



# Dignified Motors Makes Driving Accessible with groov EPIC

*Innovative engineer turns to Opto 22 to  
power an EPIC Chevy Silverado  
lift system*

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## **Opto 22**

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# DIGNIFIED MOTORS MAKES DRIVING ACCESSIBLE WITH GROOV EPIC

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## THE CHALLENGE

What do you do if you own a beautiful truck but one day find yourself a wheelchair user?

Chances are you've never considered that possibility, but answering that kind of question is what Dave Aitchison of Dignified Motors does every day.

Dave and his team specialize in vehicle conversions and accessories that meet a variety of accessibility needs. Their work improves the quality of life of all kinds of drivers, including veterans, the elderly, and families with special needs children.

As a mechanical engineer and a wheelchair user himself, Dave also sees the opportunity to introduce better technology to the mobility industry. For instance, typical accessible entry-exit systems like automatic ramps use limit switches that may lose their proper activation position over time and end up failing in problematic ways.

"Imagine that you aren't able to get out of the vehicle on your own," Dave says, "because now the door limit switch doesn't quite make its activation position. So the ramp just doesn't deploy.

"I've been trapped in everything from a 1975 Chevy full-size van to a 2004 Toyota minivan."

That observation led Dignified Motors to look for technologies designed for harsher environments and extended cycle times. They reached out to Opto 22 when they were approached by a customer who needed to upgrade her Chevy Silverado's entry system. It had



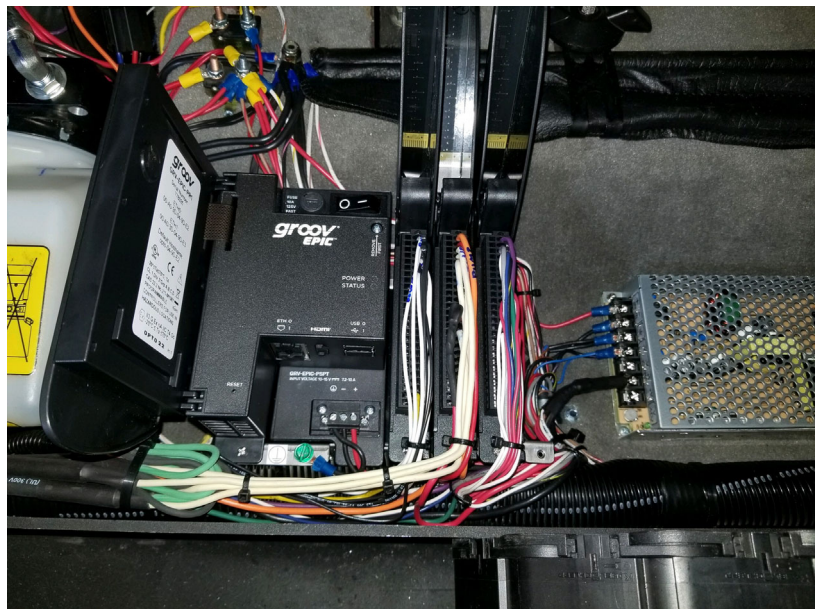
been modified previously with an inventive but slow wheelchair lift.

In the Arizona heat, the slow speed wasn't just an inconvenience, as Dave explains. "Temperature exposure is a risk for people with spinal cord injury. Two and a half minutes sitting in 115° F weather [waiting for your lift to deploy] is dangerous."

## THE SOLUTION

Dave replaced the slow-moving DC actuators with a properly sized hydraulic system and installed an Opto 22 [groov EPIC® edge programmable industrial control system](#) that, in total, sped up the deploy time to 14 seconds.

[groov EPIC](#) controls the hydraulic valve and pump system and monitors system health and passenger safety using pressure transducer readings, door proximity sensors, and



**groov EPIC embedded inside the truck's lift system**

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I/O checks for vehicle position and state. For example, if the truck is not in park, EPIC will not power the lift system, preventing accidental deployment while driving.

Take a look at DM's wicked-fast Silverado upgrade in this [Dignified Motors YouTube video](#), showing a full deploy-stow time under 30 seconds.

You can see some highlights in the photos below.

**Driver's seat deployed:**



**Driver approaches:**



**Driver in place and seat moving into position:**



### Next Conversion

Dignified Motors is working on a similar conversion for a quadriplegic veteran. They'll raise the truck body and drop the floor to accommodate the additional height of the wheelchair and lift system. The truck will also be outfitted with drive-by-wire speed control, reduced effort power steering, and a tri-pin orthotic using a spinner knob bearing, giving the driver full control without requiring full grip strength or manual dexterity.

With EPIC's embedded [groov View](#) HMI server, Dave is also able to offer his clients the option of mobile interaction with the lift system using their cell phone, which, he adds, is "a massive convenience for the mobility industry."

When asked what else led him to choose *groov EPIC*, Dave is quick to mention that "Opto 22 has a history going all the way back to the SSR. That's the kind of equipment and technology that you want to partner with when you are looking at potentially life-critical systems."

Opto 22 encourages you to think about how you can put your engineering skills to work to improve the life of someone near you. And [let us know how we can help](#).

### ABOUT DIGNIFIED MOTORS

A big thanks to Dave and his team for the opportunity to share their story. Do you have a project for them? Learn more about Dignified Motors at [dignifiedmotors.com](#) or contact Dave Aitchison:

Phone **1-800-DIG-MOTO**

Email: [info@dignifiedmotors.com](mailto:info@dignifiedmotors.com)

### ABOUT OPTO 22

Opto 22 was started in 1974 by a co-inventor of the solid-state relay (SSR), who discovered a way to make SSRs more reliable.

Opto 22 has consistently built products on open standards rather than on proprietary technologies. The company developed the red-white-yellow-black color-coding system for input/output (I/O) modules and the open Optomux® protocol, and pioneered Ethernet-based I/O.

Famous worldwide for its reliable industrial I/O, the company in 2018 introduced [groov EPIC](#)® (edge

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programmable industrial controller). EPIC has an open-source Linux® OS and provides connectivity to PLCs, software, and online services, plus data handling and visualization, in addition to real-time control.

The company's latest product line, *groov RIO*®, provides compact, autonomous edge I/O that is ideal for communicating field data in IIoT applications.

All Opto 22 products are manufactured and supported in the U.S.A. Most solid-state SSRs and I/O modules are guaranteed for life. The company is especially trusted for its continuing policy of providing free product support and free pre-sales engineering assistance.



For more information, visit [opto22.com](http://opto22.com) or contact Opto 22 **Pre-Sales Engineering**. Use the [Contact Us form](#) on our website or call:

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or **951-695-3000**

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**- Dave Aitchison, Dignified Motors**

