

Your solution for the
embedded tomorrow.



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NVIDIA® TEGRA®

MUHMI



VISION

„Continuous investment in business excellence will create a superior basis for the expansion of innovative production line ensuring recognition and growth of the Company on the world market.“

MISSION

„By integrating our own innovations and new technologies we develop and manufacture special purpose robotic systems to protect human lives in most dangerous environments, primarily in demining, mining and fire-fighting.“

DOK-ING Ltd. is a 100% privately owned Croatian company, established in the late 1991 and registered for the production of robots and special purposes equipment. The Main office, production facility and service are located at 15 172 m2 area in Zagreb, Croatia.

The main reason for the start of demining machines production in Croatia was the problem with mines left over after the war. Not less important was the desire to help local deminers in their dangerous work and reduce the additional threats. This fact determined the Company's Logo „Don't send a man to do a machines job!“ Therefore mine pollution was used to test their products quality in real conditions and work on the improvement. An excellent reference was thus achieved before the exit onto the international markets.

Product range

DOK-ING machines are designed for one purpose _ to protect human life in extreme conditions. Product range consists of 3 main areas that could benefit from using technology and specialized machines to work remotely in enviroments that are not aprochable to human workers.

Mine clearing equipment - MV-4 system and MV-10 double tool mine clearance system are tracked remote controlled machines designed to clear all types of AP and AT mines, as well as unexploded ordnance. (UXO). Excellent maneuverability allows them to demine different types of terrain. The tool attachments used

with both systems are flail, roller, blade, tiller and gripper. Those enable the mine clearance systems to be used as multifunctional robotic systems in a number of various dangerous situations, protecting assets and most important, human life.

Dozers for underground mining - developed on the previous experience with demining equipment, but adjusted to the needs of the South African mining sector. Dozers are designed as a very low profile remote controlled multifunctional machines that can be used in mining and construction industry. After the machines

with convenient fuel, new projects are concerned with the development of the electric dozers.

Fire-fighting robotic vehicles - using the same basis as for the machines and equipment developed before, the multifunctional, remotely controlled, robotized system MVF-5 was constructed to help and protect firefighters, improve safety and security, as well as the rescuing operations in the extreme conditions of natural disasters and every other dangerous situation where human lives are threatened.

MyHMI - HMI Synergy

In the era of the necessity for Human Machine Interface (HMI) enhancements, DOK-ING recognized the opportunity for imparting a fully modular and innovative HMI framework. **MyHMI** uses the power of software to achieve the synergy between man and machine. Modularity of the framework includes possibilities for a customizable advancement of the HMI in the domains of communication, data acquisition and processing, and visualization. The framework's innovative component is contained in its orientation towards distributed processing and embedded systems. MyHMI provides an easy interface implementation, regardless of the architecture and graphics mechanisms, even the communication system it relays on, through an easy to use graphical development tool.

Ergonomics of MyHMI interface

MyHMI is an industrial application development platform, adjustable to the specific requirements. It's fully flexible towards an underlying hardware platform and communication systems, and thus has opportunitive usage in many industries:

// Automation and manufacturing

// Energy and infrastructure

// Medical and pharmaceutical

// Travel and transportation

MyHMI concerns any industry branch which shows the need for control and visualization mechanisms through HMI.

Intended use of **MyHMI** can be seen through:

Managing concept - referring to the design, industrial system integration and management, and customer or end users aspects of a HMI.

Engineering concept - referring to the development, implementation, building, maintenance and customization aspects of a HMI.

The two concepts interleave in the unique purpose of developing, and delivering or managing of visual, processing and communication components of the industrial interfaces.

MyHMI - partner in graphical interface development

MyHMI framework represents an innovative approach in design, development, and integration or building of the graphical interfaces.

Based on it's modularity, **MyHMI** enables building of graphical interface platforms, that are easily customizable to fit the special requirements. Besides the customizability, the main gain of using **MyHMI** as interface development partner, is a rapid deployment. Fast and adjustable construction of the graphical

elements enables quick and robust deployment of the interface.

The customizability and rapid deployment, not only evolve procedures of enhancing the interface itself, but evolve the whole product development process.

Development with MyHMI reduces:

Risks - The modular, pre-tested graphics software core, mountable on various hardware and OS platforms, simplifies custom application development, lowering the risks of cross platform portability. **MyHMI** enables significant HMI extensibility, keeping the consistency in the development process at the same time.

It also increases development process agility and responsiveness to the customer demands changes, reducing risks of negative outcomes for the clients.

