Acorn Plasma CNC Controller: A Plasma CNC controller Hardware and Software kit.

A do-it-yourself 4 axis CNC control board for use with Plasma CNC machines and related special applications.

The Centroid Acorn CNC controller is a 4 axis step and direction CNC control board with built-in Motion Control CPU, PLC with 8 optically isolated inputs and 8 relay outputs, High Speed Torch voltage closed loop feedback and four axis drive interface connections. Acorn runs in conjunction with Centroid CNC12 CNC control software on a Windows PC that meets the Centroid minimum CNC PC requirements and communicates though a reliable Ethernet connection.

Touch Screen Enabled Centroid CNC12 Software

Sitara™ ARM® Processors — TEXAS INSTRUMENTS

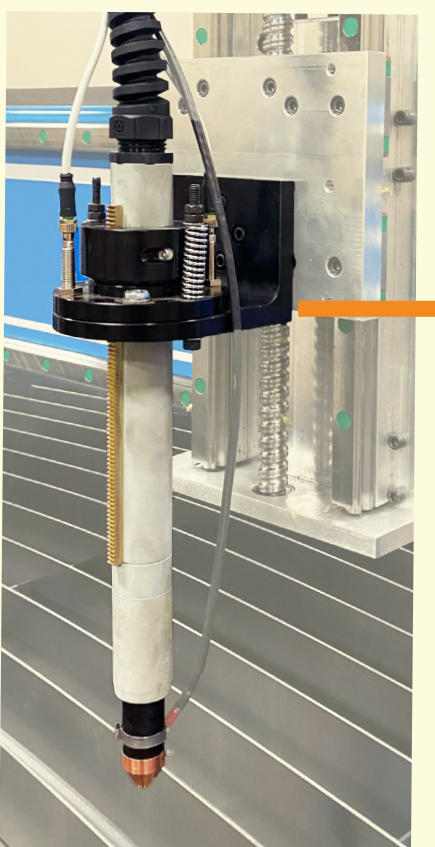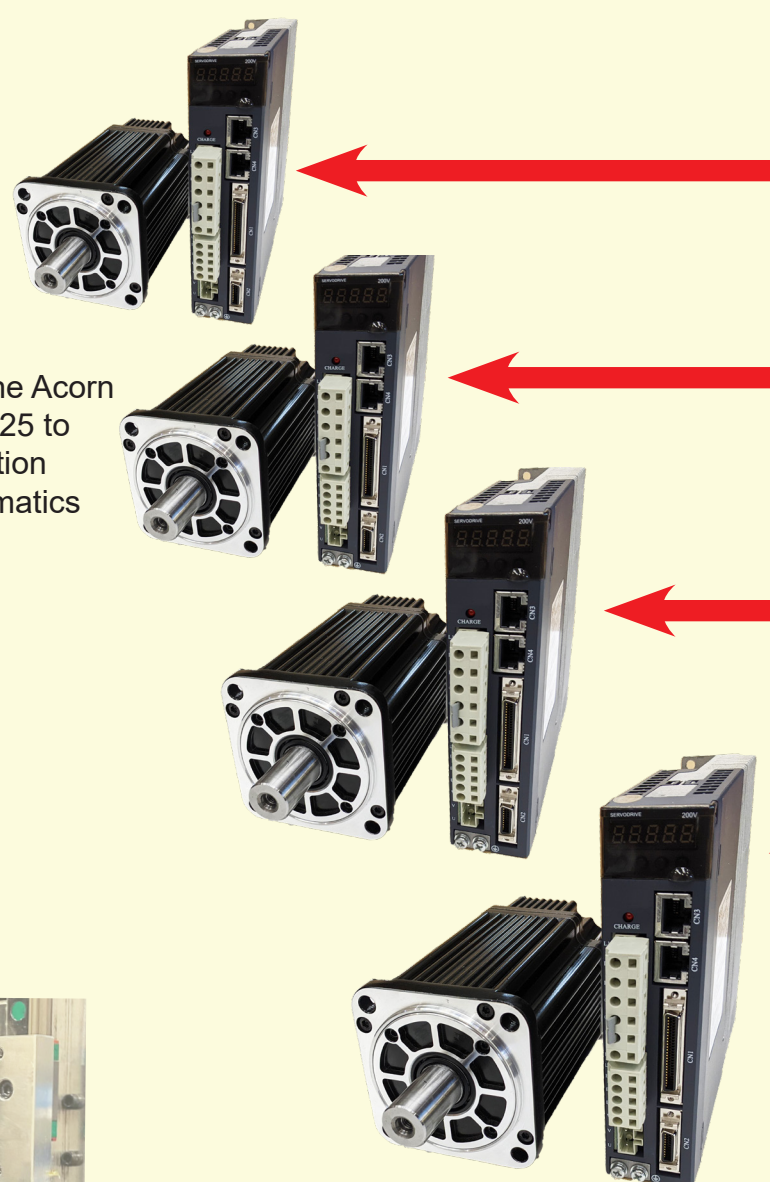### On-board Motion Control CPU

