# Nicholas A. Lombardy

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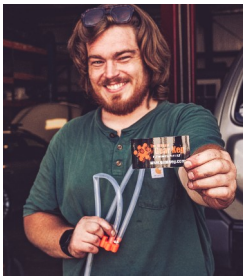


## Systems Integration Engineer

I'm Nick, and first, I want to thank you for taking a look at my resume. In this impersonal age, it takes a lot to read a submission, and I very much appreciate your time. I'm a high level systems integration engineer with years of experience solving all kinds of challenging problems at the intersection of digital and physical systems. I'm seeking a role where my love of this intersection can be fully utilized. Particularly, I love controls, feedback loops, engineering solutions, and troubleshooting. I hope you like what you see, and thank you for your consideration.

## Technical Assets

- Automotive Troubleshooting and aftermarket ECU experience.
- Exceptional diagnostic intuition
- Electrical systems, off-grid solar, and EV powertrain experience.
- Embedded systems software development
- Python, Javascript, Powershell, Perl, Bash, Node.js, Three.js, HTML, CSS
- Additive manufacturing
- Extensive FreeCAD experience
- Linux, Windows, and MacOS system administration
- Full product development cycle experience.
- Comfortable with mechanical work with experience doing including clutch replacements, engine swaps, suspension work, and harness repairs.

## Projects

**Vehicle Powertrain**

Built 2 project EFI conversions on Volvo Redblocks involving full Megasquirt 2 builds that were hand soldered by me from the DIYAUTOTUNE kits. They both utilize LS1 ignition coils. One utilizes a custom cam angle sensor made by welding a bicycle sprocket onto the cam gear and utilizing an optical trip sensor for the trigger. The other utilizes a 4g63 cam angle sensor utilizing the YoshiFab billet distributor/CAS adapter, 680cc injectors designed for a MKIV 1.8t, a Volvo 850 throttle body on a 3d printed glass filled nylon adapter, GM IAT and coolant temp sensors, and a Mitsubishi 3000gt VR4 fuel pump in the tank.

Designed and built an electric vehicle drive system that incorporated a 72v DC circuit for the powertrain; a 110v AC circuit for optional accessories; and multiple, independent, 12v circuits for lights and stereo equipment. Top speed was limited mechanically by referencing the motor's datasheet, picking the target RPM where torque started to fall off significantly, measuring the differential ratio of the vehicle, and picking the ideal gear ratio from the motor to the differential. This worked successfully on the first attempt and provided a top speed permanently limited by back EMF to 10mph while providing incredible torque for a 5kw motor, reducing current draw while cruising, and allowing the minimum amount of time for the motor to sit at full stall. The vehicle, built for a private business, was in near daily service for a period of over 5 years before being retired due to physical damage unrelated to the power systems that were installed.

Project leader for multiple engine swaps. I'm experienced changing clutches, differentials, and transmissions. I'm very comfortable working with tools and repairing major mechanical systems.

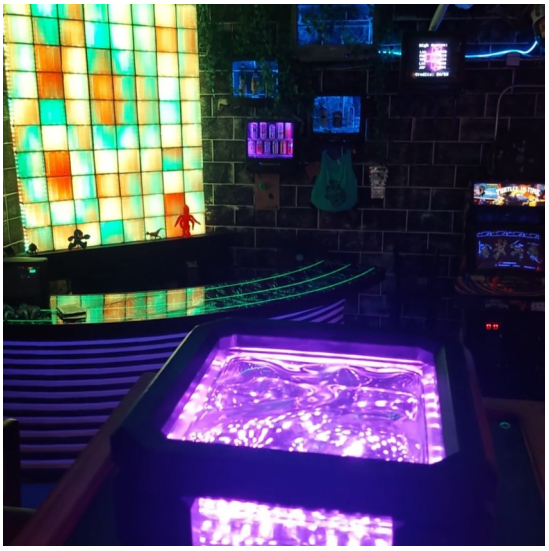
**Glass Block Wall Game**
Installed thousands of addressable LEDs on a large glass block wall in Boneyard Chattanooga. Hand-built control boards to provide logic-level shifting and control them from ESP32 compatible microcontrollers with onboard Ethernet. Wrote software to play a Tetris-inspired game on the glass block wall utilizing Node.js to talk with the WLED API and a front-end for a display in the console written in Three.js. Developed a unique controller to play the game using a glass block as the interface. This controller utilized 3d printing, programming an Arduino Mega, carpentry, and plasma cutting steel.

