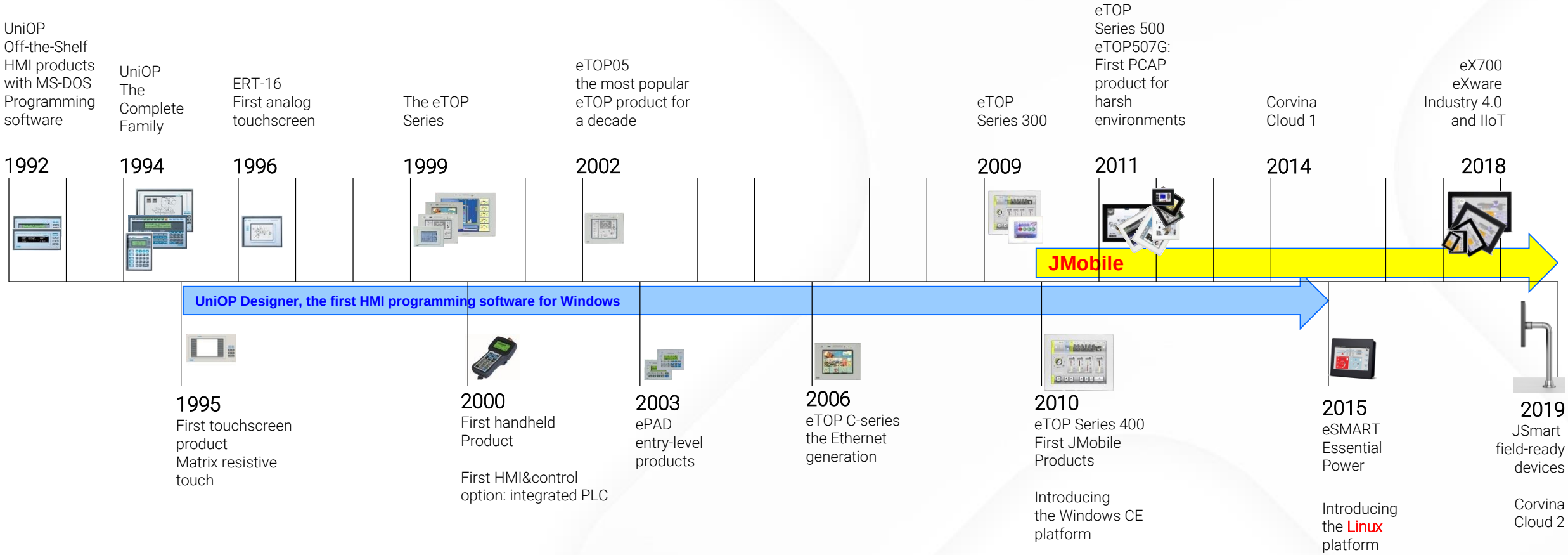
EXOR at Hiflex Wederverkoopdag

February 2019

What’s harder, unusual and far more useful is setting the values, purpose and vision that guide:

- the work we do,
- the service we deliver,
- the attitude we adopt and
- the meaning we hope to create

EXOR HMI Technology Timeline



Even with the best products in the world…

If we do not understand or do not communicate why we exist
then we are making it harder for people to believe in EXOR

Including employees as well as clients

EXOR 1995

- Can you recognize display technologies?
- Can you tell which have disappeared?
- Did buttons disappear first in industrial HMIs or mobile phones?
- Which one of the products was the last to be phased-out?

Do these questions tell you a lot about EXOR attitude to technology and customer service?

From buttons to the Cloud...

X Platform

Industry 4.0 ready

PLATFORM

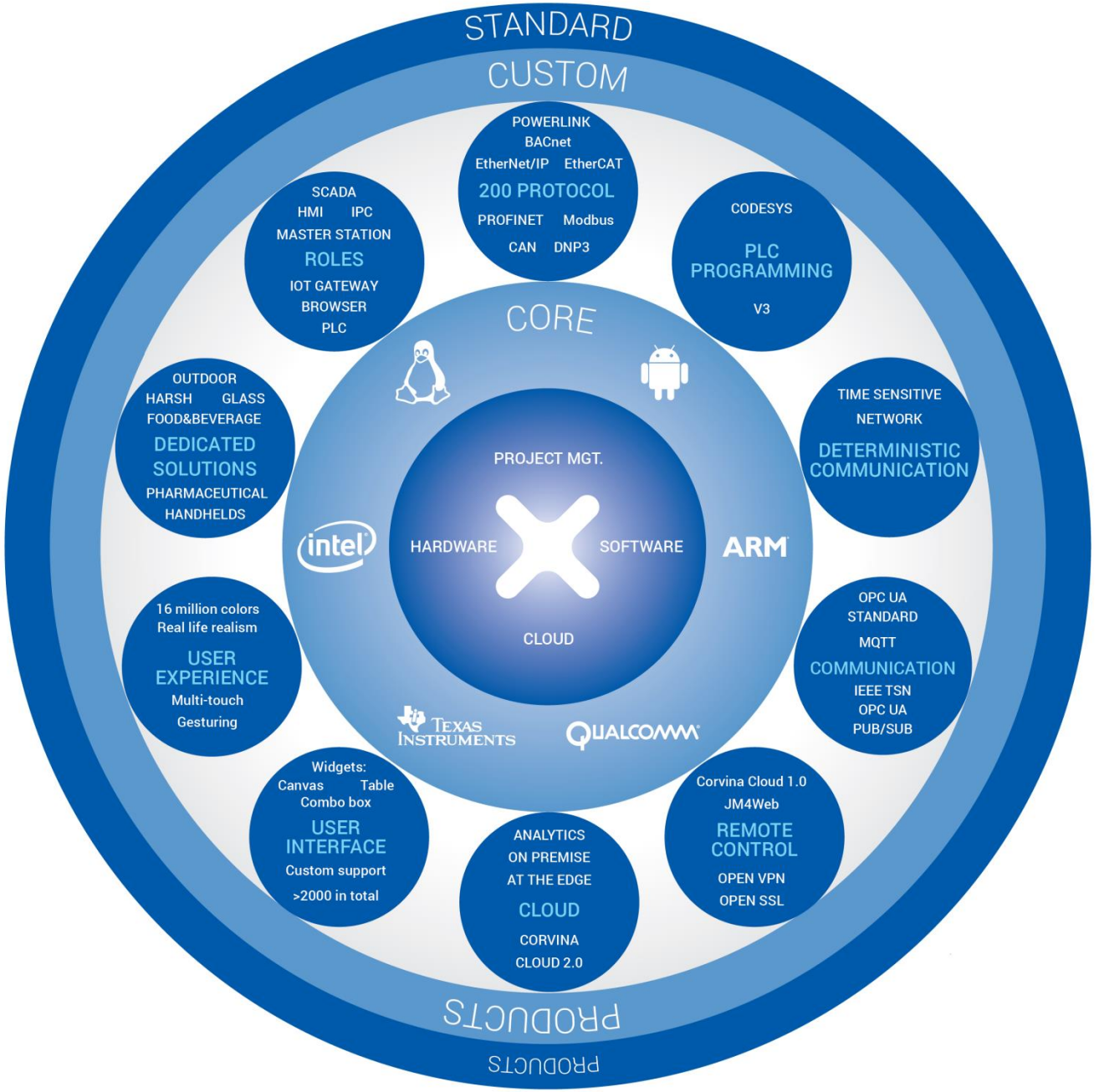
Make products work together

Create better applications

X Platform by EXOR is your complete guide to realize any Industry 4.0 plans.

Its goal is to help you to rapidly develop new applications of smart connected devices.

The X Platform is the only true complete IIoT platform because it can partner with you in the implementation of your Industry 4.0 plan no matter where you and your company are now.



Software

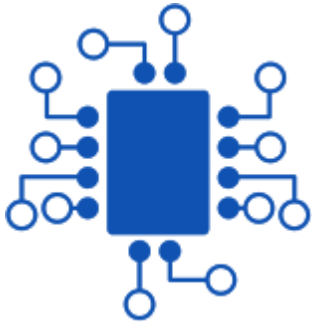
Hardware

Cloud

X Platform: What Are the Benefits?

