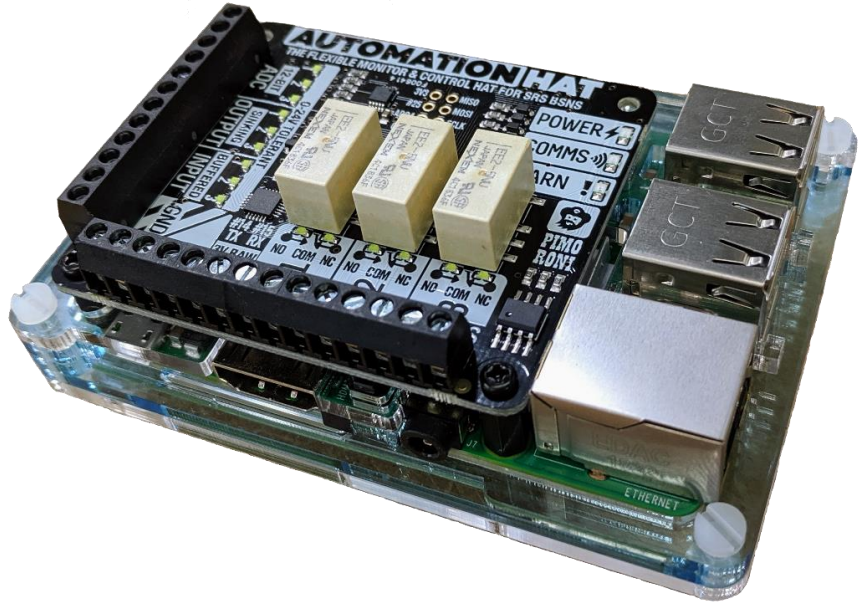
VERSA BUILT ROBOTICS



VersaBuilt Robotics Robot2CNC

Why Robot2CNC?

VersaBuilt Robotics Robot2CNC provides a simple and easy way to communicate with CNCs.

This communication kit provides the ability to run any program on a CNC, cycle start the CNC, and check to see if the program completed successfully.

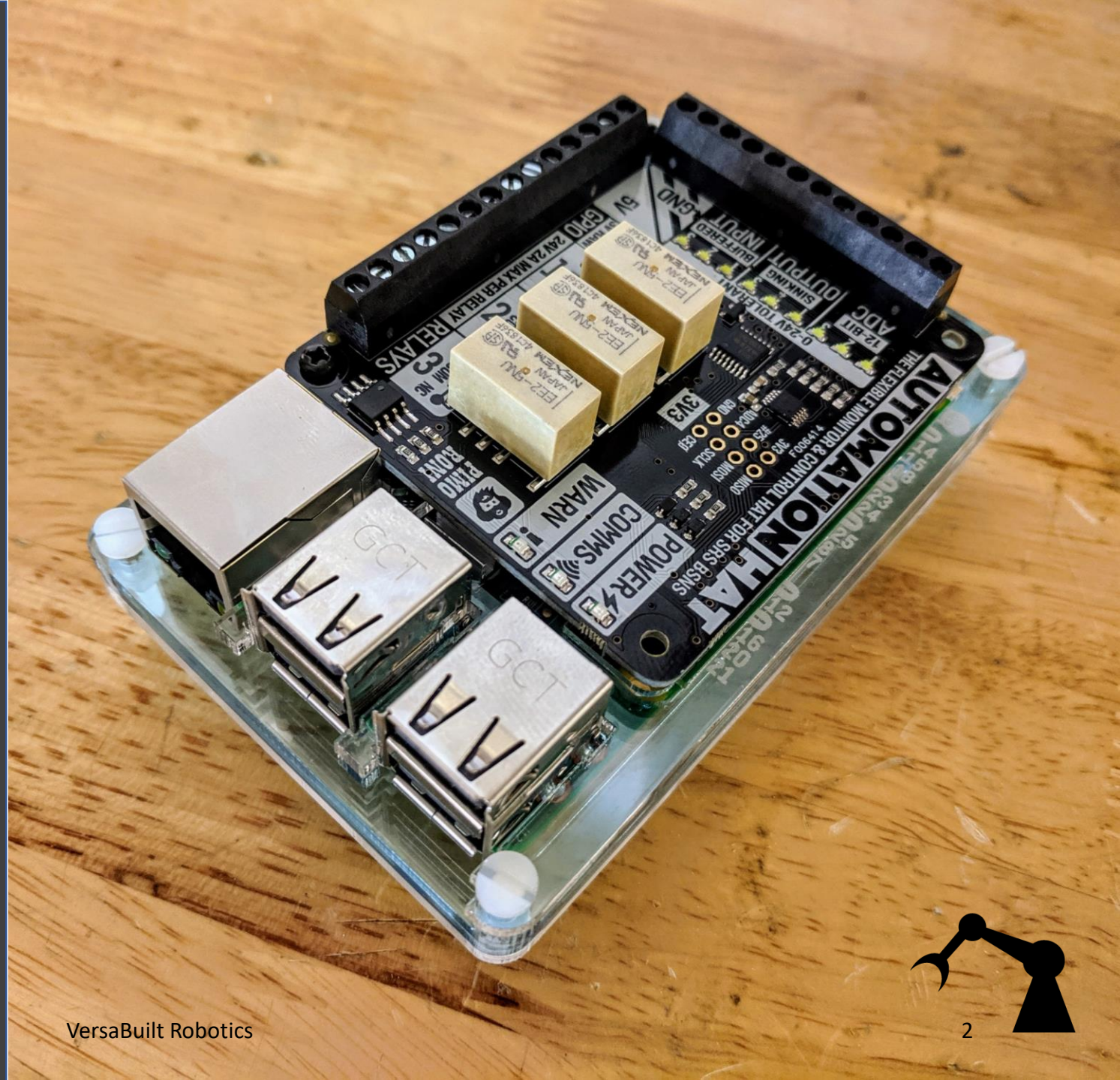
The Robot2CNC allows testing robot and CNC independently to enable easy proving out of automated processes.

The value this kit provides to a programmer:

- Enables creation of robot programs based on a part number (or dynamically) to easily change between different types of parts
- Enables running multiple operations on a single part
- Enables other programs to run as commanded by the robot (wash program or table load program)

The value this kit provides to an installer:

- Simple installation
- Isolated testing
- Defined API
- Compatible across multiple brands of CNCs



