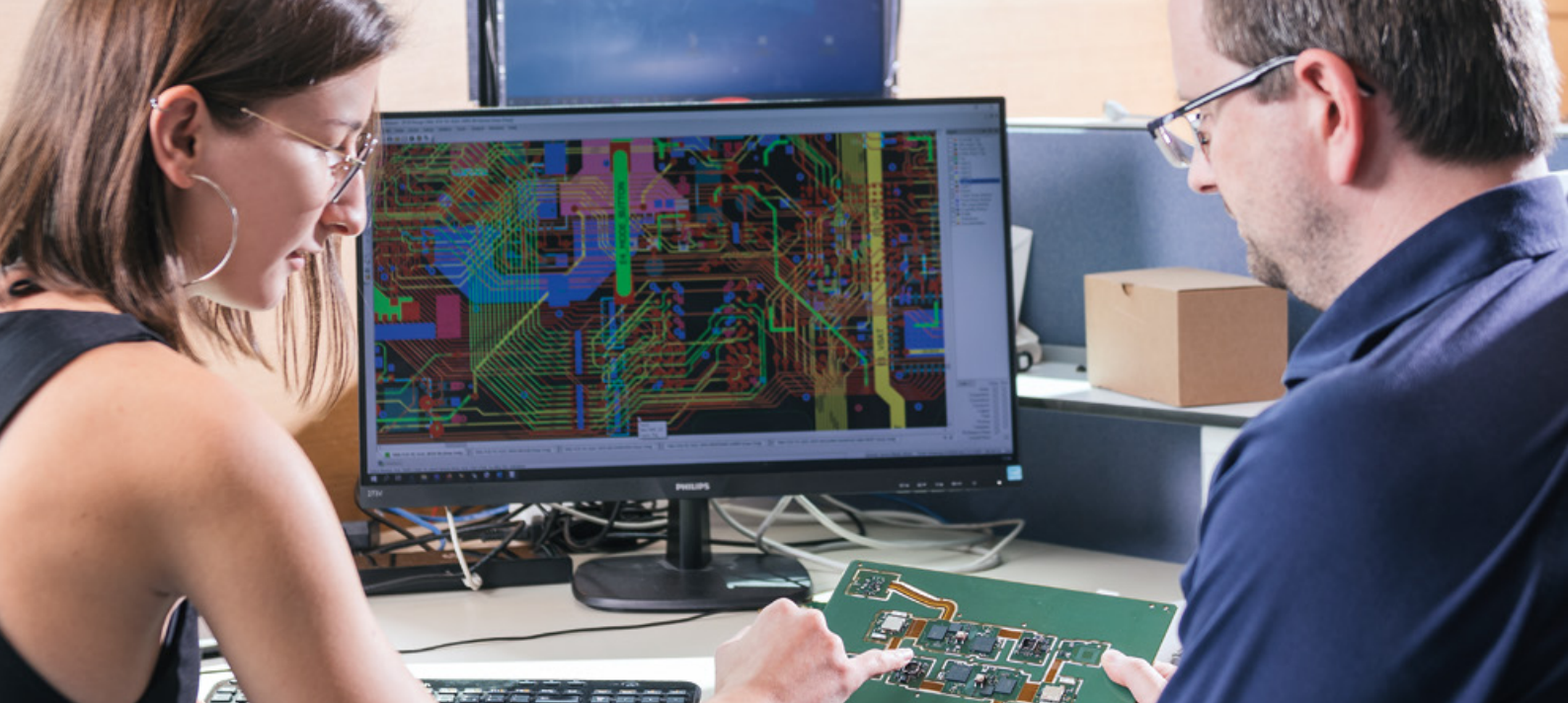


We stand for
Electronics – Development and
Manufacturing Services



kontron



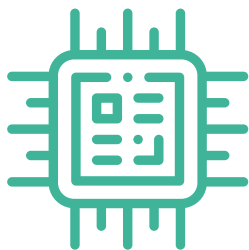
Our ideas move you forward

From the initial idea through development to a market-ready product and subsequent manufacturing – we are here for you. Our many years of development experience and our expertise in the latest components and processes guarantee our shared success.

Electronics² – A strong network for development, production, and innovative solutions

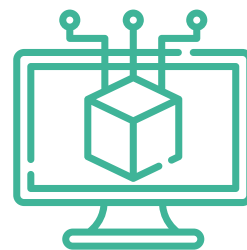
These are your advantages – everything from a single source

- ▶ Ideal partner for engineering, sampling, test equipment and series production
- ▶ Technology know-how and maximum solution competence
- ▶ Successful product qualification (EMC, UL, TÜV, etc.)
- ▶ Comprehensive lifecycle services based on the SiliconExpert database
- ▶ Qualified full service provider with long-standing ODM/EMS experience – product success guaranteed
- ▶ Presence, development, and production facilities in Europe and America, as well as partners in Asia.



