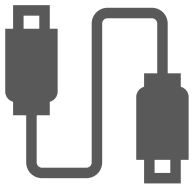
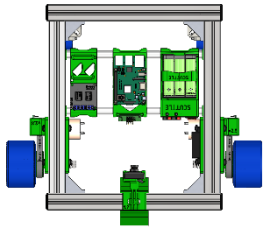
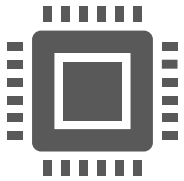






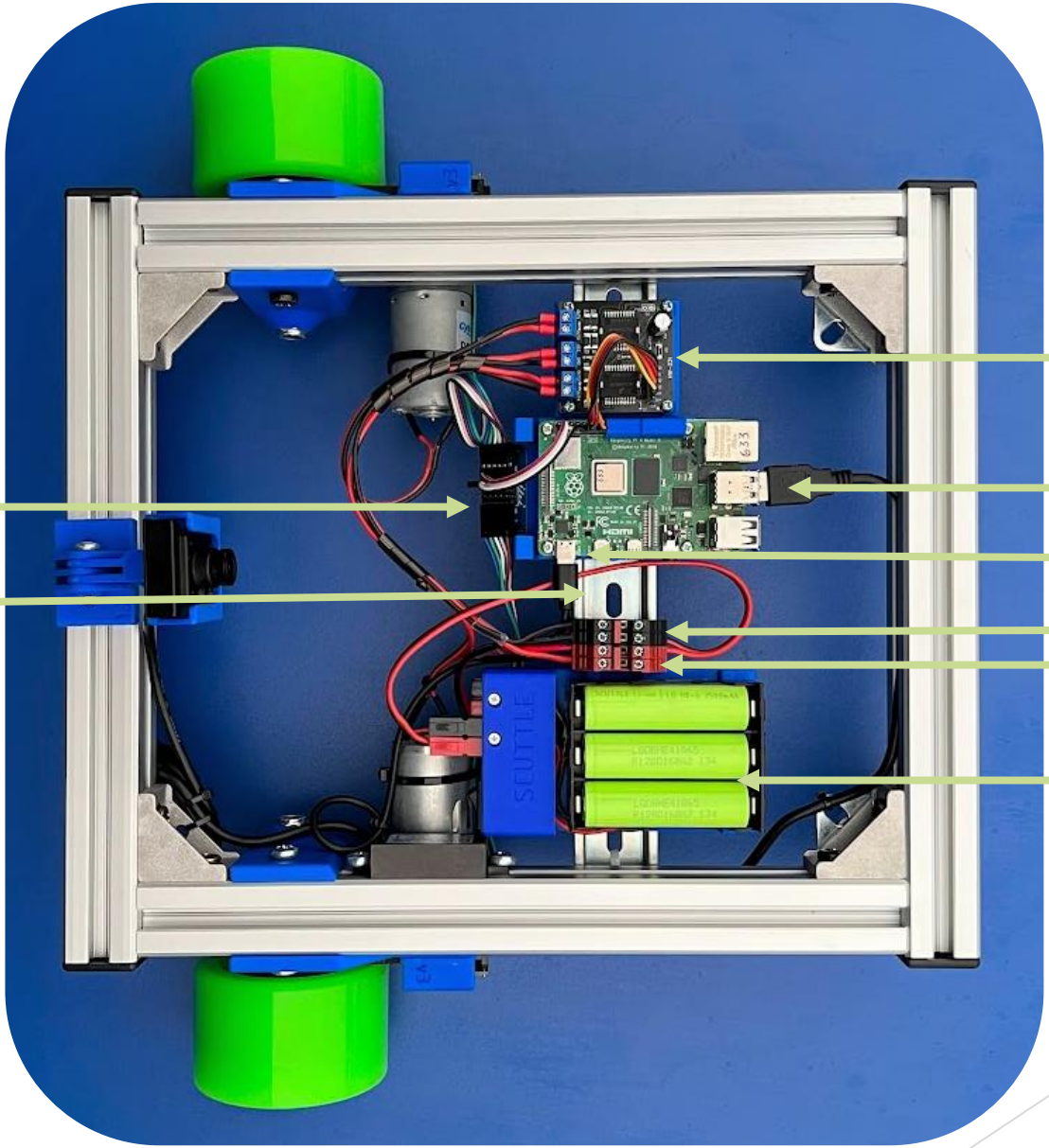
SCUTTLE v3.0

Upgraded Features in Electronics, Hardware, and Modules.

