2026 / WHITEPAPER

Decoupling hardware and software dependencies in industrial control systems

Supporting your embedded control systems so you can build smarter, launch faster with PTIC middleware.

Prodrive
Technologies
Industrial Control

OEMs face increasing challenges in advancing their hardware without causing disruptions or requiring extensive re-engineering of their software. As machinery grows more complex, these difficulties are exacerbated by frequent hardware updates, the necessity to manage multiple product variants, and the imposition of stricter requirements, such as cybersecurity standards.

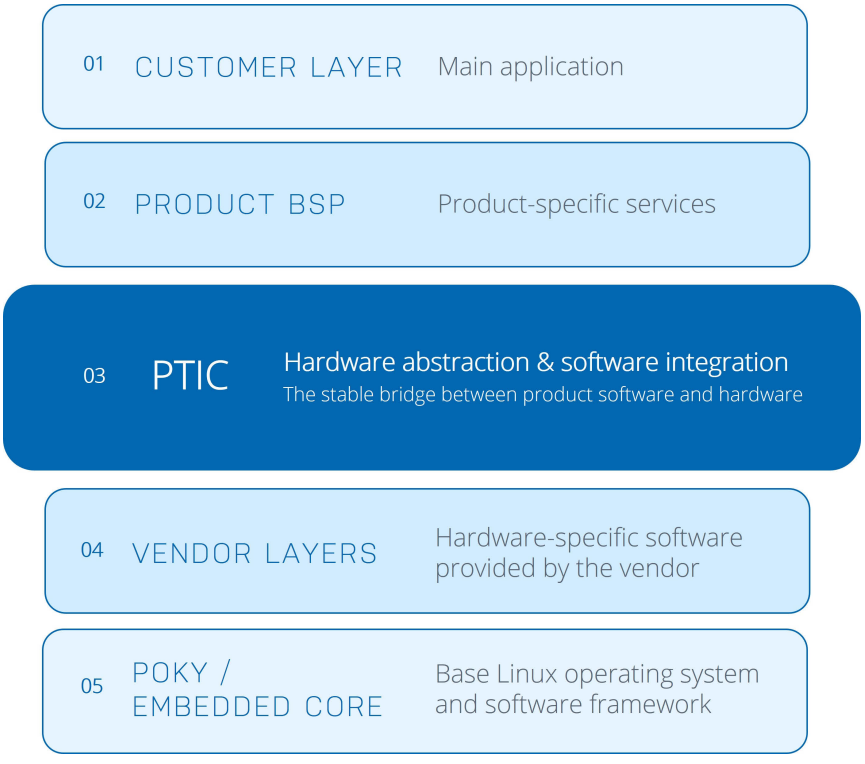
The fundamental problem stems from the tight coupling between hardware and software. This interdependence restricts flexibility and scalability throughout the product lifecycle, making it hard for OEMs to adapt to evolving market demands and technological advancements.

PTIC: The middleware solution

Prodrive Technologies addresses these challenges with PTIC (Prodrive Technologies Industrial Control), a middleware platform designed to enable OEMs to decouple hardware from application software. PTIC empowers manufacturers to develop their software independently, thus avoiding limitations imposed by the hardware changes.

Built on a Yocto-based Linux distribution, PTIC leverages an industry-standard embedded framework to deliver flexibility. Positioned between the BSP layer and the hardware vendor-specific layer, its middleware architecture separates hardware dependencies from higher-level software, providing hardware transparency to both the BSP and customer layers and enabling OEMs to focus on application development without concern for underlying hardware changes.

> // PTIC gives OEMs the freedom to develop software independently of the underlying hardware. We assure customers can focus on their core technology instead of reinvesting resources in hardware integration and maintenance. //



PTIC framework

Martijn de Gouw
Team Lead PTIC software

Seamless hardware integration

The dedicated abstraction layer within PTIC is crucial for separating application software from hardware dependencies. By utilizing this layer, OEMs can replace key components - including CPUs and I/O modules - without the need to modify or re-engineer their application software. This architectural strategy streamlines migration to new hardware platforms and greatly reduces the time and effort typically required for redesigns. The abstraction layer ensures that hardware upgrades or changes can take place independently, preserving software stacks and enhancing flexibility and scalability. As a result, OEMs can innovate on hardware without needing to worry about software stability.