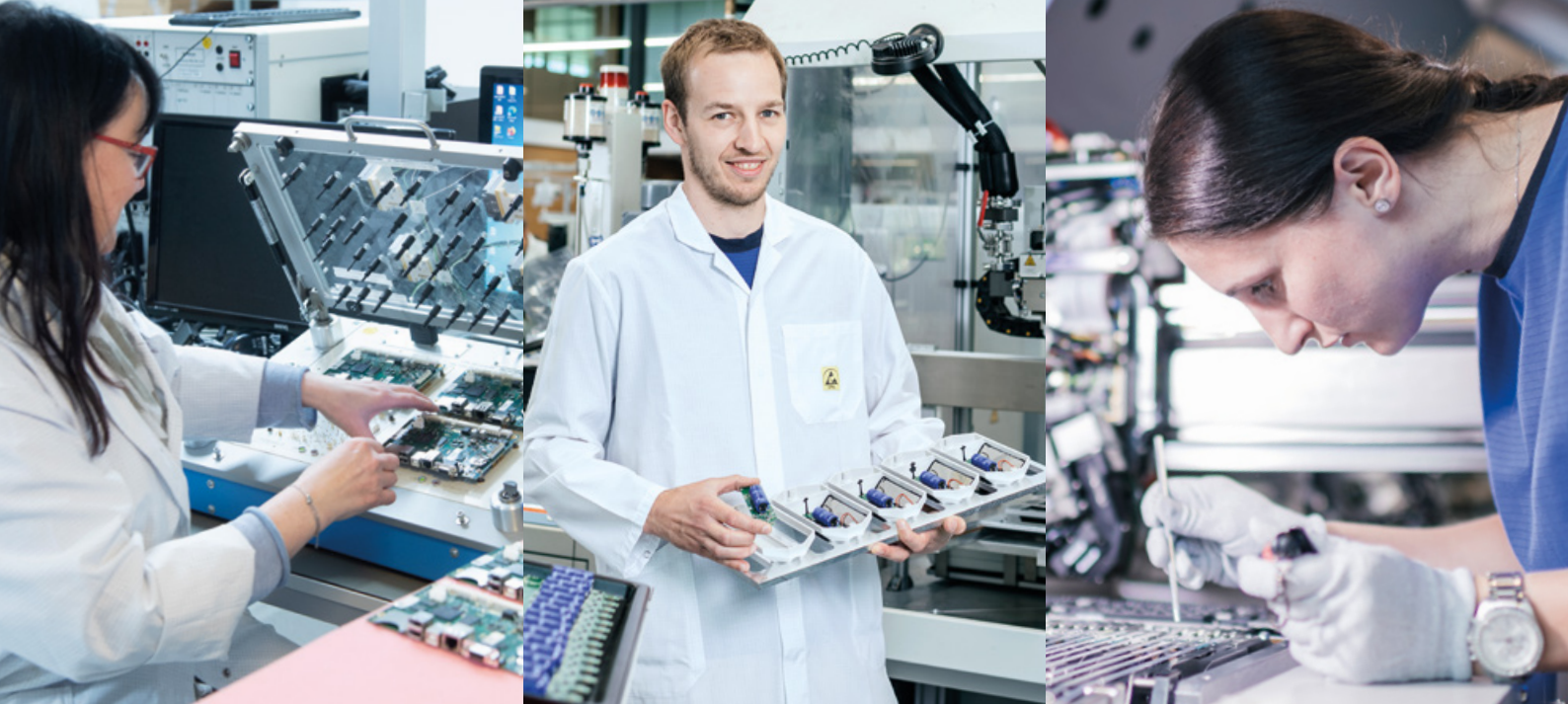
HARDWARE

Our core competence lies in the implementation of industrial control and communication solutions, display units and peripheral modules.



SOFTWARE

We are your specialist for custom software development in automation, networking and visualization for devices and machines.



Development – Prototyping – Zero Series

Our team has long-standing experience in developing product ideas and solution concepts. We are ideally placed to develop ready-to-use applications, manufacture prototypes and zero series, and assume series production of your assemblies.

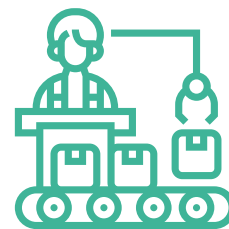
Someone to lean on – Your trusted partner for quality

- ▶ Prototype engineering and production in line with your requirements
- ▶ Adaptation and customization of standard products as desired
- ▶ Zero series production testing prior to technical release
- ▶ Initial sample and inspection report (ISIR) for documentation of test results prior to series production, as per your specifications
- ▶ Development Kits provide an engineering platform for your software developers
- ▶ Close collaboration with processor OEMs ensures that we are always state of the art



MECHANICS

In-depth knowledge of current manufacturing technologies and state-of-the-art development tools guarantee you products that meet defined quality standards and are tailored to your individual requirements.



PRODUCT INDUSTRIALIZATION

We offer you a diverse service portfolio, from prototype to serial production and from medium to high volumes



Welcome to **Electronics²**

Electronics², as the central service brand of the Kontron Group, offers a wide range of development and production services as well as its own products. The portfolio includes customized solutions and sets new standards in technological innovation and quality for global corporations as well as small and medium-sized enterprises. We understand the unique needs of all our clients.

Kontron Electronics GmbH, together with other subsidiaries of the Kontron Group in Europe and America, as well as partners in Asia, ensures improved supply chains, faster delivery times, and reduced environmental impact through a local-for-local approach.