Revision: 2023.04.20

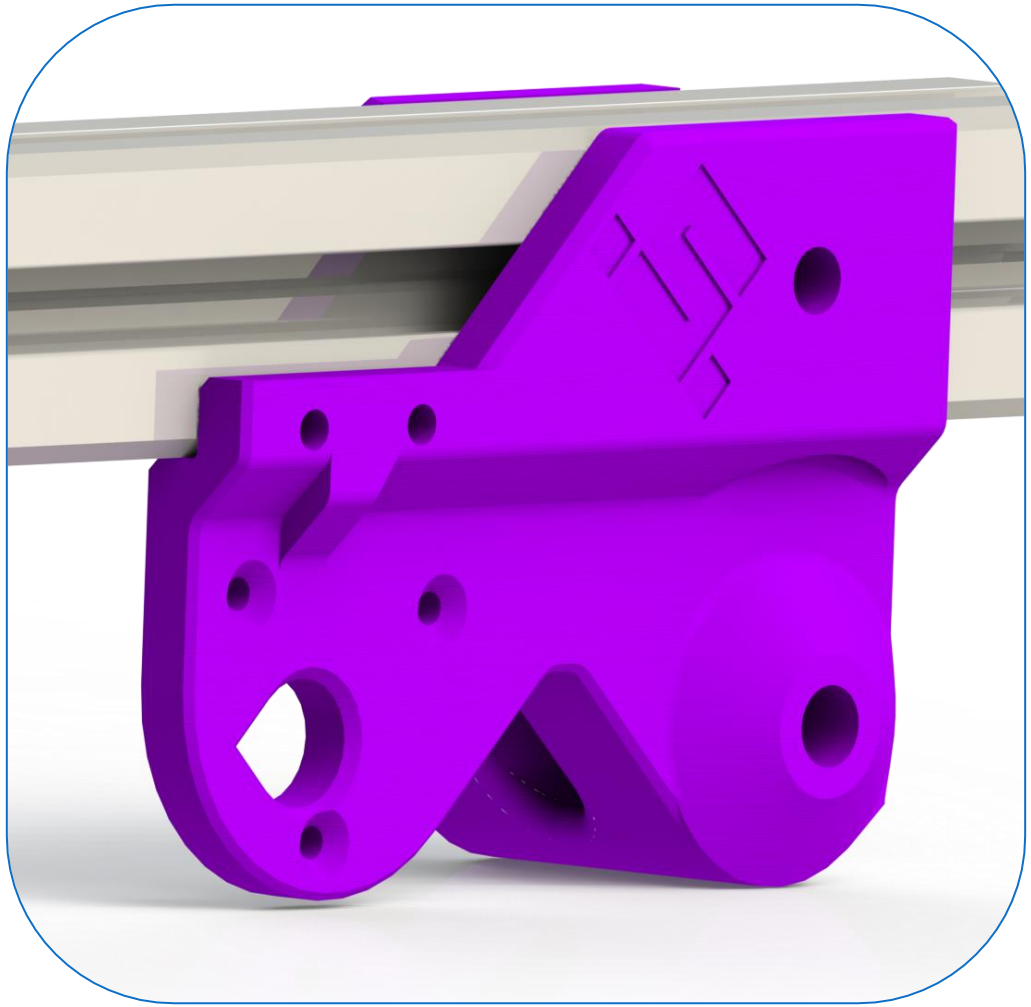
LINK TO THIS GUIDE:
qr.scuttlerobot.org/g/2mHl5LbMkPC

