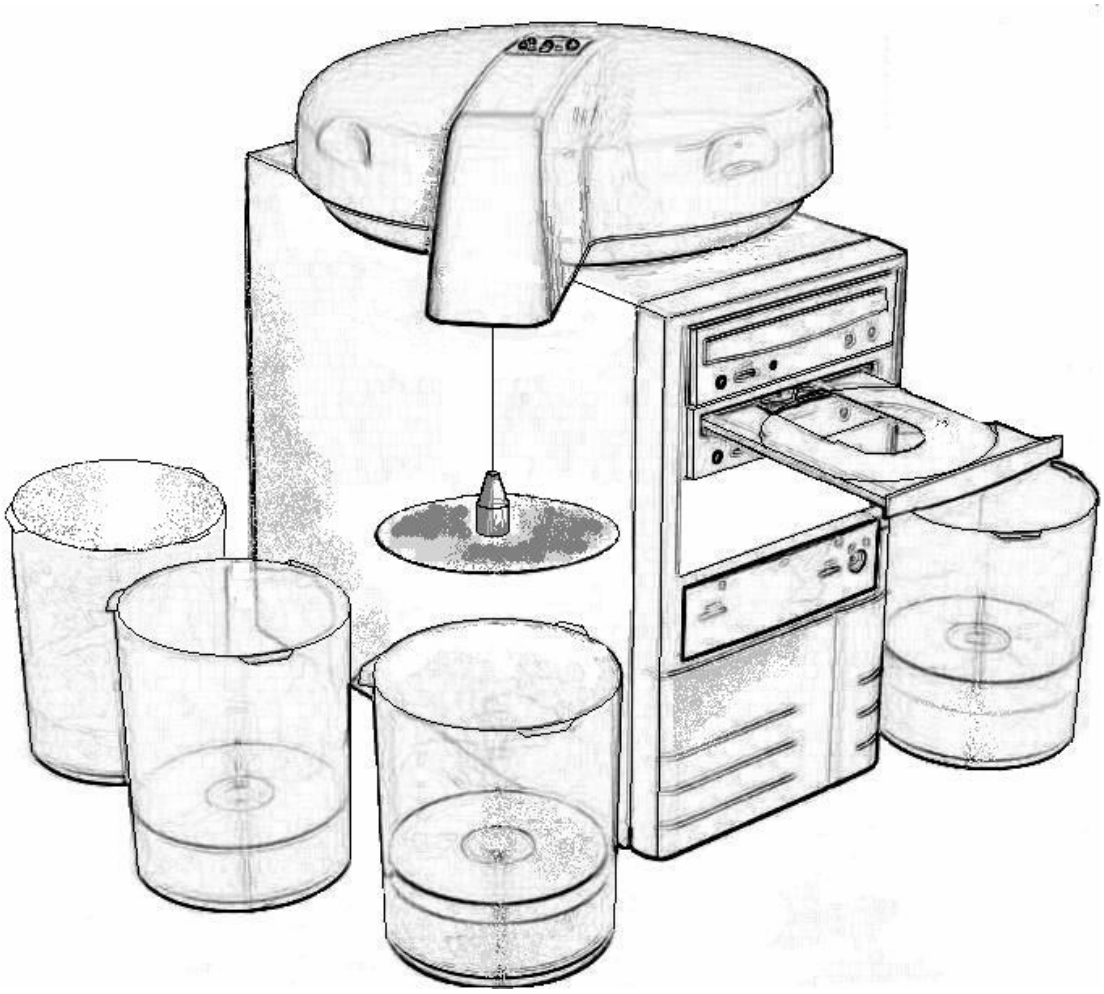


DEXTERIX

Developer’s sheet

In order to use Dexterix in conjunction with your own disk processing application, two customized sets of commands have been provided, as described hereunder. All the general physical requirements described in the DEXTERIX Quick Start Guide apply.
The serial port settings are 9600, N, 8, 1, with software flow control (RTS/CTS are not wired and not used).

1.) Most disc processing jobs follow a similar, repetitive pattern: the discs are to be taken from a common input (we can call them "blanks"), processed, and then delivered to the output. The discs that failed to be processed correctly should be discarded to a separate output. Examples of such jobs include disc duplication, printing, ripping, testing, etc.
When automating such "traditional" jobs Dexterix can take care of bin management by itself. Namely at each given moment it "knows" by itself where to bring a blank disc from and where the processed disc should be delivered to, depending on the bin configuration initially set by the human operator. When a certain blank-discs bin becomes empty, Dexterix changes the bin configuration automatically.
This topic is extensively detailed on our website with reference to automating a duplication tower. This video should be relevant for the process:
http://www.youtube.com/watch?v=Yz4QrTMsYTQ
When the robot manages the bin configuration itself as described above, the disc-processing controller (or the software controlling the robot) sends simple commands such as "load a blank disc in" or "take out the disc to the processed discs bin", without actually having to specify the bin locations.