Our know-how ensures your success

- › Hardware development of electronic components and devices
- › Software development for automation, secure networking and visualization
- › Mechanical design with state-of-the-art development tools
- › Product industrialization from prototype to series production
- › Top-level manufacturing services
- › Stringent quality and functional testing
- › Final assembly work for complex components and devices





Electronics² – Your benefits at a glance

- ▶ **Low volume/high mix to very high volume/low mix**
As a leading electronics service provider, we cover the entire spectrum – from prototypes to small and medium series through to high-volume series production.
- ▶ **Network of electronics service providers**
With locations in Europe and America as well as partners in Asia, we are ideally positioned to meet the needs of our customers locally.
- ▶ **Active site selection**
We will advise you on which location best meets your requirements.
- ▶ **Internal second source**
We offer maximum supply security in the event of production downtime. Thanks to site-independent redundancy, we are able to ensure resilient production.
- ▶ **Lifecycle analysis and management**
We use SiliconExpert forecast data to help you determine the optimum time for your new design or redesign.
- ▶ **Product and cost analysis**
Our experts offer solution-oriented advice on how to reduce costs when selecting components and manufacturing processes in order to achieve the best result for you.
- ▶ **Logistics concepts**
Our solutions include consignment stock, Kanban, rolling forecast and safety stock to ensure your continuous supply.
- ▶ **Secure supply chains**
Take advantage of our global purchasing network. We avoid supply bottlenecks through forward-looking planning and strategic partnerships.
- ▶ **Consistent quality management and comprehensive certifications**
We ensure that the highest quality standards are maintained and that your requirements are always met.
- ▶ **One-Stop-Shop for comprehensive solutions**
Comprehensive development and manufacturing services as well as standard products, from modules to complete systems. Software from secure operating systems to complex applications. Industry-specific solutions for future markets such as solar energy, eMobility, 5G communication and transportation.

Your Powerhouse for Electronics Solutions.

We are your partner

We obtain your components, mount your circuit boards and are pleased to offer you options for end-to-end outsourcing. With our know how and long-standing experience as EMS (electronics manufacturing services) provider, we are your 24/7 consultation partner.



MANUFACTURING EXPERTISE

In addition to geographic proximity, we offer you a wide-ranging portfolio of production competence in assembly technology, soldering processes and surface protection.



TESTING & QUALITY

All our electronic components, modules and systems are subjected to intensive quality and functional testing.



FINAL ASSEMBLY

Following electrical function testing and programming, we carry out complete assembly of your modules and devices as required.



SERVICE

We cover the entire lifecycle of electronic assemblies and devices. In addition, we offer you the advantages of a large, global supplier network.

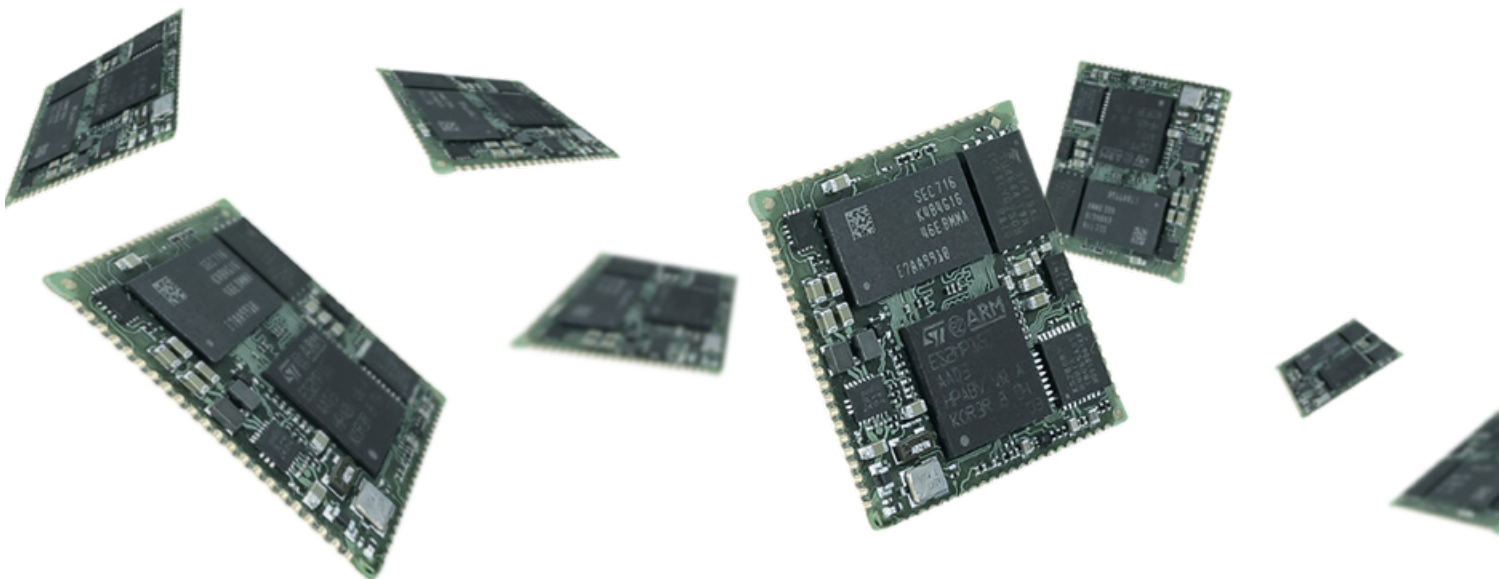


Quality makes the difference

Thanks to our mature processes and long-standing experience, our standard products are always at the cutting edge of technology and meet maximum quality standards.