Overview

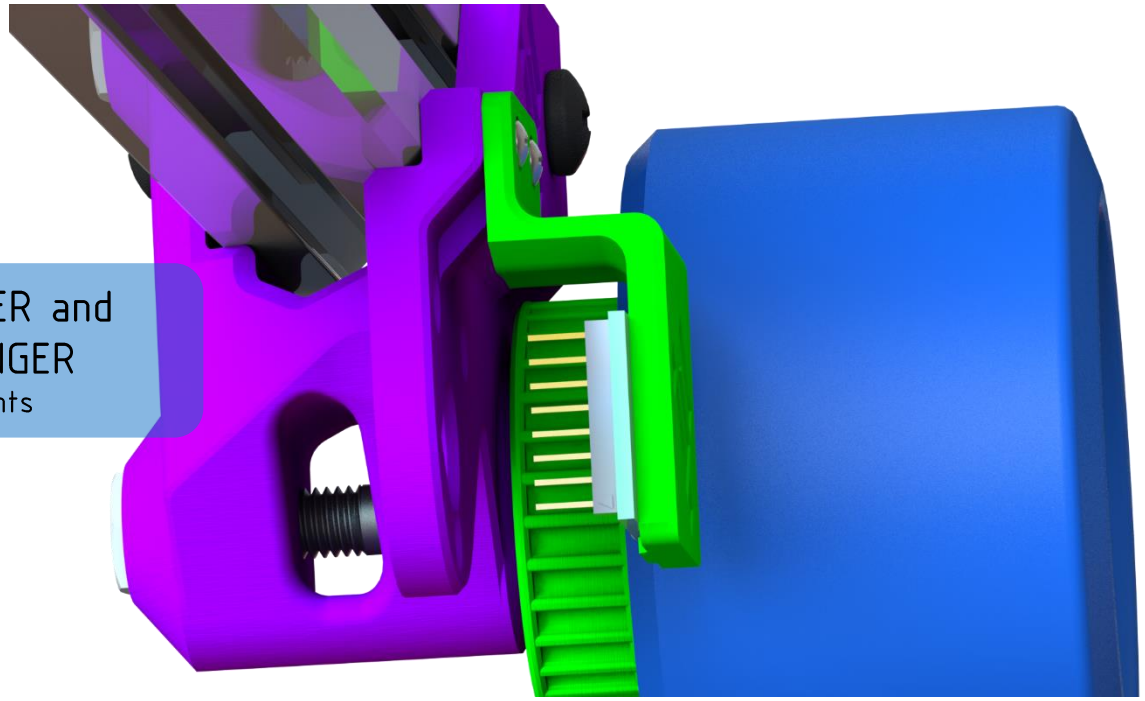


Hardware Upgrades

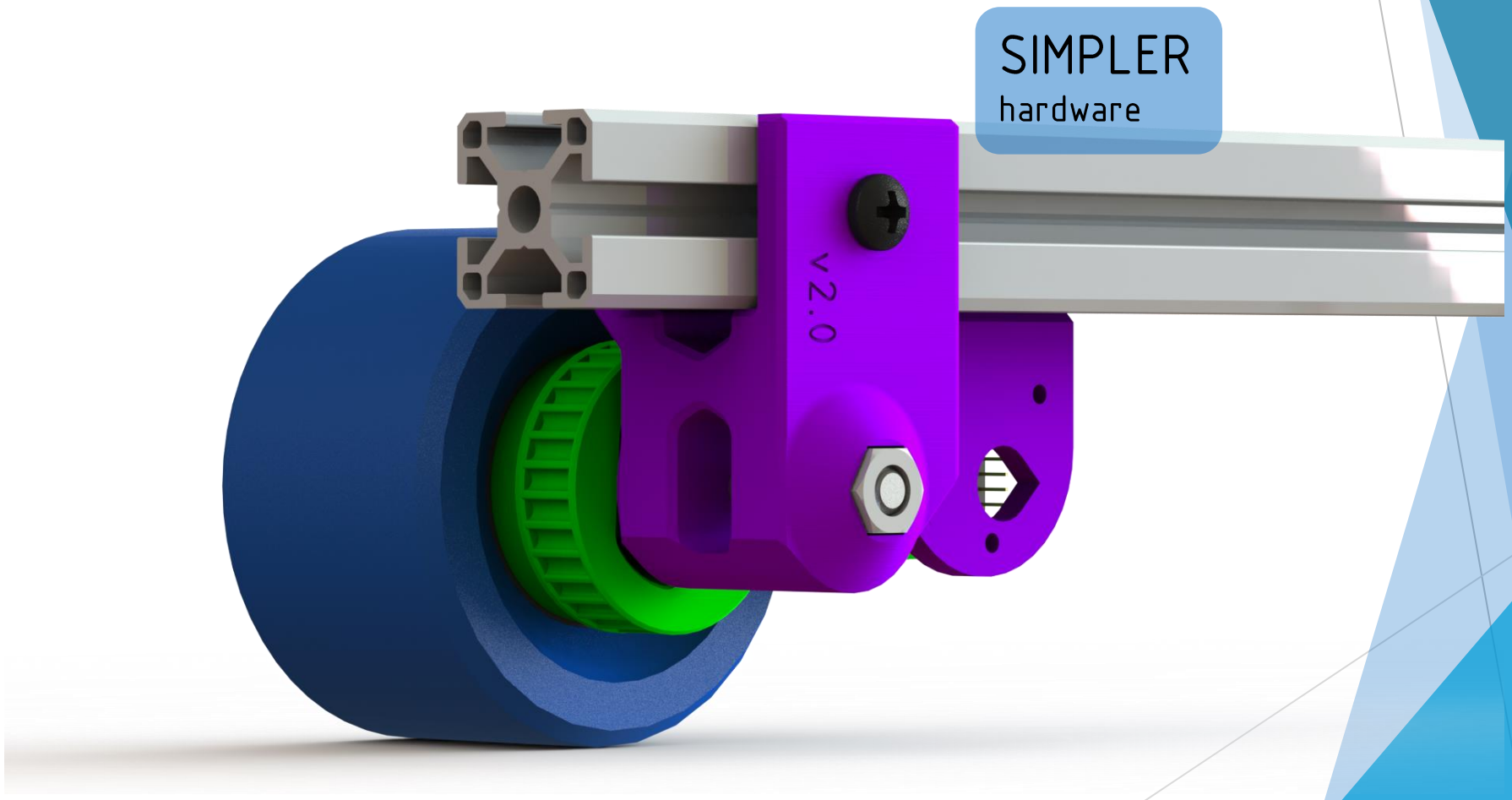
LIGHTER and STRONGER
3d cOMPONENTS



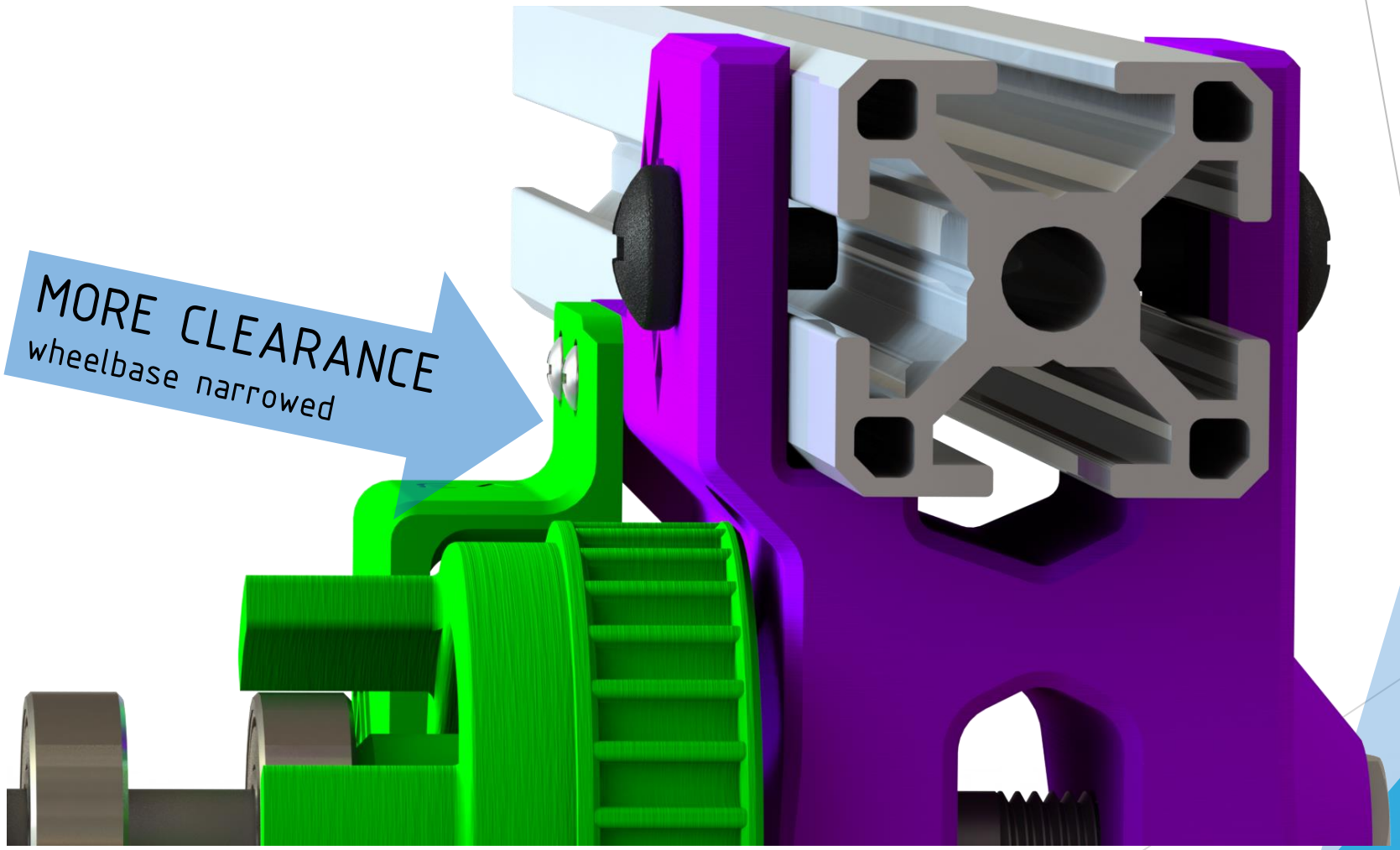
Hardware



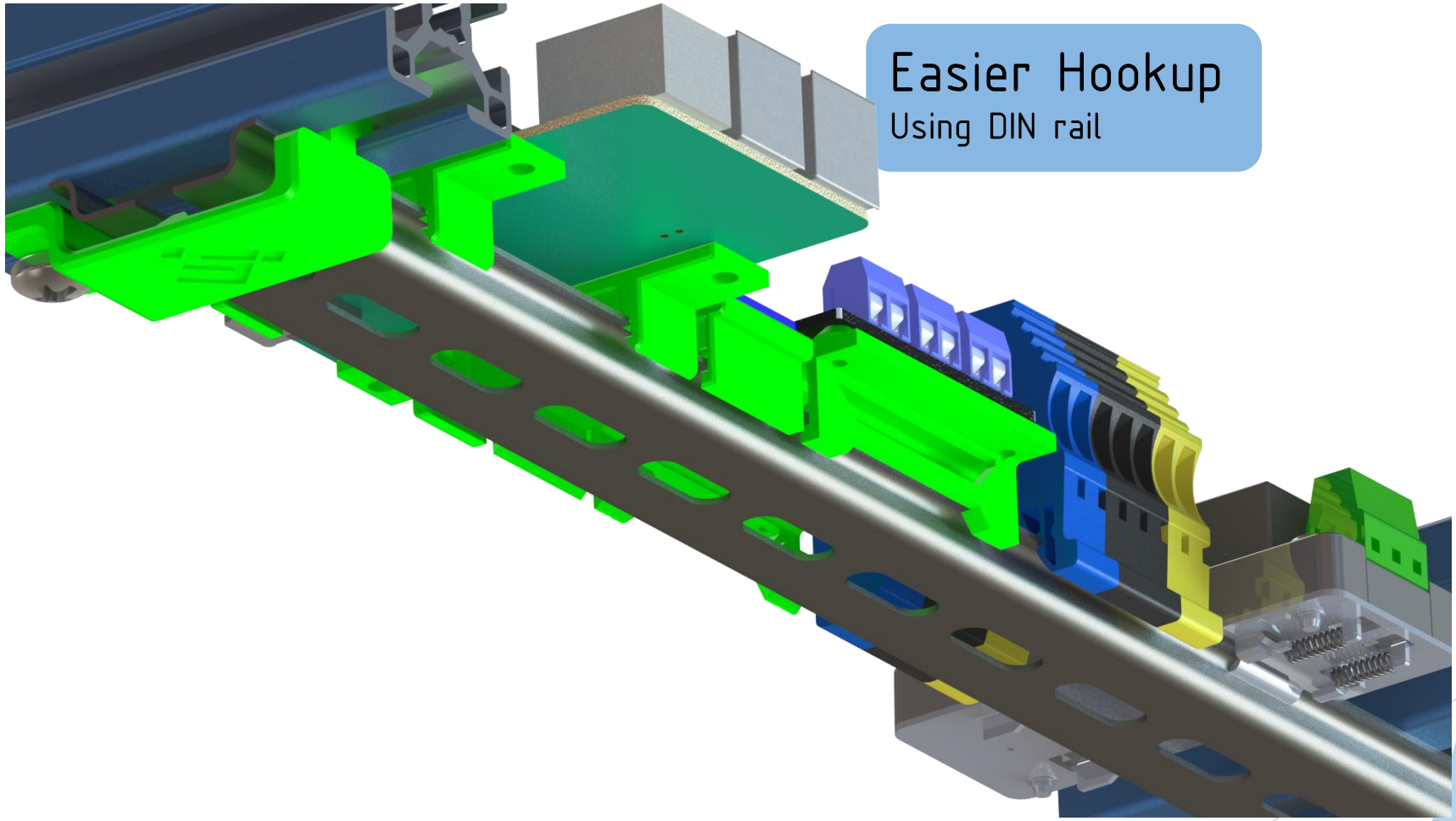
Hardware



Hardware