Acorn contains its own on-board Motion Control CPU, the AM335x 1gHz ARM Cortex A8 processor which generates reliable smooth motion pulses to the motors. Acorn does not rely on the Windows PC CPU for time critical motion control, inputs, outputs or other machine functions. This results in a rock solid CNC control that does not hiccup or get bogged down by Windows interfering with the motion.

8 Relay Outputs for devices controlled by the Acorn PLC, add-on up to 56in/56out

Command and control larger Relays, Contactors, Solenoids, etc..
Common examples: Air Solenoids, Water pumps, Lube Pumps, Dust collection, Estop contactors, etc. Outputs are controlled by M-codes, PLC and/or the operator control panel and are user configurable.
Add up to 56 in and 56 out with the Acorn Ether1616 add on I/O board!

Ethernet Communication

World Power
Accepts 50/60 Hz
100-120 or 200-240 VAC

24 VDC logic power supply

Reliable Ethernet communication between the CNC PC and the Acorn CNC control board. Most Windows 10/11 PC's that meet the Centroid minimum performance requirements can be utilized with the Acorn CNC controller. The on-screen Virtual Control Panel is user configurable and allows individual customization and control over operator button functionality, color, text size and placement. The Centroid Acorn Plasma CNC software is provided in three levels, "Plasma Free", "Plasma Pro" and "Plasma Ultimate". All levels include the Centroid Material Profile Manager for easy management of Plasma settings for individual materials, Restart Mode, Closed loop THC operation, THC configuration menu and much more see web page for details.

Control Stepper Motors and/or Servo Motors
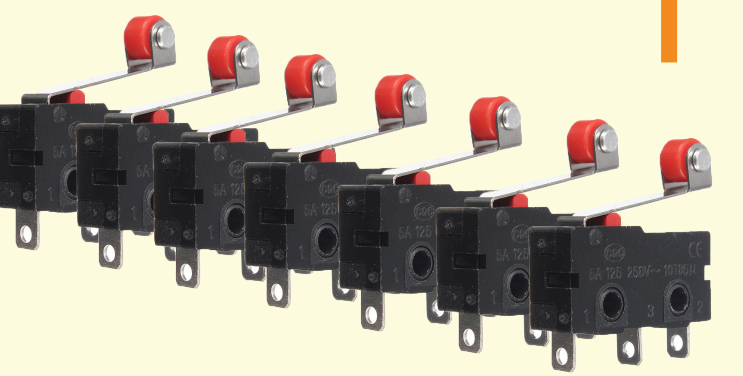**Step and Direction Drive Interface for Four Axes**

Run most any axis motor drive that accepts step and direction.

For example: Gecko, Teco, Estun, Yaskawa, Teknic ClearPath-SD, DMM, Delta, Leadshine and many others. Up to 4 axes.