Faster Time-to-Market

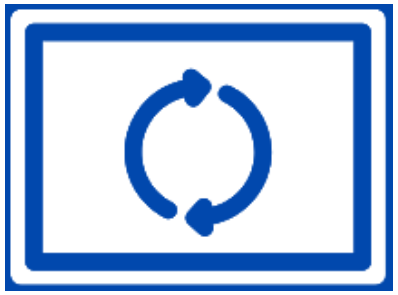
New product design is a complex and expensive undertaking for any company. Not only can EXOR's **multiyear experience help to reduce the risk** associated with this but the flexibility and power of the microSOM to Corvina Cloud **allows (mid-project) pivoting** which is crucial to final commercial success



Simplicity

Simplicity in technology use cannot exist without having a tremendous level of **sophistication in hardware and software**. Exor microSOM allows product design across the **entire enterprise architecture**: Product, Field Device, Control Device, Station, Work Centres and also connection to Enterprise level data analytics, via the Corvina Cloud.

Being simple to Exor means you not worrying about compatibility.



Easy Upgrade or Downgrade Decisions

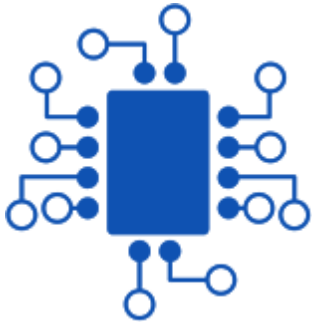
Use EXOR SOM technology and display options allow you to design your IIoT product yourselves or you can have **EXOR design, develop and test your product** or simply choose to **customise an already existing standard** EXOR product.

The point is, **with the X Platform you have this level of choice,** which we will help you make. Nothing is standing in your way to come to market with your Industry 4.0 product.

What Makes X Platform So Complete?

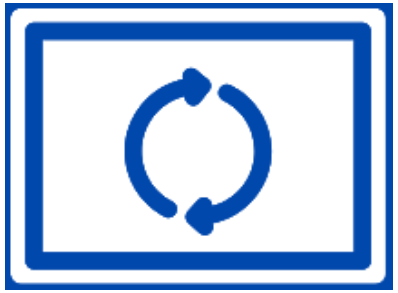
Mechanical and electronic design
total design of projects at the mechanical level are regularly managed at the EXOR International Lab in Italy.

Operating system customization
The BSP usually requires customization to the embedded processor platform on which it runs. Developers who customize the BSP must not only understand the operating system itself, but also the intricacies of the underlying hardware as well as how application developers expect to interact with the BSP.



Visualization and control software
Communication across multi-vendor, multi-protocol and multi-device environments and then sending this data to local or cloud storage is a requirement for manufacturing efficiency. JMobile suite of software offers this unmatched level of user experience because EXOR is deliberately neutral to all protocols.

Connectivity
Seamless integration is achieved with the vast library of protocols that is common with JMobile software. Existing installations are easily employed and upgraded when necessary and very little programming skill is needed given the brilliant User Interface of JMobile.



Cloud based technologies
EXOR offers via the Corvina Cloud a state of the art fully customizable cloud service that seamlessly integrates the data acquisition and user applications.

Regulatory certification
All electronic products, regardless of industry, application, or use case, must minimally pass regulatory certification. Having an experienced business partner with a history of designing HMI interface devices and moving them through the certification process can be critical to a successful product launch

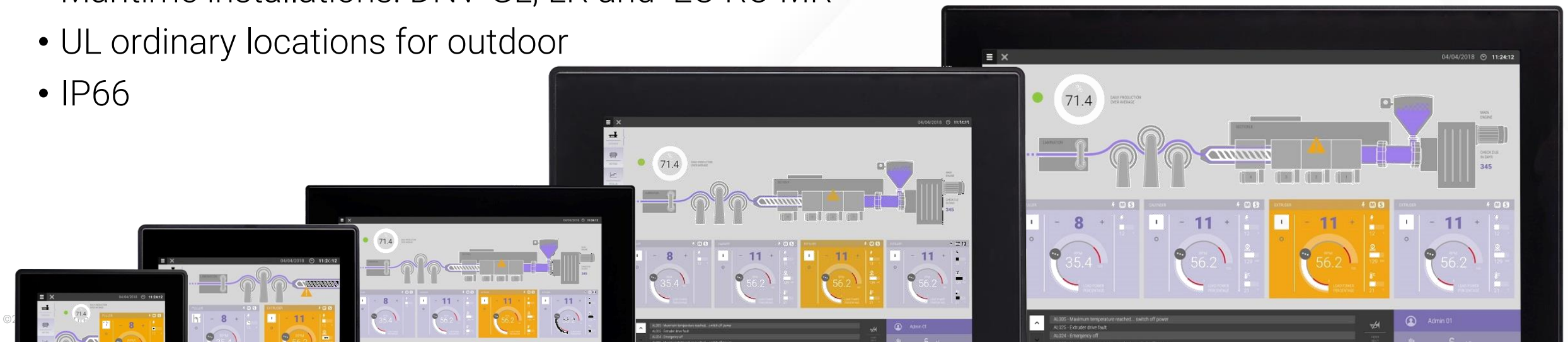
eX700: Revolutionary IIoT Controller

The EXOR flagship HMI products have gone much further, creating the ultimate all-in-one solution ready for scalable applications across many industries.

- Top performance with dual and quad core ARM CPU and Linux operating system
- True glass, high-resolution PCAP touch
- Fully connectable upstream and downstream
- Ideal platform for performing JMobile applications
- CODESYS PLC with networked I/O EtherCAT, PROFINET, EtherNet/IP, POWERLINK, CANopen
- Optimal performance for browser applications with Chromium
- Corvina Cloud router for secure remote connection

eX700: Revolutionary IIoT Controller for demanding installations

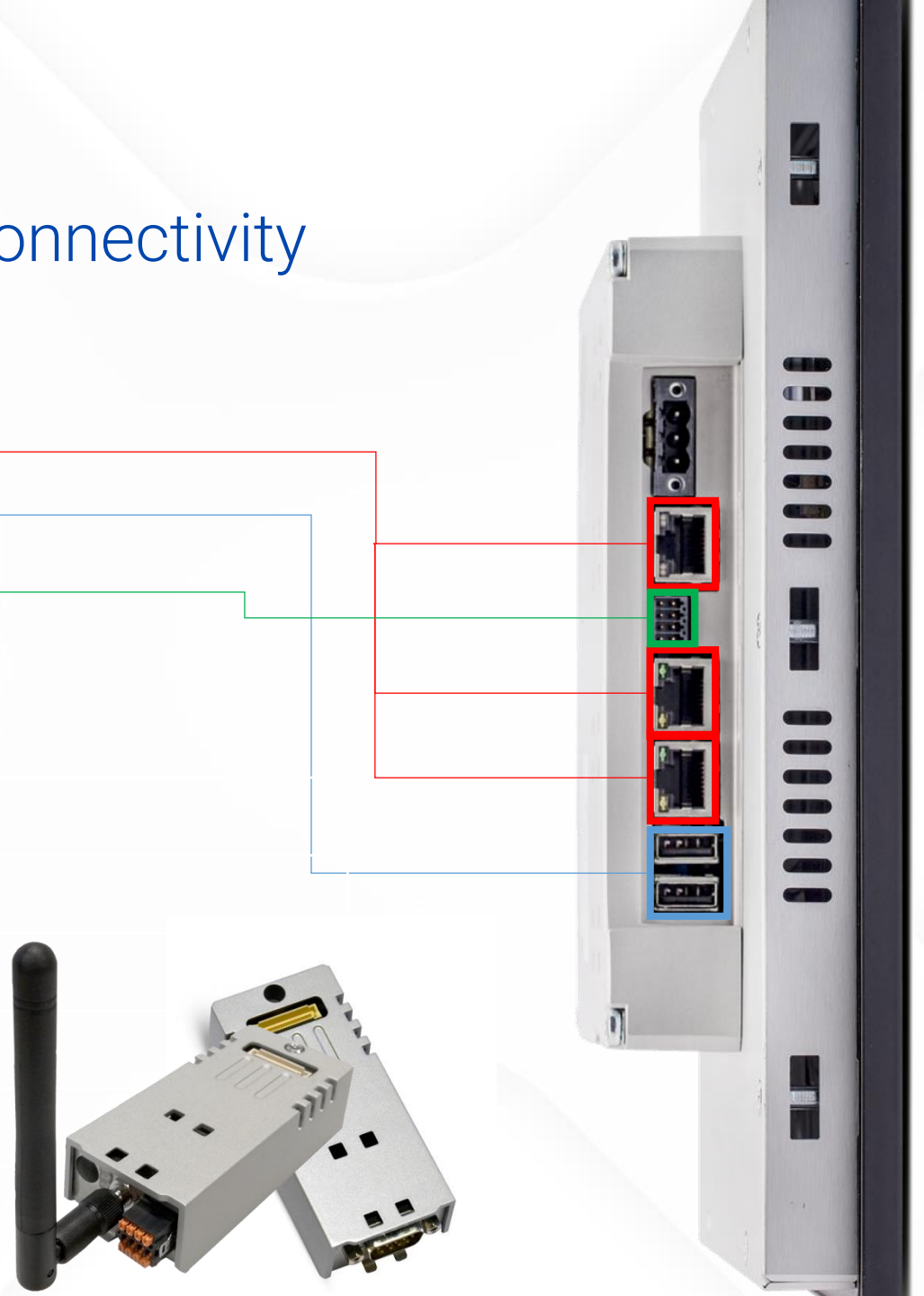
- Ample display range 5”, 7”, 10.1”, 15.6” and 21.5” and resolution up to full HD and up to 16M colors
- PCAP touch technology with multitouch gestures
- Wide operating temperature range -20°C to +60°C
- Full choice of certificates
- Hazardous locations: IECex, ATEX and UL Class I Div 2
- Maritime installations: DNV-GL, LR and EU RO MR
- UL ordinary locations for outdoor
- IP66