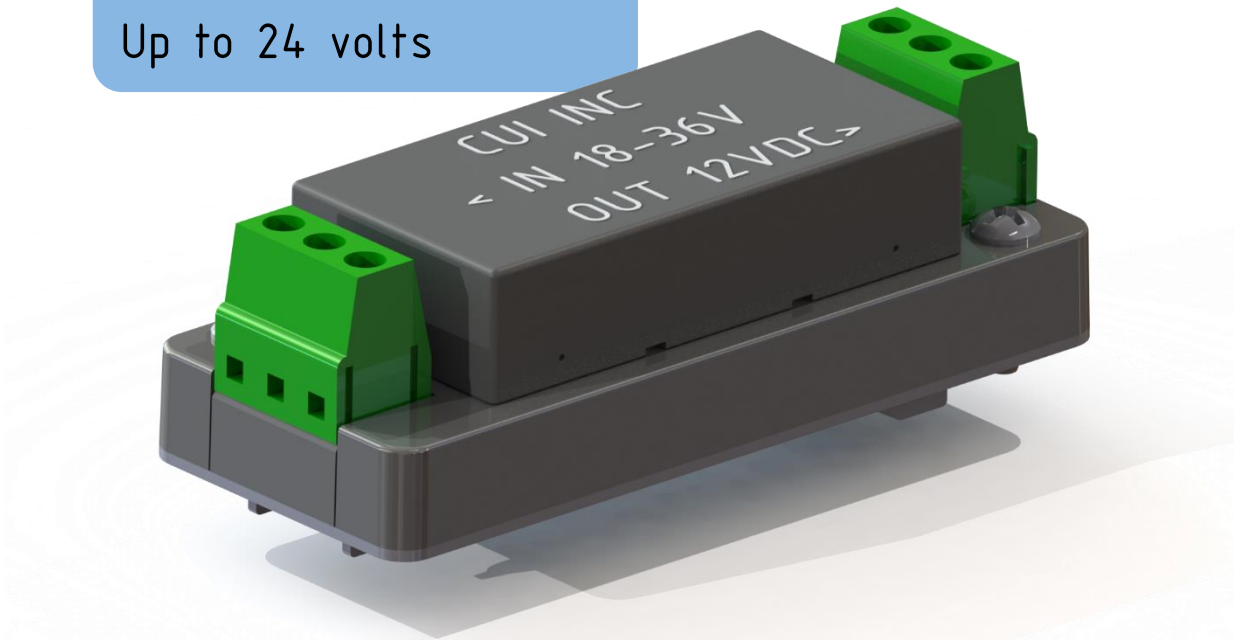


Hardware



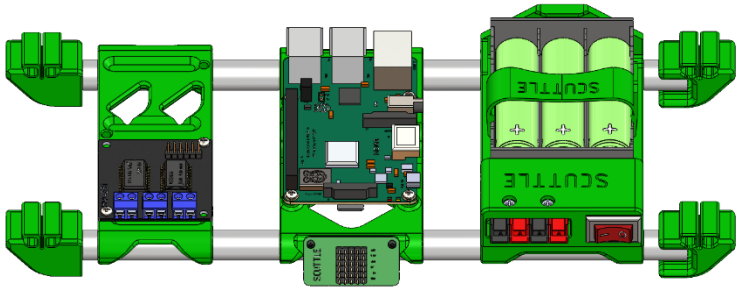
Hardware

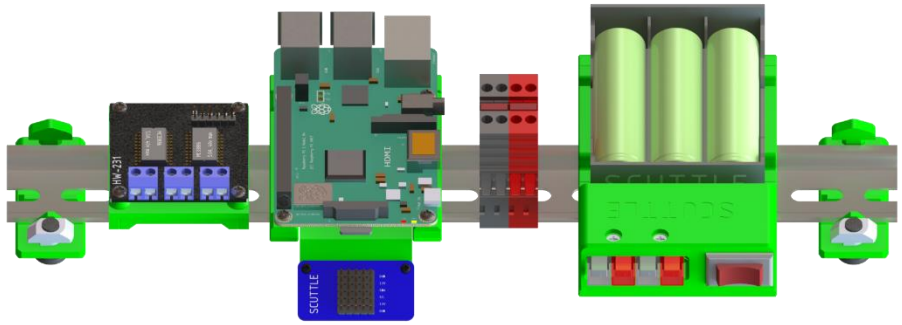
NEW OPTIONS
Up to 24 volts



Easy to Build

Twin Rods replaced by DIN rail

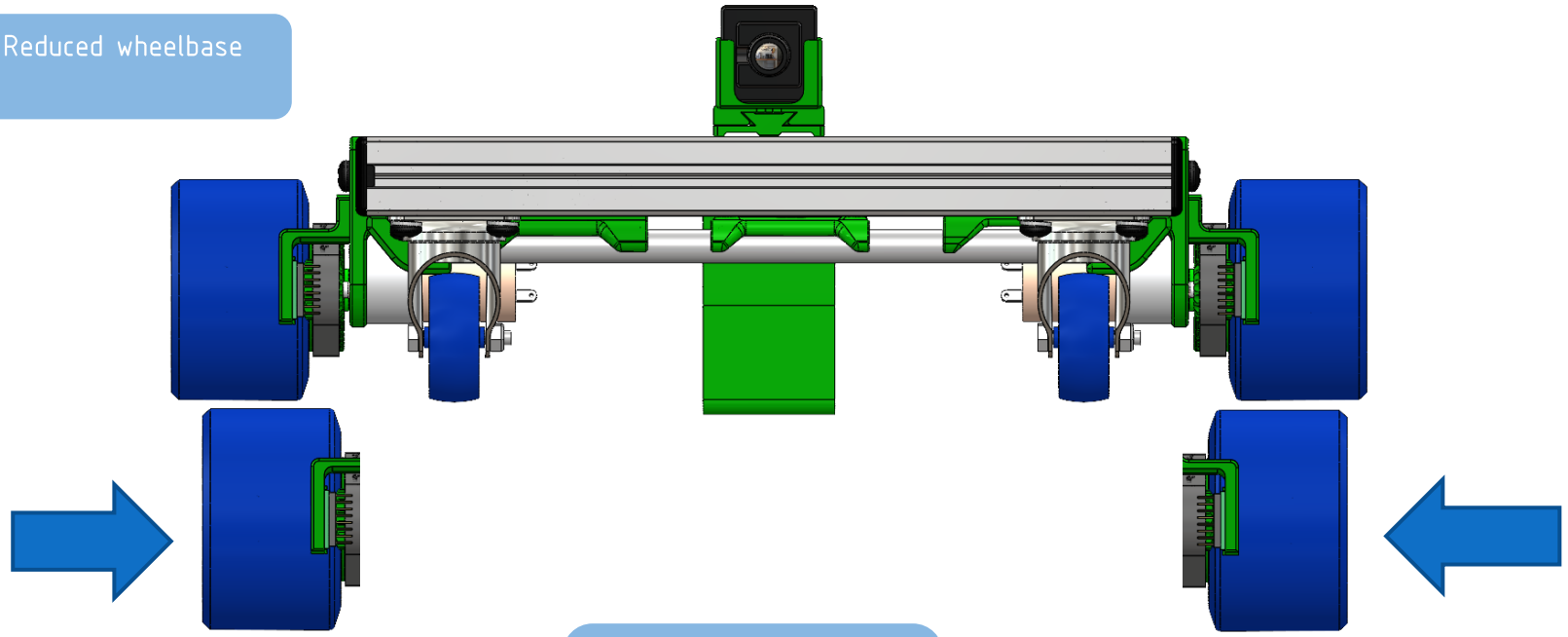




