

ECU Production Software Download Station

Electronic Control Units (ECUs) are critical components of almost every system within modern vehicles, from engines, transmissions, and EV powertrains to door modules, latches, and lamp assemblies. While ECUs are typically programmed with some basic functions at the circuit board level during their manufacture, they often need to be re-programmed right before the final assembly process to get the latest ECU firmware updates and install application dependent calibrations. To accomplish this, some manufacturers simply choose an existing assembly line operation where the ECU is already powered up and adapt that station to perform the ECU programming step. Frequently this happens to be at End-of-Line (EOL) test, or some equally critical station. A problem with that choice is that “Flashing Software” is usually slow, error prone, and can become just as complex as the regular operations at that station. The drivers of that complexity are typically increasing cyber-security requirements and an exponential growth of calibration parameters. The bigger problem is that ECU flashing time cuts into the total cycle time of the main station operation itself. To solve these problems, DMC has developed a dedicated Production Software Download Station that treats the ECU programming operation as it should be treated today, like its own ‘digital assembly line’.

Application Challenges

- Flashing ECU software can be slow and error prone if not done correctly
- Modern ECUs require a variety of software components to be installed, such as a bootloaders, memory configuration applications, customer-specific calibrations, and evolving security libraries
- Process complexity keeps increasing due to new calibration and cyber-security requirements
- Adding ECU software download steps to existing processes, like EOL Test, cuts into their cycle time

The DMC Solution

- Object-Oriented LabVIEW based software built on the DMC Cortex Framework
- Uses NI cDAQ platform for compact and cost-effective digital and analog measurements and interfaces
- Support for NI XNET or Vector interfaces for CAN and LIN bus communications
- Leverages NI TestStand for simple download sequence definition and customization by test engineers

DMC Solution Advantage

- DMC’s solution provides a turn-key, production-line-ready, software download station to act as your ‘digital assembly line’ for building up the firmware of your ECU
- Save cycle time for your more capital-intensive assembly and test processes by moving the ECU software download process out of your main line
- Compact station design can program 4 to 8 ECUs asynchronously in parallel, reducing floorspace requirements



Why Work With DMC?

DMC is a leading systems integrator specializing in electronic component test and validation solutions. DMC offers a consultative approach to test system integration with:

- Proven expertise in test system automation and hardware/software integration for production lines and R&D/validation laboratories
- A large team with decades of experience led by industry veterans.
- A nationwide presence with the ability to support installations anywhere in the U.S.
- Long-term service and support, ensuring continuous system performance.

"I recently had the pleasure of working with DMC on a substantial project. We needed a company that could deliver engineering expertise and software promptly, as our development schedule was very aggressive. They truly took ownership and pride in their end of the project, ultimately resulting in an outstanding working relationship and final product. We will continue to work with and recommend DMC for future projects."

- Jeff Wasil
Associate Engineer at BRP

Key Specifications

Industries	Automotive, Commercial Vehicle, Truck, Bus, Off Highway, Construction, Marine
Controller Specifications	Windows PC based.
Typical System Size	20U high rack system: 24" Wide, 32" Deep, 44" High.
Software Download Methods	NI XNET Native LabVIEW code, or alternatively, Vector Vflash Station wrapper.
CAN Protocol Support	SAE J1939, UDS, XCP/CCP, or proprietary protocols through customization.
Data Reporting	Custom report formats are available through NI TestStand. Optional MES or database system integration through customization.
Data Entry	Keyboard & 2D Barcode Reader. Optional MES integration through customization.

For more information on the solution, contact DMC at the link below.

<https://www.dmcinfo.com/contact>