



-TECU- *Traction Engine Control Unit*

MAXIMIZE LOCOMOTIVE POTENTIAL

Frustrated with fuel costs, watching your wheels slip along with your profits?

Concerned about older, unreliable equipment?

Anxious about unpredictable breakdowns that cause service disruptions?

BRING YOUR FLEET INTO THE 21ST CENTURY!

The TECU system has substantial benefits over older control units:

- **Improved wheel slip and creep control**
- **Typically a 20-30% increase in tractive effort and adhesion**
- **Easier installation**
- **Approximately 1/4 the size of Dash-II module rack**
- **Fewer modules and reduced wiring**
- **Improved Asset Management**
- **Enhanced main generator and traction motor protection**
- **Built-in diagnostics and fault logging**



Integrates into TMV electrical cabinet



Modules make maintenance easy

1-519-624-8219
sales@tmvcontrol.com

TECU MAJOR FUNCTIONS

- Wheel Slip Control
- Cooling Fan Control
- Engine Heater Control
- Creep Control for Increased Tractive Effort
- Dynamic Brake Control
- Transition Control
- Air Compressor Control
- Main Generator Power Control and Engine RPM Control
- Automatic Ground Relay Reset
- Load Meter Output
- Auto Engine Stop Start (AESS)
- Traction Motor Cut-Out (Switch or On Display)
- Over Current and Over Voltage Protection
- Open Traction Motor, Pinion Slip, and Locked Axle Protection
- Power Contactor Control
- Sanding Control
- Testing of All Major Locomotive Functions
- Fault Logging and Fault Log Download
- LCD Touch Screen (6" or 10")

Latest Addition!

- Remote Tracking (GPS) with Wireless Connectivity

SYSTEM COMPONENTS



CURRENT SENSORS



AXLE GENERATORS



LCD TOUCH SCREEN



TECU SYSTEM

CASE STUDY

A TMV Case Study: Lancaster and Chester Railway

This case study examines the impact of installing a TMV Traction and Engine Control Unit (TECU) on a locomotive to reduce operational costs. By installing TECUs on 2 locomotives, the Lancaster & Chester Railroad was able to use 40% fewer locomotives and significantly reduce operating costs.

With over 118 years of continuous rail operations, the L&C provides South Carolina and the Charlotte region with a strong transportation ally for industrial growth. Motive power consists of 9 locomotives with a full-service locomotive shop.

In this situation, the operator was required to run 5 locomotives on the line. The train ran 5-6 days per week and used about 175 gallons of fuel per day. Based on these figures, the costs per locomotive are as follows.

Maintenance: \$30,000 - \$35,000 per locomotive per year assuming no major breakdowns

Fuel: \$120,000 per year (assuming \$2.75/gallon)

Total Operational Cost per locomotive: \$150,000 per year

The costs of installation for the system were about \$60,000 per locomotive. This includes 2 weeks of shop time, for a total cost of \$120,000.

After installation of the TMV TECU on 2 of the GP38s, the operator was able to run the same train with 3 locomotives (2 with the TECU and 1 locomotive without the control system). These 3 locomotives in consist were able to pull the same amount of freight as 5 GP38s.

Resulting savings in the first year:

\$300,000 saved - \$120,000 installation costs = **\$180,000 saved in Year 1**

Ongoing savings: **\$150,000 per year per locomotive**

Conclusion:

Using the TECU, the L&C was able reduce 5 locomotives to 3 locomotives.

Installation of TMV TECU on short line locomotives will result in significant savings. Payback time for the initial investment can be as little one half year, with ongoing savings benefitting the operator.

The TECU integrates well into older equipment during locomotive refurbishments



ABOUT TMV

CELEBRATING OUR 10th ANNIVERSARY!

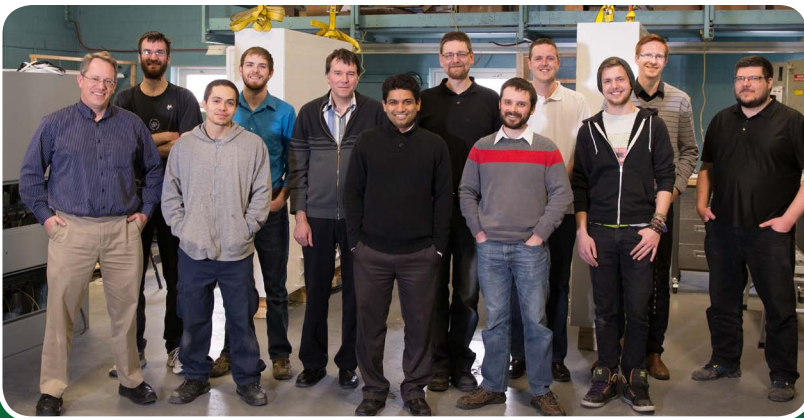
In 2005, Derick Vander Klippe, with 18 years of experience designing locomotive electronics, started **TMV Control Systems Inc.** The initial launch was in partnership with a locomotive builder and the first facility was a home office. However, within one year, TMV hired staff, and moved into a small industrial bay, using the extra space for prototypes, engineering development, and production.

Based on his experience developing several other locomotive systems, Derick developed the first product for TMV, the Traction Engine Control Unit (TECU). The TECU has since become our signature product. In addition, programming took place for the TECU-PC software, an integral part of the overall TECU package. The software allows real time downloads and diagnosis from the TECU, saving mechanical staff and our technicians an enormous amount of time in identifying problems on locomotives.

While demand for the new product was initially quite low, there were several faithful customers that helped TMV to get off the ground. Even with these customers, it wasn't until late 2009 that we celebrated the sale of TMV's 50th TECU system. This slow start gave TMV the time it needed to thoroughly test the TECU system. At that time TMV still only had 3 employees. We are very thankful for the trust and support that these early customers gave us.

The last five years have been very eventful for TMV and we have enjoyed rapid growth. TMV is now independently owned. We have moved into a significantly larger facility (13,000 sq ft) and grown from 3 employees to over 15. In September 2014 our quality management system received ISO 9001:2008 certification. As of early 2015, we shipped out our 200th TECU.

We are thankful to our many customers for their support. They include a Class 1 railroad, locomotive leasing companies, locomotive builders, rail maintenance companies, and numerous short lines. Our product is in operation on locomotives and other rail vehicles across the continent.



TMV's engineering and production staff in Cambridge, ON, Canada.

CORPORATE HEADQUARTERS:

**428 Dundas St N
Cambridge, ON N1R 5R4
Canada
Phone: 1-519-624-8219
tmvcontrol.com**



QUALITY ASSURANCE

Finally, as we celebrate our 10th anniversary, we are pleased to announce the opening of our US Field Office in Pennsylvania. We will continue to serve the rail industry with products that are known for performance and reliability. We also plan to continue with our excellent service and our desire to serve the needs of our customers.

US FIELD OFFICE:

**1093 Parks Road
Corsica, PA 15829
USA
Phone: 814-303-9868**