Fewer Brackets
Fewer Fasteners
Remove all electronics easily

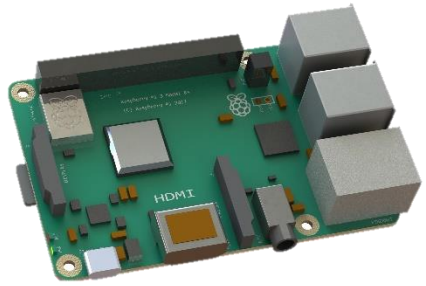
Better Performance

Reduced wheelbase

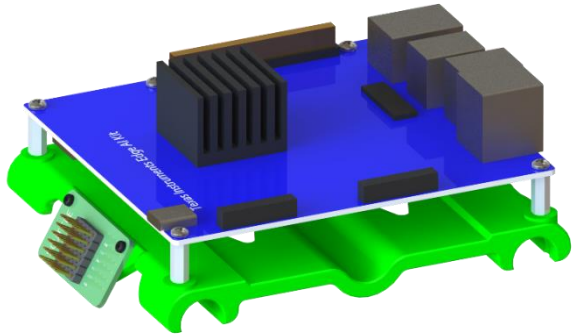


Steadier Driving
Improved path clearance
Reduced Axle Stress

v3.0 ▶ More Compatibility