Benefit from short time-to-market cycles and reduce your product launch costs.

Upon request, our qualified staff will handle custom product development and design services for your company.



Web and Control Panel

– Long-term use in industrial environments

High-quality Touch Panels with a long-term available, compatible housing concept for demanding applications as Control or Web Panel with a wide range of optional software functions.



Web Panel 6x, 5", 7", 10", 15" FHD

- › NXP Arm® i.MX8M Plus, 4 Core 1.6 GHz
- › Higher Performance with modern Arm® Quad Core CPU
- › PoE optional



Web Panel 7", 10", 15"

- › NXP Arm® i.MX6, 1 or 2 Cores 800 MHz
- › NXP Arm® i.MX8M Mini, 4 Cores 1.6 GHz (CE, UL)
- › Intel Atom® E3800, 2 Cores 1.33 GHz, 4 Core 1.91 GHz



Control Panel 6x

- › NXP Arm® i.MX8M Plus Quad Core, 1.6 GHz
- › 2x GbE, up to 2x CAN FD, 2x RS485, RS232
- › Optional M.2 Slot, CODESYS® SoftPLC



Control Panel 7", 10", 15"

- › NXP Arm® i.MX6, 1 – 2 Cores, 800 MHz
- › 2x 10/100 ETH, CAN, RS485, 2x RS232
- › Optional CODESYS® SoftPLC

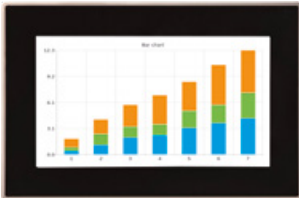
These are your benefits

- › **First-class visualization** – High-resolution IPS display with optical bonding for highest image quality in any installation position
- › **Intelligent software** – QIWI Toolkit with performance-optimized HTML-5 browser for easy configuration and parameterization of devices / browsers
- › **Multi-lingual** – Software tools with comprehensive language support
- › **Optional packages 1** – CODESYS® SoftPLC with VISU and large selection of fieldbus protocols
- › **Optional packages 2** – Spider Control™ Microbrowser or SCADA from iniNet, flexible integration platform for digitalization with HTML-5 HMI
- › **Attractive housing design** – Slim aluminum frame, edge protection, IP65 front side
- › **Ideal for OEM's** – Customization, easy with modular kit

Multitouch Panel

– More transparency in almost every situation

In demanding applications, high-value Multitouch Panels are used as decentralized operating and display devices and for process visualization and optimization.



Display-Line 7" i.MX8M Mini

- NXP i.MX8M Mini 4x Arm® Cortex®-A53 @1.6 GHz
- 1x Arm® Cortex®-M4 @400 MHz
- 7" IPS-Display, 1024 x 600 Pixel 450 cd/m²



Display-Line 5" i.MX6 ULL

- NXP i.MX6 ULL 1x Arm® Cortex®-A7 @800 MHz
- 512 MB DDR3-RAM
- Glass front, frameless IP65, 5" TFT-Display



Display-Line 7" Pi-Tron CM4

- Broadcom BCM2711, 4x Arm® Cortex®-A72 @1.5 GHz
- 3D Video Engine
- 7" IPS-Display, 1024 x 600 Pixel 450 cd/m²



Touch monitor with HDMI connection

- From 5" to 15.6"
- HDMI connection for various resolutions including scaling
- Custom housing and mounting systems

These are your benefits

- **High-quality visualization** – High-resolution displays with wide viewing angle offer best-possible image quality
- **Low-power to high-performance** – Scalable in display size and processor performance
- **Software-based solution** – Rely on our tools for quick and easy visualization
- **Easy configuration** – Sophisticated software tools for quick and easy panel adaptation in line with customer requirement
- **Long-term availability** – Investment security thanks to form, fit and function
- **Lifecycle management** – Professional support for extended product lifecycle

Automation

– Proven control cabinet solutions

Automation and IoT solutions control and regulate processes, devices and machines. Robust design makes the products versatile and particularly suitable for use in industrial applications.



AL i.MX8M Mini & Plus

- ▶ NXP i.MX8M Mini, 4x Arm® Cortex®-A53 @1.6 GHz
1x Arm® Cortex®-M4 @400 MHz
- ▶ NXP i.MX8M Plus, 4x Arm® Cortex®-A53 @1.6 GHz
1x Arm® Cortex®-M7 @800 MHz, NPU (2.3 Tops)
- ▶ 1 GB up to 4 GB LPDDR4-RAM, 4 GB up to 64 GB eMMC
- ▶ Stainless steel housing 111 x 25 x 76 mm, for mounting on 35 mm mounting rail



AL i.MX6 ULL

- ▶ NXP i.MX6 ULL, 1x Arm® Cortex®-A7 @800 MHz
- ▶ 512 MB DDR3-RAM
- ▶ 4 GB eMMC
- ▶ Stainless steel housing 111 x 25 x 76 mm, for mounting on 35 mm mounting rail



