

DIGITAL FUTURE  
FROM EDGE TO CLOUD  
STANDARD AND CUSTOM IOT SOLUTIONS

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Press conference  
- Embedded World 2019 -

Nuremberg, February 26, 2019

# AGENDA

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Time	Topic	Presenter
12:00 - 12:05	Welcome & Agenda	<b>Norbert Hauser</b> VP Marketing
12:05 - 12:20	Group Strategy	<b>Hannes Niederhauser</b> CEO
12:20 - 12:30	Kontron Technology Strategy	<b>Norbert Hauser</b> VP Marketing
12:30 - 12:45	Innovations at Embedded World 2019	<b>Norbert Hauser</b> VP Marketing
12:45 - 12:50	Q&A	

Download all of our EW2019 PR's from our Online MediaKit: <https://www.kontron.de/ew2019>

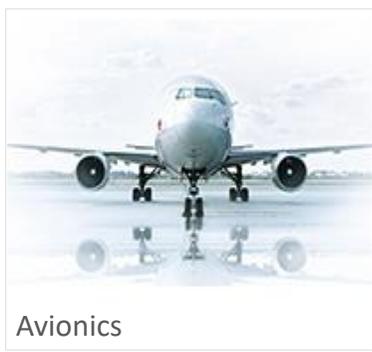
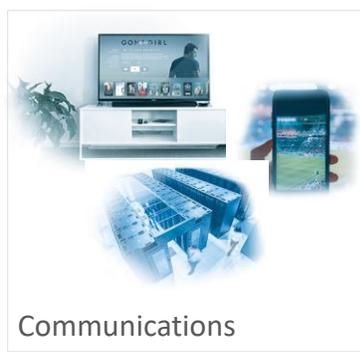
# S&T BUSINESS MODEL



## IT Services | Europe

## IoT Solutions | Europe + Asia

## IoT Solutions | America



Revenue plan 2019: EUR 450 Mio.\*

Targets:

- ▶ EBITDA > 5%
- ▶ Growth pa: 5%

Revenue plan 2019: EUR 525 Mio.\*

Targets:

- ▶ EBITDA > 12%
- ▶ Growth pa: >12%

Revenue plan 2019: EUR 190 Mio.\*

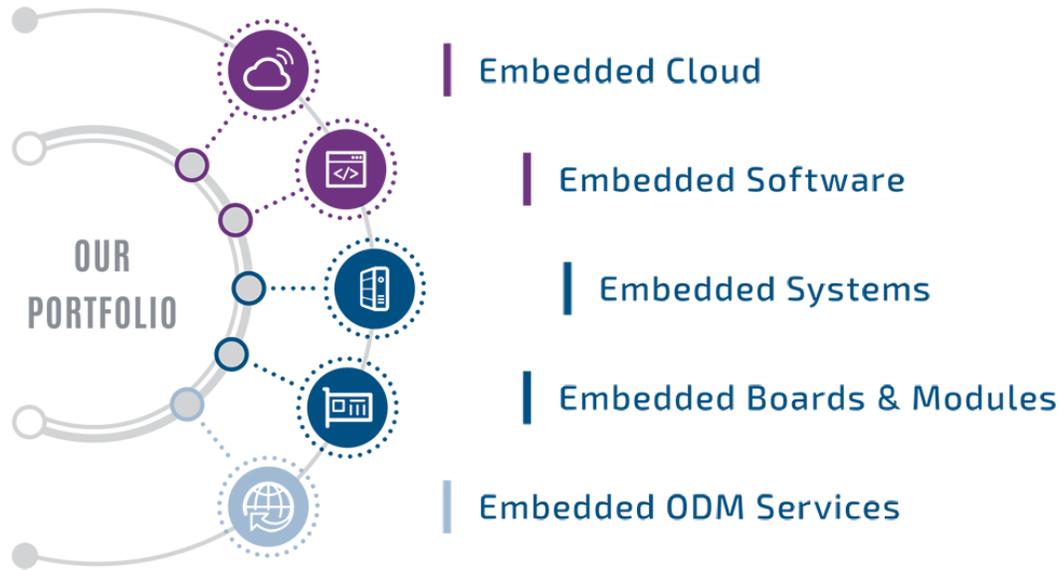
Targets:

