Centroid CNC12 v5.24+ Wizard Input and Output “Canned” PLC Functions and CNC12 M-codes

documents/wizard inputs and outputs/centroid_wizard_input_output_canned_PLC_functions_v5.x rev10.odt - 3-3-2025

Inputs

Input Wizard Name	Description / Purpose	Related M-codes or Macros	Category	Platform
ATC_AirPressureOk AirPressureOk	The input that is used for detecting if the Air Pressure is at an acceptable level to continue with work, perform a tool change etc.		All, ATC, Mill, Router	Acorn, AcornSix, Hickory
ATC_CarouselIsIn CarouselIsIn	The input from the ATC Carousel sensor that indicates the carousel is in the IN position toward the spindle.		All, ATC, Mill, Router	Acorn, AcornSix, Hickory
ATC_CarouselIsOut CarouselIsOut	The input from the ATC Carousel sensor that indicates the carousel is in the OUT position away from the spindle.		All, ATC, Mill, Router	Acorn, AcornSix, Hickory
ATC_ToolCounter ToolCounter	The input that is used as a tool index counter sensor from the ATC, which is only used for carousel or tool arm.		All, ATC, Mill, Router	Acorn, AcornSix, Hickory
Ax1_MinusJoystick Ax1_PlusJoystick Ax2_MinusJoystick Ax2_PlusJoystick	Inputs from axis jogging joystick switches to command movement.		All	AcornSix
Axis1DriveOk Axis2DriveOk Axis3DriveOk Axis4DriveOk	Individual Drive Fault input for each axis. FirstAxisDriveOk SecondAxisDriveOk etc.. Add corresponding drive fault message X axis drive Fault Y axis drive Fault etc.. Individual DriveOk Signals: On (Green) = Good Off (Red) = Fault		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
Axis5DriveOk Axis6DriveOk			All, Mill	AcornSix
BackGear	This lets CNC12 know to flip the spindle direction, so that CW (M3) is always CW. Switch input to indicate to CNC12 that the machine is in BackGear so CNC12 will know to reverse the spindle direction automatically (M3 CW and M4 CCW).		All, Mill	Acorn, AcornSix

ChuckFootPedal	Lathe Chuck Foot Pedal input, When the Input is Closed (Green), it will toggle between Chuck Open/Close or ColletOpenClose ON/OFF		All, Lathe	Acorn, AcornSix
ChuckIsClosed	Chuck closed indicator sensor/switch input tells CNC12 that the chuck is closed.		All, Lathe	Acorn, AcornSix
ChuckIsOpen	Chuck open indicator sensor/switch input tells CNC12 that the chuck is open.		All, Lathe	Acorn, AcornSix
CutOffIsDown	An input that tells CNC12 that the Cut Off device has completed its stroke.		All, Lathe	Acorn, AcornSix
CycleCancel2	Additional external CycleCancel button assigned to an input. Use this input definition to wire an external hardware Cycle Cancel Button. See related USB-BOB product for even more operator console controls		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
CycleStart2	Additional external CycleStart button assigned to an input. Use this input definition to wire an external hardware Cycle Start Button. See related USB-BOB product for even more operator console controls		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
DrawBarReleased	Input is active when Draw Bar/Pull Stud is active indicating that the tool is released from the spindle. Displays the message “Draw Bar is Released” when the input is active, then the follow-up message “Draw Bar Clamped” when the input is inactive. Logic-wise, this is treated the same way as ToolisUnclamped. ToolisUnclamped and DrawbarReleased can not be selected at the same time.		All, Mill, Router	Acorn, AcornSix
DriveOK	Signal from axis drive letting Acorn know the axis drive is okay with no faults. One input for multiple Drive Fault signals. Evokes an E-Stop condition if any drive sends a fault signal to CNC12 with this input. See related: Individual drive inputs		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
EStopOk2	Additional Secondary EStop circuit input. Use this input definition to wire an additional hardware EStop Button(s), light curtain, pull rope/chain, many estops can be daisy chained into this one input.		All, Safety, Mill, Lathe, Router, Plasma	Acorn, AcornSix

FeedHold2	Additional external FeedHold button assigned to an input. Use this input definition to wire an external hardware Feed Hold Button. See related USB-BOB product for even more operator console controls		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
HomeAll	One input for all home switches. This is the preferred Acorn method of homing. Use this when it is desired to only use one input for all of the Home switches. Saves on inputs and makes wiring easier while maintaining the same level of performance.	cncm.hom cnct.hom cncr.hom	All, Home, Mill, Lathe, Router, Plasma	Acorn, AcornSix
HomeLimitAll	Individual input for a combination home and limit switch. Use this when it is desired to only use one input, wired in series, for all of the Home and Limit switches. Saves on inputs and makes wiring easier while maintaining the same level of performance. Switches will act like a Home Switch when running a home program and act like a limit switch in all other cases.		All, HomeLimit, Mill, Lathe, Router, Plasma	Acorn, AcornSix
LimitAll	One input for all limit switches. This is often used in conjunction with HomeAll. Use this when it is desired to only use one input for all of the limit switches. Saves on inputs and makes wiring easier while maintaining the same level of performance.		All, Limit, Mill, Lathe, Router, Plasma	Acorn, AcornSix
LubeOK	Low lube level indicator switch input. Low Lube Level Indicator input. Displays message to fill the lubrication tank.		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory
Ohmic Sensor OhmicSensor	Input used for an ohmic specific plasma torch tip touch-off. See the Plasma Installation Manual for more info. See the relevant schematic and Plasma manual for hook-up and use.		All, Plasma	Acorn, AcornSix, Hickory
PartChuteIsIn	A switch input that tells CNC12 that the part chute has retracted.		All, Lathe	Acorn, AcornSix

PressureLowMessage	Input for Low Pressure Alarm. Issues a message when the input is active, and continues to run until the G-code job is complete. Works just like the Low Lube Level Indicator Input. Issues a warning message and continues to run until the job is complete.		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
PressureLowStop	Input for a low-pressure sensor. Issues a message and E-Stop condition when the input is active.		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
ProbeDetect	Input used to let CNC12 know that a touch probe is plugged in and in use. This enables Probe protection. See probe setup guide. See Touch Probe Setup Manual for more detailed information.		All, Probe, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory
ProbeTripped	Input to indicate that a probe has been tripped(see probe setup guide for more info). See Touch Probe Setup Manual for more detailed information.		All, Probe, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory
RPM Sensor	Input for a one pulse-per-revolution Spindle Speed Indicator. Generally only used for machines that lack a spindle encoder. Typically used with Hall Effect sensors (Note: cannot be used for threading. Threading requires a spindle encoder, and a spindle encoder and RPM_Sensor cannot be used at the same time. If an encoder is installed, CNC12 reads the spindle speed from the encoder, and an RPM_Sensor is not necessary. An RPM_Sensor is for machines without a spindle encoder where the user wishes to have a true spindle RPM readout within CNC12 displayed on the main screen. This input is located in the Wizard Input Definitions Menu.		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix

SafetyDoorLockConfirmed	Safety Door Locked confirmation Input used for machine tool safety. Typically for a door lock with an auto locking mechanism. See Acorn Door Interlock Safety documentation for more details		All, Safety, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory
SafetyDoorSwitchClosed	Door closed confirmation input. Typically for a machine tool safety door switch, but could also be used for another safety device's input. See Acorn Door Interlock Safety documentation for more details. P985 = 1, Allows slow jog with the door open P985 = 2, Does not allow any movement with the door open		All, Safety, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory
SpindleTempAlarmMessage	Input for Temperature Alarm which issues a message when the input is Active and finishes the current G code job (does not stop current Job that is running). Works just like the Low Lube Level Indicator Input. Issues a warning message and continues to run until the job is complete.		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
SpindleTempAlarmStop	Input for Temperature Alarm which will issue a message and Estop condition when input is active (stops current Job that is running).		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
SlavedHomeInput	Home switch input used for autosquaring of paired axes on slave axis side used in conjunction with HomeAll. See paired axis and squaring setup guide for more info. Required for auto-squaring to function on a paired axis.		All, Home, Mill, Router, Plasma	Acorn, AcornSix