Control Unit 6x

- ▶ NXP Arm® i.MX8M Plus Quad Core 1.6 GHz
- ▶ 2 GBE, up to 2x CAN FD isol., 2x RS485 isol., RS232
- ▶ Compact metal housing for DIN rail mounting
- ▶ Optional CODESYS® SoftPLC



AL Pi-Tron CM3+ (Housing without ventilation) AL Pi-Tron CM4

- ▶ Pi-Tron CM3+: Broadcom BCM2837B0, 4x Arm® Cortex®-A53 @1.2 GHz
- ▶ Pi-Tron CM4: Broadcom BCM2711, 4x Arm® Cortex®-A72 @1.5 GHz
- ▶ Pi-Tron CM4: 1 GB / 4 GB / 8 GB LPDDR4-RAM
- ▶ Stainless steel housing 111 x 25 x 76 mm, for mounting on 35 mm mounting rail

These are your benefits

- ▶ **CODESYS® ready** – Perfect project support thanks to many years of PLC programming activities
- ▶ **Flexible interfaces** – These common protocols have been implemented: CAN, CANOpen, EtherCAT, Modbus, ProfiNet, OPC UA, all common protocols available with CODESYS®
- ▶ **Custom solutions** – The modular system allows easy adaptation to customer-specific requirements
- ▶ **Power and performance** – Scalable via processor lines and variable memory sizes
- ▶ **Challenging conditions** – Reliable products for 24/7 operation in industrial environments
- ▶ **Perfect teamwork** – The control, panels and peripheral devices work hand in hand on the basis of established standards
- ▶ **Compact all-in-one solution** – Easily expandable via multifunction I/O modules and extremely versatile

I/O Module

– For realizing complex projects

I/O modules are extension systems for digital and analog standard inputs and outputs. The systems are used to control actuators, read sensors and communicate with the controller via CAN, RS485 or Ethernet.



AL CAN I/O-Modul

- 12x digital input and output
- 4x analog input and output
- 2x temperature input



RIO Remote I/O

- Communication via EtherCAT or CANOpen
- Digital and analog inputs and outputs
- Standard configurations and options for custom solutions



PiXtend® eIO Digital One Pro

- 8x 3.3 / 5 / 12 / 24 V Digital input including counter function
- 8x 0.5 A, 5 / 12 / 24 V Digital output
- Fast digital logic "HyperLogic"



PiXtend® eIO Analog One Pro

- 4x 0...5 V / 0...10 V, 10 bit analog voltage input (AI-U)
- 4x 0...10 V, 12 bit analog voltage output (AO-U)
- 2x 0...20 mA, 12 bit analog current input (AO-I)

These are your benefits

- **Flexible connection** – Depending on the I/O module, the connection is via robust RS485 bus (Modbus RTU), CAN bus or EtherCAT
- **Easy integration** – Also with systems by third-party manufacturers
- **Various designs** – Compact or flat design with convenient connection technology
- **Flexible mounting** – Delivery also possible without housing for direct mounting on a mounting plate
- **Wide range of applications** – Thanks to various combinations of digital inputs and outputs, the modules are suitable for a wide range of applications
- **Industry-grade connection technology** – Compact spring-loaded terminals for convenient and space-saving wiring
- **Modular expandability** – Thanks to fieldbus connectivity, the control system can be adapted to growing system requirements by adding other modules

Raspberry Pi

– Successful implementation of industrial projects

Take advantage of the Raspberry Pi with PiXtend® and Pi-Tron. The PiXtend® product range consists of electronic controllers as well as expansion boards for digital and analog inputs and outputs.



PiXtend® V2-L- Pi 4 & PiXtend® V2-L-

- Brushed stainless steel DIN rail housing
- Raspberry Pi 4 or 3B+ single-board computer
- Retain memory 64 Byte Flash EEPROM
- Suitable for CODESYS® SoftPLC



PiXtend® V2-S- Pi 4 & PiXtend® V2-S-

- Brushed stainless steel DIN rail housing
- Raspberry Pi 4 or 3B+ single-board computer
- Retain memory 32 Byte Flash EEPROM
- Suitable for CODESYS® SoftPLC



Pi-Tron CM3+

- Broadcom BCM 2837B0 4x Arm® Cortex®-A53 @1.2 GHz
- 3D Video Engine
- 1 GB LPDDR2-RAM
- Suitable for CODESYS® SoftPLC



Pi-Tron CM4

- Broadcom BCM 2711 4x Arm® Cortex®-A72 @1.5 GHz
- 1 GB up to 8 GB LPDDR4-RAM
- Optional WLAN/Bluetooth
- Suitable for CODESYS® SoftPLC