- EBITDA > 12%
- Growth pa: 10%

Upgrade of “Embedded Systems” segment in America to “IoT Solutions” to be completed in 2019

\* incl. I/C revenues

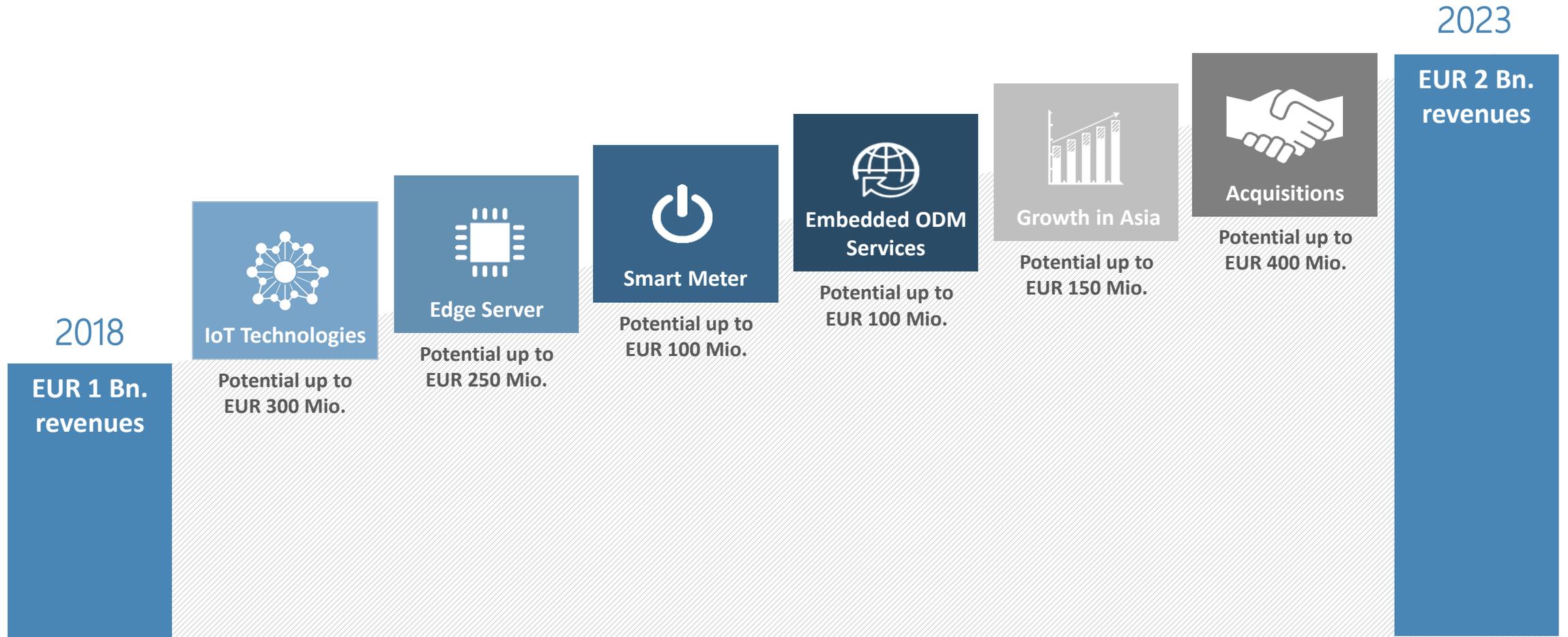
# GROWTH THROUGH EMBEDDED ODM SERVICES



	<p>Cooperation with Ennoconn/Foxconn</p>
	<p>One partner for any volume ODM in DACH + EE + China Offer engineering services</p>
	<p>Full value chain from boards to systems to cloud networks</p>

