both points can be monitored. If both are monitored: only one overload will need to be tripped. This will signal both inputs simultaneously to the PLC. The ZEN will stop both conveyors if used.

- Connect a customer-supplied alerting device to the relay output. Bring power to one terminal, and the other terminal is the signal to the device.

Alerting Device Requirements

The alerting device can be an AC or DC device. It may be a beacon light, a horn, or any alert that you determine is adequate warning to remove risk of getting hurt when the conveyor begins automatic movement.

Testing for Safe Operation

Perform this test after the installation of the ZEN programmable relay. This test applies to *Cyber A/T*, *Cyber*, and *SmartSet Pro* saws.

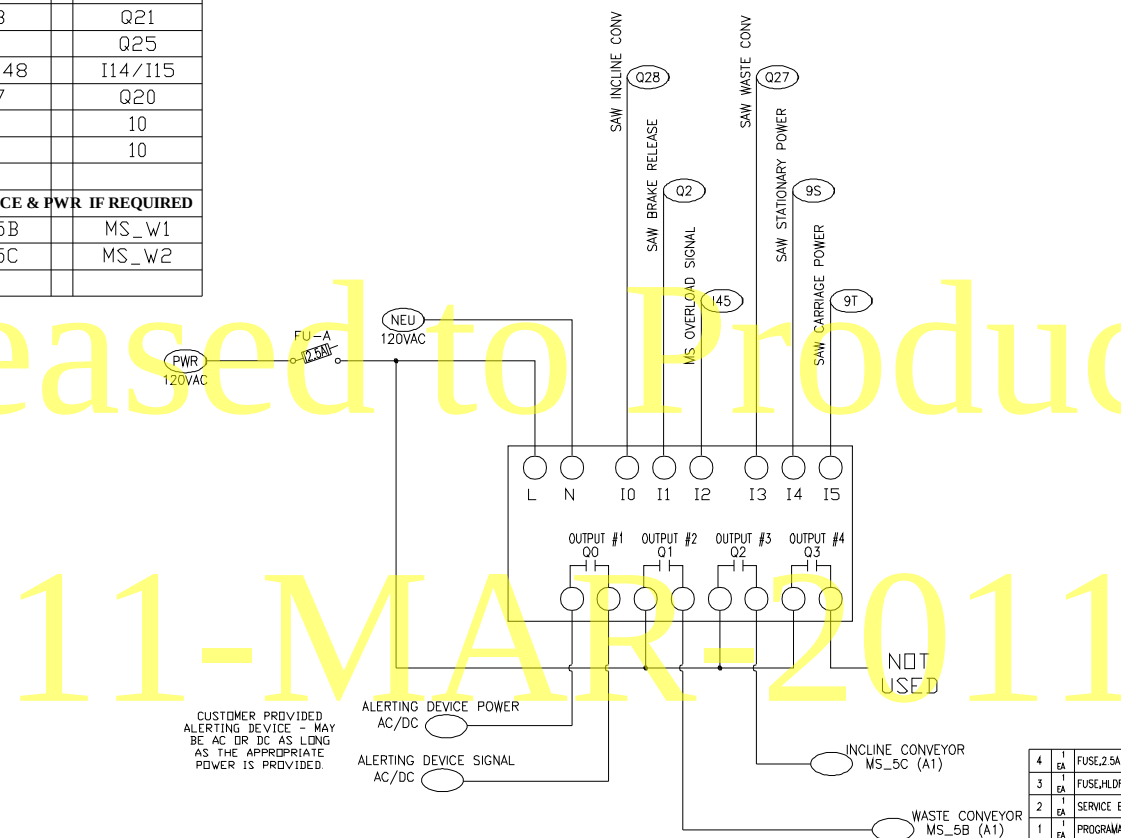
	 WARNING
	CRUSH OR CUT HAZARD! Each step must be satisfied and the part working correctly before moving to the next step.

1. Remove the lockout/tagout devices in a safe manner.
2. Verify all inputs are working correctly to the programmable relay:
 - a) Test Input (i1) Brakes Released (Start a blade long enough to verify the input - less than 5 sec).
 - b) Test Input (i2) simulate an Overload condition (trip the overload device).
 - c) Test Input (i4 & i5) Control Power loss (Engage E-stop Circuit).
 - d) Do not proceed until inputs are working correctly.
3. If the inputs above are working correctly:
 - a) Test Input (i0) Start & stop incline conveyor using operator screen.
 - b) Test Input (i3) Start & stop waste conveyor using operator screen.
 - c) Do not proceed until inputs are working correctly.
4. Verify manual start of conveyors by turning the conveyor ON at the touch screen.
5. Engage an E-stop while running and verify conveyors are OFF.
6. Manually engage an E-stop for each conveyor to trip the overload associated with the conveyor
7. Verify overloads are still monitored by operator interface.
8. Verify that the overload condition stops conveyor outputs on programmable relay (Refer to electrical schematics to correct.)
9. Verify that conveyors automatically start when blades are started (after 5 second delay).
10. Verify that the conveyors automatically stop when blades are shut off (after 5 second delay).

INPUT & OUTPUT SIGNALS FOR ZEN PROGRAMMABLE RELAY

SAW ELECTRICAL DWG#	90507	92034	90129
	CYBER AT	CYBERSAW	SS-PRO
I0	Q28	Q28	Q21
I1	Q2	Q2	Q25
I2	I45/I48	I45/I48	I14/I15
I3	Q27	Q27	Q20
I4	9S	9S	10
I5	9T	9T	10
Q0	CUSTOMER SUPPLIED DEVICE & PWR IF REQUIRED		
Q1	MS_5B	MS_5B	MS_W1
Q2	MS_5C	MS_5C	MS_W2
Q3			

REFERENCES TO INPUT OR OUTPUT CONNECTION NUMBERS BELOW ARE TAKEN FROM CHART. SELECT AND CHANGE REFERENCES DEPENDING ON THE MODEL OF SAW THIS ADDITIONAL WIRING IS BEING ADDED TO. REFER TO SERVICE BULLETIN FOR ADDITIONAL SUPPORT INFORMATION.



4	1	EA	FUSE, 2.5A	BUSSMAN #2.5A		P	516540
3	1	EA	FUSE, HLD, TERM, BLK	ENTRELEC #115378.05		P	518207
2	1	EA	SERVICE BULLETIN			D	58193
1	1	EA	PROGRAMMABLE RELAY, 6/40	OMRON #ZEN-10C3AR-A-V2		P	515980

ITEM	QTY	PART NAME	MATERIAL ANALY OR DESCRIPTION	LENGTH	CODE	DWG NO./PART NO.

FEATURES			
APPROVED	DATE	WFO	
CHECKED	DATE	DRAWN	

ELECTRICAL CONNECTIONS							
VDC	DATE	WFO	WASTE CONVEYOR ZEN CONTROL				
CHECKED	DATE	DRAWN	DATE	WFO	SCALE	PAGE	REV
			1/24/11	X	NONE	1 of 1	90620