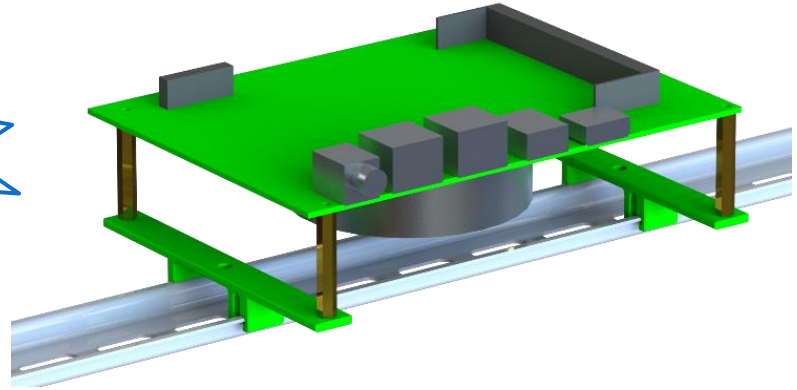


~5 watts
Raspberry Pi



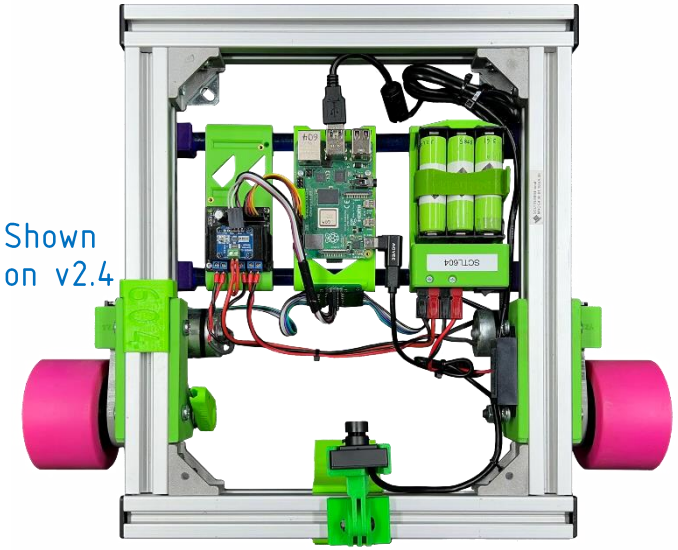
~20 watts
Texas Instruments Computer

New for v3.0



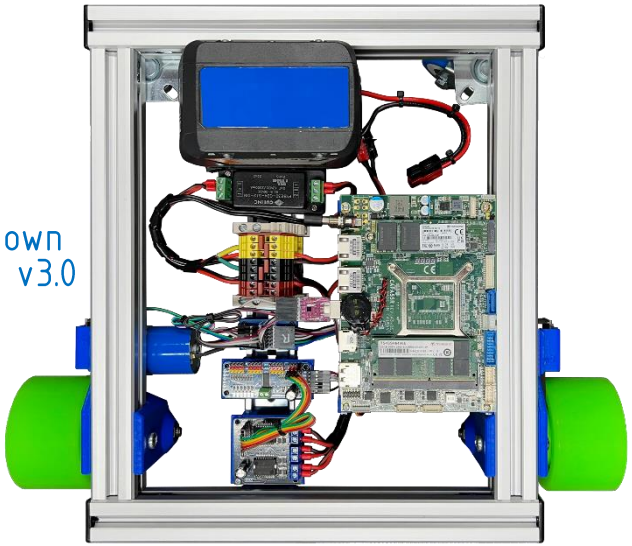
~40 Watts
Intel i7 Computer

Broadcom: Versatility, high value.