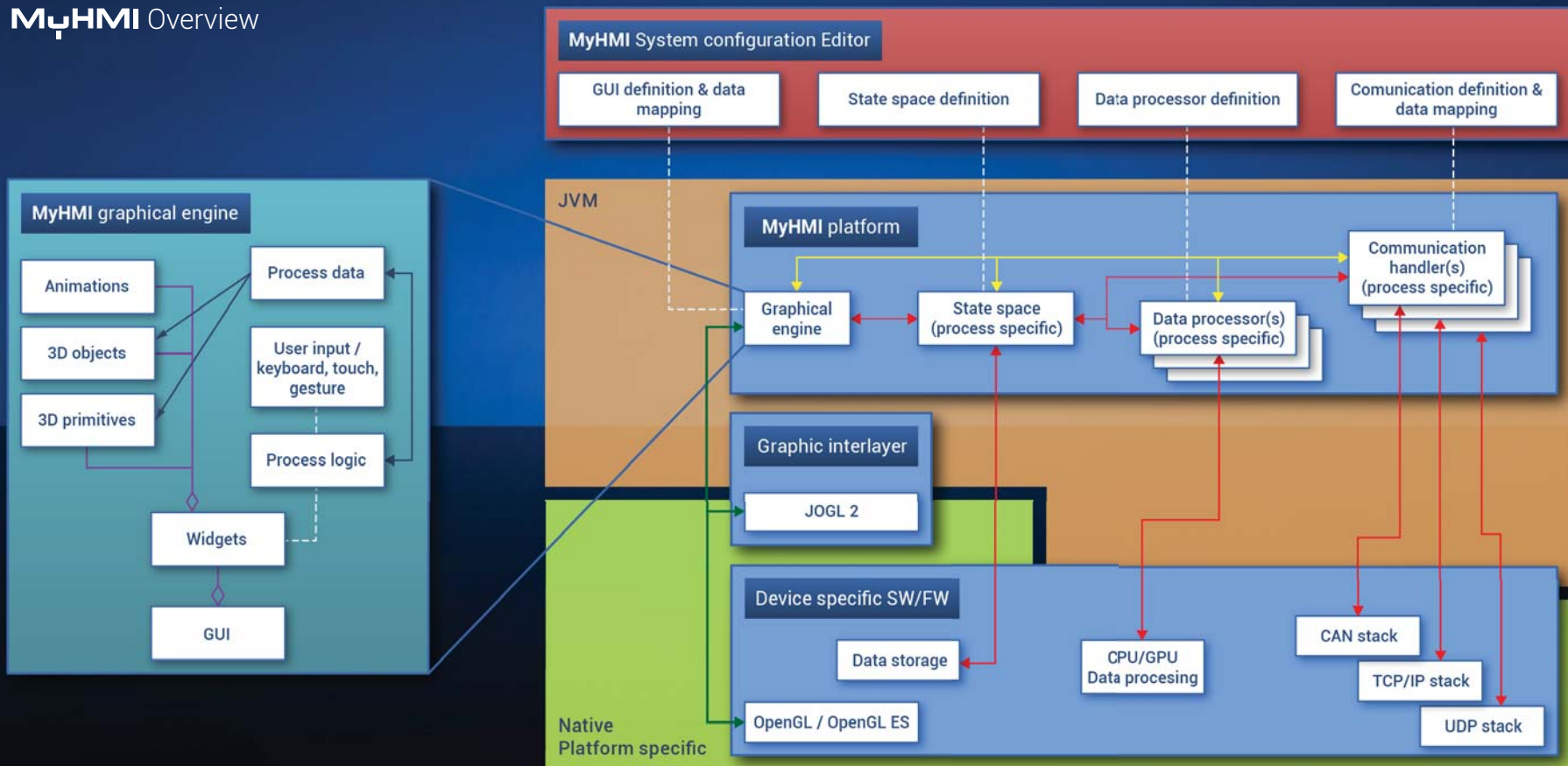
Time-to-market - **MyHMI** eases the process of building a HMI from the bottom, as well as enhancements of the interfaces built with **MyHMI**.

Customizability of **MyHMI** enables adding and changing of the special use intended interface elements, in a remarkably reduced time period.

Costs - **MyHMI** provides easily and quickly adjustable graphical elements due to its modularity thus reducing overall costs through all phases of the development process.

Changes and adjustments in the visual and functional dimensions of the interface do not slow down nor downgrade the deployment, reducing the costs of customization or enhancements.