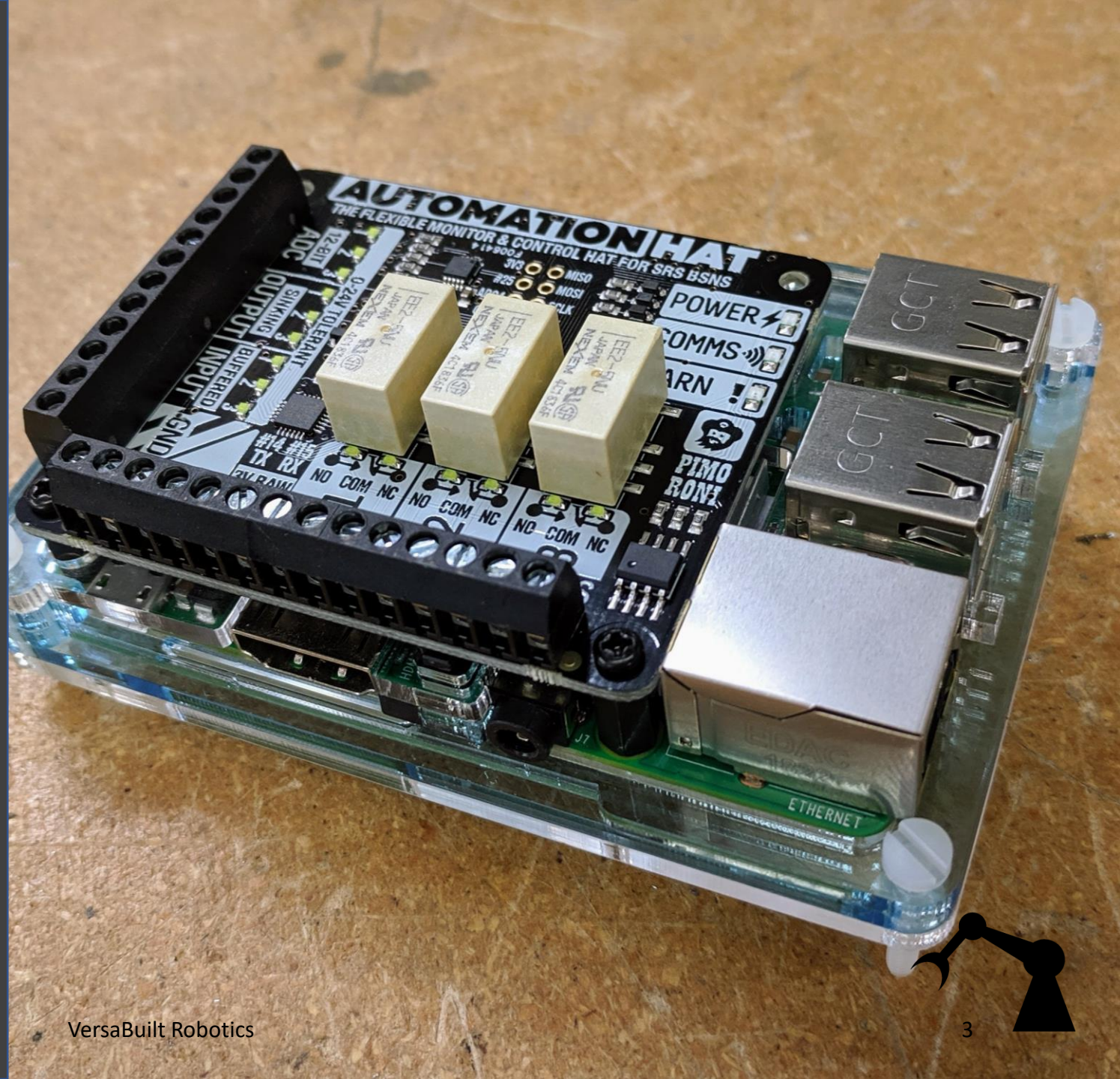
Overview

The VersaBuilt Robotics Robot2CNC provides a simple, consistent and reliable way to communicate and control a CNC from a robot

The Robot2CNC is a small computer that mounts inside the CNC cabinet and communicates with the robot via an ethernet connection and small pieces of software loaded onto the robot and the CNC

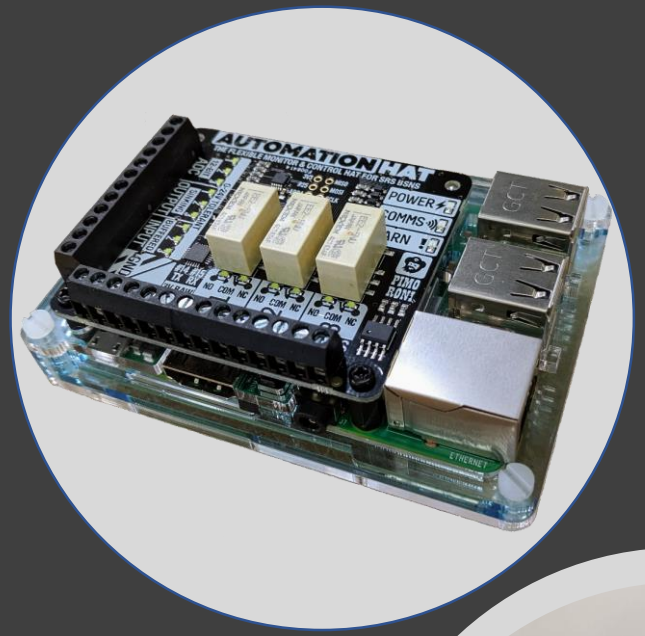
Robot2CNC allows execution of any program stored on the CNC machine

Robot2CNC maintains the CNC's safety interlock features



In The Box

- Robot2CNC Appliance
- USB Flash Drive with:
  - Software for CNC
  - Manuals
  - Software for Robot
- Ethernet Cable for communication between robot and Robot2CNC
- CNC specific communication cables and connectors
  - Ethernet to USB
  - Serial to USB
- Wiring for cycle start connection



Steps

Connect

- Ethernet Cable from robot to Robot2CNC
- CNC specific cables and wiring between Robot2CNC and CNC
- Browser to Robot2CNC

Install

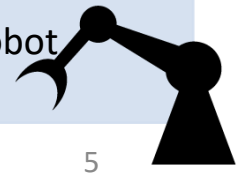
- Software on CNC Controller and configure settings
- Software on robot

Configure

- Network settings
- CNC communication settings

Operate

- Send commands from robot to Robot2CNC
- Receive responses from the Robot2CNC to the robot



Connect

Robot and CNC

Cycle Start Relay

Browser

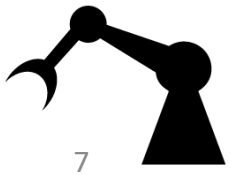
Connect Robot to Robot2CNC

For more information on the steps required to connect your robot to the Robot2CNC, please refer the setup manual for your specific robot make and model

Using the published API, any robot can be configured to use the Robot2CNC appliance allowing the Robot2CNC to handle the CNC specific communication

As of August 2019 VersaBuilt Robotics has release software for the following robots:

Universal Robots

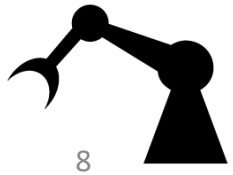


Connect CNC to Robot2CNC

For more information on the steps required to connect your CNC to the Robot2CNC, please refer the setup manual for your specific CNC make and model

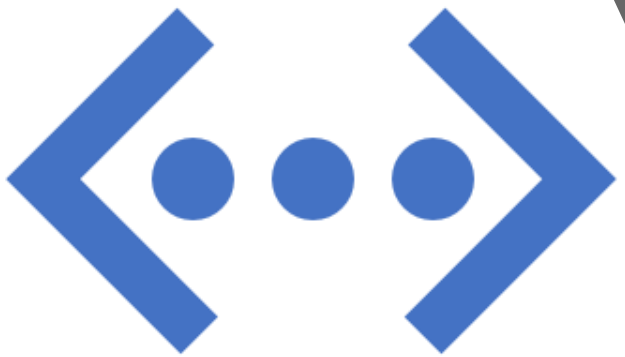
Current Models Supported:

