

REFLASH SERVICES

MOVIMENTO®

A division of Aptiv

Keep your vehicles in sync with the pace of software development.



Complete flash and reflash projects more quickly



Save money while streamlining operations



Improve quality and customer satisfaction

Today's vehicles are more dependent than ever on software. Trends like assisted driving, electric vehicles, advanced safety, infotainment, and increased regulation are accelerating this growth. Many vehicles currently on the road are running more than 100 million lines of source code. Industry analysts say that the amount manufacturers are spending on automotive software will double this decade, reaching \$80 billion by 2030.

This software growth presents a tremendous opportunity for manufacturers to offer new features and higher-quality products to their customers. But it also introduces new challenges.

All software has issues. As a result, vehicles makers are often modifying software right up until they ship a vehicle, making it necessary to reflash modules frequently.

As a result, OEMs say that they struggle to ensure that each vehicle is running the most up-to-date software version. They have tried to build over-

the-air (OTA) update solutions in-house is taking more effort than expected.

Currently, processes for reflashing vehicle modules rely heavily on manual procedures. It's time-consuming and expensive. And records about which vehicle is running which software are often inaccurate.

Meeting reflash needs throughout the vehicle lifecycle

Movimento simplifies the process of keeping vehicle software in sync at every stage of production.

At the preproduction design and testing phase, our on-site teams handle reflash tasks so that engineers can focus on higher-value work.

For the production phase, Movimento has two different offerings. Our reflash stations make it easy for Tier 1 suppliers to update their modules before shipment to an assembly plant. And

• **A P T I V** •

our in-plant flash systems and services integrate into your production line, ensuring each vehicle has the latest software.

Immediately after production, manufacturers sometimes experience emergencies where they need to reflash a large number of vehicles or modules quickly. For those situations, our rapid response teams are on call 24/7 and can quickly complete reflash campaigns anywhere in the world.

Unbeatable speed and quality

Working with Movimento makes sense for manufacturers because it costs less and takes far less time than handling reflash tasks on your own. Our plug-and-play PUMA tools enable parallel and multi-module reflash, which allows us to complete flashes quickly.

In addition, our Nuvolo cloud software provides 100% traceability, as well as reporting and reflash campaign management down to specific VINs. It integrates securely with your servers. We have a 99.5% first-time success rate and a 99.9% overall success rate with reflashes. And we're ISO 9001:2015 certified.

Extensive experience

With nearly twenty years of experience, we are the automotive industry's reflash experts. Our on-site (preproduction) teams flash 100,000 modules per year. Our in-plant (production) teams flash 3 million vehicles per year. And our reflash campaigns (postproduction) update 500,000 modules per year.

To learn more or set up a meeting, please visit our website at www.movimentogroup.com.

Case study: On-site Preproduction

One OEM was having engineers handle reflashes on its 500-vehicle preproduction fleet. Because of decentralized processes and a lack of experience, it was taking about 8 hours to update a vehicle, and many vehicles were often grounded while waiting for a software update. The entire operation was disorganized, and it cost about \$300,000 per month in engineering time.

To address these issues, the OEM contracted with Movimento to provide on-site reflash services. Using PUMA flashing tools and the Nuvolo traceability application, the Movimento team made the reflash process much more efficient. As a result, the OEM reduced its costs by 20%, yielding \$800,000 in annual savings. At the same time, they increased uptime for their preproduction fleet and improved initial vehicle quality.



Meeting the demands of evolving software throughout the vehicle lifecycle

On-site teams
Dedicated teams that ensure early production, media, show, etc. vehicles' software is up-to-date



2



OEM production line software flashing

Dynamically flash ECUs while vehicles are on OEM production lines; no added wait time and reduced inventory complexity

3

Supplier software support
Initial module software flash; completed as part of existing Tier 1 manufacturing line processes



1



Universal software reflash

Delivers safety-critical, complex, and time-sensitive software updates to all vehicle modules for in-vehicle and loose modules

4

Movimento provides software management options for every stage of the vehicle production lifecycle

Pre-production

Production

Movimento Solution Components



HARDWARE

PUMA 4 and PUMA 5 hardware supports the latest vehicle networks and architectures, as well as enabling parallel and multi-module reflash



CUSTOM FLASH SOFTWARE

Proprietary scripting software allows us to support modules and vehicles from any manufacturer and complete multi-module reflashes in parallel



NUVOLO CLOUD

Our Nuvolo cloud provides full traceability, reporting, and reflash campaign management down to specific VINs



EXPERT REFLASH TECHNICIANS

Our technicians respond within 24 hours with hands-on support to ensure successful campaigns and provide best-in-class customer service

Case Study: Reflash Campaign in Mexico

Recently, an OEM discovered that more than 30,000 of its vehicles produced at facilities in Mexico unexpectedly needed a software reflash. It was urgent. The manufacturer couldn't deliver the vehicles to dealers and customers until the reflash had been completed. More than \$1.5 billion worth of inventory was just sitting around.

