

Requirements: Acorn CNC12 version v4.60 or later.

Provided is an example of a carousel tool changer for use with an ACORN CNC system. Carousel type tool changers require PLC specific logic and depending on the tool changer, the plc provided may need further editing. This PLC tool changer is a simple carousel tool changer that uses forks to grab and place the tool in the spindle. This plc does not support carousel's that require to move up or down and swingarms. The tool change sequence for this PLC is:

1. Moves spindle to tool change position and orients the spindle. Carousel rotates to proper putback location.
2. Carousel moves in, engaging the fork with the tool. Spindle then unclamps and moves up to clearance position.
3. Carousel rotates to requested tool. Spindle moves back to tool change position and clamps tool.
4. Carousel Moves out away from the spindle. Tool change is complete.

The mfunc6.mac file and the plc can be edited by the user for their specific tool changer. For more information on editing the m6 macro, check out our "Introduction to Centroid Macros" document found here. [https://www.centroidcnc.com/centroid\\_diy/downloads/acorn\\_documentation/centroid\\_cnc\\_macro\\_programming.pdf](https://www.centroidcnc.com/centroid_diy/downloads/acorn_documentation/centroid_cnc_macro_programming.pdf)

For more information on editing the plc, check out our video series found here. [https://www.youtube.com/watch?v=7WiEJiQwqXo&list=PLXhs2C5No0\\_gFS\\_RmKNo7hii2WKledQIQ](https://www.youtube.com/watch?v=7WiEJiQwqXo&list=PLXhs2C5No0_gFS_RmKNo7hii2WKledQIQ)

and our PLC programming manual found here.

[https://www.centroidcnc.com/centroid\\_diy/downloads/CNC12-v412\\_operator\\_manuals/centroid-cnc12-plc-programming-manual.pdf](https://www.centroidcnc.com/centroid_diy/downloads/CNC12-v412_operator_manuals/centroid-cnc12-plc-programming-manual.pdf)

**\*\*NEW\*\*** As of ACORN CNC12 v4.60+, this version allows the use of the wizard to assign ATC Inputs/Outputs for the Mill BETA ATC PLC for a Carousel Tool Changer.

#### Installation:

1. Install ACORN CNC12 V4.60+ on PC System.
2. Extract files from centroid\_acorn\_v460\_mill\_carousel file into the [c:\cncm](#) directory and overwrite all files.
3. Start CNC12 and open the Acorn Wizard. Assign Drive Type and Required I/O for your system and ATC. See the **Inputs and Outputs** section below for I/O that is used by this particular Carousel setup. Write changes to CNC and follow on screen prompts.
  - A. Under Preferences CNC Control, Ensure to set Custom VCP Skin to Yes to retain VCP with Index Buttons provided with this installation. Otherwise, Wizard will revert to default Mill VCP.
4. Set the following CNC12 parameters. From the main screen press F1(Setup)→F3(Config)→137(Or User specified password)→F3(Params).
  - A. Parameter #6 = 1 (ATC Installed)
  - B. Parameter #160 = 1 (Enhanced ATC Setting, see operator manual Chapter 15)
  - C. Parameter #161 = Maximum number of bins for carousel
  - D. Parameter #820 = 0 (Sets Machine type to Mill)
  - E. Parameter #830 = 1 **\*\*NEW\*\*** (Sets type of ATC you have for PLC and macros, value is subject to change in future, ensure to check documentation on every update)
5. Shutdown CNC12 and power cycle ACORN, restart CNC12 once you see the heartbeat.

6. Initialize the ATC: To Initialize the ATC, F1(Setup)→F3(Config)→F6(ATC Init). This will ask you to put tool 1 into the spindle. Ensure the carousel is also at position for tool 1 when performing ATC Init. This process will be required if the carousel loses position.
7. Setup Return Point for ATC ToolChange Position. Navigate to Return Point Menu F1(Setup)→F1(Part)→F9(WCS Table)→F1(Return). Input X, Y, Z Machine Position required for Tool Change Under G30 Column. Press F10 to save changes and ensure to select Yes (F1) when prompted to save G30 Z axis position for tool change.

#### **Inputs and Outputs:**

##### **Inputs:**

1. ATC\_ToolCounter
2. ATC\_CarouselisOut (Away from Spindle)
3. ATC\_CarouselisIn (Towards Spindle)
4. SpindleisOriented
5. ToolisUnclamped
6. VFDZeroSpeed (Optional)

##### **Outputs:**

1. ATC\_CarouselForward
2. ATC\_CarouselReverse
3. ATC\_CarouselOut (Away from Spindle)
4. ATC\_CarouselIn (Towards Spindle)
5. OrientSpindle
6. UnclampTool