SlavedAxisDriveOk	Signal from an axis drive that the drive is okay with no faults. When using axis pairing, the slave axis can have its own unique DriveOK signal. This can be used with all other axes, either using individual DriveOK signals or one input for DriveOK.		All, Mill, Lathe, Router, Plasma	Acorn
SpindleLowRange	Input used for a Low/Med/High range indicator switch which tells CNC12 that machine is in Low/Med/High spindle range.	M41 Low Range	All, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory
SpindleMedRange		M42 Med Range		
SpindleHighRange		M43 High Range		
SpindleOk	Signal from spindle drive letting Acorn know spindle drive is okay with no faults.		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
SpindleIsOriented	An input from a VFD orient card which indicates that the spindle is oriented correctly. Typically used with ATCs to confirm the tool is in the proper position ready to put back into the tool pocket.		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
ToolCheck2	Additional external ToolCheck button assigned to an input. Use this input definition to wire an external hard Tool Check Button. See USB-BOB for alternative to this method.		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
ToolUnclampButton	Input for an external Tool Release Button for ATC spindles to activate the ToolUnclamp output. Input for an external Tool Unclamp Button. These are typically mounted on the spindle for manual tool changes. Press the button and the tool is released from the spindle. This button is deactivated while running a job.		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix

ToolTouchOffDetect	Input used to let CNC12 know that a Tool Touch Off device is plugged in and in-use. This enables probe protection. See probe setup guide for more info. See Touch Probe Setup Manual for more detailed information.		All, Probe, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory
ToolTouchOffTriggered ToolTouchOffTripped	An input to indicate that a Tool Touch Off device has been triggered. See probe setup guide for more info. See Touch Probe Setup Manual for more detailed information.		All, Probe, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory
ToolIsUnclamped	Input used with a sensor to verify that the tool is actually unclamped, typically used with ATC spindles. Logic-wise, is treated the same way as DrawBarReleased. ToolisUnclamped and DrawbarReleased can not be selected at the same time.		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
ToolRack In Sensor	This input is used to check that the ToolRack is in the IN position toward the spindle.		All, ATC, Mill, Router	Acorn, AcornSix, Hickory
ToolRack Out Sensor	This input is used to check that the ToolRack is in the OUT position away from the spindle.		All, ATC, Mill, Router	Acorn, AcornSix, Hickory
ToolTurretCounter	This input is used to count the current turret position, typically used with a Lathe Turret.		All, ATC, Lathe	Acorn, AcornSix
ToolTurretPosBit1 ToolTurretPosBit2 ToolTurretPosBit3 ToolTurretPosBit4	Up to four inputs can be used as bits to determine the current active tool from the ATC. Typically used with a Lathe Turret. These four bits are used in combination to express the currently selected tool.		All, ATC, Lathe	Acorn, AcornSix
ToolTurretSyncBit	This input is used for homing ‘Counter’ and ‘Timer’ based turrets M18 rotates the turret to seek the turret home switch and waits for ToolTurretSyncBit to trigger, then sets the current turret tool position to 1. Typically used with a Lathe Turret.	M18	All, ATC, Lathe	Acorn, AcornSix
TorchArcOk	Input used for the Plasma cutter Arc box signal, letting CNC12 know that the Plasma arc is OK. See Plasma Operator manual for more info.		All, Plasma	Acorn, AcornSix, Hickory
TorchBreakawayOk	Input used by a Torch Mount to indicate that the Torch has physically hit something. When this input is low (Red) will trigger a fault condition Used by CNC12 to invoke an E-Stop condition to prevent any damage to the Torch. See Plasma Operator manual for more info.		All, Plasma	Acorn, AcornSix, Hickory

TorchFloatSwitch	Signal input from the Plasma Torch Mount Float Switch. See Plasma Operator manual for more info.		All, Plasma	Acorn, AcornSix, Hickory
TouchPlateDetect	Input used to let CNC12 know that a touch Plate is plugged in and in use. Typically used with CNC12 Router		All, Probe, Mill, Lathe, Router	Acorn, AcornSix, Hickory
TouchPlateTripped	Touch Plate tripped input. Typically used with CNC12 Router		All, Probe, Mill, Lathe, Router	Acorn, AcornSix, Hickory
VFDUpToSpeed	Input used for the VFD signal that indicates that the Spindle motor is “up to speed”. Lets CNC12 know that the spindle has reached the specified speed and CNC12 can continue with the program. Used in G-code and Tool Change macros. The PLC can be modified to issue a message confirming, if desired.	M100 or M101/5000X, where X is the input number	All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
VFDZeroSpeed	Input used for the VFD signal that indicates that the Spindle motor is a “zero speed”. Lets CNC12 know that the spindle has reached zero speed and CNC12 can continue with the program. Used in G-code and Tool Change macros. The PLC can be modified to issue a message confirming, if desired.	M100 or M101/5000X, where X is the input number	All, Mill, Lathe, Router, Plasma	Acorn, AcornSix

ZriHomingAll	Input to Home at an Index Pulse for all Axes. A very precise way to auto home a machine tool that is using open or hybrid closed loop axis motors. This allows Acorn and AcornSix to use a dedicated input from an encoder or other sensor for the machine home position. Commonly uses the marker pulse signal from the axis motor encoder. Typically the axis motor drive provides an output that is wired to this input, which sends a signal that the encoder marker pulse has been reached. This facilitates very accurate homing for precision work and is time-saving on setups. Example schematic. See Macro Manual for home program examples. M105 /X P(ZriHomingAll input number) F3; Move X plus at 3 IPM until the input closes.	cncm.hom cnct.hom	All, Home, Mill, Lathe, Router, Plasma	Acorn, AcornSix
FirstAxisHomeOk SecondAxisHomeOk ThirdAxisHomeOk FourthAxisHomeOk	Individual input for an Individual home switch (use HomeAll and/or LimitAll to save on inputs). Notes: For Acorn users trying to save on inputs this method uses more inputs than necessary. Use HomeAll instead. This is only used in special cases where the Home Switches cannot be wired in series or parallel.		All, Home, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory
FifthAxisHomeOk SixthAxisHomeOk				AcornSix, Hickory
SeventhAxisHomeOk EighthAxisHomeOk				Hickory
FirstAxisHomeLimitOk SecondAxisHomeLimitOk ThirdAxisHomeLimitOk FourthAxisHomeLimitOk	Individual input for a combination home and limit switch (use HomeAll and/or LimitAll to save on inputs). Note: For Acorn users trying to save on inputs this method uses more inputs than necessary. Use HomeAll, LimitAll, and Software Travel Limits instead. This is only used in special cases where the Limit Switches cannot be wired in series or parallel, or having individual inputs for each switch is desired. This is used in conjunction with the OPTIONAL FirstAxisMinus(or Plus)LimitOK for the over-travel limit switch (the recommended method is to use HomeAll and then the Optional LimitAll. See schematic S14954).		All, HomeLimit, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory
FifthAxisHomeLimitOk SixthAxisHomeLimitOk				AcornSix, Hickory
SeventhAxisHomeLimitOk EighthAxisHomeLimitOk				Hickory
FirstAxisMinusLimitOK FirstAxisPlusLimitOK SecondAxisMinusLimitOK SecondAxisPlusLimitOK	Individual input for an individual limit switch (use HomeAll and/or LimitAll to save on inputs). Note: For Acorn users trying to save on inputs this method uses more inputs than		All, Limit, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory

ThirdAxisMinusLimitOK ThirdAxisPlusLimitOK FourthAxisMinusLimitOK FourthAxisPlusLimitOK	necessary. It is recommended to use LimitAll for Acorn. Acorn, AcornSix. Advantage is that these individual limit switch inputs gives CNC12 and the operator additional information as to which specific switch has been triggered. Recommended for Hickory systems not using the Absolute Encoder Homing method.			
FifthAxisPlusLimitOk FifthAxisMiusLimitOk SixthAxisPlusLimitOk SixthAxisMinusLimitOk				AcornSix, Hickory
SeventhAxisPlusLimitOk SeventhAxisMinusLimitOk EighthAxisPlusLimitOk EighthAxisMinusLimitOk				Hickory
CarouselAtHome	Input used to sense if ATC carousel pot is in the home position.		All, Mill, ATC, Router	Hickory
CarouselPotIsDown	Input used to sense if ATC carousel pot is down. Typically used on swingarm style ATCs		All, Mill, Router, ATC	Hickory
CarouselPotIsUp	Input used to sense if ATC carousel pot is up. Typically used on swingarm style ATCs		All, Mill, Router, ATC	Hickory
DSPProbeTripped	Special Input for use with DSP type probes such as a DP-7. Do not used this input with any other type/mfg probe.		All, Mill, Lathe, Probe, Router	Hickory
SwingarmAtStop	Input signals that the ATC swingarm is at stop position. When Assigned, also requires ArmAtHome, ArmAtClamp, and SwingarmMotorEnable to be assigned as well.		All, Mill, Router, ATC	Hickory
SwingarmAtHome	Input signals that ATC swingarm is at home position. When Assigned, requires ArmAtStop, ArmAtClamp, and SwingarmMotorEnable to be assigned as well.		All, Mill, Router, ATC	Hickory