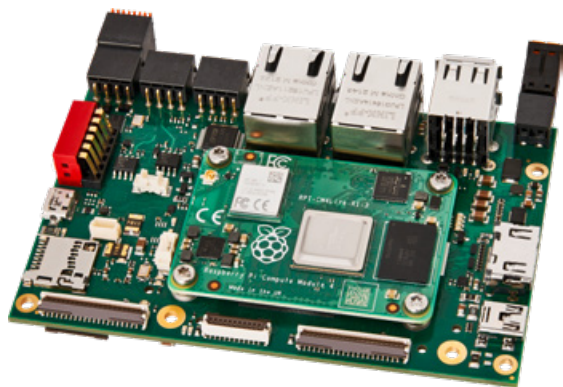
These are your benefits

- **Sophisticated platform** – Different CPU designs, complementary I/O modules and display units intelligently combined for control and visualization solutions
- **Short time to market** – Take advantage of a rapid migration from Raspberry Pi prototype to serial product
- **Industrial starter kit** – Find out whether the Pi-Tron product with the Raspberry Pi computer module matches your requirements
- **Extensive software pool** – Ready-made projects for almost any application are available on the internet
- **Video documentation** – How-to videos from the Raspberry Pi community provide instructions for installation, programming and project implementation
- **Reduced software costs** – Latest open-source software is available via the Raspberry Pi community anytime, without licensing costs
- **Industrial Raspberry Pi** – A cooling concept and a robust stainless steel housing make our products suitable for industrial use



Raspberry Pi – Solutions for industrial products

As Raspberry Pi Design Partner we support you with our expertise in the development of new Raspberry Pi product designs.



Your benefits at a glance

- ▶ Realization of sophisticated industrial projects
- ▶ Reduction of software development costs thanks to available program packages, tools and community support
- ▶ Rapid migration from Raspberry Pi prototype to serial product
- ▶ Scalable range of functions thanks to broad compute module offering
- ▶ All software of the Raspberry Pi community can be used on industrial hardware
- ▶ PLC applications feasible, because CODESYS® SoftPLC available
- ▶ Preferential access to the latest information from the Raspberry Pi Foundation
- ▶ The Raspberry Pi Foundation's commitment to availability provides future-proof development opportunities

Open Standard Module™ Spezifikation (OSM) – Standard for soldered System-on-Modules

Several manufacturers, including Kontron, have developed the OSM standard for soldered System-on-Modules as founding members within the Standardization Group for Embedded Technologies (SGET).



OSM-S i.MX8M Plus

- NXP i.MX8M Plus, 4x Arm® Cortex®-A53 @1.6 GHz
- 1x Arm® Cortex®-M7 @800 MHz
- 2x 1 Gbit/s IEEE 1588 (1x mit TSN)
- 2x CAN FD
- Form factor 30 mm x 30 mm



OSM-S i.MX8M Mini

- NXP i.MX8M Mini, 4x Arm® Cortex®-A53 @1.6 GHz
- 1x Arm® Cortex®-M4 @400 MHz
- Suitable for CODESYS® SoftPLC
- Form factor 30 mm x 30 mm



OSM-S i.MX93

- NXP i.MX93, 2x Arm® Cortex®-A55 @1.7 GHz
- 1x Arm® Cortex®-M33 @250 MHz
- 1x Arm® Ethos™-U65 microNPU
- 2x 1 Gbit/s IEEE 1588 (1x with TSU)
- Form factor 30 mm x 30 mm

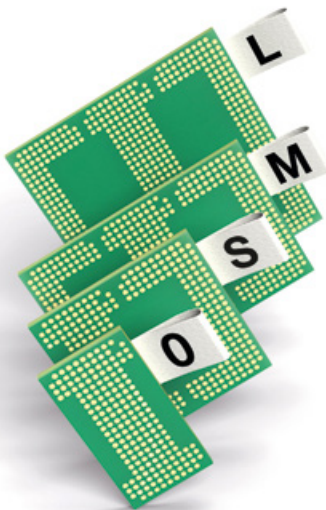
These are your benefits

- **Scalable CPU power** – For embedded applications with unaltered board designs
- **Extended baseboard lifecycle** – More computing power thanks to pin compatible system-on-modules with current processors
- **Open-source solution** – Advantages in hardware development thanks to open standards and reference designs
- **Second source strategy** – Predefined interfaces ensure supplier independence
- **Investment security** – Standard successor products available through the process generations
- **Global distribution** – Successfully established market leader for the OSM standard



Open Standard Module™

The new OSM standard for soldered system-on-modules governs the wide variety of manufacturer-specific modules with respect to frame size, pin assignment and interfaces.



The Standardization Group for Embedded Technology (SGET) has defined four successive module formats; O, S, M and L.

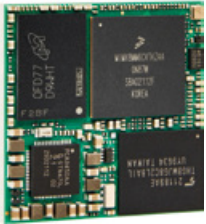
Your Benefits at a Glance

- ▶ OSM-Module – soldered on board, without plug connectors
- ▶ Fully automated assembly, soldering and testing possible
- ▶ Proven design for individual board and application development
- ▶ Versatile, high-performing and manufacturer-independent platform
- ▶ SoM and SBC include a standard periphery set featuring a large number of interfaces
- ▶ Minimized design risk thanks to validated technology
- ▶ Shorter time-to-market cycles keep you ahead of the competition
- ▶ Maximum flexibility thanks to manufacturer independence

System-on-Module

– Powerful, compact modular component

SoMs are full-fledged industrial computers that combine microprocessor (CPU), main memory (Flash and RAM) and power supply on a compact printed circuit board.