eX700: Revolutionary IIoT Controller for connectivity without borders

- 3 Ethernet porta with separate IP
- 2 USB Host
- 1 serial multistandard RS-232/RS-422/RS-485
- 1 SD interface
- 2 plug-in slots

Serial expansion	PLCM03, PLCM04
CANopen	PLCM01
Profibus DP	PLCM06
Digital and analog I/O	PLIO03, PLIO06, PLIO07
3G Modem	PLCM09
KNX TP	PLCM02



Products for Vertical Markets

EXOR leverages on the technology built in existing products to evolve new generations of effective **dedicated products**.

From the roots of the high-end eX700 HMI products you get:

eX700G products for outdoor and harsh environments

eX700FB for food&beverage applications

eXware700 as powerful IoT gateways.

All with **one** software **JMobile** & **Corvina Cloud**

eX700G HMI products for extreme applications

Extend the successful eX700 HMI products for use in demanding environments:

- marine
- oil and gas
- mobility
- outdoor

Designed to survive the harshest conditions:

- **rated for outdoor installation**
- IECex certification
- **optical bonding**
- high-brightness display with **sunlight readability**

Available with 7" eX707G and 10.1" display eX710G.

eX700FB products for Food&Beverage applications

eX707FB and eX715FB products bring the **performance of eX700 series** to critical areas in food&beverage applications.

Products are ready for all cleaning procedures required in food areas.

Polished and rugged stainless steel bezel, sturdy glass PCAP touchscreen with **protective polyester coating**, food-compliant gasket make these products **an optimal choice where IP69 is a requirement.**

eX700FB products for Food&Beverage applications

Designed in conformance with guidelines in DIN EN1672-2.
Bezel made with stainless steel AISI 316L.
Gasket in compliance with FDA 21 CFR 177.2006.
Strong tempered glass touchscreen with polyester coating.
IP69 for high pressure/high temperature cleaning.

Key technology for Italian ice creams!

eSMART: Stripped Down Essential Power

Have a tight budget and high volumes?

eSMART rethinks the whole budget HMI sector

There is no other low cost HMI Series in the world that can offer the range of features and certificates, opening dramatically the range of possible applications and industry verticals.

It is the real price-breaker door opener product!

Display 4.3”, 7” and 10.1” with resistive touchscreen

Fully compatible with Jmobile, available as web browser with Chromium

Certified for marine and hazardous locations

eXware703, eXware707 and eXware707Q

Rugged and compact **IIoT controllers**. Ideal solution for **data-intensive edge** applications.

Rich software options for an uncomplicated start in IIoT and Industry 4.0:

- JMobile with **JM4web HTML5** interface and data gateway functions including **OPC UA server and client**. All JMobile protocols.
- **Corvina Cloud router** for secure remote connection. Fully compatible with Corvina Cloud 2.
- CODESYS PLC with networked I/O EtherCAT, PROFINET, EtherNet/IP, POWERLINK, CANopen.

Can be used as a **Linux-based open platform** for customized applications

eXware707 and eXware707Q

Powerful dual core and **quad core** ARM Cortex-A9 processors.

3 Ethernet ports for network separation. Each port with own IP address.

Wide operating temperature range.

Rugged all-metal design.

Plug-in modules for easy system expansion. Compatible with PLCM09 modem for wireless connectivity.

Approved for use in hazardous locations.

Legacy industrial equipment and IoT

The simplest way for **legacy industrial equipment to IoT** following Industry 4.0 concepts.

Seamless integration is achieved with the vast library of communication protocols that is common with JMobile software. Existing installations are easily employed and upgraded when necessary.

"Legacy equipment connections can be challenging, however, because **legacy equipment often wasn't designed to communicate** with other devices and systems; original communications protocols (if any) almost always require translation. Further, the isolation and proprietary nature of legacy systems were seen as a method of security, neither of which offers much protection for today's manufacturing environment." Mark T. Hoske, Control Engineering magazine

IIoT goes where it has never gone before

eXware705

Rugged and compact **IIoT controller** to use when **conditions are harsh** in character.

Designed for marine and mobile applications.

Water immersion protection IP67.

Rich software options for an uncomplicated start in IIoT and Industry 4.0:

- JMobile with **JM4web HTML5** interface and data gateway functions including OPC UA server and client. All JMobile protocols.
- Corvina Cloud router for secure remote connection.
- CODESYS PLC with networked I/O CANopen.

Full plastic design.

NMEA2000 product certification.

DVI Adapter

Adds **DVI input and output** options to EXOR products.

Touch/mouse supported.

Display resolution up to **Full HD**.

Excellent update performance thanks to direct access to video internals.

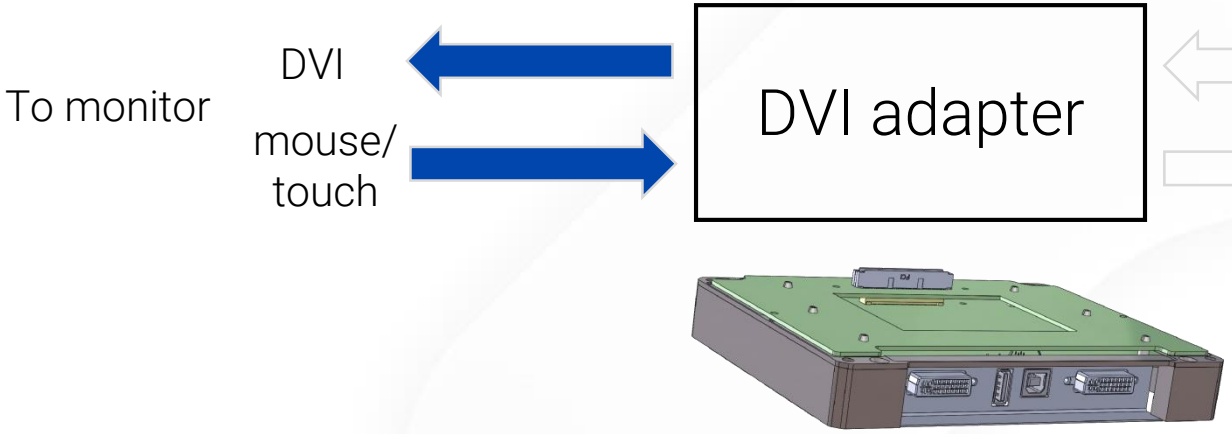
Compatible with eX and eXware products (eXware707, eX707 to eX721).