SwingarmAtClamp	Input signals that ATC swingarm is at clamp position. When Assigned, requires ArmAtStop, ArmAtHome, and SwingarmMotorEnable to be assigned as well.		All, Mill, Router, ATC	Hickory
SpindleChillerOk	Signal sent by spindle chiller that it is running normally. When assigned, requires SpindleChillerOut to be assigned as well.		All, Mill, Lathe, Router	Hickory
SpindleInverterOk	Input to indicate fault condition in the inverter/VFD.		All, Mill, Lathe, Router	Hickory
SpindleZeroSpeed	Input to indicate the spindle has stopped.		All, Mill, Lathe, Router	Hickory
OrientComplete	Input from the VFD indicating the spindle has oriented ready for tool change to continue.		All, Mill, Lathe, ATC, Router	Hickory
ToolClamped	Input to indicate the tool has been clamped.		All, Mill, Lathe, Router	Hickory
ToolUnclamped	Input to indicate the tool has been released.		All, Mill, Lathe, Router	Hickory
ToolRelease	Operator ATC tool release button input to activate the output “UnclampTool”.		All, Mill, Lathe, Router	Hickory

Outputs

Output Wizard Name	Description / Purpose	Related M-codes or Macros	Category	Platform
AbrakeRelease BbrakeRelease CbrakeRelease UbrakeRelease VbrakeRelease WbrakeRelease XbrakeRelease YbrakeRelease ZBrakeRelease	Outputs to release the axis brakes when motion starts and activate the brake when power is removed from that axis motor. See Hickory wiring diagrams for more info.		All	Hickory
AirBlow	Output to control (ON/OFF) the ATC air blow solenoid. Note: Activates automatically with UnclampTool.		All, Mill, Lathe, Router	Hickory
AugerDir	Output used to select the chip auger direction.		All, Mill, Router	Hickory
AugerEnable	Output used to enable the chip auger.		All, Mill, Router	Hickory
CarouselDir	Output used to select the ATC carousel direction.		All, Mill, ATC, Router	Hickory
CarouselEnable	Output used to enable the ATC carousel.		All, Mill, ATC, Router	Hickory
CarouselIn	Output used to activate the ATC carousel to move in toward the spindle.		All, Mill, ATC, Router	Hickory

CarouselOut	Output used to activate the ATC carousel to move away from the spindle.		All, Mill, ATC, Router	Hickory
ChipPumpOn	Output used to activate Wash Down. This pumps coolant into the machine to wash chips into the auger.		All, Mill, Router	Hickory
Crosshair Laser On	Output used to activate the Cross Hair aiming laser.		All, Router	Hickory
InverterResetOut	Output used to clear faults on the VFD.		All, Mill, Lathe, Router	Hickory
OrientRequest	Output to request the VFD to move spindle into orient position.		All, Mill, ATC, Lathe, Router	Hickory
SpindleDirection	Output used to toggle spindle direction.		All, Mill, Lathe, Router	Hickory
SpindleEnable	Output used to enable the spindle.		All, Mill, Lathe, Router	Hickory
AirBlowNozzle	Activates the general purpose Air Blow Nozzle Output.		All, Mill, Router	Acorn, AcornSix
SwingarmMotorEnable	Output used to enable the ATC swingarm motor. When Assigned, requires ArmAtStop, ArmAtHome, and ArmAtClamp to be assigned as well.	M13	All, Mill, Router, ATC	Hickory
ATC_CarouselForward	Output to control the ATC Carousel in the Forward direction so that it counts up in tools (1 > 2 > 3 > etc.)		All, ATC, Mill, Router	Acorn, AcornSix
ATC_CarouselIn	Output used to activate the ATC carousel to move in toward the spindle.		All, ATC, Mill, Router	Acorn, AcornSix
ATC_CarouselOut	Output used to activate the ATC carousel to move away from the spindle.		All, ATC, Mill, Router	Acorn, AcornSix

ATC_CarouselReverse	Output to command the ATC Carousel in the Reverse direction so that it counts down in tools (4 > 3 > 2 > etc.)		All, ATC, Mill, Router	Acorn, AcornSix
ATCAirBlowActivate	Output to control (ON/OFF) the ATC air blow solenoid. Note: Activates automatically with UnclampTool.	M15	All, Mill, Router	Acorn, AcornSix
AutoSquareRelayForHard Pair	Hardware Pairing Auto Squaring relay. This is an output used to disable the drive signal to the paired axis Master Axis drive. See the axis pairing documentation for more info and the hookup schematics. https://centroidcnc.com/centroid_diy/schematics/pbrowse.php?term=hardware		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
Axis1BrakeRelease Axis2BrakeRelease Axis3BrakeRelease Axis4BrakeRelease	Brake control output for an axis brake. Releases brake when axis motor power is enabled and applies the brake when axis motor enable is removed. When the axis is powered, the brake is released (Green). E-Stop/Fault applies the brake (Red). M93 releases the power (Brake ON, Red).		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
Axis5BrakeRelease Axis6BrakeRelease			All, Mill, Lathe, Router	AcornSix
CAxis Enable	Output used to enable the C-axis drive.		All, Lathe	Acorn, AcornSix
CarouselPotUp	Output used to move the ATC carousel pot up. When assigned, requires the input “CarouselPotIsUp” to be assigned as well.	M15	All, Mill, Router, ATC	Hickory
CarouselPotDown	Output used to move the ATC carousel pot down. When assigned, this output works in conjunction with the input CarouselPotIsDown. and is required to function.	M14	All, Mill, Router, ATC	Hickory

ChargePump	A signal that tells a G540 stepper drive that it is good to run and everything is ok. Charge pump is only available on Output number 3. Charge Pump Output used for legacy drives that require a charge pump signal to enable them.		All, Mill, Lathe, Router, Plasma	Acorn
CloseChuck	A relay output used to close a chuck (M11 on). It looks for ChuckIsClosed input or times out according to parameter 992 and then turns off relay. Parameter 992 is a timer (in ms) for Turnoff or Fault if the ChuckIsClose Input is selected. M11 Turns on CloseChuck. It turns off when the timer or Input is seen. M11 Turns off M10. See the related OpenChuck Output. See the Chuck Appendix attached to this document.	M11	All, Lathe	Acorn, AcornSix
CoolingFanOut	Output used to signal to spindle chiller fan to start. When Assigned, requires SpindleChillerOk and SpindleChillerOut to also be assigned.		All, Mill, Lathe, Router	Hickory
ColletOpenClose	An output typically used for the 5C collet open/close function. This output is typically used for a Dunham-style air-operated chuck. Note: Output and VCP button skinevent 74 uses OUT1130 for the LED. See the Chuck Appendix attached to this document.		All, Lathe	Acorn, AcornSix

CutOff	Output that controls a parts cutoff device commonly found on lathes (M27 on). Looks for CutOffIsDown input to close or times out according to parameter 995 and then turns off relay (M28 forces output off). Parameter 995 is a timer (in ms) for Turnoff or Fault if the Cutoffisdown Input is selected. M13 Turns on Cutoff. Waits for the input or timer and turns off Cutoff. M14 is an optional turnoff.		All, Lathe	Acorn, AcornSix
DriveResetOut	An output used to clear faults from a axis drive. CNC12 cycles this output when EStop or reset is cycled. The signal tells drive to reset and clear any faults. The Output is active (Green) when the physical E-Stop is depressed (E-Stop condition from the actual E-Stop Button Input). The Output is inactive (Red) when the physical E-Stop is released (E-Stop condition from the actual E-Stop Button Input). Requires a physical E-Stop Button to work. The Reset Button on the VCP is not an E-Stop Button.		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
DustCollectionOn	An output relay to turn on/off a dust collector contactor/relay (M35 on M36 off).	M35	All, Mill	Acorn, AcornSix
DustFootActivate	Output to control (ON/OFF) dust foot. Requires Macro M94/28 (Note: An example is contained in Centroid supplied M57 & M58 macros)		All, Router	Acorn, AcornSix
Flood	Flood pump on/off relay output (M8 on M9 off).	M8 Flood ON M9 Flood OFF	All, Mill, Lathe	Acorn, AcornSix, Hickory