The manufacturer contacted Movimento, and we sprang into action.

This reflash campaign posed some unique challenges relative to others we have handled. The vehicles were spread across two locations about 250 miles apart in a very remote area. The vehicles used an unusual type of data connector that we hadn't worked with before. Cell service was spotty. And to top it off, the team would need to deal with threats from extreme weather, as well as poisonous snakes, spiders, and other wildlife.

Movimento met those challenges by quickly designing and 3D-printing an adaptor that would allow the PUMA hardware to connect to the vehicle. We also developed a new software script that improved cell connectivity. Three days after the initial call, we were on location performing the first reflash in the campaign.

Within just 32 days, Movimento had reflashed 30,625 vehicles, completing as many as 1,400 reflashes in a single day. The campaign saved the OEM \$1.2 million compared to doing the work with in-house staff. They were able to move their inventory much more quickly than they had anticipated. None of our staff were bitten by snakes. And most importantly, they were able to deliver the high-quality vehicles their customers expected.

PUMA™ Hardware

Movimento's PUMA hardware supports up to 4 CAN FD channels, as well as DoIP and Automotive Ethernet. And it boots in less than 15 seconds.

Specs:

- 4 GB RAM
- 16 GB eMMC storage
- Wi-Fi 802.11 ac/a/b/g/n
- Bluetooth 5 and BLE
- 2x USB
- IP65
- J1962 (replaceable)
- MMOTA coming late 2023



Movimento Features and Benefits

Category	Feature	Benefit
Hardware	Portable PUMA hardware	Plugs easily into OBD ports, enabling fast flashes under just about any conditions
	Custom rigs	Streamlines production processes while eliminating the need to design and build your own tooling
	MMOTA (coming late 2023)	Enables fast reflashes with minimal interaction from on-site personnel
Software	Support for modules and vehicles from all manufacturers	Provides assurance that Movimento can meet your organization's unique flash and flash needs
	Parallel multi-module reflashes	Speeds up the flashing process, particularly when working on a high volume of vehicles
	Support for the latest vehicle networks and architecture	Eliminates the need to order special hardware or software to handle the demands of modern vehicles
	Customizable	Adapts to meet individual project needs
Cloud	100% Traceability	Ensures that every vehicle is running the most up-to-date software version
	Built-in reporting capabilities	Provides the time-stamped documentation you need to show that each module on each vehicle has been flashed correctly
	Connects securely to your servers	Assures that you have the most up-to-date software images from your own systems
Staff	24-hour availability	Provides the immediate service you need if and when emergency reflashes become necessary
	Global support	Allows you to obtain service anywhere in the world, no matter how remote the location
	Full-time on-site teams available	Provides immediate service while freeing up your engineers and other employees for more valuable work
	Extensive training	Allows the team to complete their flashing tasks quickly and effectively in dynamic and challenging environments
Organization	ISO 9001:2015 certification	Gives you the peace of mind that comes from knowing safety- and production-critical reflashes will meet the highest standards
	Flawless execution	Enables the high product quality that results from Movimento's 99.5% first-time success rate and a 99.9% overall success rate
	15 years of experience	Offers the confidence that comes from working with the industry's leading experts

About Movimento

Founded in 2005, Movimento began with a vision to help create the software-enabled vehicle. Since that time, we have remained on the cutting edge of technology that is changing the way the world drives.

In 2017, Movimento was purchased by Delphi Automotive. Later that year, Delphi split into two separate companies, and Movimento became part of Aptiv.

Today, Aptiv is a global technology leader with more than 200,000 people across more than 131 manufacturing

facilities and 11 major technical centers worldwide. With a presence in 48 countries, we address mobility's toughest challenges through our deep software and systems integration expertise, delivering market-relevant solutions for our customers.

Our mission is to make the world safer, greener, and more connected than ever before. As these trends converge and the world of mobility changes, we will lead this change. Mobility has the power to change the world, and we have the power to change mobility.