- Haas Legacy CNCs (mills and lathes)
- Haas NGC CNCs (mills and lathes)
- CNCs with Fanuc Focus 2.0 Controllers
- Okuma CNC with P300 Controllers (mills)



Connect to the Robot2CNC

1. Plug in the provided power supply to power on the Robot2CNC
2. Using a device with Wi-Fi capabilities, connect to the Robot2CNC's Wi-Fi network based on serial number
   - Network: VBRxxxxx
   - Password: versabuilt
3. Using a laptop or pc web browser
   - Visit the following URL: 192.168.4.1:9001
4. This should connect you to the Robot2CNC Welcome page



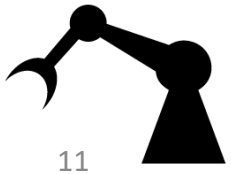
Install

Software on Robot
and CNC Controller

Install and Configure your Robot

For more information on the steps required, please refer the setup manual for your specific robot make and model

Obtain the appropriate manual from the provided VersaBuilt Robotics USB Thumb Drive or visit www.versabuilt.com/pages/resources



Install and Configure your CNC

For more information on the steps required, please refer the setup manual for your specific CNC make and model

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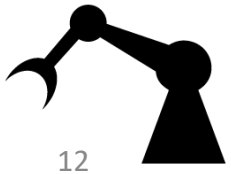
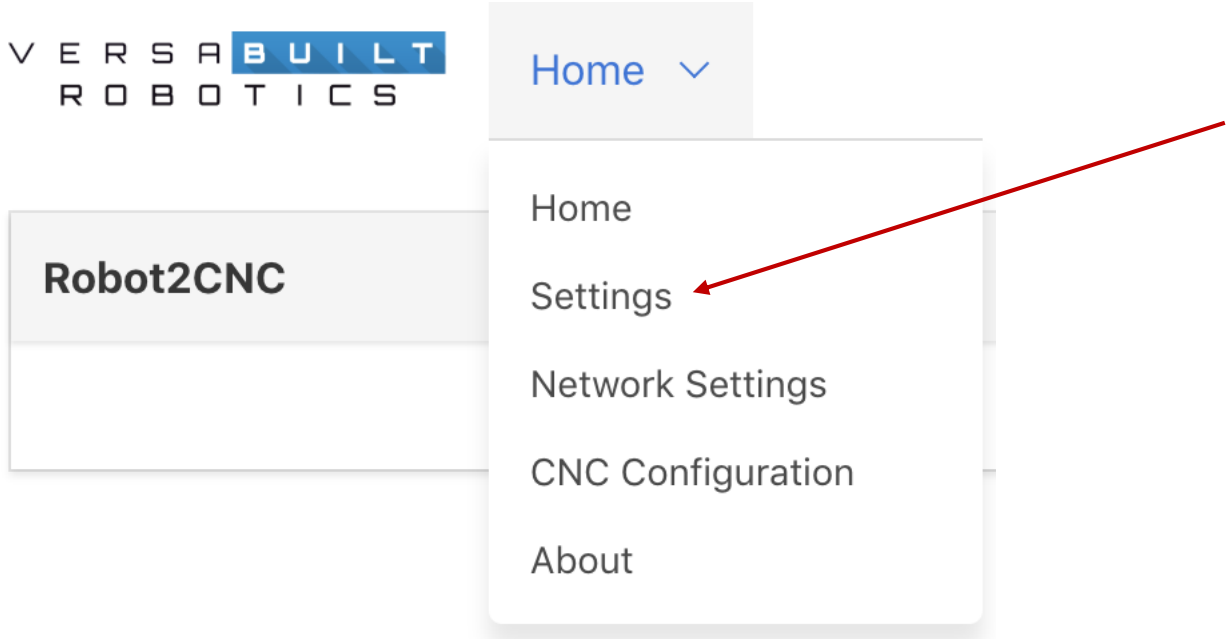


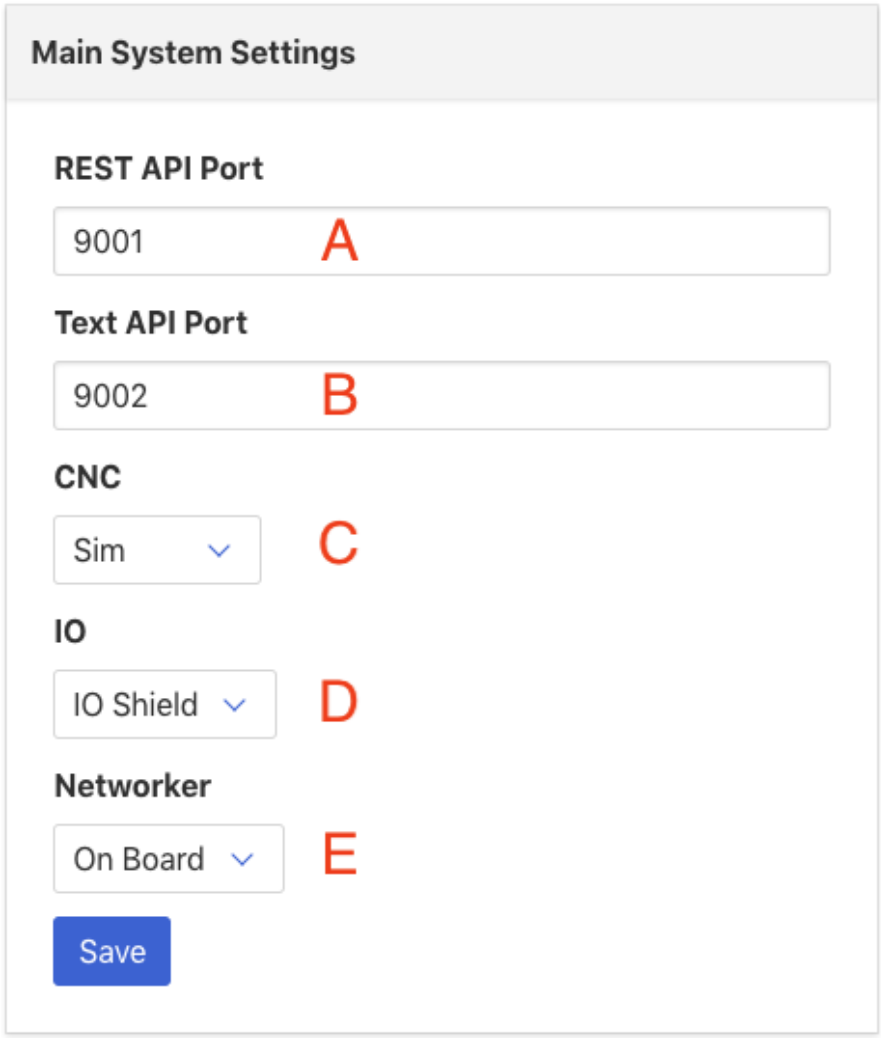
Configure

Robot2CNC settings

Robot2CNC Settings

- Once connected to the Robot2CNC, use the menu in the upper left side to select the **Settings** page