G540SpinRevOff G540SpinFwdOff	Legacy G540 spindle control output (used when controlling the spindle through a G540). Not recommended. Instead use the G540 in “Drive Only” mode. See schematic S14979 for the recommended G540 hookup.		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
LaserAlignActivate	Output to control (on/off) cross-hair material alignment laser marking. Requires Macro, M94/29 (Note: An example is contained in Centroid supplied M57 & M58 macros)		All, Router	Acorn, AcornSix
LaserCooling_Fan	Output for use with a Laser Cooling Fan Turns on with M37 (LaserEnable)		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
Laser Deploy	Output to move the laser carriage into working position.		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
LaserEnable	Output to control the Safety Interlock Circuit of a diode laser, such as with a J-Tech diode laser. M37 - Enables safety interlock and resets the laser. M38 - Disables safety interlock after a delay to allow the component cool down. See Acorn to Laser schematics for typical use.		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
LaserReset	Output to send a reset signal to the Safety Interlock Circuit of a laser, such as with a J-Tech laser. Momentary output to reset the laser. See Acorn to Laser schematics for typical use.		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
LubePump	Output that controls an automatic lube pump (See parameter 179 for more info). See the Centroid CNC12 Operator’s Manual, Chapter 15 for information on Parameter 179 and how to change the way this output functions to match the type of lube pump being used.		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory

Mist	Mister solenoid on/off relay output (M7 on M9 off).	M7 Mist ON M9 Mist OFF	All, Mill, Lathe	Acorn, AcornSix, Hickory
NoFaultOut	Output signal from Acorn (to a drive Estop contactor etc.) indicating that Acorn is “okay” ready to run and is not in an Estop condition. Output is active when there are no Faults within the CNC System. This output is inactive during an E-Stop condition (which can be triggered by many things). Used to wire an E-Stop contactor so that the contactor will shut off high-power devices during an E-Stop condition. See Acorn system schematics for example wiring.		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
Ohmic Enable OhmicEnable	Third party ohmic sensor box support. Output that is used to connect the Ohmic signal to the CNC. Output that is used with Ohmic sensor boxes. Enables the Ohmic sensor box before the Torch Touch-off. See the Plasma Installation Manual for more info. See the relevant schematic and Plasma manual for hook-up and use.		All, Plasma	Acorn, AcornSix, Hickory
OpenChuck	A relay output used to open a chuck (M10 on). It looks for ChuckIsOpen input or times out according to parameter 992 and then turns off the relay. Parameter 992 is a timer (in ms) for Turnoff, or Fault if ChuckIsOpen Input is selected. M10 turns on OpenChuck, which turns off when the timer or input is seen. M10 Turns off M11. See the Chuck appendix attached to this document.	M10	All, Lathe	Acorn, AcornSix
OrientSpindle	Used to send output signal to orient card to go ahead and orient the spindle. M19 Turns on spindle orient Output and waits for the “SpindlesOriented” input to activate. M20 turns off the spindle orient Output.	M19	All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
Oscillation On	Output to turn on oscillation mode for use with a tangential knife		All, Mill, Router	Acorn, AcornSix

PartChute	Output that controls a parts catcher commonly found on lathes (M22 on). Looks for PartChuteIsIn input or times out according to parameter 994 and then turns off relay (M23 forces output off). Parameter 994 is a timer (in ms) for Turnoff, or Fault if PartChuteIsIn Input is selected. M22 Turns on Partchute, which turns off when the timer or input is seen. M23 is an optional turnoff.		All, Lathe	Acorn, AcornSix
PopUpPins	Output to control (ON/OFF) material alignment pins typically air solenoid. Requires Macro, M94 Note: An example is contained in Centroid supplied M57 & M58 macros P419 adding adding 2 will deactivate pop up pins with M3/4. This setting is also in the Acorn Wizard.		All, Router	Acorn, AcornSix, Hickory
PWM Output	Pulse Width Modulation Output for lasers and spindles PWM signal output. Note: For Acorn only: Only available on Output #2 DB25 connector Pin #14 and Relay 2 is sacrificial and must be disconnected and cannot be used when using PWM Output. See Laser Hookup schematics for typical use.		All, Mill, Lathe, Router, Plasma	Acorn
PWMSelect	Acorn Output used to select PWM for Laser or PWM for Spindle This Output is used to move the PWM signal from Spindle to Laser. See the Acorn to Laser schematics for typical use. Not necessary when using AcornSix or Hickory since they have multiple PWM outputs.		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
ReverseToolTurret	Output to reverse the direction of the tool turret, typically used with Lathe turrets.		All, ATC, Lathe	Acorn, AcornSix
RotateToolTurret	Output to control rotation ON/OFF of tool turret, typically used with Lathe turrets		All, ATC, Lathe	Acorn, AcornSix
RouterDustCollection	Output to control (ON/OFF) a Dust Collection motor through a relay or contactor. Works exactly like Flood, uses M8/M9 and uses same button on the VCP as Flood. Can't assign Flood and DustCollection at same time.	M8	All, Router	Acorn, AcornSix, Hickory

RouterVacuumHoldDown	Output to control (ON/OFF) a material Vacuum hold down pump. Works exactly like Mist, uses M7/M9 and uses same button on the VCP as Flood. Can't assign Mist and DustCollection at same time.	M7	All, Router	Acorn, AcornSix, Hickory
SafetyDoorLockOpen	Used to energize a lock solenoid to allow the safety door to be opened. See Acorn Door Interlock Safety documentation for more details. Energized when not running a job. If P985 = 1, will unlock door if feedhold and spindle is not on, If p985 = 2 only unlocks if no job in progress.		All, Safety, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory
Scribe On	Output to turn on a metal scribe, typically used to turn on a Plasma Air/motor vibrating scribe for metal marking.		All, Plasma	Acorn, AcornSix
SpindleBrakeRelease Spindle Brake Release	A relay output used to control a spindle brake. CNC12 applies the brake release when the spindle is commanded to run (M3 or M4). Brake is ON in all other cases. Pre-mapped to Aux 7 for operator convenience for manual tool changes that required the brake to be ON to prevent the spindle from turning during a manual tool change. Parameter #990 sets the delay timer in milliseconds. Default is 250 milliseconds (a quarter of a second)		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory
SpindleCooling	Output to control (on/off) spindle cooling typically a fan or water pump. Requires Macro, M94 (Note: *Example use in M55 & M56)*		All, Mill, Lathe, Router	Acorn, AcornSix
SpindleChillerOut	Output to signal the spindle chiller to start. When Assigned, requires SpindleChillerOk to be assigned as well.		All, Mill, Lathe, Router	Hickory
SpindleCooling_Fan SpindleCoolingFan	Output for use with a Spindle Cooling Fan, Turns on/off with Spindle		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory

SpinFWD	Relay output used to command spindle forward. Typically used with a VFD (or contactor/relay). See Acorn wiring schematics (M3 FWD M5 Off). SpinFWD works in conjunction with SpinRev. Alternative method is to use "VFDDirection". See Acorn wiring schematics for more details: Schematic S14983 vs. Schematic S15008	M3, M5	All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
SpinREV	Relay output used to command spindle reverse. Typically used with a VFD (or contactor/relay). See Acorn wiring schematics (M4 REV M5 Off). SpinFWD works in conjunction with SpinRev. Alternative method is to use "VFDDirection". . See Acorn wiring schematics for more details: Schematic S14983 vs. Schematic S15008	M4, M5	All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
TailStockInOut	Output that is typically used to activate air solenoid to move a Lathe TailStock In or Out. SPDT relay can be wired either way. M32 Turns on TailstockInOut, will stay on unless M33 is issued, even through resets and Faults	M32, M33	All, Lathe	Acorn, AcornSix
ToolRack In	Output to move a sliding Tool Rack In (Towards Spindle).		All, ATC, Mill, Router	Acorn, AcornSix, Hickory
ToolRack Out	Output to move a sliding Tool Rack Out (Away from Spindle).		All, ATC, Mill, Router	Acorn, AcornSix, Hickory
ToolTurretEnable	Output to enable the Tool Turret, typically a lathe turret.		All, ATC, Lathe	Acorn, AcornSix
TorchOn	Output to Turn Plasma Torch On Signal sent to Plasma cutter box to turn on the Plasma Arc. See Plasma schematics and installation manual for more info.		All, Plasma	Acorn, AcornSix, Hickory