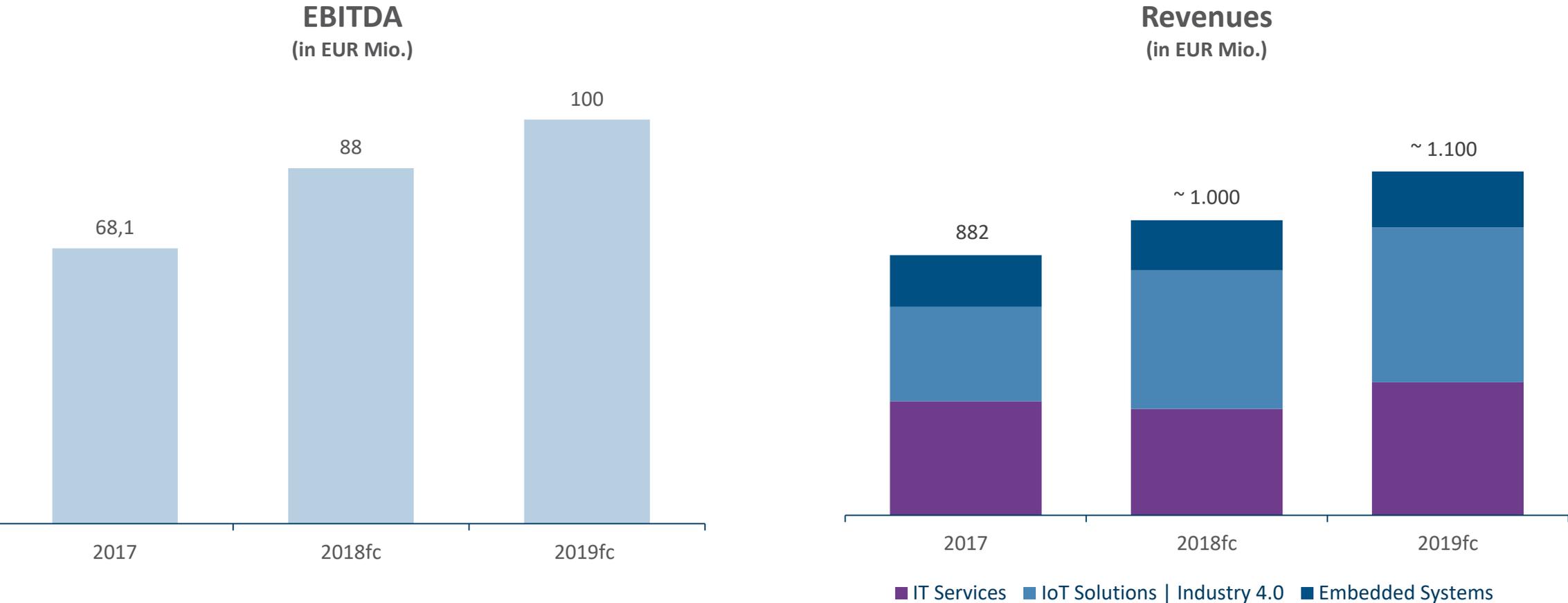
Kontron Electronics provides ODM/EMS for low volume - high mix in the DACH & EE region