Main System Settings

A. REST API Port
   - Allows the change of the REST API port if desired

B. Text API Port
   - Allows the change of the Text API port if desired

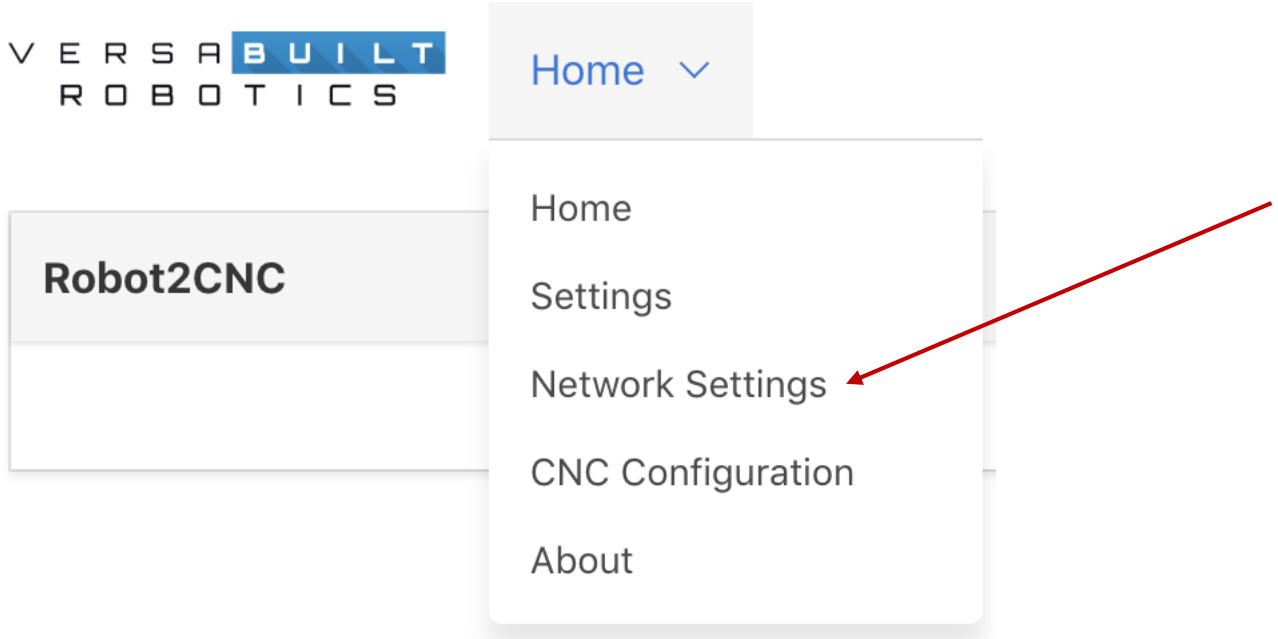
C. CNC Selection
   - Allows selection of CNC including Sim mode for testing

D. IO Selection
   - Allows selection of Sim mode for testing purposes

E. Networker Selection
   - Allows selection of Sim mode for testing purposes

Network Settings

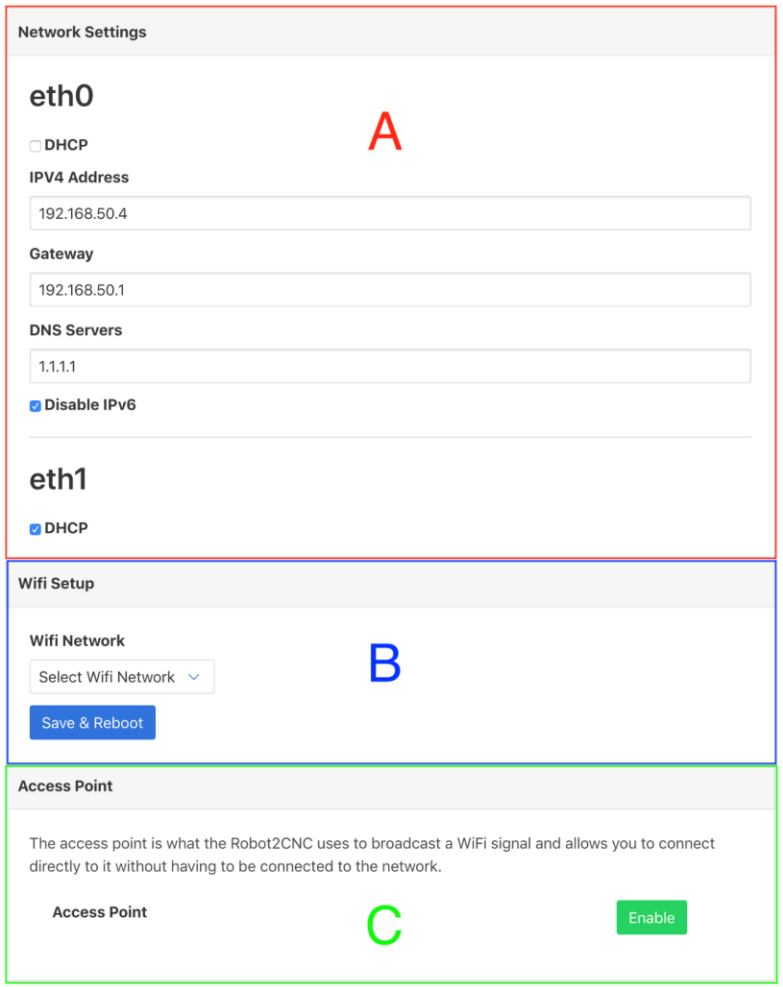
- Once connected to the Robot2CNC, use the menu in the upper left side to select the **Network Settings** page