TorchTouchDisconnect	Output to disconnect Torch Touch. See Plasma schematics and installation manual for more info.		All, Plasma	Acorn, AcornSix, Hickory
TurnClampOn	A relay output used to control a clamp (M10 on M11 off). Can also be used for a Spindle Clamp ON/OFF or any other general clamp use.	M10 Clamp ON M11 Clamp OFF	All, Mill, Router	Acorn, AcornSix, Hickory
UnclampTool	Output used to release the tool pull stud to release the tool from the spindle.	M15/M16	All, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory
VacuumOn	An output relay to turn on/off a vacuum hold down (M27 ON, M28 OFF). M27 activates Vacuum Output. M28 turns the Vacuum Output OFF.	M27/M28	All, Mill	Acorn, AcornSix, Hickory
VFDDirection	Industry standard way of commanding spindle VFD direction. The Output is activated when motor direction is commanded to reverse (M4). Allows a SPDT output relay to VFD connection (just like Allin1DC and Oak) to command the Spindle direction rather than having two dedicated relays when using the alternative SpinFwd and SpinRev outputs. . controlled by M3/4, VCP spindle CW/CCW buttons. See Wiring Schematics. Here is one example.	M3/M4/ M5	All, Mill, Lathe, Router, Plasma	Acorn, AcornSix

VFDEnable	Industry standard way of commanding spindle VFD enable. Output used to enable a VFD. Lets VFD know that it is good to go. Used in conjunction with VfdDirection. See schematics. Here is one example.	M3/M4/ M5	All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
VFDResetOut	Output used to reset a VFD after a fault. Output is Active (Green) with Physical E-Stop depressed (E-Stop condition from the actual E-Stop button input). Output is inactive (RED) when E-Stop is released. See schematic S15008.		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix
WorkLight	Output for a Worklight Starts On at Powerup Worklight defaults to ON when control is powered up, use the VCP worklight button to turn the work light ON and OFF. Controls for Worklight on startup are in the Acorn Wizard under CNC control preferences. (P419 adding 1 disables worklight on startup.)		All, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory
Output1	General Purpose output, can only be assigned to Output number with same number. User editable M-codes so it is easy to modify for any kind of use. M89 will turn off those outputs all at once	M61 activates Output1 M81 deactivates Output1	All, Custom	Acorn, AcornSix, Hickory
Output2		M62 activates Output2 M82 deactivates Output2		

Output3		M63 activates Output3 M83 deactivates Output3		
Output4		M64 activates Output4 M84 deactivates Output4		
Output5		M65 activates Output5 M85 deactivates Output5		
Output6		M66 activates Output6 M86 deactivates Output6		
Output7		M67 activates Output7 M87 deactivates Output7		
Output8		M68 activates Output8 M88		

			deactivates Output8		
GreenLight	Output for a Green Light on a Light Stack. Parameter 890 toggles the lights from being solid to flashing when activated. P890=1 Solid when activated P890=0 Blinking when activated GreenLight is on when the job is in progress with no faults.			All, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory
AmberLight	Output for an Amber Light on a Light Stack. Parameter 890 toggles the lights from being solid to flashing when activated. P890=1 Solid when activated P890=0 Blinking when activated AmberLight is on when no job is in progress with no faults (machine in idle).			All, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory
RedLight	Output for a Red Light on a Light Stack. Parameter 890 toggles the lights from being solid to flashing when activated. P890=1 Solid when activated P890=0 Blinking when activated RedLight is on when the machine is in fault condition.			All, Mill, Lathe, Router, Plasma	Acorn, AcornSix, Hickory

M94M955111	General purpose outputs, for use by power users that wish to activate any output within a custom Mcode using the M94 (output ON) and M95 (Output Off) commands. For example: Set M94M955111 to an output using the Acorn Wizard. For this example let's set it to output 8. Then to turn on output 8 use the M94 (output ON) m code in a custom macro like this. M94/11; this will turn on output 8 G4 P2; wait 2 seconds M95/111; this will turn off output 8 Example two: set M94M955120 to Output 36 on the Ether1616 output menu using the Acorn Wizard. This is one way to use it in a custom macro. M94/120; this will turn on Output 36 G4 P2; wait 2 seconds M95/120; this will turn off Output 36	General purpose outputs, for use by power users that wish to activate any output within a custom Mcode using the M94 (output ON) and M95 (Output Off) commands. For example: Set M94M955111 to an output using the Acorn Wizard. For this example let's set it to output 8. Then to turn on output 8 use the M94 (output ON) m code in a custom macro like this. M94/11; this will turn on output 8 G4 P2; wait 2 seconds M95/111; this will turn off output 8 Example two: set M94M955120 to Output 36 on the Ether1616 output menu using the Acorn Wizard. This is one way to use it in a custom macro. M94/120; this will turn on Output 36 G4 P2; wait 2 seconds M95/120; this will turn off Output 36 M94/111 turns on the output that "M94955111" is assigned to. M95/111 turn off the output that "M94955111" is assigned to.		Custom	Acorn, AcornSix

	M94/111 turns on the output that “M94955111” is assigned to. M95/111 turn off the output that “M94955111” is assigned to.				
M94M955112	M94/112 turns on the output that “M94955112” is assigned to. M95/112 turn off the output that “M94955112” is assigned to.	M94/112 turns on the output that “M94955112” is assigned to. M95/112 turn off the output that “M94955112” is assigned to.		Custom	Acorn, AcornSix
M94M955113	Etc.	Etc.		Custom	Acorn, AcornSix
M94M955114				Custom	Acorn, AcornSix
M94M955115				Custom	Acorn, AcornSix
M94M955116				Custom	Acorn, AcornSix
M94M955117				Custom	Acorn, AcornSix
M94M955118				Custom	Acorn, AcornSix
M94M955119		M94/112 turns on the output that “M94955112” is assigned to. M95/112 turn off the output that “M94955112” is assigned to.		Custom	Acorn, AcornSix
M94M955120		Etc.		Custom	Acorn, AcornSix
M94M955121				Custom	Acorn, AcornSix
M94M955122				Custom	Acorn, AcornSix

M94M955123				Custom	Acorn, AcornSix
M94M955124				Custom	Acorn, AcornSix
M94M955125		General purpose outputs, for use by power users that wish to activate any output within a custom Mcode using the M94 (output ON) and M95 (Output Off) commands. For example: Set M94M955111 to an output using the Acorn Wizard. For this example let's set it to output 8. Then to turn on output 8 use the M94 (output ON) m code in a custom macro like this. M94/11; this will turn on output 8 G4 P2; wait 2 seconds M95/111; this will turn off output 8 Example two: set M94M955120 to Output 36 on the Ether1616 output menu using the Acorn Wizard. This is one way to use it in a custom macro. M94/120; this will turn on Output 36 G4 P2; wait 2 seconds M95/120; this will turn off Output 36 M94/111 turns on the output that "M94955111" is assigned to. M95/111 turn off the output that "M94955111" is assigned to.		Custom	Acorn, AcornSix
M94M955126		M94/112 turns on the output that "M94955112" is assigned to. M95/112 turn off the output that "M94955112" is assigned to.		Custom	Acorn, AcornSix

Centroid Supplied Macros located in the \system\ folder

Park.mac	User editable machine tool parking macro that is used when shutting down the machine for the day. Allows user to override the default park behavior with any customization necessary. With Acorn Typically park is used to return the machine tool to the home position when using “Simple Home” (M26) or very close to the home position so homing out the next morning is fast and easy. Editable from the Acorn Wizard or in the ‘system’ folder. The macro contains examples of typical park scenarios in the macro itself, open it to see them. Custom Parking Macro F10 - Shutdown Menu > F1 - Park		Acorn, AcornSix, Hickory
cncm.hom	Mill Machine tool homing program located in \cncm directory, Acorn Wizard will auto generate based on settings		Acorn, AcornSix, Hickory
cnct.hom	Lathe Machine tool homing program located in \cnct directory, Acorn Wizard will auto generate based on settings		Acorn, AcornSix, Hickory
cncr.hom	Router Machine tool homing program located in \cncr directory, Acorn Wizard will auto generate based on settings		Acorn, AcornSix, Hickory
artic_wall_follow.cnc	Radial Wall Following digitizing for articulating head machines 5 Axis Macro		
atan2.cnc	Finds the angle between two points Helper macro for other macros		all
Axis_Calibration.cnc	Calculates the "Overall Turns Ratio" for Each Axis. VCP > Utils Macro		Acorn, AcornSix,
bound_dig_pass.cnc	Single Boundary Digitizing Pass Boundary Digitizing		all
check_home_status.cnc	Check to Ensure axes are homed Helper Macro for other Macros		all
com_stress_test.cnc	Communications Stress Test: Checks that the connection between the CNCPC and CNC Control Board is stable VCP > Utils > Option 2		all