**The Gear Keg**
It's a pneumatic tool for filling transmissions, differentials, and transfer cases with gear oil. I manufacture, market, package, and ship each unit myself. I'm proud to have gone through a full product development cycle on my own, and the feedback I've received from users has been very encouraging!

**3D Printers**
Over the years, I've designed several and built 3 3D printers from scratch. One has been a successful, from-scratch tool changer. The most recent is a modification for the X and Y motion system on the ubiquitous Ender 5 Plus utilizing the Galileo 2 standalone extruder and Dragon Burner toolhead.

**3D Surveying and CAD**
Worked on projects involving point cloud modeling, creating interactive 3D reports for resource stockpiles using data acquired through Trimble products, and working with large, fly over, LIDAR scans of the City of Chattanooga. Have used CAD and 3D printing to design brackets and functional solutions to physical problems.

**Gauge Cluster**
Wrote software to display Salesforce data on a physical gauge. Utilized experience with Linux, embedded computers, Node.js, and database integration. Also wrote software that displays data collected through an Arduino microcontroller on a JavaScript rendered, digital gauge cluster in real time.



# Employment History

**Entrepreneur** ◦ 2023 – Present
I left Canary Systems to build a large glass block wall video game for the reopening of The Coin-Op inside of Boneyard Chattanooga (on 2nd page). While working on the block wall, I decided to finally build the large, tool changing 3D Printer I had been designing. After finishing the block wall, I designed and released my first physical product: The Gear Keg. It's a tool for filling transmissions, differentials, and transfer cases with gear oil. I'm proud to have gone through a full product development cycle on my own, and the feedback I've received from users has been very encouraging!

**Canary Systems** ◦ 2019 – 2023
Created Python, SQL, and PowerShell scripts to automate data collection, transition, and organization. Wrote programs for data loggers, performed baseline calibrations on instruments, helped with instrument installations, and set up client facing databases to manage and display collected data. Managed off-grid solar power installations. Maintained internal and customer facing software installations and environments. Provided remote software training and troubleshooting sessions to customers and internal staff. Contributed innovative problem solving ideas and strategies to my team.

**Western Electric** ◦ 2021 – 2022
Responsible for engineering final solutions and production methods for a new home Hi-Fi amplifier. Contributed to UI and update components of software. Engineered an automated power cycle testing system with logging and video recordings for each test. Coordinated orders and inventory from multiple vendors and contractors. Repaired and operated a variety of modern and repurposed industrial manufacturing machines utilizing pneumatic, electrical, chemical, and heating systems.

**ring-u** ◦ 2017 – 2019
Contributed to hardware and software development, interface design, testing, and ongoing product enhancements. Created tutorial videos on configuring different components of a ring-u phone system. Have customer reviews posted online that directly mention my outstanding technical support. This position helped advance my technical skills and broadened my experience with remote tech support.

**Electric Bike Specialists** ◦ 2016 – 2017
Expanded knowledge of electrical systems and batteries. Built a routine and reputation for direct customer interaction. Led sales for several months in a row. Learned the difference between what I would want as a technology focused individual and what customers wanted as end users. This understanding helped influence development at ring-u.

**Independent IT Consultant** ◦ 2010 – 2018
Experience with technology consulting started with tutoring and game console repair. This quickly moved to business desktop support, server administration, and network architecture design. I worked on several programming projects, built custom desktops and servers, and repaired a vast array of small business technology. I developed a reputation as the guy to call when something was broken, and I've rarely shied away from a challenge.

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Thank you for your consideration. I'm excited about the future and hope to be working with you.

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