# S&T GROWTH PATH CONTINUES: EUR 2 BN. IN 2023



S&T Group: We grow by determining and meeting the right technology trends

# S&T'S GROWTH PATH CONTINUES: GUIDANCE FOR 2019



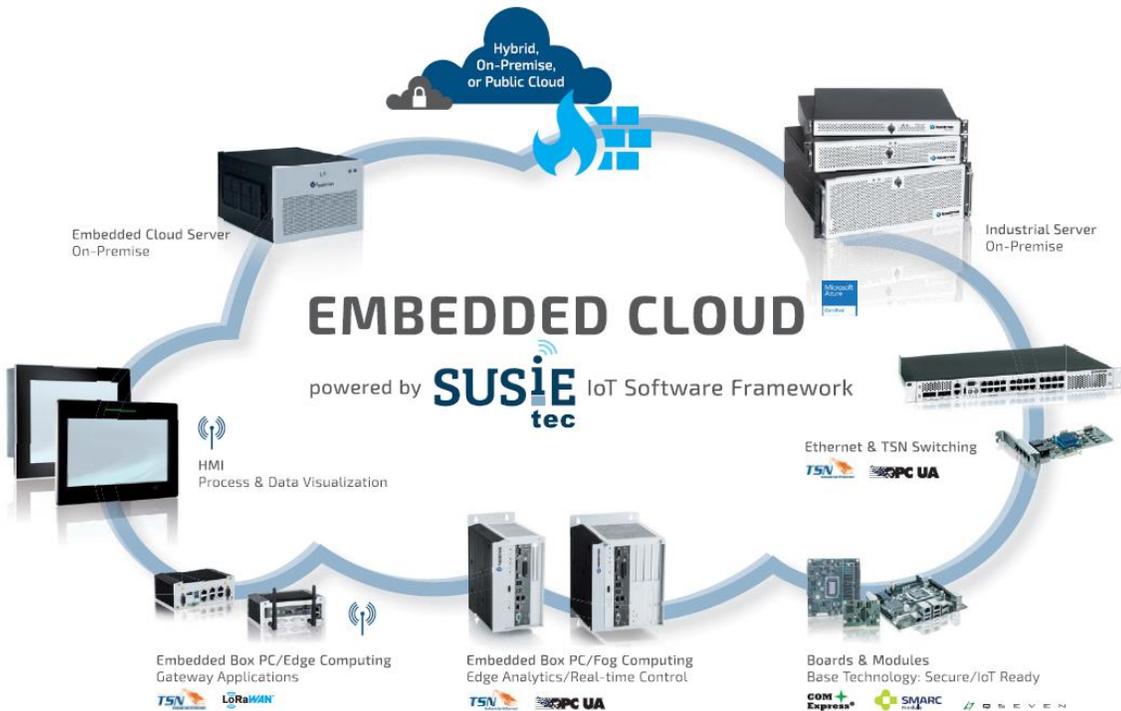
2018 guidance confirmed | Guidance for 2019: ~ EUR 1.1 Bn. revenues (+ M&A potential) and at least EUR 100 Mio. EBITDA

\*9M 2018

# FIVE MARKET TRENDS 2019



## Digitization requires Computing Power, Connectivity and Data Analysis



▶ Intelligent Edge Computing

▶ OPC UA with Time Sensitive Networking (TSN)

▶ Connectivity

▶ 5G mobile communications standard

▶ AI Artificial Intelligence (Machine Learning)

We are well positioned: Kontron Embedded Cloud + software competence via IoT Software Framework SUSIEtec