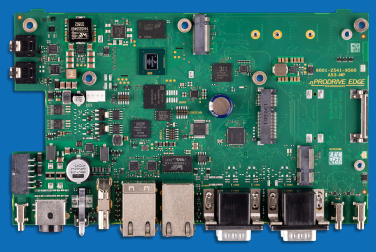
Unified support for multiple hardware variants

Industrial control systems often lacks standardization. Differences in vehicle size, power levels, and regional requirements lead to diverse hardware configurations within a single product family. PTIC provides a unified software platform that facilitates reuse across these variants. By offering a consistent framework for firmware, drivers, and middleware, PTIC supports multiple hardware under a single software baseline. This reduces development duplication and simplifies maintenance across various product lines.

Cybersecurity as a foundation

PTIC is engineered with security and lifecycle management built in from the start. The platform features integrated cybersecurity capabilities, including CRA-compliant vulnerability tracing, SBOM Vulnerability Management, secure boot, storage encryption, storage integrity validation, and tools for signing images for secure boots, including Yocto recipes. These features provide OEMs with audit ready software foundations and protection against vulnerabilities.

PTedge is a series of industrial edge computing and development platforms designed to accelerate the development of connected, AI-enabled, and software-defined applications.

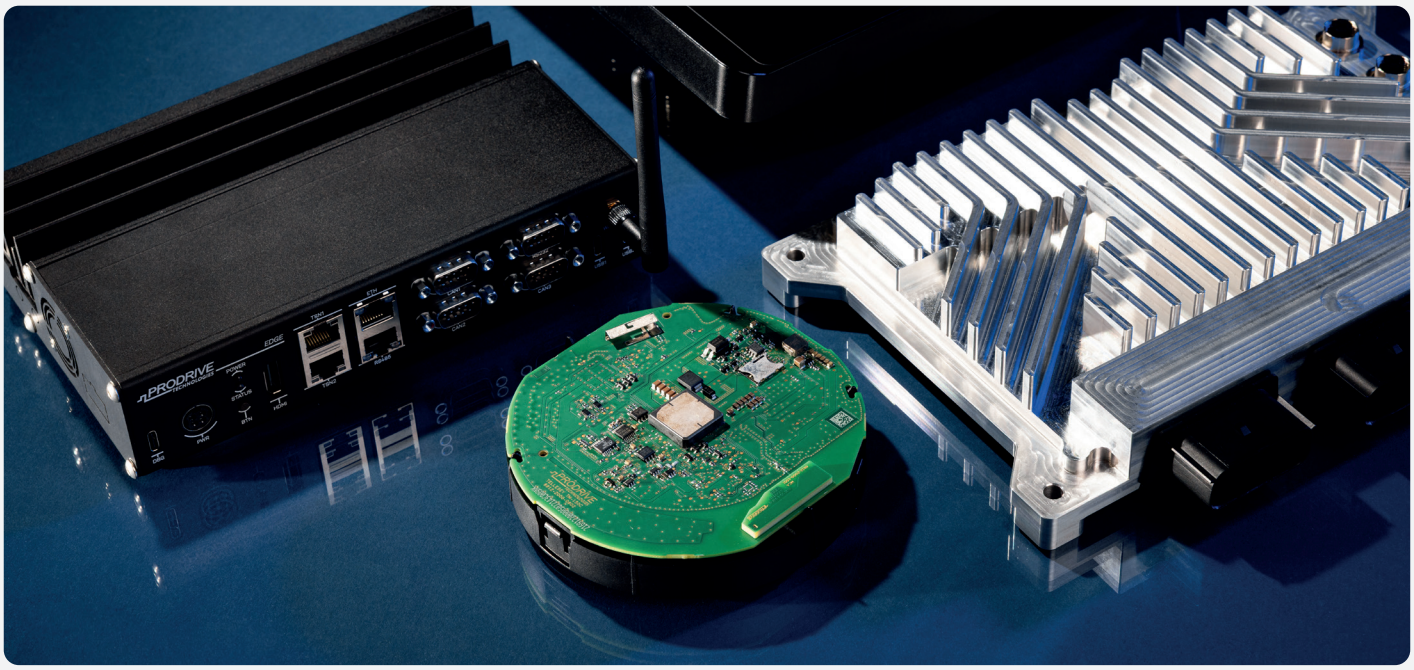


PTedge
a series of ARM-based edge computers running PTIC software

Your partner in embedded controls solutions

The ability to adapt hardware without rewriting software becomes increasingly valuable as new innovations emerge. PTIC meets this need through its layered architecture and hardware abstraction approach, enabling OEMs to respond to technological changes and evolving requirements while minimizing redesigns. With PTIC, OEMs can build smarter and launch faster.

We support the following industrial applications in test, design and manufacturing of your industrial control systems.

Industrial applications

Discover additional information regarding our embedded controls:
Embedded controls & industrial IoT