correct_position.cnc	Convert a 5 axis vector into 3d space for Articulated Head Helper Macro for 5 Axis		all
correct_position_a.cnc	Compensates for tool center point offset from A-Axis center of rotation Helper Macro for 5 Axis		all
correct_position_b.cnc	Compensates for tool center point offset from B-Axis center of rotation Helper Macro for 5 Axis		all
create-straight-rotary-artic-head-lookup-tables.cnc	Generate an artic-head-lut.txt file for a B axis with Magnescale scale. This file is used as input for the calibration routines to generate a tilt.tab Helper Macro for 5 Axis		all
goto_machine_xy_zero.cnc	Move to XY Home Position VCP > GOTO XY HOME		all
goto_machine_xyz_zero.cnc	Move to XYZ Home Position VCP > GOTO XYZ HOME		all
goto_part_xy_zero.cnc	Goto Work Coordinate XY0 VCP > GOTO WCS XY0		all
grid_digitize.cnc	Vertical wall following digitizing Unused.		all
home_machine_cycle.cnc	Runs Homing Routine for Mill/Lathe/Router/Plasma VCP > Set XYZ Home		all
homing_relay_square.cnc	Homing Macro for Hard Wired Paired Axis with Disable Relay. Call written to cncm.hom when using Hardware Paired Axis and Auto Squaring		all
move_primitive.cnc	Move and handle cases where some axes are disabled Helper macro for other macros		all
MPGmacro1.mac	User Customizable Macro for WMPG Macro Button 1 WMPG > Macro 1 Button		all
MPGmacro2.mac	User Customizable Macro for WMPG Macro Button 2 WMPG > Macro 2 Button		all
MPGmacro3.mac	User Customizable Macro for WMPG Macro Button 3 WMPG > Macro 3 Button		all
MPGmacro4.mac	User Customizable Macro for WMPG Macro Button 4 WMPG > Macro 4 Button		all
part_zero_auto_z.cnc	CNC12 Part Zero Auto Measure for 3rd Axis		all
perform_park.cnc	Will call park.mac macro based on parameter 413		all

	VCP > Park		
perform_spindle_warmup.cnc	Spindle Warm up Macro VCP > Spindle Warm Up		all
perform_tool_change.cnc	Tool Change Request from a CNC12 Menu Router: F5 - Tool/ATC > F7 - Change Tool		all
probe_angle.cnc	Probe to find an Angle Router: F1 - Set Part Zeros > F3 - Probe > F8 - Find Angle		all
probe_bore.cnc	Probe to find the center of a bore Router: F1 - Set Part Zeros > F3 - Probe > F1 - Bore		all
probe_boss.cnc	Probe to find the center of a boss Router: F1 - Set Part Zeros > F3 - Probe > F2 - Boss		all
probe_center_inside.cnc	Probe to find the center in the specified axis inside of a hole, bore, or slot Called by probe_bore.cnc and probe_cycles_select.cnc		all
probe_center_outside.cnc	Probe to find the center in the specified axis around a boss or web Called by probe_boss.cnc and probe_cycles_select.cnc		all
probe_check_configuration.cnc	Perform Various Checks to ensure Probe is configured properly Called by probe_stylus_calibration.cnc and tool_offset_auto_measure.cnc		all
probe_clearance_traverse.cnc	Maneuver over an object (like a boss or web) Helper Macro for moving probe		all
probe_clearance_traverse_across_and_down.cnc	Maneuver over an object (like a boss or web) Helper Macro for moving probe		all
probe_comp_two_points_on_a_line.cnc	Compensate by the probe radius for two points on a line Helper Macro for other macros		all
probe_cycles_select.cnc	Select the probing macro to call based on input Called by most probing cycles (Bore, Boss, Probe CSR)		all
probe_get_constants.cnc	Set up some constant values before calling probing routines Helper Macros		all
probe_get_modals.cnc	Set up some modal values before calling probing routines Helper Macros		all
probe_inside_corner.cnc	Probe to find an inside corner Router: F1 - Set Part Zeros > F3 - Probe > F5 - Inside Corner		all
probe_limit_position.cnc	Limit a destination to the travel limit or to the probe search distance Helper Macro for Probing, called by		all

	probe_clearance_traverse_across_and_down.cnc and probe_outside_coner.cnc		
probe_move.cnc	A generic 3 axis probing move which handles the differences between probe types Helper Macro for Probing, called by most Probe Macros		all
probe_move_p0.cnc	A generic 3 axis probing move which handles the differences between probe types		all
probe_move_to_intersection.cnc	Find the intersection and move the probe there Helper Macro for Probing, called by probe_outside_corner.cnc and probe_inside_corner.cnc		all
probe_move_to_surface.cnc	Move the probe to a surface Helper Macro for Probing, called by tool_offset_auto_measure.cnc and tool_offset_set_z_ref.cnc		all
probe_move_to_surface_p0.cnc	move the probe to a surface		all
probe_outside_corner.cnc	Probe to find an outside corner Router: F1 - Set Part Zeros > F3 - Probe > F6 - Outside Corner		all
probe_protected_move.cnc	Make a protected probe move Helper Macro for Probing, called by most Probing Macros		all
probe_pull_back.cnc	Pull back after a probing move Helper Macro for Probing, called by probe_move.cnc		all
probe_step_over.cnc	Step over in a digitizing macro Helper Macro for Probing, called by Digitizing (wall_following.cnc, vertical_wall_follow.cnc, and grid_digitize.cnc		all
probe_stylus_calibration.cnc	Performs Bore cycle to determine stylus size. VCP - Utils > Option 4 ~OR~ Router: F1 - Set Part Zeros > F3 - Probe > F10 - Stylus Calibration		all
probe_tt1_move.cnc	A generic 3 axis probing move which handles the differences between probe types Helper Macro for Probing, called by probe_move_to_surface.cnc		all
probe_tt1_move_p0.cnc	A generic 3 axis probing move which handles the differences between probe types		all
probe_two_points_on_wall.cnc	Probe two points along a wall Helper Macro for Probing, called by probe_outside_corner.cnc		all
probe_user_vars.txt	Text file to store variables for probes		all

probe_write_point_to_file.cnc	Write a point to the currently open data file Helper Macro for Probing, called by Digitizing (grid_digitize.cnc, vertical_wall_follow.cnc, wall_following.cnc)		all
rotate_b_position.cnc	Rotate a given position around the b-axis center of rotation, by the angle given Helper Macro for other Macros		all
rotate_vector.cnc	Rotate a vector by an angle given. Helper Macro for other Macros		all
rotate_vector_b.cnc	Rotate a vector by an angle given, around the B-Axis Helper Macro for other Macros		all
scale_vector.cnc	Scale a vector from an input length to a required length Helper Macro for other Macros		all
select_laser_macros.cnc	Select Laser Macro Operation VCP > Laser Macros		all
set_laser_csr.cnc	Laser Orient CSR Macro VCP > Laser CSR		all
set_laser_xy.cnc	Set XY zero location using Laser Alignment cross hairs VCP > Set Laser XY		all
set_part_all_zero.cnc	Set Work Coordinate of all axes at Current Location VCP > Set All0		all
set_part_axis_zero.cnc	Set Work Coordinate of specified axes at Current Location VCP > Set Axis0		all
set_part_x_zero.cnc	Set Work Coordinate X0 at Current Location VCP > Set X0		all
set_part_xy_zero.cnc	Set Work Coordinate XY0 at Current Location VCP > Set XY0		all
set_part_y_zero.cnc	Set Work Coordinate Y0 at Current Location VCP > Set Y0		all
set_part_z_zero.cnc	Set Work Coordinate Z0 at Current Location VCP > Set Z0		all
set_tool_number.cnc	Allows operator to easily set the Tool Number when manually changing tools VCP > Set Tool		all
setup_defines.cnc	Setup Variable Defines for Macros Helper Macro for other macros		all