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# FROM HIGHEST CPU/GPU PERFORMANCE TO LOWEST POWER, SIZE & COST



## Broader CPU technology base

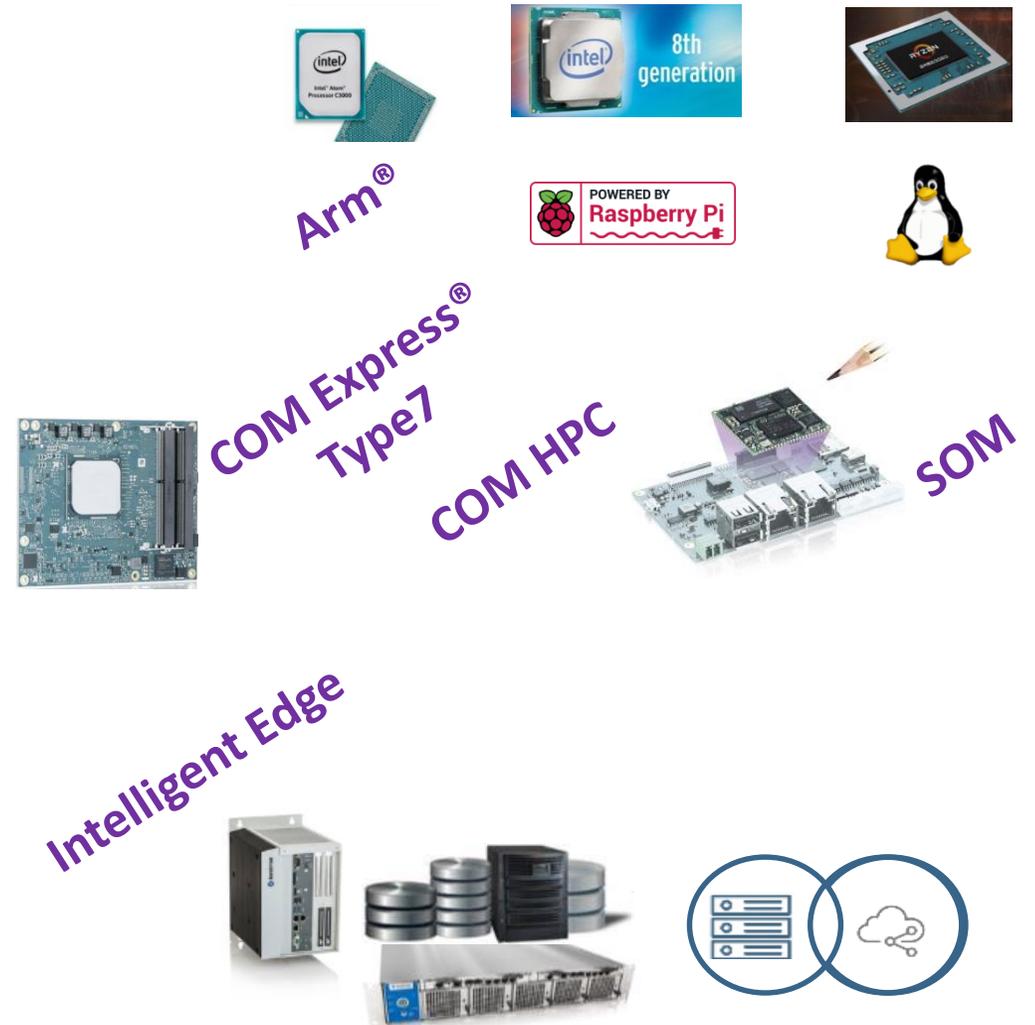
- ▶ Integrate latest X86 technology from Intel® and AMD
- ▶ Extend focus on Arm®: more suppliers, more platforms, LINUX

## Extended form factors for modules and boards

- ▶ New COM form factors for HPC applications
- ▶ New Arm® based extremely small and cost effective SOM

## Broader variety of system choices

- ▶ Powerful and compact intelligent edge computers and servers
- ▶ Smaller/lower cost IoT gateways and general purpose box PCs
- ▶ Optional machine learning HW acceleration



# FOCUS ON EFFICIENT CONNECTIVITY & OPEN COMMUNICATION



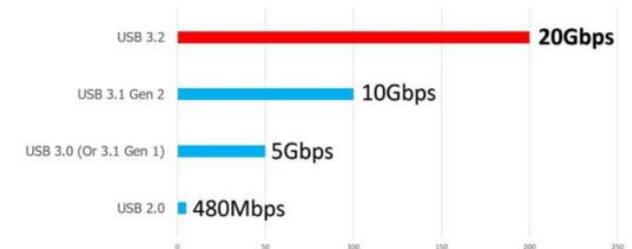
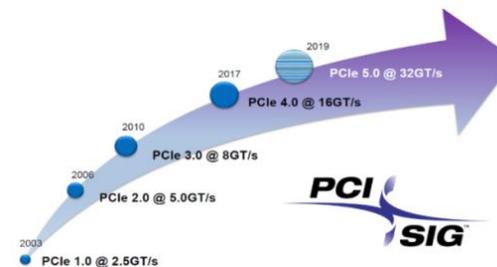
## Ethernet real time, deterministic data flows using IEEE 802.1 TSN

- ▶ A disruptive transport technology for real time computing in industrial, automotive, transportation and defense applications
- ▶ Open standard OPC UA for M2M communication and cloud gateways