Shown on v2.4

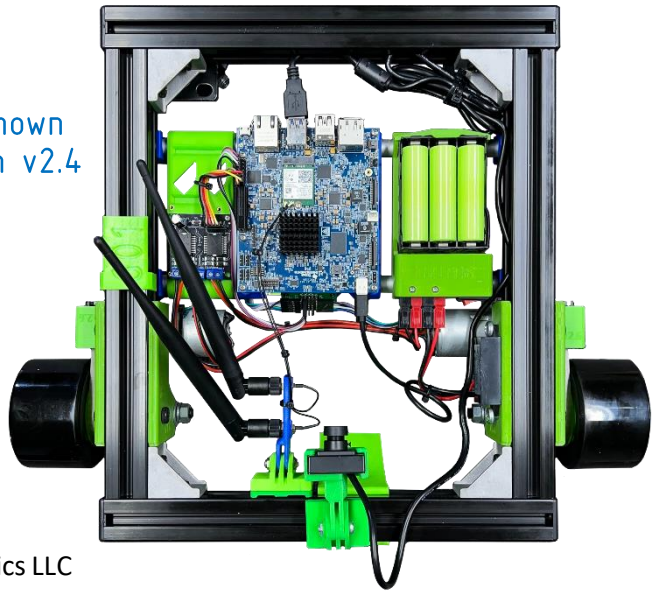
Intel's Latest: Max Processing Performance