Easy and flexible configuration with JMobile Studio.

Compact controller with video interface

The simplest way to quickly assemble a powerful stand-alone controller with DVI video output.

Ideal for embedded controllers and for digital signage systems.



Compact controller with video interface

The simplest way to quickly assemble a powerful stand-alone controller with DVI video input.

Easily transfer video input information to web.

Web interface HTML5

To monitor

DVI

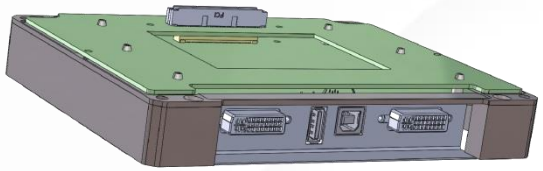
mouse/ touch

DVI adapter

DVI

mouse/ touch

From external source



JSmart field-ready HMI products

The product for field installation. Ruggedized for use in harsh environments.

IP67 environment protection.

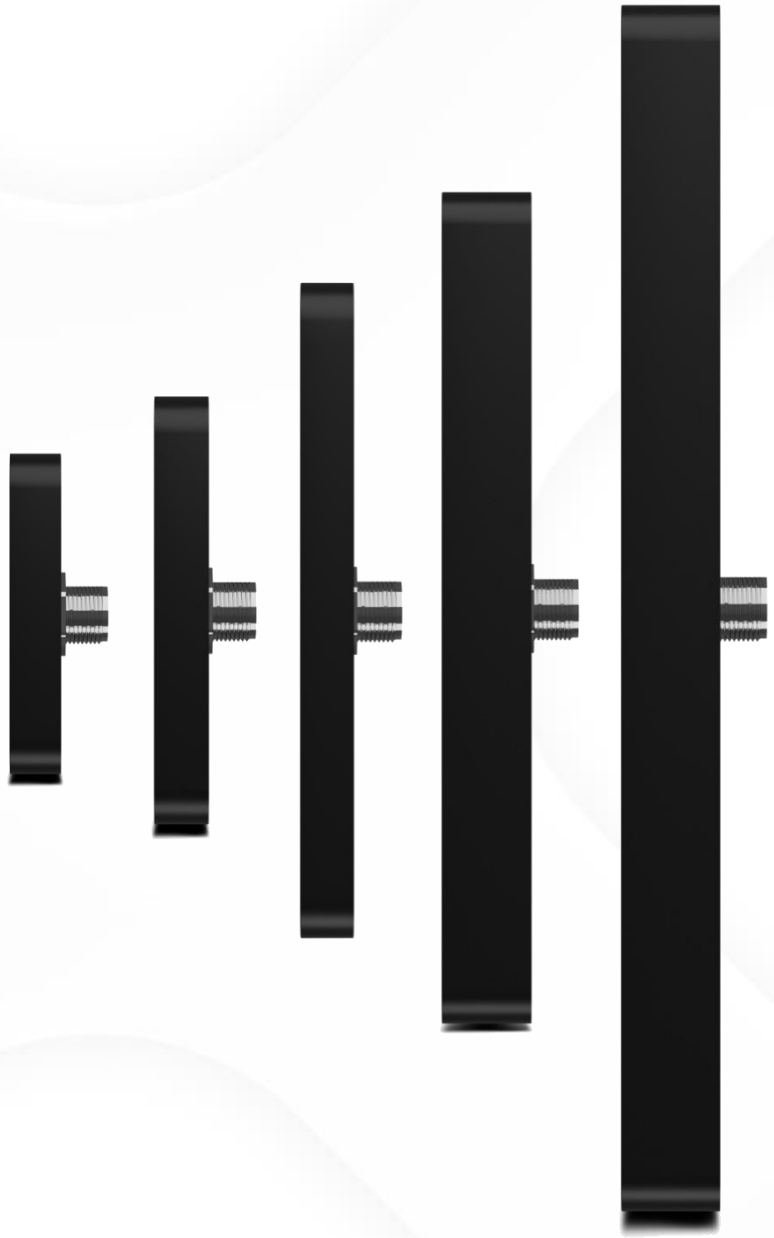
Installation with **mounting arm** or 22 mm hole.

Wide operating temperature range.

Rich software options for an uncomplicated start in IIoT and Industry 4.0:

- JMobile with JM4web HTML5 interface and data gateway functions including OPC UA server and client.
- CODESYS PLC with networked I/O.
- Optimized for use as **web browser** with hardware graphic accelerator.

Linux-based open platform for customized applications.



JSmart field-ready HMI products

Robust **glass front** with PCAP multitouch.

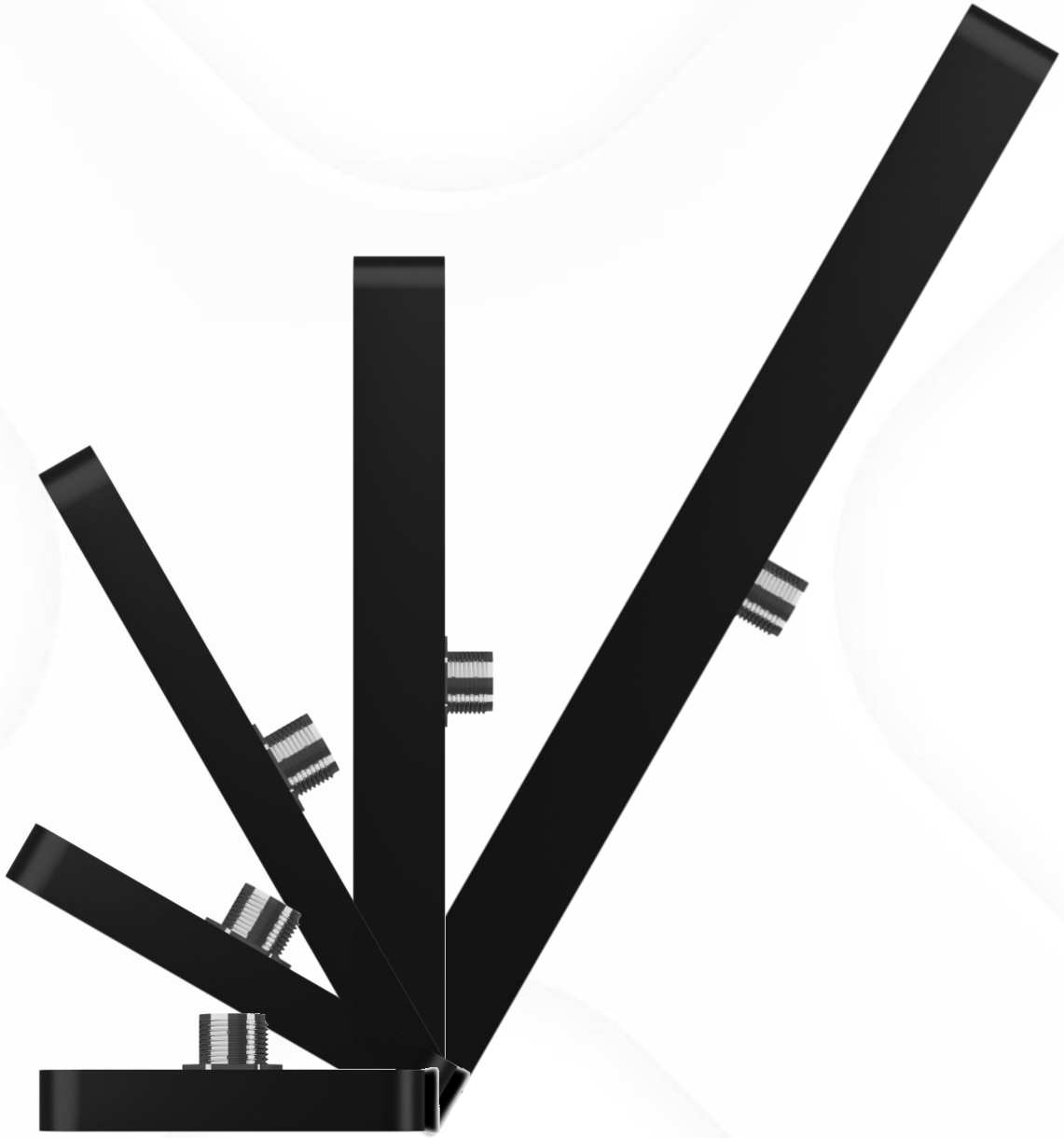
Powerful dual core and quad core ARM Cortex-A9 processors.