## Massively increasing bandwidths on WAN, LAN and local interfaces

- ▶ WIFI 5/6, LTE 4G/5G, next gen PCIe & USB



## IOT centric LPWAN wireless technologies

- ▶ LTE CAT-1, LTE-M, NB-IoT, LoRaWAN®

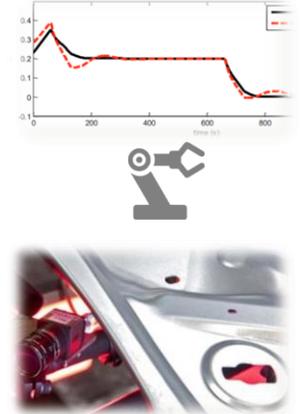


# EDGE ARTIFICIAL INTELLIGENCE (AI) ACCELERATION



## Industrial

Edge analytics, machine learning, control loop optimization, robots, optimized QA inspection and defect analysis



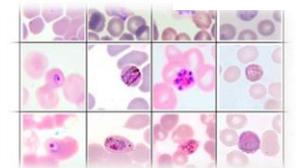
## Transportation

**Autonomous vehicles**  
Cars, trucks, agriculture equipment, AGV, UAV, drones



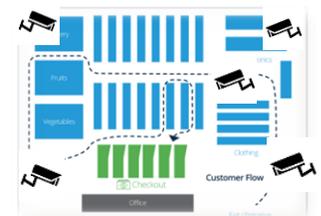
## Digital Health Care

Image analysis/diagnostics



## Retail:

people tracking, Shop floor optimization, object classification,



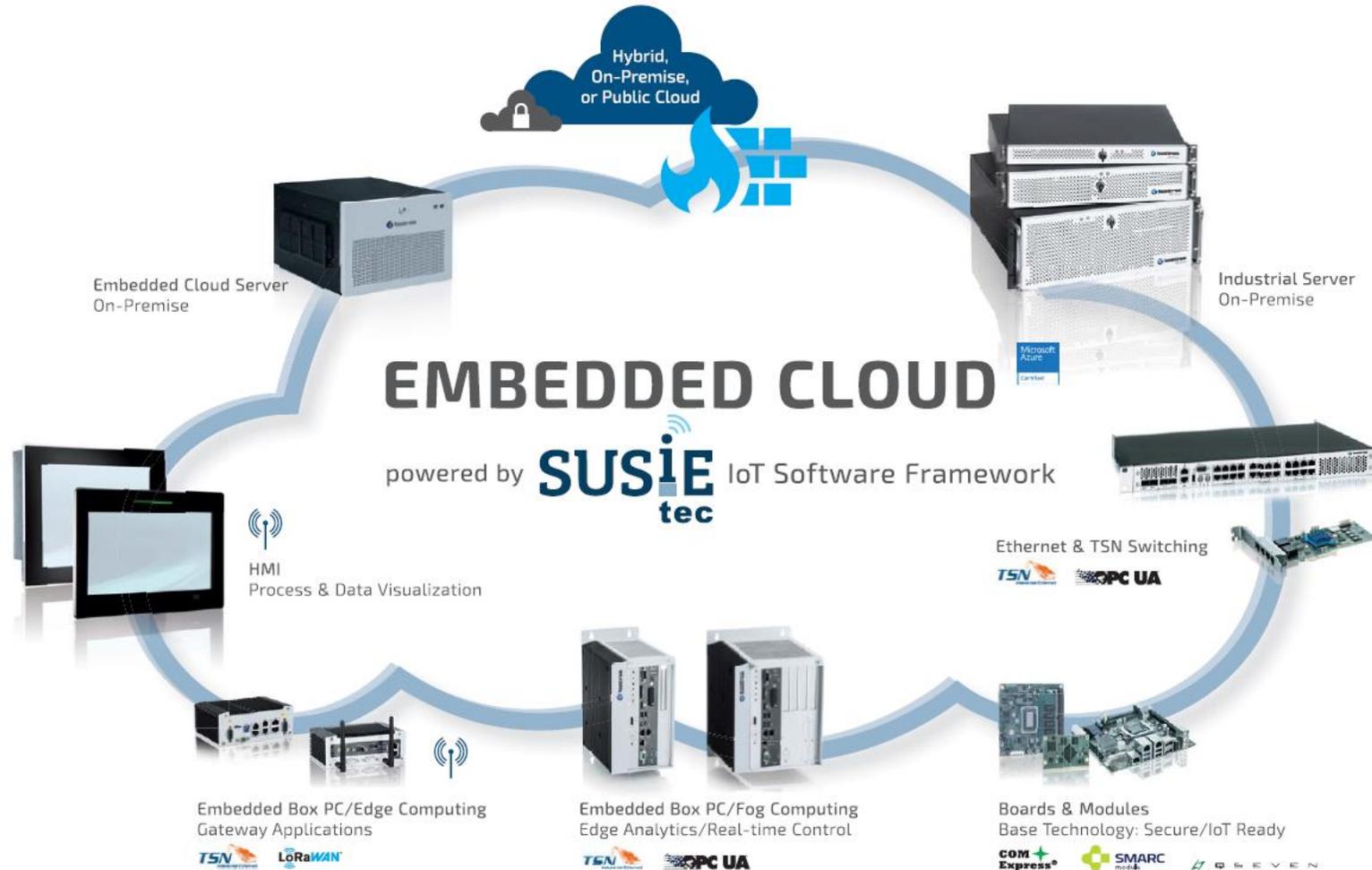
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# DIGITAL FUTURE. FROM EDGE TO CLOUD STANDARD AND CUSTOM IOT SOLUTIONS



