



Technical Note: 10000038

Interfacing the MDC-360 to the TFI Model 376 Crucible Indexer

This tech note describes how to interface the Maxtek MDC-360 controller to the Telemark Model 376 Crucible Indexer to provide automatic control of crucible position.

Interfacing requires 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. The interface will require the use of up to six programmable inputs and outputs on the side of the MDC-360. On the Model 376 indexer side, the interface will require connection to four or six of the "Pocket Selected" outputs and the "To Select" inputs.

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 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 Indiv.
- Set the Drive parameter to Up.
- Set the Feedback Type parameter to Individual.
- 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 two or three inputs labeled "SourceN Pocket 0,1&2". Set all of the "SourceN Pocket x" input's true level to high. This defines the inputs as high true to be compatible with the 376 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.

With the above parameter settings, the MDC-360 will automatically create the following inputs and outputs which must be connected to the Model 376 Indexer 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) Model 376 (connector J3)
- SourceN Pocket 1 input Pocket 1 Selected output PIN# 5
- SourceN Pocket 1 return 12V Return return PIN# 1
- SourceN Pocket 2 input Pocket 2 Selected output PIN# 7
- SourceN Pocket 2 return 12V Return return PIN# 1
- SourceN Pocket 3 input Pocket 3 Selected output PIN# 9
- SourceN Pocket 3 return 12V Return return PIN# 1
- SourceN Pocket 4 input Pocket 4 Selected output PIN# 11
- SourceN Pocket 4 return 12V Return return PIN# 1
- SourceN Pocket 5 input Pocket 5 Selected output PIN# 13 (Optional)
- SourceN Pocket 5 return 12V Return return PIN# 1 (Optional)
- SourceN Pocket 6 input Pocket 6 Selected output PIN# 15 (Optional)
- SourceN Pocket 6 return 12V Return return PIN# 1 (Optional)
- SourceN Pocket 1 output To Select 1 input PIN# 4
- SourceN Pocket 1 return Select return PIN# 16
- SourceN Pocket 2 output To Select 2 input PIN# 6
- SourceN Pocket 2 return Select return PIN# 16
- SourceN Pocket 3 output To Select 3 input PIN# 8
- SourceN Pocket 3 return Select return PIN# 16
- SourceN Pocket 4 output To Select 4 input PIN# 10
- SourceN Pocket 4 return Select return PIN# 16
- SourceN Pocket 5 output To Select 5 input PIN# 12 (Optional)
- SourceN Pocket 5 return Select return PIN# 16 (Optional)
- SourceN Pocket 6 output To Select 6 input PIN# 14 (Optional)
- SourceN Pocket 6 return Select return PIN# 16 (Optional)

The SourceN Pocket 1,2,3,4,5 and 6 outputs from the MDC-360 tell the 376 indexer which pocket to rotate too. The SourceN Pocket 1,2,3,4,5 and 6 inputs to the MDC-360 tell the 360 which pocket is currently in position. The number of inputs and outputs created by the MDC-360 depends on the setting of the Number of Pockets parameter in the source setup. If the Number of pockets is set to four, then four inputs and outputs will be created. If the Number of pockets is set to six then six inputs and outputs will be created.

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

- Create a multi-layer “dummy” process. The process should have the same number of layers as the source has pockets (eg. four pocket source = four layer process).
- Set all of the layer thickness to zero.
- Select a different material for each layer such that layer 1 requires pocket 1 and so on. Note that the pocket number for a material is defined by the Pocket parameter in the Define Material Screen.
- Set the Pause On Layer Complete parameter in the Display Setup menu to “yes” so the 360 will stop after getting each pocket into position.
- Run the “dummy” process to test the interface.

When the “dummy” process is started, the 360 will enter the “Change Pocket” state for the first layer. In this state the 360 will activate the “SourceN Pocket 1” output and wait for the “SourceN Pocket 1” input to go true. If the input doesn’t go true in the time allotted by the Rotator Delay parameter (source setup), then the 360 will indicate a Source Fault. If the input does go true in the allotted time then the 360 will continue with the layer. (Note that the current pocket position can be viewed in the Source/Sensor Status screen).

Since the layer thickness of the dummy process is set to zero, the 360 will go to Layer Complete and wait for a Start key press to start the next layer. The above steps will be repeated for the remaining layers until the process is complete.

If the any of the layers resulted in the wrong pocket being selected then you should check both the controller programming and the wiring of the interface cable between the MDC-360 and the 376 Pocket Indexer.

Document Title:	Interfacing the MDC-360 to the TFI Model 376 Crucible Indexer
Document ID:	10000038
Creation Date:	
Modified Date:	4/19/2005
Related Products:	MDC-360C , MDC-361C
Product Line:	Thin Film / Vacuum
Notes:	Originally released as THIN FILM TECHNICAL NOTE V-138. This tech note also applies to: MDC-360 (obsolete); MDC-361 (obsolete); MDC-370 (obsolete)