setup_key_defines.cnc	Setup Key Defines to make M222 Key Presses easier to read Helper Macro for other macros		all
spindlebenchtest.cnc	Tests analog output for the spindle.		all
system_user_vars.txt	Text file to store user variables.		all
tool_library_tool_change.cnc	Tool Change Request from Tool Library Menu F5 – Tool/ATC > F8 – Tool Library > F7 – Change Tool		all
tool_offset_auto_measure.cnc	Auto Measure Tool from Tool Offset Menu F5 - Tool/ATC > F3 - Auto Measure		all
tool_offset_man_measure.cnc	Manual Measure Tool from Tool Offset Menu F5 - Tool/ATC > F3 - Manual Measure		all
tool_offset_set_z_ref.cnc	Set Z Ref from Tool Offset Menu F5 - Tool/ATC > F1 - Z Ref		all
tool_offset_tool_change.cnc	Tool Change Request from Tool Offset Menu F5 - Tool/ATC > F7 - Change Tool		all
touch_plate_auto_set_csr.cnc	Select Touch Plate Set CSR Cycle to Call Router Only: F1 - Set Part Zeros > F4 - Plate > F7 - Set CSR Angle		all
touch_plate_auto_z_zero.cnc	Set WCS Z0 with Touch Plate Router Only: F1 - Set Part Zeros > F4 - Plate > F5 - Z Only		all
touch_plate_cycles_inside_corner.cnc	Inside Corner Touch Plate Cycles Router Only: F1 - Set Part Zeros > F4 - Plate > F2 - Corner		all
touch_plate_cycles_inside_side.cnc	Inside Side Touch Plate Cycles Router Only: F1 - Set Part Zeros > F4 - Plate > F3 - Side		all
touch_plate_cycles_outside_corner.cnc	Outside Corner Touch Plate Cycles Router Only: F1 - Set Part Zeros > F4 - Plate > F2 - Corner		all
touch_plate_cycles_outside_side.cnc	Outside Side Touch Plate Cycles Router Only: F1 - Set Part Zeros > F4 - Plate > F3 - Side		all
touch_plate_cycles_select.cnc	Select Touch Plate Cycle to Call		all

	Router Only: Helper Macro called by other touch plate macros		
touch_plate_get_variables.cnc	Setup Variables for Touch Plate Macros Router Only: Helper Macro called by other touch plate macros		all
touch_plate_move.cnc	Generalized Probing Move Command for Touch Plate Macros Router Only: Helper Macro called by other touch plate macros		all
touch_plate_move_p0.cnc	Generalized Probing Move Command for Touch Plate Macros.		all
tt_check_configuration.cnc	Check to ensure TT is correctly configured before use Called by system before allowing Tool Touch Off device use		all
utility.cnc	CNC Control Utility: This macro is provided by Centroid as a home to put common CNC control utilities under one button on the VCP. VCP > Utils		all
vertical_wall_follow.cnc	Vertical wall following digitizing Unused.		all
wall_following.cnc	Wall following / surface following digitizing routine for XY plane Router > F7 - Utility Menu > F9 - Digitizing > F8 - Wall Following		all
Notes: “RouterDustCollection (M8)” can not be used with “Flood (M8)” at the same time. DustCollectionOn (M35) CAN be used with “Flood (M8)” at the same time. “RouterVacuumHoldDown (M7)” can not be used with “Mist (M7)” at the same time. VacuumOn (M33) CAN be used with “Mist (M7)” at the same time. VfdDirection (M3/M4) can not be used in conjunction with SpinFWD (M3), SpinREV (M4), G540SpinRevOff, G540SpinFwdOff outputs, see schematics for proper hookups and use Refer to the CNC12 Mill and Lathe Operator manuals for more details and example of M codes https://www.centroidcnc.com/centroid_diy/centroid_manuals.html			

Centroid Supplied Macros	Description, located in c:\cncm (mill) , c:\cncr (router), c:\cnct (lathe), c:\cncp (plasma)	Typical use
M3	Spindle CW	Mill, Lathe, Router
M3	Torch On	Plasma
M4	Spindle CCW	Mill, Lathe, Router
M5	Spindle OFF	Mill, Lathe, Router
M5	Torch Off	Plasma
M6	Tool Change. If no custom mfuncm6.mac exists, then the CNC12 default M6 is used.	Mill, Router
M7	Mist, Refer to the CNC12 Mill and Lathe Operator Manuals for more details on this M-code RouterVacuumHoldDown ON	Mill, Lathe, Router
M8	Flood, Refer to the CNC12 Mill and Lathe Operator Manuals for more details on this M-code RouterDustCollection ON	Mill, Lathe, Router
M9	Mist and Flood OFF, Refer to the CNC12 Mill and Lathe Operator Manuals for more details on this M-code RouterDustCollection and RouterVacuumHoldDown OFF	Mill, Lathe, Router
M10	Mill: SET ClampOn Lathe: SET ChuckOpen, RST ChuckClose	Mill, Lathe, Router
M11	Mill: RST ClampOn Lathe: RST ChuckOpen, SET ChuckClose	Mill, Lathe, Router
M13	Cutoff Tool ON	Mill, Router
M14	Cutoff Tool OFF	Mill, Router
M15	Tool unclamp macro	Mill, Router
M16	Tool clamp macro	Mill, Router
M18	ATC Initialization	Mill, Router
M19	Spindle Orientation Macro	Mill, Router

M20	Turn Spindle Orientation Off Macro	Mill, Router
M21	Chip Pump On	Mill
M22	Chip Pump Off	Mill
M22	PartChuteIn macro	Lathe
M23	Turn off PartchuteIn macro	Lathe
M27	VacuumOn macro	Mill, Router
M28	Turn OFF the VacuumOn macro	Mill, Router
M32	Turn on TailStockInOut	Lathe
M31	Auger Forward	Mill
M32	Auger Reverse	Mill
M33	Auger Off	Mill
M33	Turn off TailStockIn, Turn on TailStockOut	Lathe
M34	Unused Macro and Available for customization	
M35	DustCollection On	Mill, Router
M36	Turn off DustCollection	Mill, Router
M37	LaserEnable	Mill, Router
M38	LaserReset	Mill, Router
M41	Selects Low Range Gear	Mill, Lathe, Router
M42	Selects Med Range Gear	Mill, Lathe, Router
M42	Selects Med Low Range Gear	Mill, Lathe, Router
M43	Selects High Range Gear	Mill, Lathe, Router

M43	Selects Med Range Gear	Mill, Lathe, Router
M44	Selects High Range Gear	Mill, Lathe, Router
M50	Carousel Index Plus	Mill
M50	C-Axis Disable	Lathe
M51	Carousel Index Minus	Mill
M51	C-Axis Enable	Lathe
M51	Unused macro and Available for customization	Router, Plasma
M52	Unused macro and Available for customization	
M53	Unused macro and Available for customization	
M54	Unused macro and Available for customization	
M55 (mfunc55.mac)	Unused macro and Available for customization	
M56	Unused macro and Available for customization	
M57	Unused macro and Available for customization	
M58	Unused macro and Available for customization	
M59	Reset Home Position, pre mapped to VCP Aux 12 “Reset Home” , runs macro to reset home without have to reboot the machine tool.	
M61	Use Acorn Wizard i/o map to set Acorn Output 1 = to "OUTPUT1" then this macro (M61) will turn on that output	
M61	Torch Cycle Start	Plasma
M62	Use Acorn Wizard i/o map to set Acorn Output 2 = to "OUTPUT2" then this macro (M62) will turn on that output	
M62	Torch Cycle End	Plasma
M63	Use Acorn Wizard i/o map to set Acorn Output 3 = to "OUTPUT3" then this macro (M63) will turn on that output	

M63	Torch Cycle Start without Pierce Cycle	Plasma
M64	Use Acorn Wizard i/o map to set Acorn Output 4 = to "OUTPUT4" then this macro (M64) will turn on that output	
M64	Torch Marking Cycle	Plasma
M65	Use Acorn Wizard i/o map to set Acorn Output 5 = to "OUTPUT5" then this macro (M65) will turn on that output	
M65	Load Plasma Cutting Profile	Plasma
M66	Use Acorn Wizard i/o map to set Acorn Output 6 = to "OUTPUT6" then this macro (M66) will turn on that output	
M67	Use Acorn Wizard i/o map to set Acorn Output 7 = to "OUTPUT7" then this macro (M67) will turn on that output	
M68	Use Acorn Wizard i/o map to set Acorn Output 8 = to "OUTPUT8" then this macro (M68) will turn on that output	
M69	Move all axes to machine Zero	
M70	Sets an axis to zero	
M71	Axes Home Tripped Check (Used in Paired Axes Auto Squaring)	
M72	3rd Axis Homing (Used in Paired Axes Auto Squaring)	
M73	Independent Axis Homing (Used in Paired Axes Auto Squaring)	
M74	Paired Axes Auto Home/Squaring (Used in Paired Axes Auto Squaring)	
M75	Pair Axes (Used in Paired Axes Auto Squaring)	
M80	Carousel In	Mill, Router
M81	Carousel Out	Mill, Router
M81	Use Acorn Wizard i/o map to set Acorn Output 1 = to "OUTPUT1" then this macro (M81) will turn OFF that output	
M82	Use Acorn Wizard i/o map to set Acorn Output 2 = to "OUTPUT2" then this macro (M82) will turn OFF that output	