Maximum compatibly!
Depending on drive input type use the Acorn header connections or the Acorn DB25 to command drives with step and direction signal. See the Acorn Hookup Schematics for guidance.
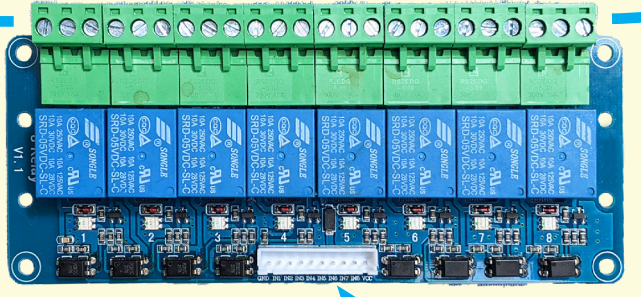
Optional Plasma Wireless MPG CNC Control Pendant
Allows the operator to conveniently and precisely run the machine remotely.

Acorn CNC

THC Fiber Optic Isolation

Torch Voltage

Torch Touch Off Ohmic/Conductive

Torch Collision

Torch Float

Digital Torch Voltage

Eight user configurable optically Isolated Inputs for Float Head switch, Breakaway switch and other sensor inputs to the Acorn PLC.

Serial cable
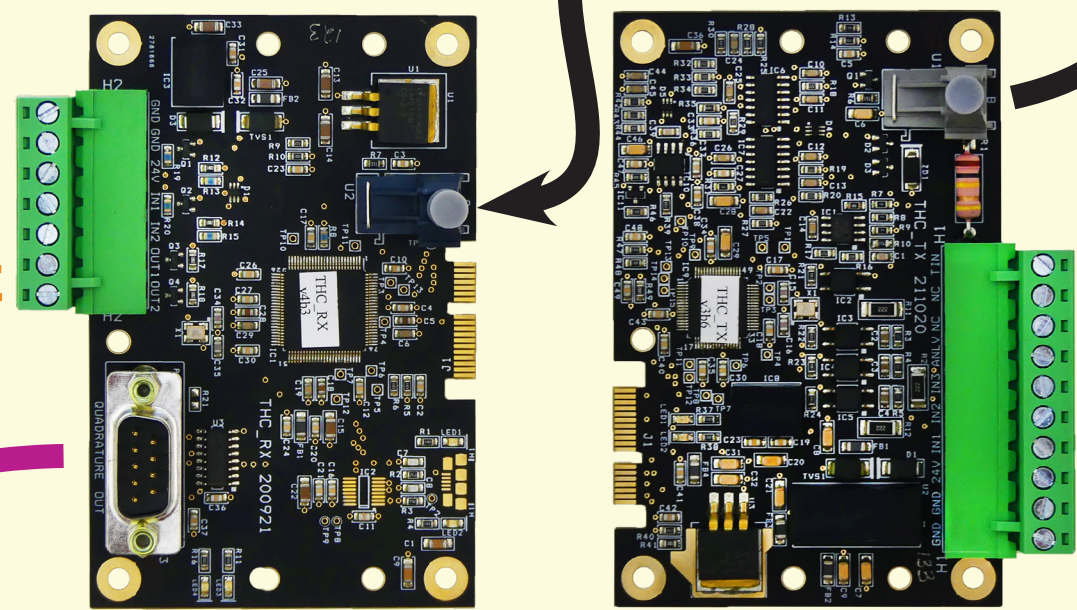
THC RX   CENTROID THC   THC TX