We provide scalable embedded intelligence along with a flexible IoT software framework for cloud computing

# SUSiEtec - SECURE IOT SOFTWARE FRAMEWORK

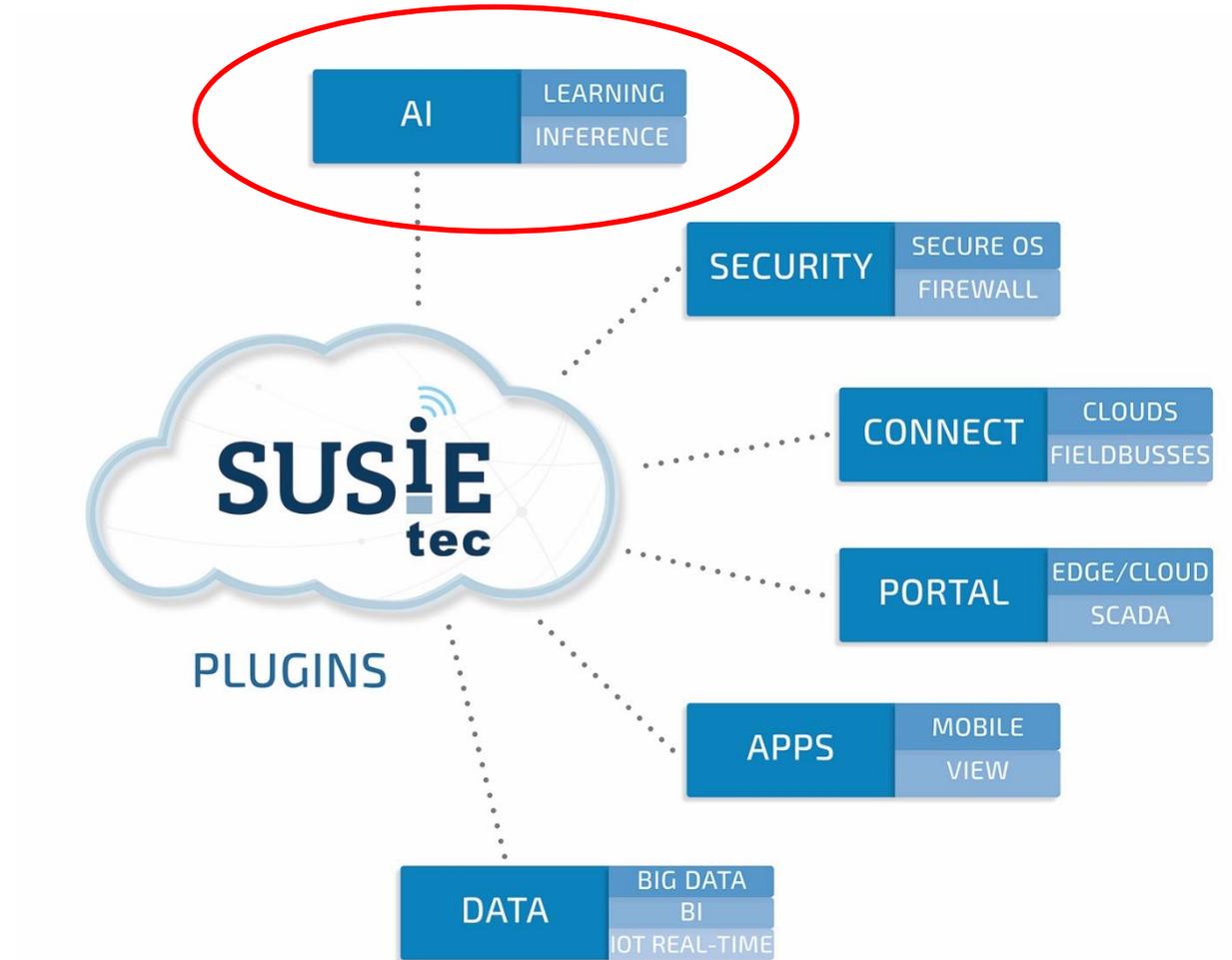


## Our Services

- ▶ Full solution Integration
- ▶ Customized embedded software
- ▶ Edge computing
- ▶ Cloud, on-premise or hybrid hosting

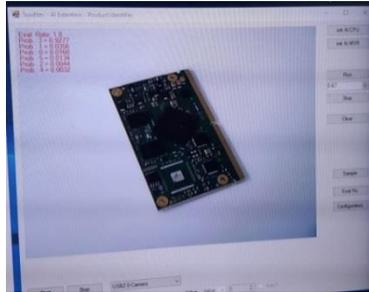
## Embedded World live demos

- ▶ Service2Go – IoT solution for service organizations to increase efficiency
- ▶ Object recognition through an artificial neural network



# SUSiEtec – AI PLUGIN

AI LEARNING INFERENCE



**Environment**  
~6 weeks of time advantage



**Ease of use**  
7 lines of code vs. 2000 lines



## Training

SUSiEtec cloud based, on-premise training

SUSiEtec tailored training environment

Open source Frameworks



## Inference

SUSiEtec .NET AI – libraries

Intel® OpenVINO™ toolkit

Hardware platform (x86, Arm®, optional accelerators)

OPENVINO™

CPU GPU VPU FPGA

## Services

We help customers solving their AI challenges  
Project support tailored to individual needs

With SUSiEtec we are bridging the gap by providing solutions for the whole AI process, not just inference