PoE for snap-on connections (IEEE 802.3 af/at). 10/100 Ethernet.

Wi-Fi interface as option.

USB interface.

Built-in temperature and acceleration **sensors**. The first edge device with integrated environment sensors.

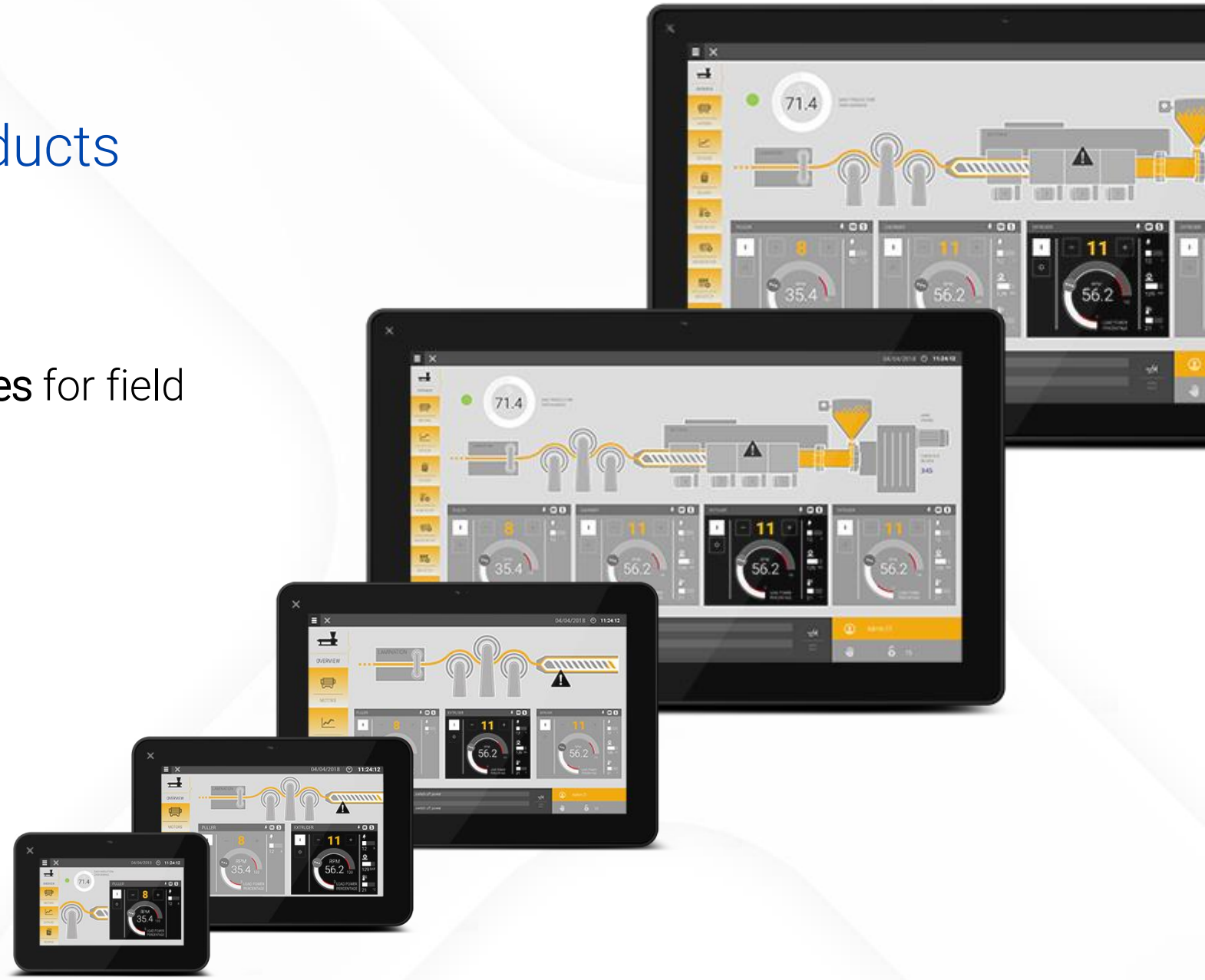


JSmart field-ready HMI products

Display sizes from 5” to 21.5”

Resolution up to Full HD 1920x1280.

Ample choice of mounting **accessories** for field installation.

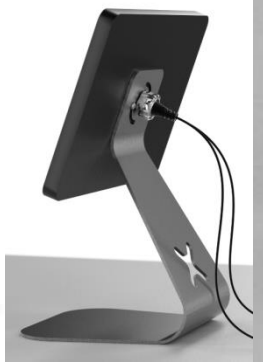


Tube-Device adapters

Simplest field installation for JSmart devices.
Optimal options for a robust set-up and wiring.

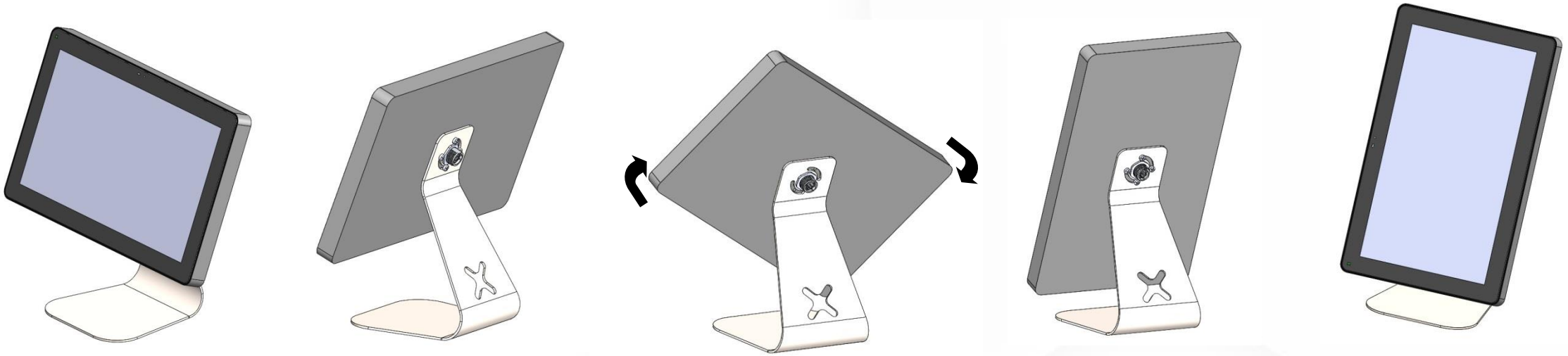
Need a rugged desktop?

Use your JSmart as a desktop appliance.
Stainless steel stand.
Compatible with harsh environments.
Strong environmental protection.
Stainless steel stand.
Works for all Jsmart display sizes.
Allows landscape and portrait installation.