Network Settings

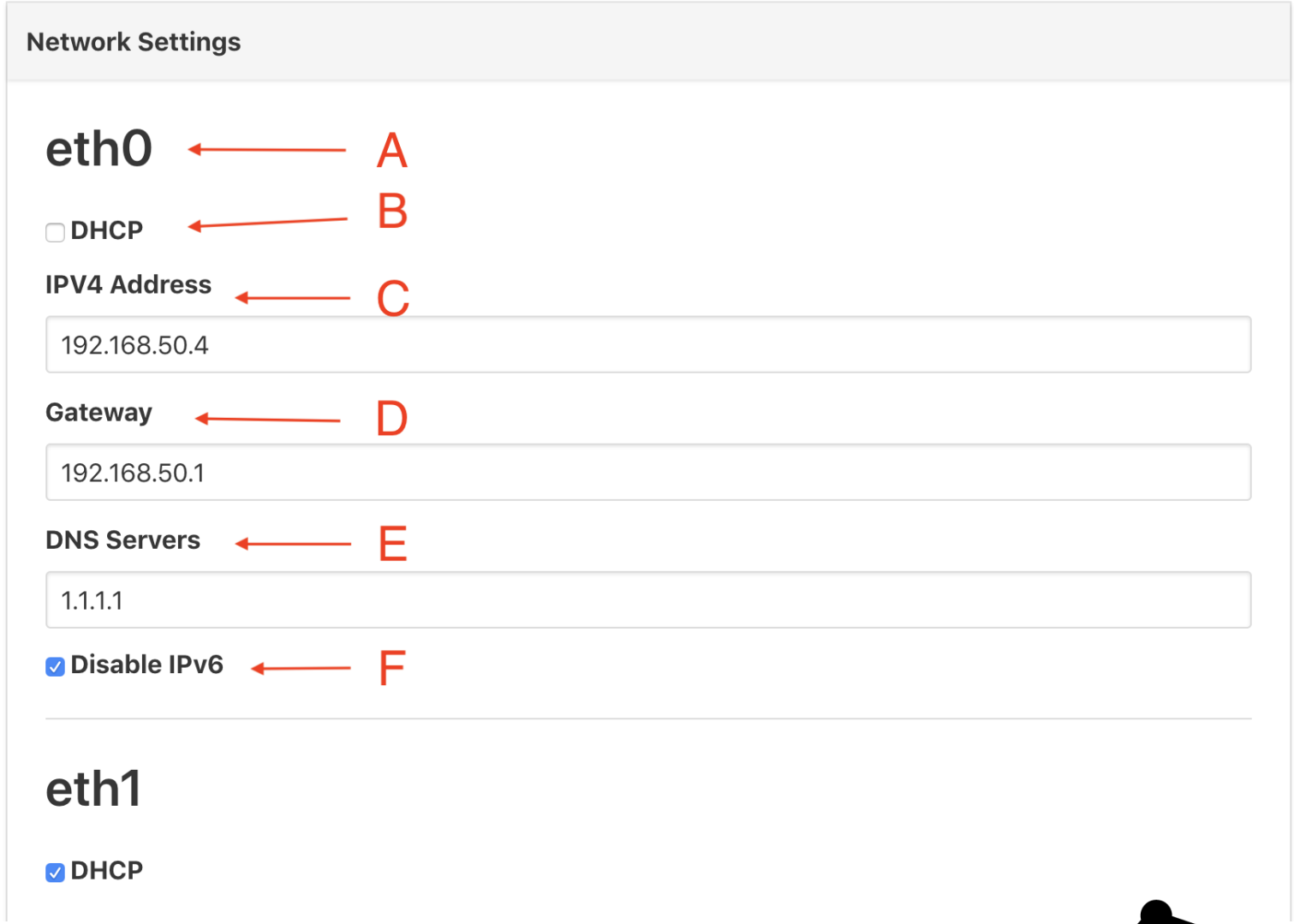
The Network Settings page has the following sections

A. Network Settings – Configure ethernet connections
B. Wi-Fi Setup – Connect to Wi-Fi network
C. Access Point – Enable or Disable Access Point
D. Current Network Settings



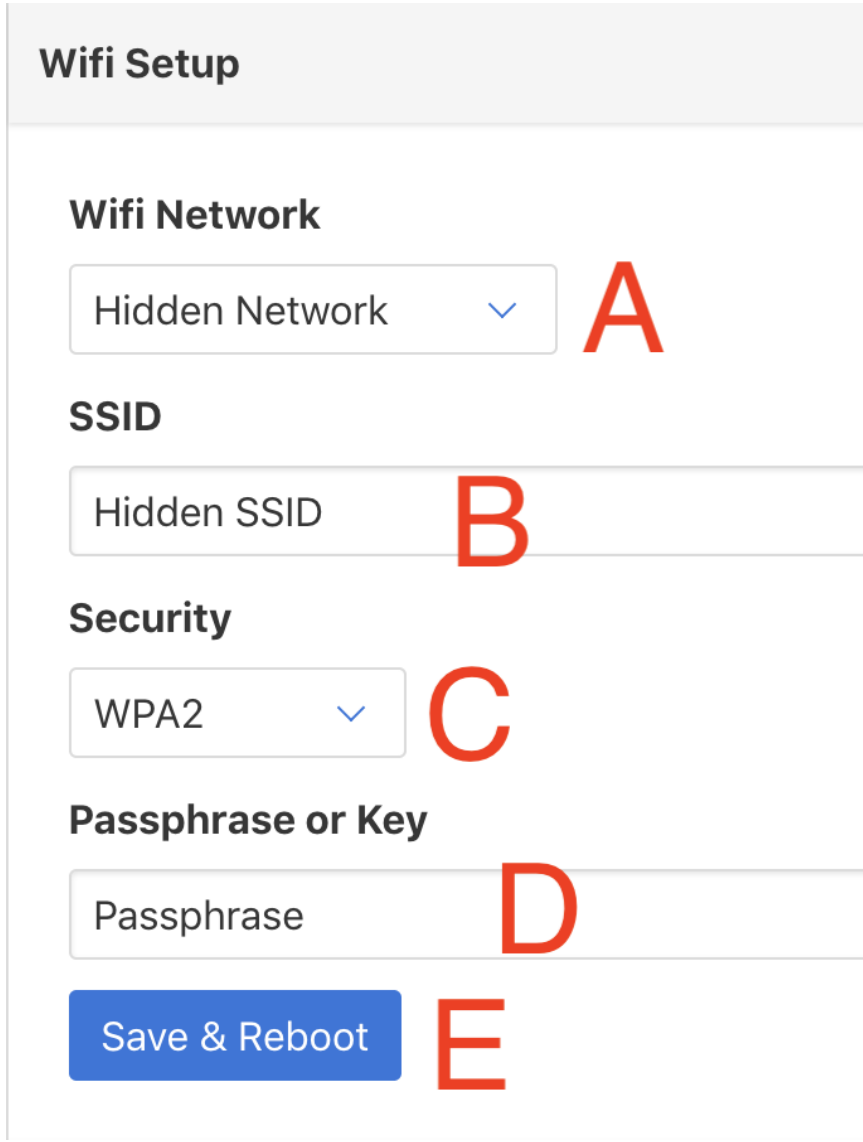
Network Settings

A. Ethernet Interface Designation
B. DHCP – If checked will remove fields B-F
C. IP Address of the connect device i.e. CNC
D. Network Gateway
E. DNS Servers
F. Enabling or disabling IPv6
   - Enabling will show a additional field Ipv6 address



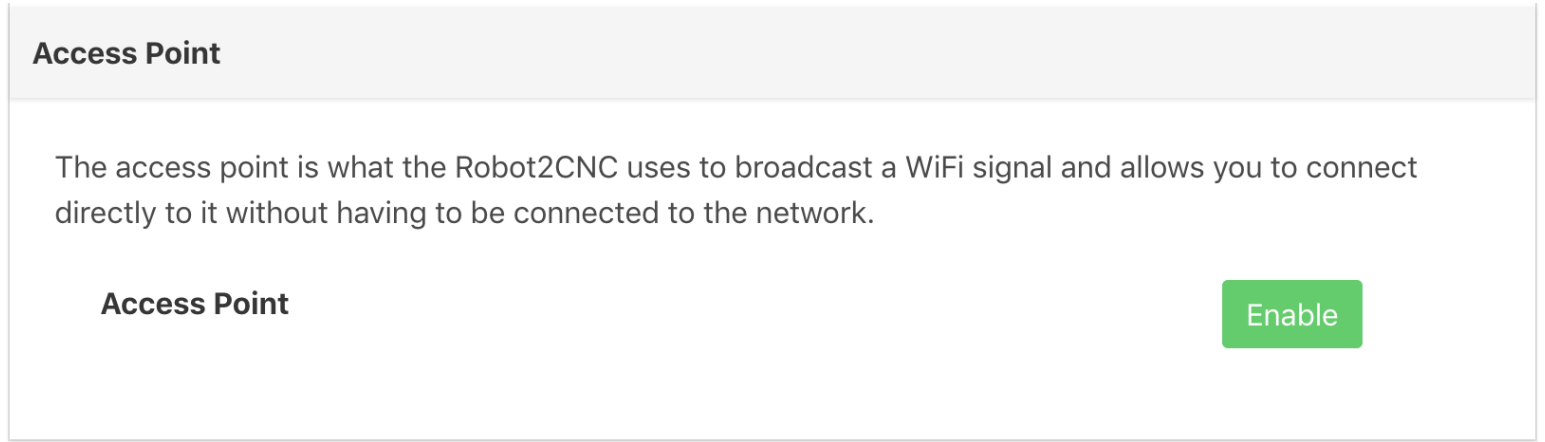
Nework Setting
Wi-Fi Setup

A. Dropdown menu to select Wi-Fi network. Select “Hidden Network” for hidden SSID’s
B. SSID of the network, if hidden, this will need to be entered
C. Type of security used by the network
D. Passphrase or key
E. Save button that will also reboot the Robot2CNC