M83	Use Acorn Wizard i/o map to set Acorn Output 3 = to "OUTPUT3" then this macro (M83) will turn OFF that output	
M84	Use Acorn Wizard i/o map to set Acorn Output 4 = to "OUTPUT4" then this macro (M84) will turn OFF that output	
M85	Use Acorn Wizard i/o map to set Acorn Output 5 = to "OUTPUT5" then this macro (M85) will turn OFF that output	
M86	Use Acorn Wizard i/o map to set Acorn Output 6 = to "OUTPUT6" then this macro (M86) will turn OFF that output	
M87	Use Acorn Wizard i/o map to set Acorn Output 7 = to "OUTPUT7" then this macro (M87) will turn OFF that output	
M88	Use Acorn Wizard i/o map to set Acorn Output 8 = to "OUTPUT8" then this macro (M88) will turn OFF that output	

Acorn Lathe Chuck and Collect Functionality Appendix. CNC12 Lathe v4.59+

1.) Air operated Collet Systems: “Dunham” style https://www.dunhamtool.com/air-closers/

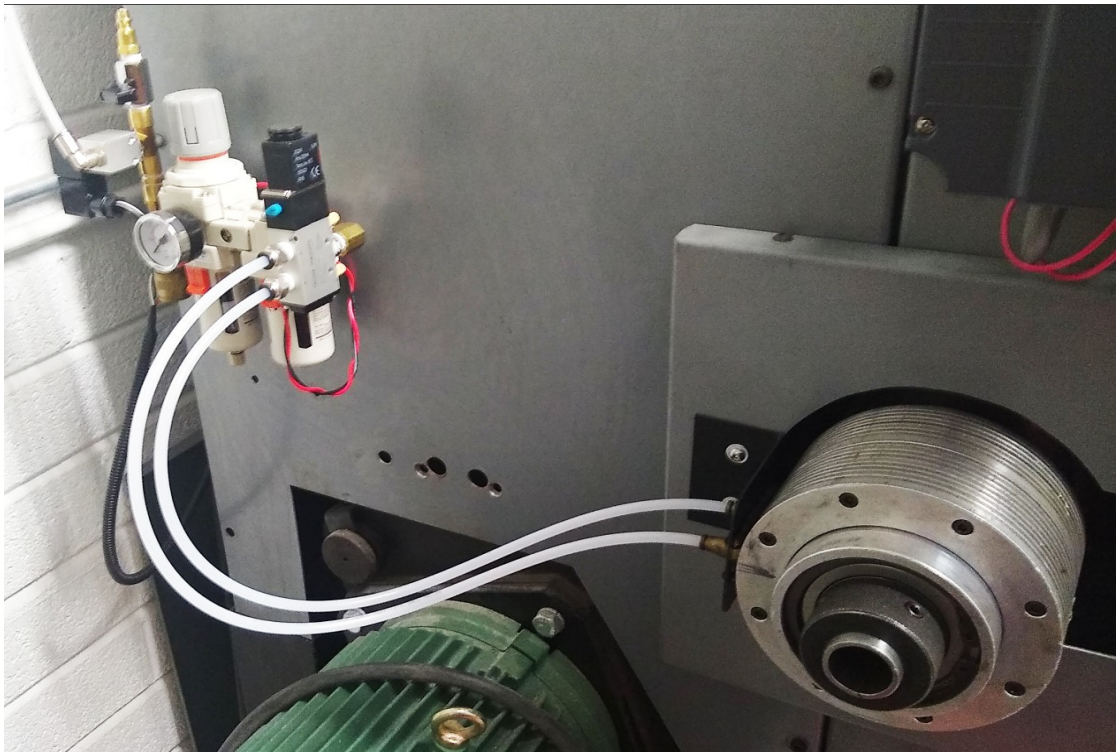
Discussion: Air operated collet systems typically have two air lines going to either side of a piston to actuate the collet chuck. Air pressure to one air line (one side of the piston) closes the chuck. Air pressure to the other air line (the other side of the piston) opens the chuck. Typically only one single pull double throw air solenoid is used and that solenoid requires only one Output from the Acorn.

An “Collet Open/Close” button on VCP is a toggle button that toggles the Collet Open Close output to the opposite state. (ON or OFF) The VCP Collet Open Close button is “spindle interlocked” and is disabled when spindle in ON.

The “Collet Open Close” output can also be activated by a foot pedal Acorn input. The Foot pedal is just like the VCP button, it toggles the Collet Open Close output from open to close or close to open each time you depress the foot pedal. Foot pedal functionality is deactivated when spindle in ON. Foot Pedal works with or without a “Collet Open/Close” VCP button

M10 will also activate the “Collet Open Close” output. M11 deactivates the “Collet Open Close” output.

An optional LowAirPressure input indicates to CNC12 that the Air pressure is absent or too low to activate the collet closer and CNC12 will not allow a job to run until the Low Air Pressure warning has been cleared.



2.) Hydraulic Chuck:

A common Hydraulic chuck configuration has two hydraulic lines going to the chuck. One line opens the chuck the other closes the chuck. Typically there are two solenoids controlled by dedicated outputs. The Acorn CNC setup Wizard calls these outputs 'OpenChuck' and 'CloseChuck'.

The Open Chuck button on VCP activates the Open Chuck output for a user specified amount of time in milliseconds and is specified by editing parameter #992. The VCP Close Chuck button activates the Close Chuck output for a user specified amount of time typically milliseconds and is parameter #992. The VCP button is Spindle Interlocked so that when the spindle is ON the VCP buttons do not function. Also when the timer is running the spindle will not turn on until timer is finished. Timers are typically required with hydraulic chucks so the chuck clamps at a consistent force and so solenoids do not over heat. Note: Typically hydraulic chucks do not require the solenoid to be on to hold the part the hydraulic pressure holds when the solenoid valve is closed.

The Open Chuck and Close Chuck output can also be activated by the foot pedal Acorn input. The single Foot pedal toggles between open and closed each time users steps on it. Example: Step on pedal and that activates the Chuck Close output for a user specified amount of time (in milliseconds and is parameter #992), Step on the foot pedal again and the Foot Pedal activates Chuck Open for a user specified amount of time (in milliseconds and is parameter #992) Foot pedal functionality is interlocked with the spindle and is deactivated when spindle in ON. Also, spindle will not turn on until the timers are finished. Foot Pedal works with or without a the Chuck Open and Chuck Closed VCP buttons

M10 will also activates the "OpenChuck" output for the users specified amount of time. M11 activates the "CloseChuck" output for the users specified amount of time.

An optional LowPressure input indicates to CNC12 that the pressure is absent or too low to activate the collet closer and CNC12 will not allow a job to run until the Low Pressure warning has been cleared.

Notes.

A common design for a two-position two-coil solenoid valve is to have detents in each position.

Even though the power to the coil may be turned off, the valve shuttle remains in its last position, and pressure continues to be applied in that direction (as long as the hydraulic pump continues to run).

A less-common design is a three-position, two-coil valve with springs that return the shuttle to a center, all-ports-blocked position when power is removed from the coil. A valve like that would cease providing pressure when power is removed. That would be useful for a hydraulic slide with a jogging action (one that you can stop at any intermediate position); but it would be a poor choice for a hydraulic chuck actuator.

Compare diagrams 'B' and 'C' on the second page of this document:
https://cdn.automationdirect.com/static/specs/nitradirectionsolenoidavs5.pdf
Those are pneumatic solenoid valves, but the same principles apply to hydraulic ones.

If your parts haven't flown out of the chuck since you enabled the shut-off timer, then your valve is almost certainly as shown in diagram 'B'.

Note: These two stock methods (chuck and collet) of controlling a Lathe part holding are provided for your convenience and are the most common and typical way of controlling a CNC chuck