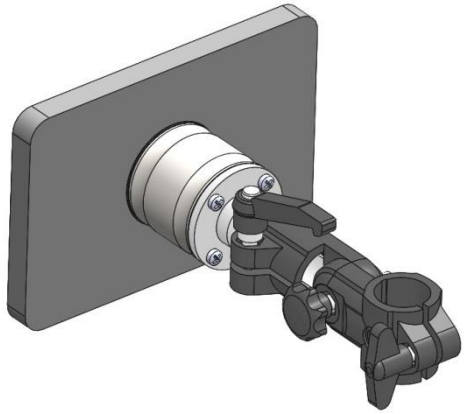


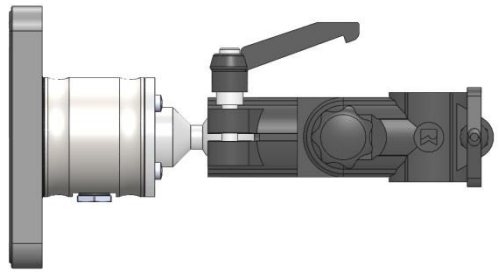
Need a rugged desktop?

Quickly change the setup of your display.



Compatibility with third-party arms and adapters





Handheld HMI: Move your HMI where you need it

- The Handheld device range from EXOR is a true HMI in your hand: powerful and easy to program to your needs, they remain the perfect choice for safe mobile requirements.
- A specialized section of the market where strict attention must be given to the rigourous safety laws that govern the use of handheld devices.

H3: wired communication

H4: wireless communication

The wireless option leads to many positive features being enhanced

- Higher Safety in all areas with no pendant wires to causes issue
- Less injury risks
- No broken cable downtime
- Far less physical fatigue of operator

JMobile: visualization and connectivity for X-Platform

Exor began developing the **JMobile** software in 2006 in close cooperation with a group of major clients. This trusting collaboration with the market has continued throughout the subsequent years and as a consequence has led to a **unique software package**.

The **three principles that have guided and will continue to guide** the development of JMobile are:

- **Remain open** to the major fieldbus / protocols of communication
- **Use open and universally recognized** market technological standards such as HTML5, SVG, XML
- Integrate selected market-leading **3rd party software with a seamless UI and extremely secure**.

These three principles working together offer EXOR International and our customers the best of all situations where the secure, solid JMobile backbone of highly critical software is able to contain and implement all the software required for Industrial IoT implementation..

JMobile: looking at 4.0

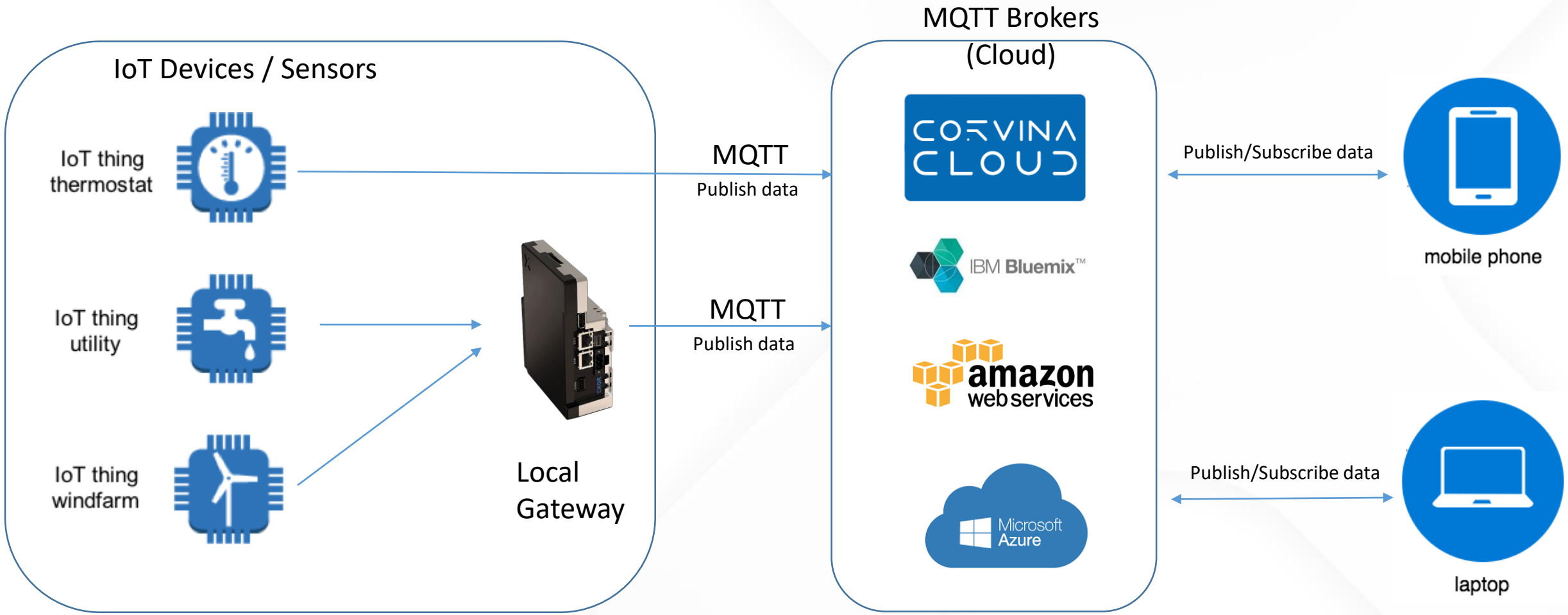
JMobile is one of the key components of X-Platform

Why version 4.0 ?

- Design looking at industry 4.0
- From the **Field** to the **Edge** up to the **Cloud**. And back.

- Studio - One tool for design work . Ready for multiple runtime platforms (PC / HMIs / Edge / Cloud). Multiple visualization (HMIs, Desktop, Mobile devices, Tablets). **One project for Native and Web projects**.
- Ready for Exor Corvina Cloud 1.0 and 2.0.
- MQTT gateway functionality / push data to cloud services (Corvina, AWS, Bluemix, Azure, ..)
- Enhanced support for the new generation of EXOR Edge devices
- Redesign of important parts of Studio GUI (Tag Editor, Project View, Object View) for
  - improved usability
  - higher productivity

MQTT Message Queuing Telemetry Transport



JMobile 4.0 Protocols

HMIs are as good as much as they can connect!

Look at JMobile protocol list!

New communication protocols in JMobile 4.0

- NMEA 2000 for marine applications
- Siemens TIA Portal one-step import of tags
- DELTA Electronics
- IDEC Microsmart
- Grundfos GENIbus

Corvina Cloud 1 – Connectivity Management

Corvina Cloud 1.0 is an **advanced connectivity management solution that puts you in control of your IIoT business.** Corvina Cloud 1.0 is powerfully robust, highly scalable and offers advanced VPN capabilities.

This IIoT-ready, secure, and user-friendly platform dramatically reduces the excess costs involved with installation and maintenance as well as preparing you for the new IIoT business models of tomorrow.