SL i.MX8M Mini

- NXP i.MX8M Mini, 4x Arm® Cortex®-A53 @1.6 GHz
- 1x Arm® Cortex®-M4 @400 MHz
- 1 GB up to 4 GB LPDDR4-RAM
- Form factor 30 mm x 30 mm



SL i.MX6 ULL/UL

- NXP i.MX6 ULL 1x Arm® Cortex®-A7 @800 MHz
- NXP i.MX6 UltraLite 1x Arm® Cortex®-A7 @528 MHz
- 512 MB DDR3-RAM / 512 MB NAND Flash
- Suitable for CODESYS® SoftPLC
- Form factor 25 mm x 25 mm



SL STM32 MP157

- STM32MP157A, 2x Arm® Cortex®-A7 @650 MHz
- 1x Arm® Cortex®-M4 @200 MHz
- 512 MB DDR3-RAM / 512 MB NAND Flash
- 1x CAN FD
- Form factor 25 mm x 25 mm

These are your benefits

- **Short development cycle** – Take advantage of the head start and get your product on the market faster
- **Reduced engineering risks** – Shorter development times and lower costs thanks to tried-and-tested solutions
- **Easy to use** – Fully developed CPU core can be used like a microcontroller
- **EMC tested** – Decoupling capacitors and impedance-controlled lines are in place
- **Complex PIN multiplexing and DDR3/4 RAM Design** – These costly and sophisticated features have already been implemented
- **Long-term availability of CPU module** – Meets the high requirements for computing power and free configuration of a variety of interfaces

CPU-Boards

– Powerful and independent platform

The boards are a unit comprised of microprocessor, system-on-module (SoM), memory, communication and LCD interfaces as well as key safety standards on a compact PCB.



BL i.MX8M Plus

- NXP i.MX8M Plus, 4x Arm® Cortex®-A53 @1.6 GHz
- 1x Arm® Cortex®-M7 @800 MHz, NPU (2.3 Tops)
- 1 GB up to 4 GB LPDDR4-RAM, 4 GB up to 64 GB eMMC
- Suitable for CODESYS® SoftPLC



BL i.MX8M Mini

- NXP i.MX8M Mini, 4x Arm® Cortex®-A53 @1.6 GHz
- 1x Arm® Cortex®-M4 @400 MHz
- 1 GB up to 4 GB LPDDR4-RAM, 4 GB up to 64 GB eMMC
- Suitable for CODESYS® SoftPLC



BL i.MX6 ULL/UL

- NXP i.MX6 ULL 1x Arm® Cortex®-A7 @800 MHz
- NXP i.MX6 UltraLight 1x Arm® Cortex®-A7 @528 MHz
- 256 MB up to 512 MB DDR3-RAM, 4 GB up to 64 GB eMMC
- Suitable for CODESYS® SoftPLC



BL STM32 MP157

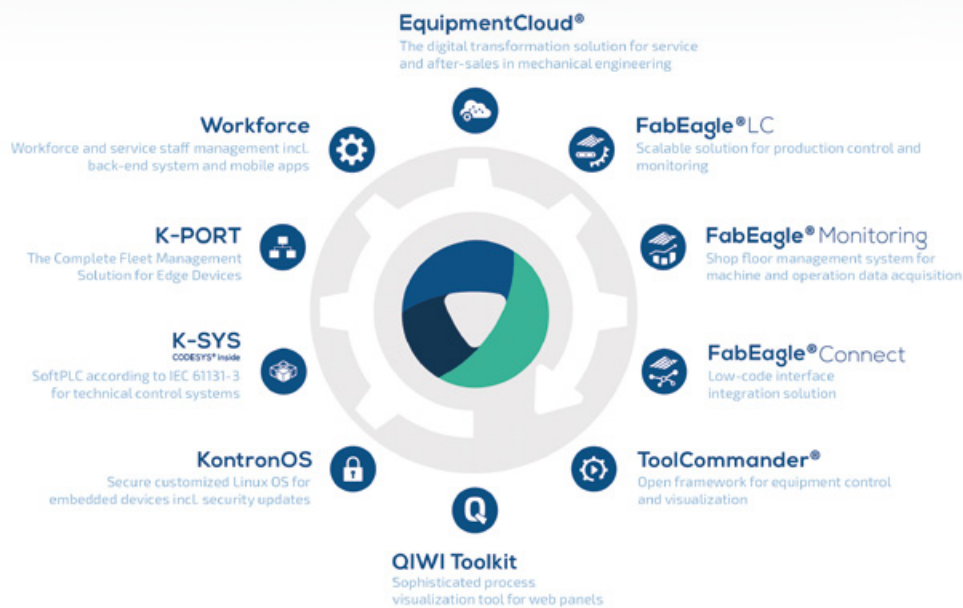
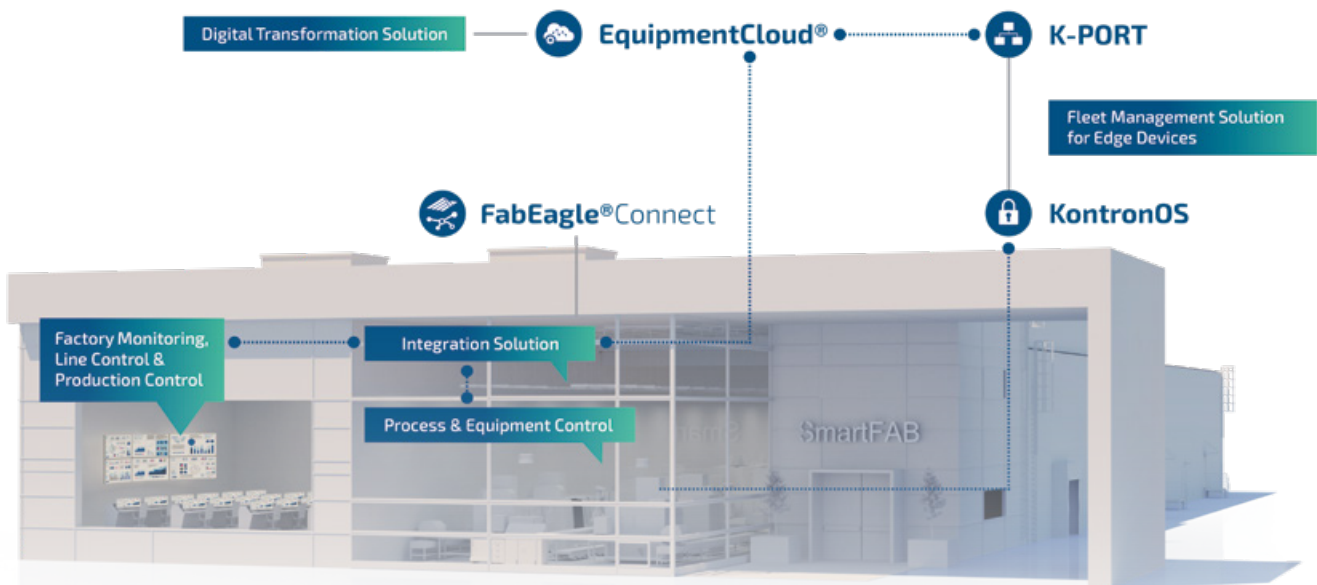
- STM32MP157A, 2x Arm® Cortex®-A7 @650 MHz
- 1x Arm® Cortex®-M4 @200 MHz
- 256 MB up to 512 MB DDR3-RAM, 4 GB up to 64 GB eMMC