Designed for stepper drivers the Acorn DB25 connector has 5VDC TTL Line driver step and direction output for up to four stepper drivers. In addition the Acorn DB25 signal pinout locations are software configurable to easily match existing drive cable pinouts for no soldering connection to legacy stepper drive cable connections.
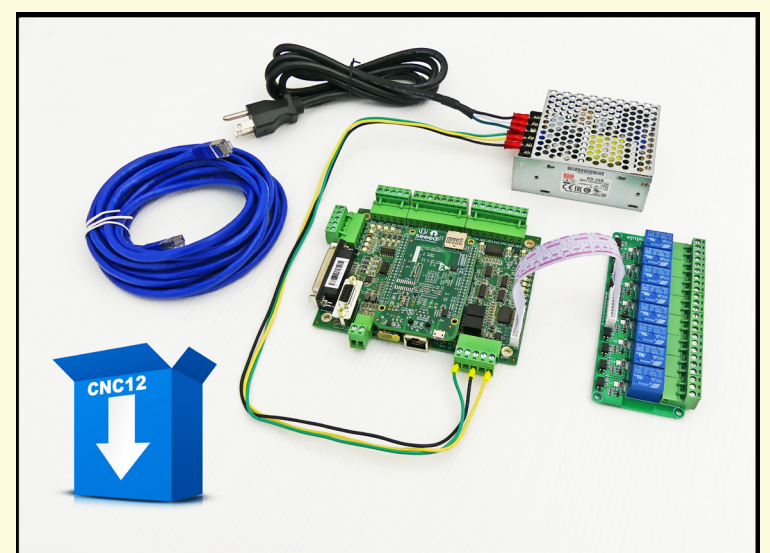
CENTROID'S THC consists of two printed circuit boards. The THC TX board is connected to the Plasma unit's arc voltage output, the Arc voltage information is then passed through Centroid's fiber optic communication technology to the THC RX board which then in turn passes the Arc Voltage information digitally via Acorn's CNC control High Speed Encoder port with a 4000 times per second position update rate.

Centroid's CNC12 software then employs its proven CNC PID loop technology to "Close the Loop" between the Z axis position (Torch Height) and the arc voltage. CNC12 reads the height of the Torch from the real time data being fed into the high speed encoder port and instantly reacts to adjust the Torch height on the fly to hold the arc voltage at the commanded value.

24 VDC logic power supply

Acorn CNC controller kit (part# 14455)
Centroid Acorn CNC controller kit includes:
- Acorn CNC control board
- 24 VDC logic power supply
- Plug and Play Relay 8 board w/ cable
- Logic power supply hookup leads
- 110 VAC power cord
- 15' Shielded Ethernet cable
- Centroid Free CNC software

Acorn CNC Software Levels
- Centroid "Plasma Free"
- Centroid "Plasma Pro"
- Centroid "Plasma Ultimate"