Network Settings Access Point

- Access Point is what broadcasts a Wi-Fi signal allowing connection without first connecting to a network
- Enabling the Access point will bring up the Wi-Fi signal but will also disconnect the Robot2CNC from any connected Wi-Fi networks
- Disabling the Access Point will bring down the Wi-Fi signal and reconnect to a previously connected Wi-Fi network



Network Settings Current Network Settings

- Information about the current network settings for Ethernet, Wi-Fi, Access Point, etc.

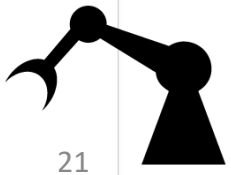
Current Network Settings

Interface:	sim0
MAC:	ab:cd:ef:gh:ij:kl
Up:	false
Broadcast:	false
Running:	false
Multicast:	false

Interface:	eth0
MAC:	a1:a2:a3:a4:a5:a6
Up:	true
Broadcast:	true
Running:	false
Multicast:	true

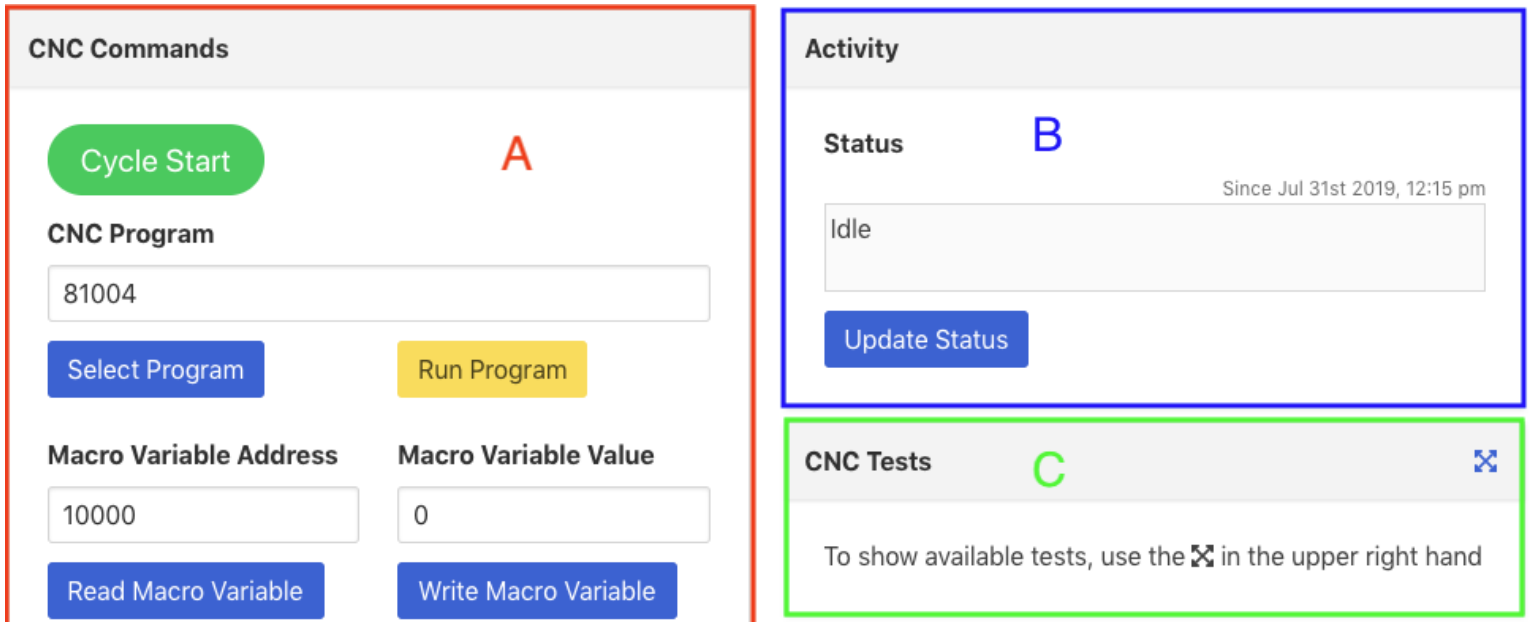
Interface:	eth1
MAC:	00:01:02:03:04:05
Up:	true
Broadcast:	true
Running:	false
Multicast:	true

Interface:	wlan0
MAC:	a1:b1:c1:d1:e1:f1
IPV4:	192.168.0.0
Subnet Mask:	255.255.255.0
IPV4	192.168.20.255
Broadcast:	
IPV6:	ab12::cd34:ef56:gh78:ij90
Up:	true
Broadcast:	true
Running:	true
Multicast:	true