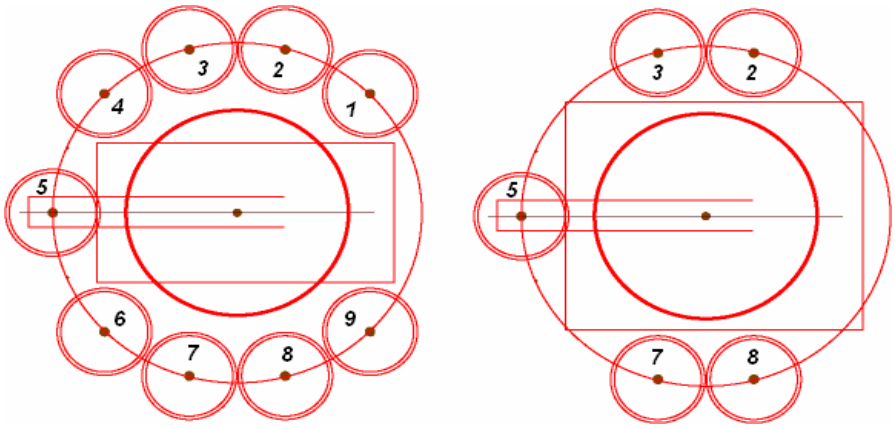
Your controller/software should send the following serial commands (ASCII char; COM port settings: 9600, N, 8, 1, without flow control), corresponding with the current action required:
-"C" Move to front. Dexterix is required to move its arm to the front (location 5). This is mainly used to check the communication with the robot at startup
-"A" Unload the disk. Dexterix is required to take the disc from the uppermost open drawer in the front (location 5) and deliver it to the current output bin
-"I" Load a blank disk. Dexterix is required to take a disc from the current blank-discs bin and deliver it to the front (location 5), into the (uppermost) open drawer
-"G" Lift up disk from the tray. Dexterix is required to lift the disc from the uppermost open drawer in the front (location 5)
-"R" Discard the bad disc. Dexterix is required to put down the disc in the front (location 5)
The last 2 commands are meant to allow the disc-processing controller (or the software controlling the robot) to close the drawer(s) in order to allow the robot to put a rejected disc in front (under the drawers)

After completing each such task, Dexterix answers **"X"** if ok or respectively **"E"** if failed. Your software/controller should deal with opening/closing the trays and deal with the disc-processing accordingly (make sure only the correct drive has its tray open)...

2.) Alternatively, when the software (or the disc-processing controller) needs to control exactly where each disc is being taken from or/and delivered to, two sets of commands (ASCII char) allow one to control the transport of a disk between any 2 of the 9 possible locations:

“Nn” (N1, N2..., N9) will determine picking up a disk from the location n
“Mn” (M1, M2..., M9) will determine releasing the disk to the location n

Once the required task is completed Dexterix answers "X" if ok or "E" if failed. Failure means that it could not pick-up (or respectively release) the disk after 6 retries. (for example it was requested to pick up a disk from an empty bin)
For your convenience, an extra error message has been added, "D", working as follows: if, by accident, you send an "Nx" command (meaning "take a disk from location x") when Dexterix already has a disk engaged, it moves to location x and answers "D" (meaning "I can't take an other disk, I already have one engaged"). Similarly, an "Mx" command (meaning "bring the disk to location x") will be answered with "D" if Dexterix doesn't have a disk engaged when "Mx" executed. (The arm will move though to location x.)
Wait for the answer before issuing a new command. Sending bulk text to the robot might determine unexpected behavior, since some letter combinations may be interpreted as valid commands.
Dexterix has to be set in Ready Mode (menu LED off) in order to communicate serially.
The numbering (with you facing the robot): 1-the further most location on the left, 5-the middle (front; regularly the trays of the processing unit), 9-the further most location on the right.



With the command set provided, each location may be either a disk bin or a processing unit tray. As shown in the figure above, if not all stacks are needed, the master equipment may be wider than a regular disk duplication tower case (wider than 8” or 20cm).

Example:
Supposing one wants a disk to be taken from location 2 and delivered into location 5, the following steps should be followed:
-send an “N2” command to Dexterix and wait for its answer. Once the disk picked up from location 2, the robot will answer with an “X”. If the required operation failed, Dexterix will answer accordingly, with “D” or “E”
-if Dexterix answer was “X”, in order to deliver the disk to location 5, an “M5” command should be issued. Once the operation successfully completed, Dexterix answers “X”

Note: The Mx/Nx commands can be used concurrently with the C,A,I,G,R set of commands within the same application. This can be useful in certain situations, such as sorting discs and delivering them to different stacks following application-specific criteria. Example: Supposing bulk discs to be processed/sorted span bins 1 to 4 (the corresponding bin configuration must be chosen accordingly), one could issue “I” commands to load the discs, followed by “G” and “M6” or “M7” or “M8” or “M9”, respectively depending on the disc processing result