Shown on v3.0

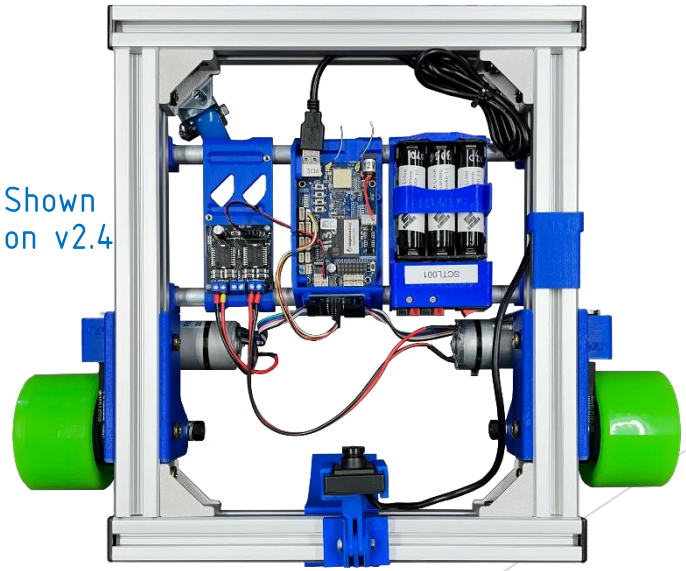
More Compatibility

TI's latest: Ultra-efficient Edge AI



Shown on v2.4

Beaglebone: Open Source & Educational

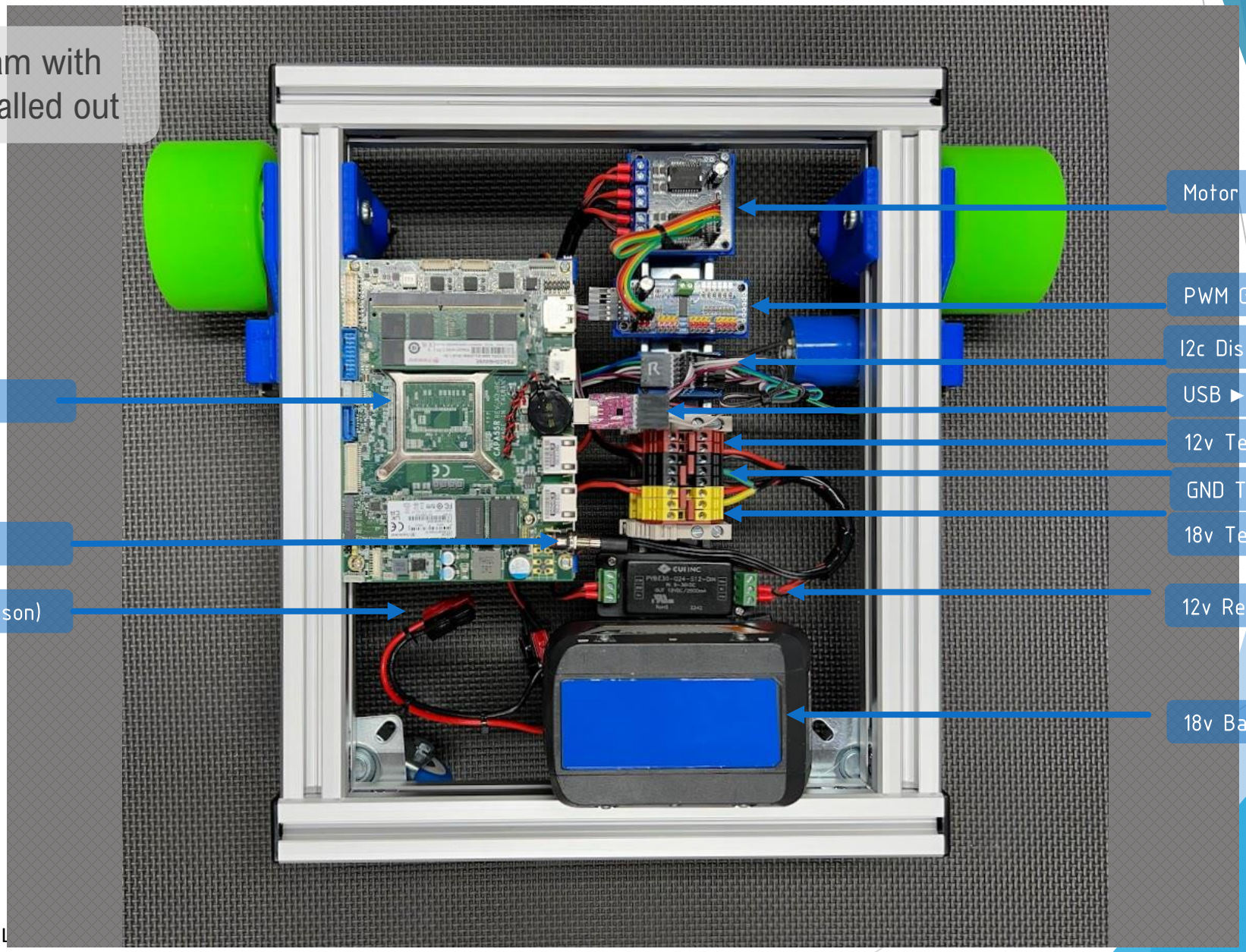


Shown on v2.4

Components Diagram

rev2022.12.20 pre-production

- Chassis Diagram with components called out



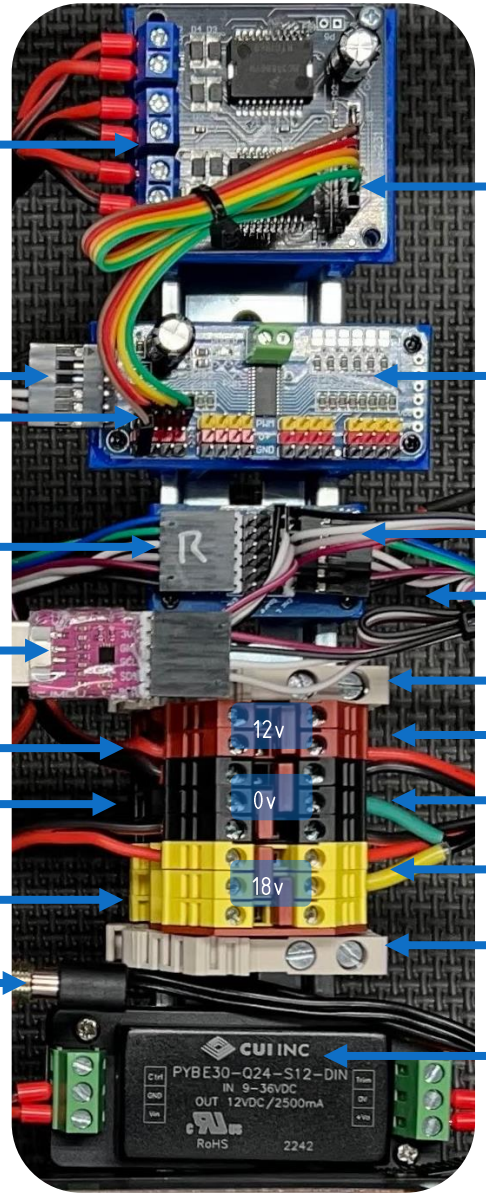
Wiring Diagram

rev2022.12.20 pre-production

- Description of terminals in SCUTTLE chassis for Intel Integration

Component ID

Terminal ID



Motor Driver Power

Motor Driver signals

I2c Input

PWM Outputs

PWM Generator Board

To RH encoder

I2c Distribution Board

To LH Encoder

USB ► i2C Adapter

clamp

► Sources

► from 12v Converter

► from source grounds

► from 18v Battery

12v

0v

18v

► Loads

► to motor driver

► to loads grounds

► to CPU

clamp

Barrel Plug 2.5x5.5mm

DC Converter

Features & Notes:

rev2022.12.20 pre-production

Axiomtek CAPA55R Datasheet

Axiomtek Integrated: Alphabot for Walmart Distribution

DIN rail terminal locks in AutomationDirect Catalog

CUI devices alternative power adapters

- Axiomtek Computer Notes:
  - This is an industrial single-board computer, typically enclosed and integrated in industrial robots. [1]
  - As of 2022.12, rugged fanless enclosures are undergoing testing by Axiomtek headquarters in Taiwan.
- DIN Rail Notes:
  - Easily expandable terminals
  - Power actuators by connecting terminals directly into DIN terminal blocks.
  - Wires are 18awg, supporting 16 amps of current (192 watts @ 12v)
- Chassis Notes:
  - This new chassis has not yet been payload-tested for the 40kg spec to match v2.4
  - The corner brackets have less rigidity than the original SCUTTLE v2.4 brackets: Test carefully with any payloads above 10kg.
  - 3mm Allen key is required for tightening the set-screws of the corner brackets.
- Power Notes:
  - DC adapter is rated for up to 30W. Demanding above 30W may cause voltage to drop below 12.0v
  - In base config, the Axiomtek SBC is powered directly by the battery, ranging from 20v to 17v (approx)
- Battery Notes:
  - Value & high capacity: 18v 4,000 mAh battery by Ridgid, containing Samsung 3.7v cells
  - Any other battery between 9v and 24v can be used as input to the DC converter
  - The Axiomtek board can operate from a 12v to 24v source
  - Remember to maintain 12v input to the motors
  - Battery Charges @ 50w – expect
- USB Access
  - USB may need expansion for anciliary devices
  - USB can be expanded with any USB 3.2 Gen2 Panels
- I2C and PWM Notes:
  - Collecting and configuring drivers for USB►I2C adapter will require software engineering effort.
  - Intel-designed reference software will be made available in 2023 for these components.
  - The PWM generator board should be used at 100Hz or higher for best DC motor responsiveness, whereas 50Hz is the standard for servos.
  - Remember: 4 PWM signals are required for driving 2 motors for forward and reverse capability.

Ridgid Battery Datasheet

Example USB3 Expansion Panel on Amazon

PWM Generator Reference Design (Adafruit)

Additional References:

- Wire Gauge & Power Transmission
  - https://www.powerstream.com/Wire_Size.htm
- Ridgid Battery Products
  - https://www.ridgid.com/us/en/18v-lithium-ion-4-ah-battery-2-pack
- Guide for building with 30mm extrusions:
  - https://catalogs.8020.net/80-20-Inc-University-Booklet/1/
- USB Headers Guide
  - https://www.cgdirector.com/usb-headers-guide/