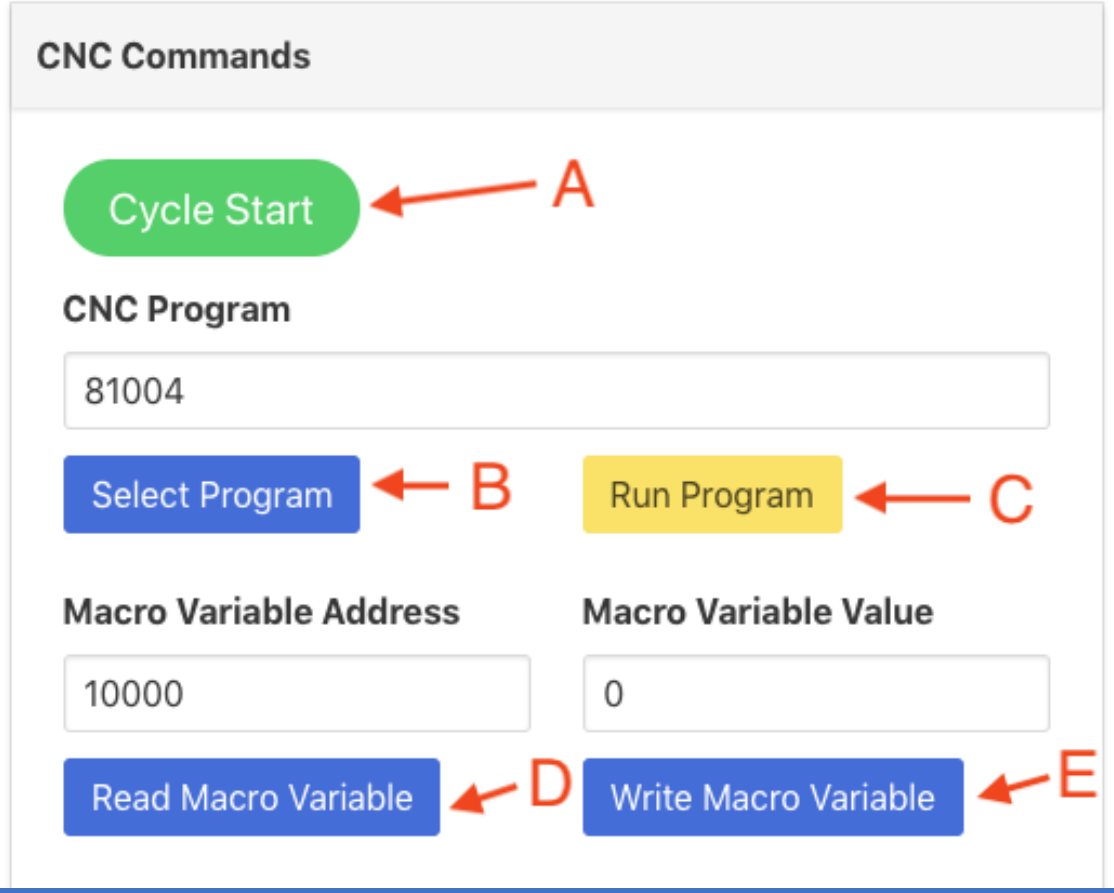
Operate

Using the User Interface



Robot2CNC Dashboard

- Landing and Home page
- Consists of 3 sections
  A. CNC Commands
  B. Activity
  C. CNC Tests



Robot2CNC Dashboard CNC Commands

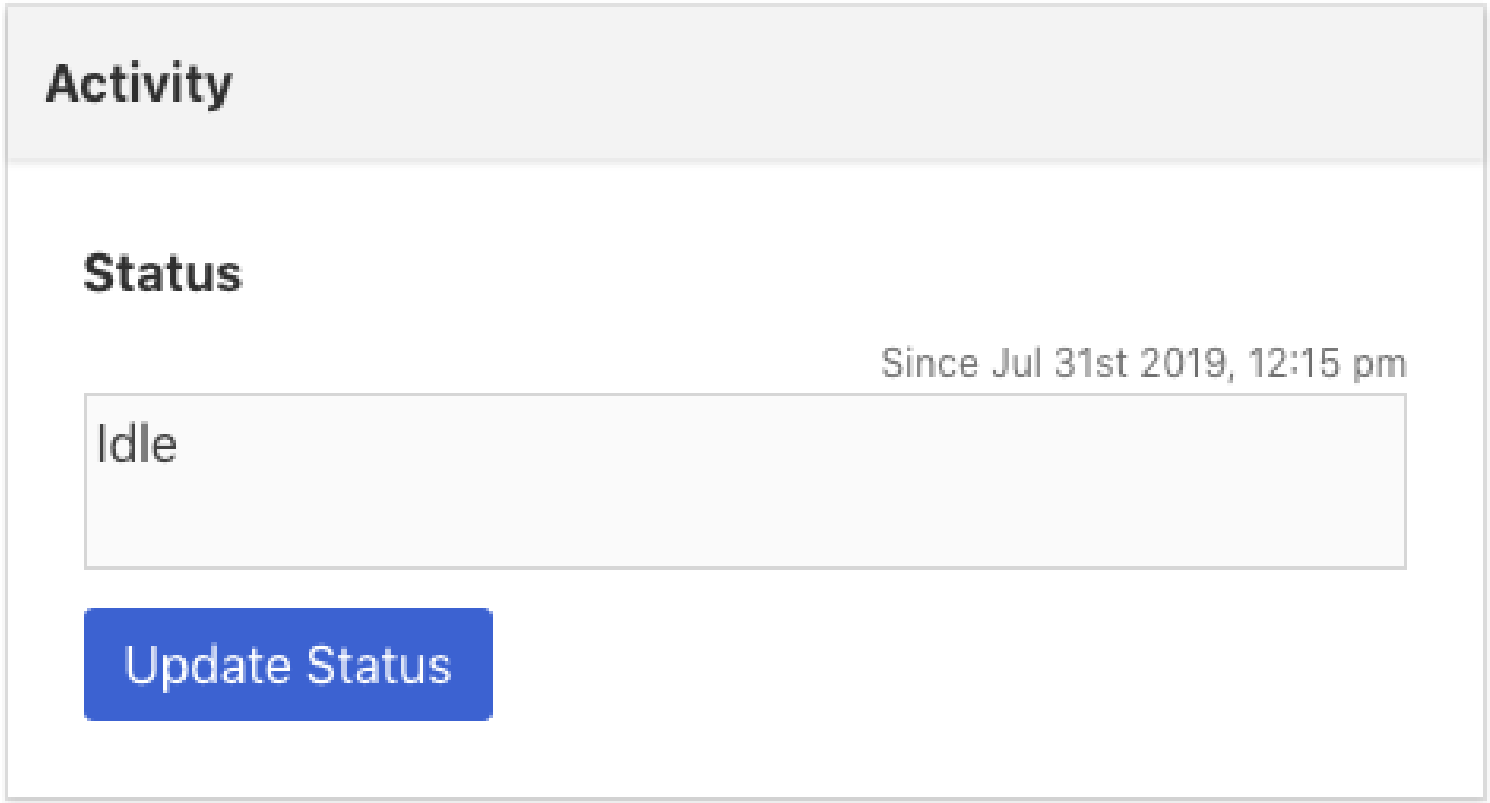
A. Cycle Start
- Sends a Cycle Start command to the CNC machine