These are your benefits

- **Reduced development effort** – Standard peripheral set, scalable as needed
- **No overhead** – Powerful computing core and up-to-date communication interfaces for a wide range of applications
- **Scalable computer power** – Custom processor and desired memory configuration selectable
- **Latest encryption technology** – Security functions meet highest security requirements
- **Software tools available** – Preconfigured development environment and board support package for rapid application development
- **Wide range of applications** – Combination of SoM and board provide a powerful and independent platform

Security in the IIoT

– Challenges and approaches to solutions



www.susietec.com

These are your benefits

- › **KontronOS** – Secure and updated devices and operating systems throughout the lifecycle of an IoT solution
- › **Security patches** – Can be applied regularly and „out of order“ in case of emergency
- › **Cybersecurity Minimum Standards** – EU Directive of the Network and Information Systems Act (NIS2)
- › **Components** – Individual requirements for hardware products and software solutions are taken into account
- › **Lifecycle** – Long-term available components, open standards like OSM, SMARC and COM-HPC as well as open source operating systems for individual requirements
- › **Holistic solution** – Overall concept of hardware and software, service, system consulting and expertise from a single source

We develop innovativ high-performance solutions

Place your trust in our deep expertise and competence to stay ahead of the competition.



IOT/INDUSTRY 4.0



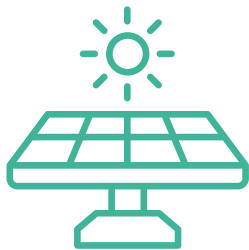
MECHANICAL ENGINEERING



MEDICAL TECHNOLOGY



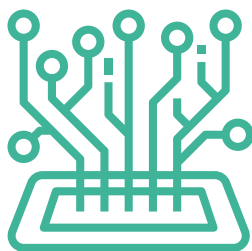
BUILDING SERVICES TECHNOLOGY



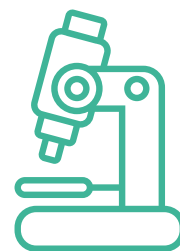
ENVIRONMENTAL TECHNOLOGY



OFFICE TECHNOLOGY



ELECTRONICS



LABORATORY TECHNOLOGY



Kontron Electronics GmbH

Max-Planck-Straße 6
72636 Frickenhausen
Germany

Tel.: +49 7022 4057-0
Fax: +49 7022 4057-22

E-Mail: sales@kontron-electronics.de
kontron-electronics.com

Kontron Electronics AG

Riedstrasse 1
6343 Rotkreuz
Switzerland

Tel.: +41 41 799 47 99
Fax: +41 41 799 47 98

E-Mail: info@kontron.ch
kontron-electronics.ch

Global Headquarters Kontron Europe GmbH

Gutenbergstraße 2
85737 Ismaning
Germany

Tel.: +49 821 4086-0
Fax: +49 821 4086-111

E-Mail: info@kontron.com
kontron.com