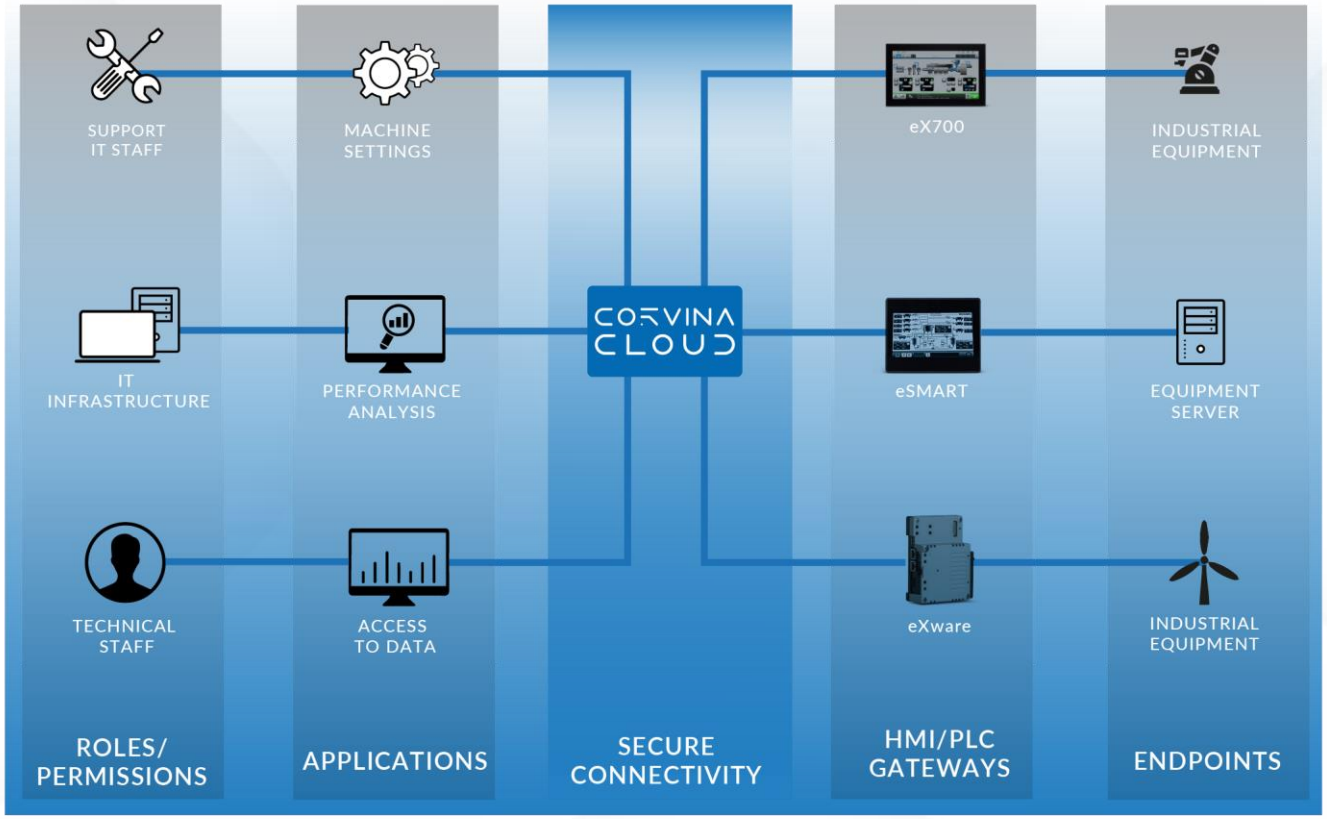
The user interface is incredibly clean and easy to use. Web-based it allows all your remote devices, networks and users to are able to communicate securely.

Corvina Cloud 1.0 **can be offered as an on-premise cloud infrastructure** that delivers the uptime and performance needed for industrial applications and control services at any scale.

Corvina Cloud 1

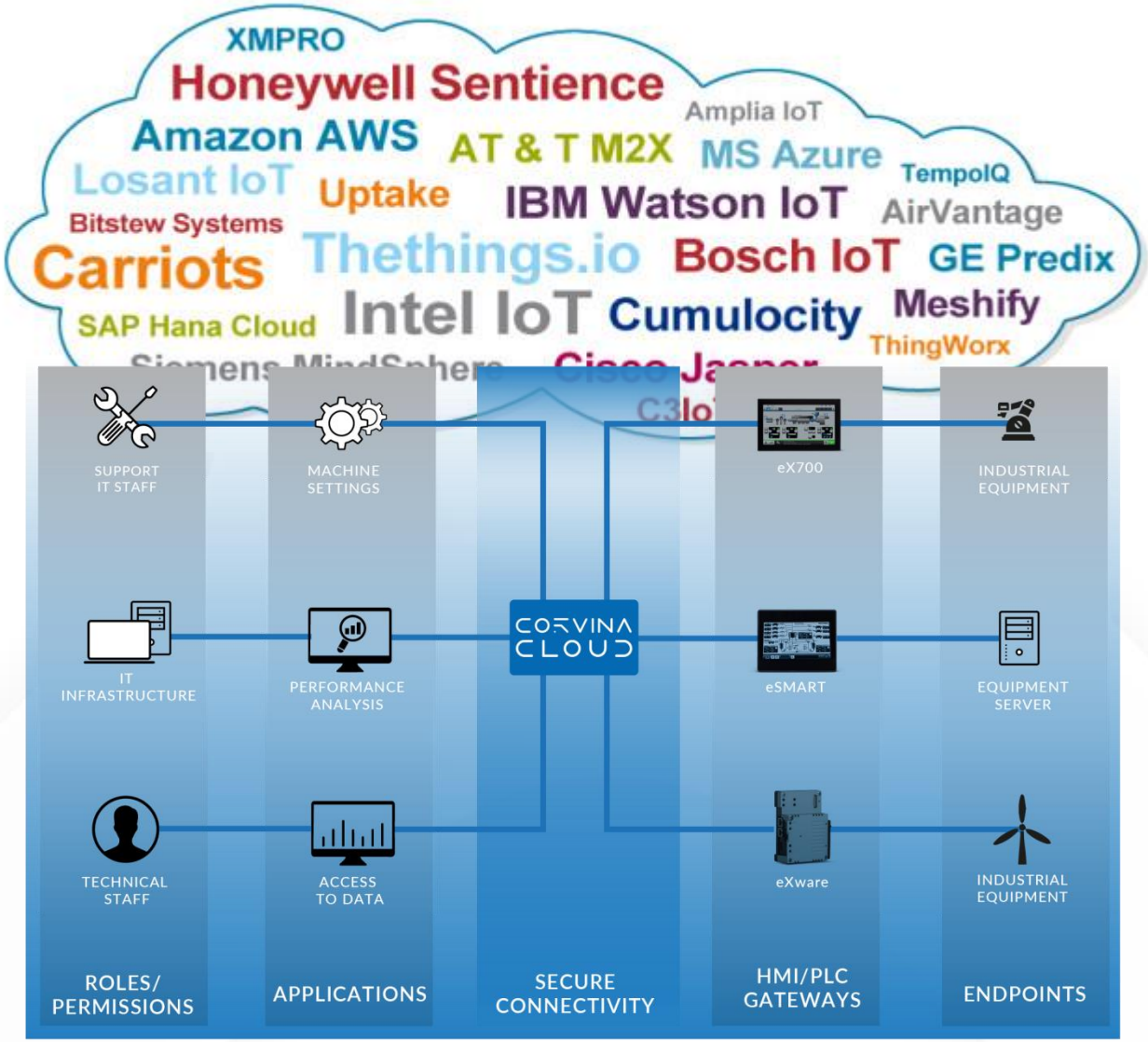
Benefits

- powerful and highly scalable solution that offers VPN with encryption for security
- Granular role-based access permissions allow users to only gain access to required resources
- access PLCs connected to serial or ethernet to HMI or eXware with PLC programming software
- view JM4web system data using standard browsers
- use JMobile Studio to update project on HMI and eXware
- use JMobile client to access HMI or eXware as remote client