B. Select Program
- Selects the CNC Program field value on the CNC

C. Run Program
- Selects and Cycle Starts the CNC with the CNC Program field value

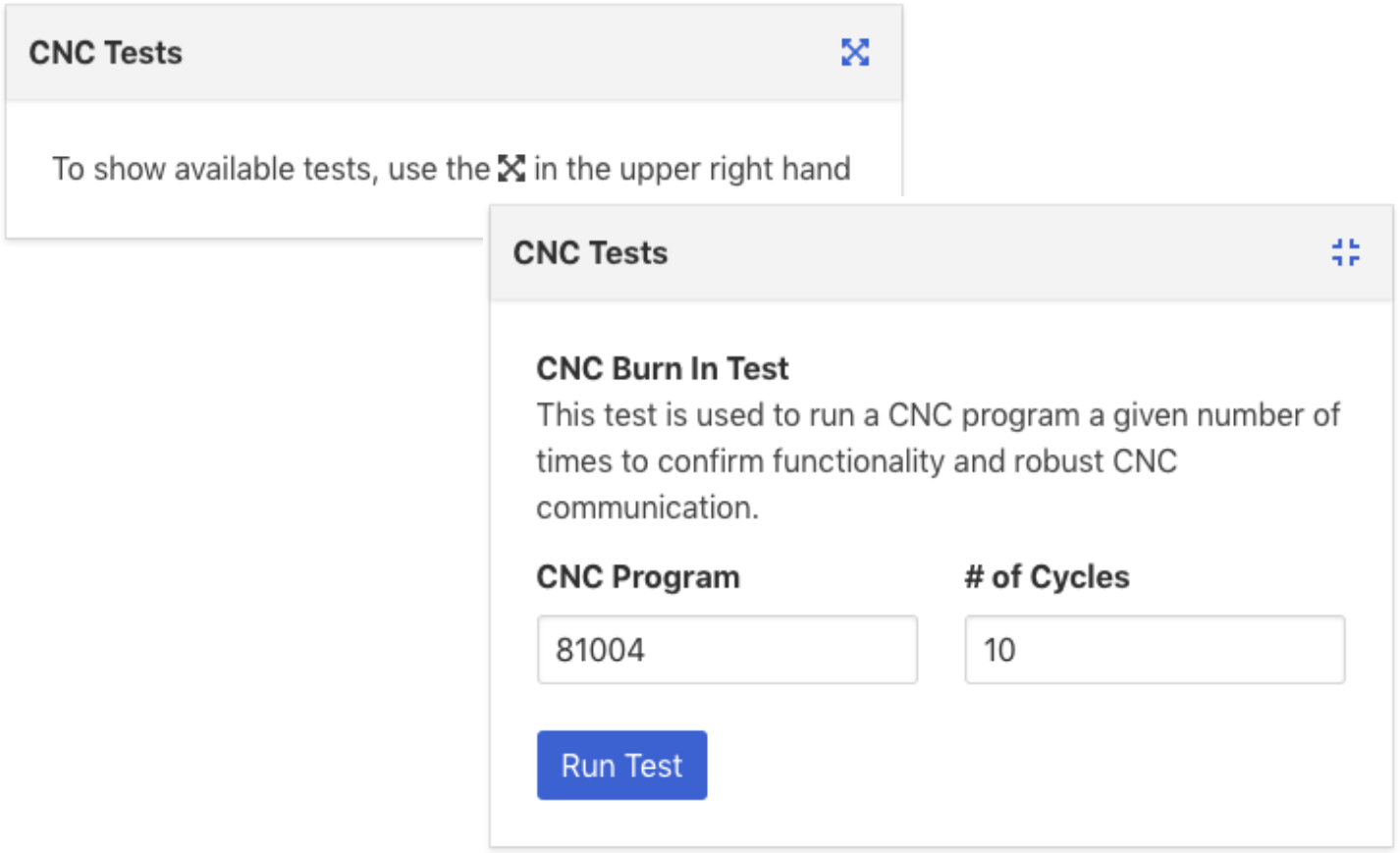
D. Read Macro Variable
- Reads the value of the Macro Variable Address and puts the value in the Macro Variable Value field

E. Write Macro Variable
- Writes the Macro Variable Value field value to the Macro Variable Address



Robot2CNC Dashboard Activity

- Activity card shows the status of the CNC
- Click Update Status to retrieve the latest status



Robot2CNC Dashboard CNC Tests

- Use the expand button in the upper right side to expand the CNC tests
- CNC Burn in Test
  - Run a CNC Program a given number of times
  - Enter the CNC Program in the CNC Program field
  - Enter the number of times to be run in the # of Cycles Field

Robot2CNC Dashboard CNC Tests

- Use the expand button in the upper right side to expand the CNC tests
- CNC Burn in Test
  - Run a CNC Program a given number of times
  - Enter the CNC Program in the CNC Program field
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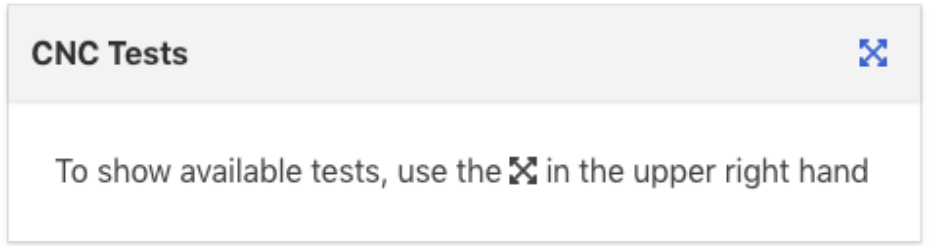
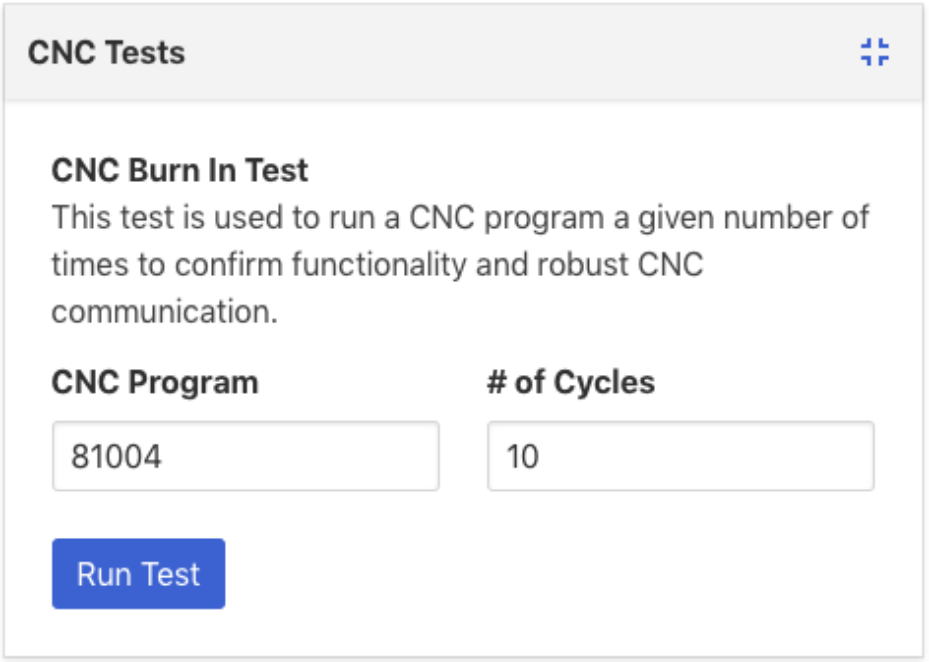
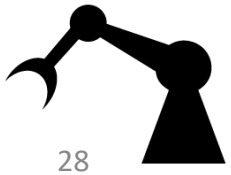




Appendix A

If your CNC is connected to your company network, please speak with your IT Administrator for correct setup and communication between VersaBuilt Robotics Robot2CNC, the CNC, and the robot.

- The CNC will need a static IP address, the IT Administrator will provide:
  - CNC IP Address: This value will be entered into the CNC and the Robot2CNC
  - CNC Subnet Mask
- The Robot2CNC can use a dynamic or a static IP address
  - If Static a System Administrator should provide Static IP address and valid Subnet Mask that should be setup on the Robot2CNC



Appendix B

- Troubleshooting Connectivity:
  - The VersaBuilt Robotics Robot2CN uses built-in procedures to communicate to the CNC
  - Verify the network cable is connected at each end to the appropriate controller
  - Verify the IP Addresses
  - For further help troubleshooting connectivity, please contact helpdesk@versabuilt.com or 208-629-5914