MyHMI Overview



MyHMI Features

- Full 3D visualization with support for OpenGL/OpenGL ES with different device profiles and import of 3D models in OBJ format
- Java based application that can run on different device profiles with ARM or x86 based architecture, easily deployed on Windows, Linux or Android devices
- Modular architecture that allows you to develop and plug-in your own data processing and data acquisition modules
- System and visualization modules are wired through respective XML configuration files
- Built-in modules specific for electric vehicles which include CAN bus or IP communication/state mapping and power consumption analysis
- 3D editor for application widgets/scenes built on Eclipse IDE, with possibility for extending basic widget functionality with your own code-behind

MyHMI Benefits

- Portability across different platforms/device profiles
- Freedom in using your own 3D models for visualization
- Ability to easily integrate your own data processing logic
- Confidence in using a fault tolerant system built with best practice industry standards
- Familiarity of proven development tools used by a wide developer base

MyHMI Design and Development

Primarily, **MyHMI** framework was developed for automotive and vehicle infotainment and control applications. In architecture design phase, the developers have foreseen extensions of those applications. They used nVidia Tegra embedded systems as the framework development platforms. Tegra based systems rapidly overwhelmed the consumers and mobile industry, with a clear tendency to expand to other industries and markets. Through the phases of **MyHMI** development cycle, the same tendency became obvious for the framework itself.

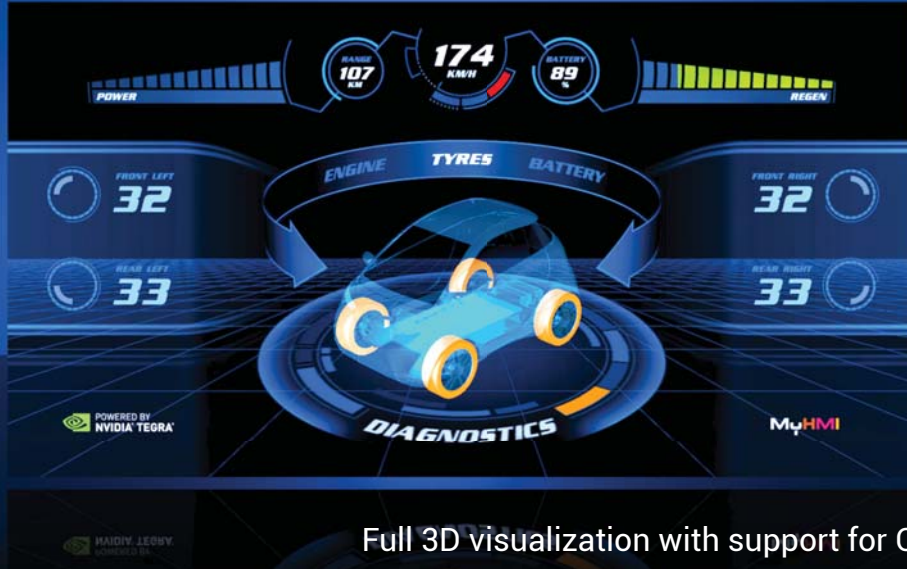
The base of **MyHMI** system is a configurable kernel for real-time data acquisition, processing, display and interactive visualization, control messaging and managing. The kernel is encapsulated by the powerful and adjustable graphical software engine. Engine's architecture is two layered, consisting of the low level graphical layer based on the OpenGL and OpenGL ES standards, and the JOGamp's JOGL2 interface interlayer. The JOGL2 interlayer provides multiplatform compatibility through device profiles and wrappers to native OpenGL driver implementations.

Therefore the interlayer enables the portability of the graphical engine to ARM or x86 based architectures, using Windows, Linux, or Android operating systems. The graphical engine enables the usage of graphical primitives, as well of more complex, compound graphical structures, in a fully 3D interactive environment, with the purpose of building a configurable graphical visualization interface.

MyHMI

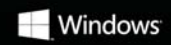


MyHMI CROSS-PLATFORM CONNECTIVITY PRESENTED AT CES 2013



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MyHMI

Industry software platform for the future

MyHMI reveals itself as the comprehensive framework for the industry interfaces deployment and integration. MyHMI is software platform adjustable to low-level device engines and communication protocols, and provides the ease of development and customizability. It leverages 3D graphical visualization, empowering the use-oriented application developers in the process of a complex and modular graphical user interfaces deployment.

As the software platform solution, MyHMI overrides the highly specialized solutions, prevailing on today's industry framework market. Superseding them because of their inertness and tightness, MyHMI provides itself the inevitable power of growth.



MyHMI is developed by DOKING Research & Innovation team.

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