Corvina Cloud 2 – Cloud from the industry and for the industry

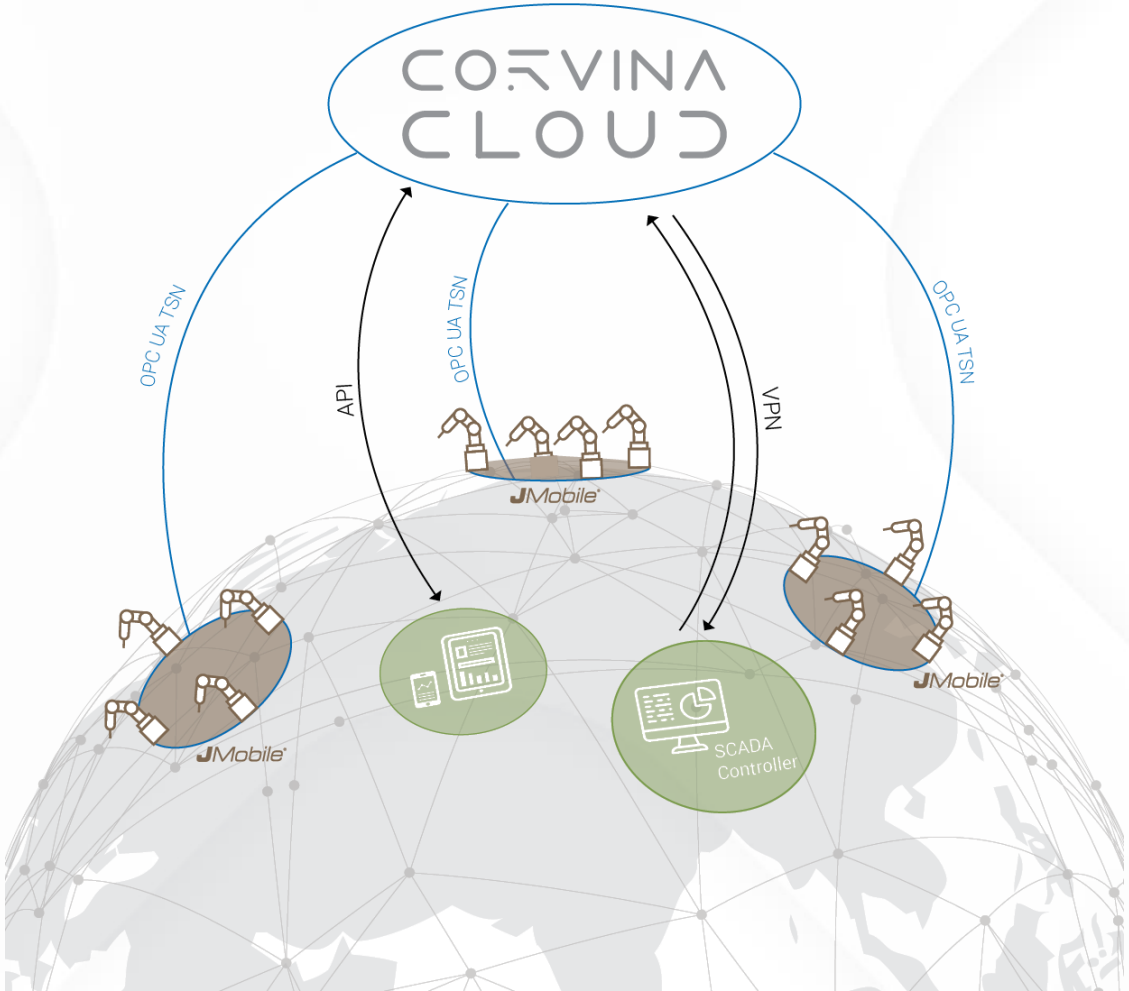
- The vast majority of cloud offerings come from the IT world, which in the industrial sector have limits.
- These limits are seen clearly at the layer below the cloud where a vast array of protocols still exist
- OPC UA , OPCA UA pub/sub over TSN , MQTT are the standard of communication it will take many years for all field level devices to use this communication.
- In the meantime there are many legacy devices and these will need an IIoT Gateway.
- This is where the IT sector have difficulty and where Corvina Cloud excels



The Standard for Industrial Cloud Connectivity

Corvina Cloud aggregates real-time plant floor data into one user-friendly, accessible, and secure framework

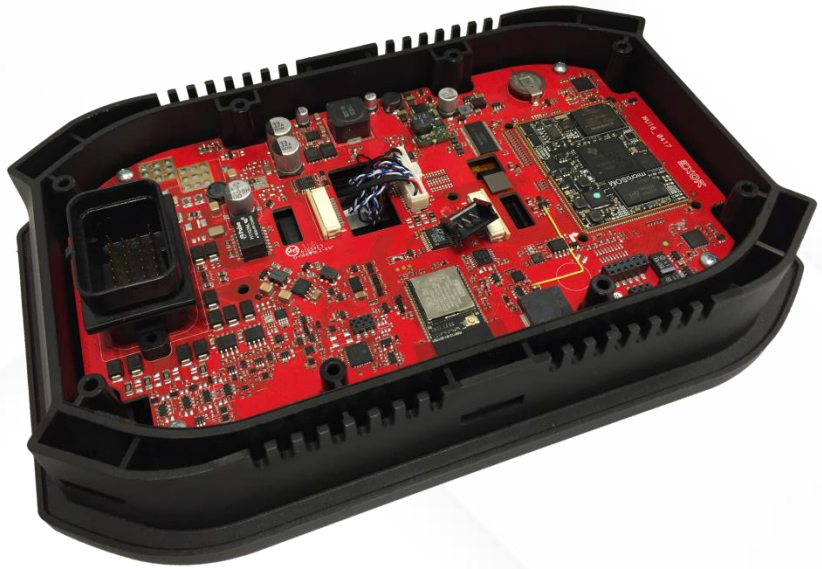
Industrial companies of all kinds are able to improve processes, increase productivity, and make more informed decision



EXOR Embedded: the 1° Component of Industrial IoT

This is where the **X Platform begins**

- Use Exor Embedded System On Module and display options to design your IIoT product yourselves.
- Have Exor design, develop and test your product or simply choose to customize an already existing standard Exor product.



Where Your IIoT Product Begins

SOM

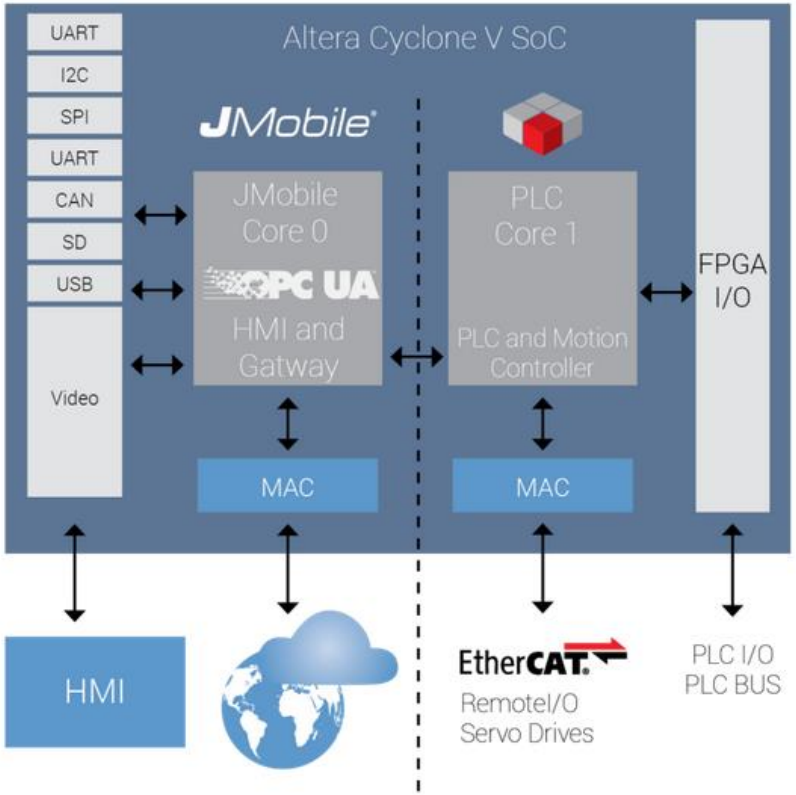
- EXOR Embedded System on Module (SOM) are smart, highly miniaturized, flexible and fully customizable solutions to be adapted for a vast array of IIoT products.
- Extremely high UI Software drivers and Configurator tool technology are available for fast and easy product development.

Dev Kits

- Use the EXOR Embedded development kits to start your own creative process.
- The kits provide a complete, high-quality design environment for engineers and dramatically help simplify the design process and reduce time-to-market.

The Industrial SoC

- JMSoC
- A System on Chip integrates a lot of system components into a single silicon chip. Along with an application processor, a SoC typically contains memory, power management circuits, and a range of peripherals such as SPI, UART, I2C, USB, SATA, PCI, and PCIe, etc.
- Altera® SoCs integrate an **ARM-based hard processor system** (HPS) consisting of processor, peripherals, and memory interfaces with the **FPGA fabric** using a high-bandwidth interconnect backbone.
- It combines the performance and power savings of hard intellectual property (IP) with the **flexibility of programmable logic.**



- JMSoC is an application suite that provides a complete solution fo control connecting equipment and visualizing data. JMSoC solution allows Altera® CV SoC users to easily develop a customized GUI application using an object-oriented programming in a few weeks without writing a single line of C code.