



## Technical Note: 10000039

# Interfacing the MDC-360 to the Temescal TRC-3460 Electron Beam Source Indexer

This tech note describes how to interface the Maxtek MDC-360 controller to the Temescal TRC-3460 Electron Beam Source Indexer to provide automatic control of crucible position.

The interface between the MDC-360 and the TRC indexer requires the following items:

- An MDC-360 Active I/O card (PN# 179239). The Active I/O card has 12 to 120 volt inputs as opposed to the TTL level inputs on the Passive I/O card.
- A 0.1 Amp 24 VDC power supply.
- Up to three programmable inputs and outputs and one dedicated Abort output on the MDC-360.

Up to three SEL inputs, up to three POS outputs and the System Interlock input on the TRC-3460.

To program the MDC-360 for automatic crucible position control, do the following steps:

- Press the MDC-360 Program key to enter the programming mode.
- Move to the Program Outputs screen under Edit System Setup\Program Outputs.
- Select a blank output for programming.
- Enter "SourceN BCD 0" for the output's name where N is the number of the source that you are programming.
- Move onto the Conditions field and press 0 to add a condition.
- Scroll down to the Pocket Condition Type, press the right arrow key to get to the Number field.
- Press 1 and then enter.
- Press the 5 key to select the Or operator.
- Repeat steps 6 through 8 selecting pockets 1, 3, 5 and 7. Skip step 8 after selecting pocket #7. The final condition should be "Pocket#1|Pocket#3|Pocket#5|Pocket#7".
- Press enter to save the condition.
- Press the left arrow key and select another blank output.
- Repeat steps 4 through 10 once if the source has 4 or less pockets and twice if the source has more than four pockets. For output "SourceN BCD 1" select pockets 1, 4, 5, and 8. For output "SourceN BCD 2", if required, select pockets 1, 6, 7, and 8.
- Move to the Source Setup screen under Edit System Setup>Edit Source Setup.
- Select one of the four possible sources to program.
- Set the number of pockets parameter to the desired number of pockets (crucibles).
- Set the Control parameter to Direct. **This step creates an output labeled "SourceN DriveUp" which will not be used. Simply leave this output unconnected.**
- Set the Drive parameter to Up.
- Set the Feedback Type parameter to BCD.

- Set the Rotator Delay parameter to the maximum time required for the indexer to rotate from crucible one around to crucible one again.
- Press the left arrow key twice to return to the System Setup Menu.
- Move up to Program Inputs and press the right arrow key.
- With the above parameter settings, the MDC-360 will have created up to three inputs labeled “SourceN BCD 0,1&2”. Set all of the “SourceN BCD x” input’s true level to Low. This defines the inputs as low true to be compatible with the TRC indexer. To set an inputs true level, move the cursor onto the True column and press the enter key to toggle between Low and High.
- This completes the programming of the MDC-360. The following list shows the input and output connections which must be made between the 360 and the TRC-3460 to complete the interface. All of the connection pin numbers are given except for the 360’s programmable inputs and outputs. Since the 360’s programmable input and output pin numbers can be changed, the user must view the Program Input and Program Output screens to determine their pin numbers.

MDC-360 I/O (I/O conn. 1 or 2)		TRC-3460 I/O connector	
SourceN BCD 0	input	Pocket POS 0	output PIN#9
SourceN BCD 0	return	External Supply Gnd	return PIN#15
SourceN BCD 1	input	Pocket POS 1	output PIN#4
SourceN BCD 1	return	External Supply Gnd	return PIN#15
SourceN BCD 2	input	Pocket POS 2	output PIN#8, (Optional)
SourceN BCD 2	return	External Supply Gnd	return PIN#15, (Optional)
SourceN BCD 0	output	Pocket SEL 0	input PIN#1
SourceN BCD 0	return	External Supply +24 V	input PIN#10
SourceN BCD 1	output	Pocket SEL 1	input PIN#2
SourceN BCD 1	return	External Supply +24 V	input PIN#10
SourceN BCD 2	output	Pocket SEL 2	input PIN#7, (Optional)
SourceN BCD 2	return	External Supply +24 V	input PIN#10, (Optional)
Abort	output PIN#1	System Interlock	input PIN#3
Abort	return PIN#20	External Supply +24 V	input PIN#10

The positive side of the 24 volt power supply must be connected to pin 10 of the TRC-3460. The ground side of the 24 volt power supply must be connected to pin 15 of the TRC-3460. You also must follow the instructions in section on “Configuring the TRC-3460 for an External 24 volt Supply”.

The SourceN BCD 0,1&2 outputs from the MDC tell the TRC-3460 which pocket to rotate too. The SourceN BCD 0,1&2 inputs of the MDC tell the 360 which pocket is in position. The number of BCD inputs and outputs created by the MDC-360 depends on the setting of the Number of Pockets parameter in the source setup. For 1 to 2 pockets the MDC will create SourceN BCD 0. For 3 to 4 pockets the MDC will create SourceN BCD 0&1. For 5 to 8 pockets the MDC will create SourceN BCD 0,1&2.

- Differences in implementation of the BCD coding between the MDC-360 and the TRC-3460 result in the displayed pocket positions being off. This is not important as long as the user only reads the pocket position from either the MDC-360 or the TRC-3460 but not both. The indicated pocket positions are as follows:

#### 4 Pocket Configuration

<b>MDC-360</b>	1	2	3	4
<b>TRC-3460</b>	4	1	2	3

#### 8 Pocket Configuration

<b>MDC-360</b>	1	2	3	4	5	6	7	8
<b>TRC-3460</b>	8	1	2	3	4	5	6	7

With the above connections and programming complete, the MDC-360 can now control the pocket position. To test the interface, do the following steps:

Document Title:	Interfacing the MDC-360 to the Temescal TRC-3460 Electron Beam Source Indexer
Document ID:	10000039
Creation Date:	
Modified Date:	10/12/2006
Related Products:	<a href="#">MDC-360C</a> , <a href="#">MDC-361C</a>
Product Line:	Thin Film / Vacuum
Notes:	Originally released as THIN FILM TECHNICAL NOTE V-139  This tech note also applies to: MDC-360 (obsolete), MDC-361 (obsolete), MDC-370 (obsolete)