Inputs for switches and sensors such as home and limit switches, proximity switches, low water, low lube switch, drive fault, float head, breakaway/collision sensor and many other uses.
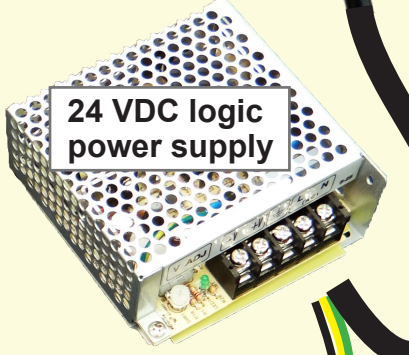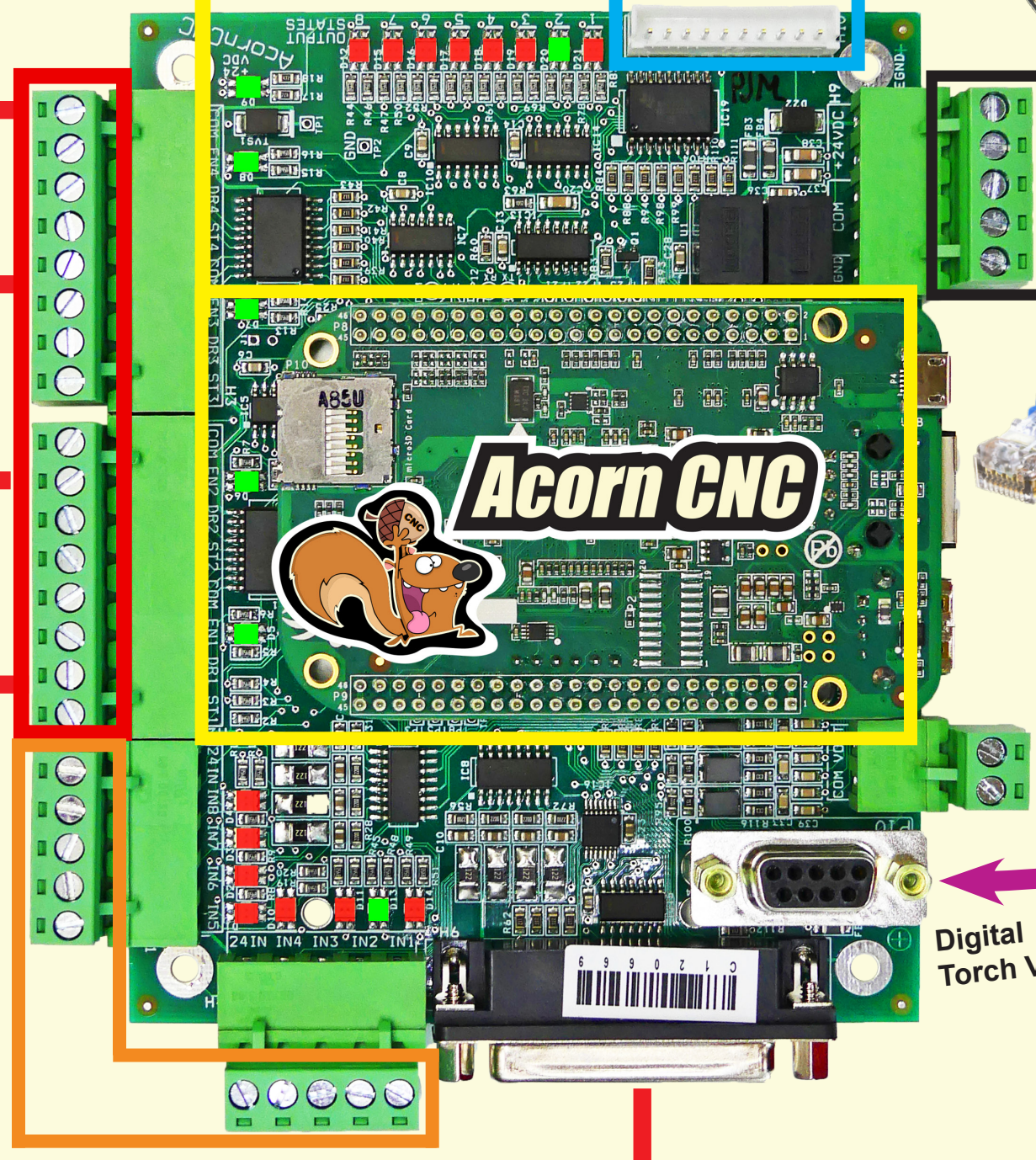
Acorn CNC THC kit (part# 15149)
Centroid Acorn CNC controller kit includes:
- THC RX and TX control boards
- 24 VDC logic power supply
- 5' Fiber Optic Cable
- Logic power supply hookup leads
- 110 VAC power cord
- 18" Shielded Encoder cable

CENTROID™

159 Gates Road, Howard, PA 16841 USA
www.centroidcnc.com

The Acorn Plasma CNC controller provides pro level performance with real time Closed Loop THC control.

Centroid's Torch Height Controller provides real time closed loop operation between the Arc Voltage and the Torch Height.
The THC continuously reads the arc voltage and relays that information to the Acorn controller via Acorn's high speed serial port.
Acorn's CNC12 plasma software reads the Arc voltage and adjusts the Z axis position to maintain the Torch target voltage on the fly closing the loop between the Torch Voltage and the Torch Height.

Acorn automatically adjust the Z axis position to hold the specified Target Voltage for the best possible cuts.

Torch Height

Time

Voltage

Target Voltage Maintained

Time

Closed Loop PID THC