# KONTRON KBOX FAMILY FOR EMBEDDED / IOT SOLUTIONS



## KBox A-Series

- ▶ Scalable performance & I/O
- ▶ Intel Atom® and Core™ ULT
- ▶ Intelligent IoT gateway
- ▶ Fanless design
- ▶ Easy customization



## KBox B-Series

- ▶ High performance Intel® Core®
- ▶ Desktop applications
- ▶ Low noise design
- ▶ Small form factor (mITX)



## KBox C-Series

- ▶ High performance, fanless
- ▶ Intel® Core™ and XEON™
- ▶ Various expansion capabilities
- ▶ Recovery functionality
- ▶ Maintenance-free



# SCALABLE INTELLIGENT EDGE COMPUTER FOR DIFFERENT APPLICATIONS

Single processor, scalable edge  
Industrial performance  
Edge analytics



NEW

Arm®



KBox A-230-LS, 5xTSN & switch  
NXP Layerscape LS1028



KBox A-150, scalable performance  
From Intel Atom® up to Intel® Core™ i7



KBox C-102, expansion & performance  
Intel® Core™ i5, i7, Intel® Xeon™  
AMD Ryzen™ (Demonstrator)

## Edge gateway

- Industrial
- Low power
- Rich I/O

## Performance



KBox A-103, rich I/O  
Intel Atom®



KBox A-203, small & flexible  
Intel Atom®



KBox A-250, digital I/O  
Intel Atom®

Entry edge gateway  
Industrial  
Low power  
Size



NEW

Arm®

KBox A-330, I/O & value  
NXP i.MX6 or Raspberry Pi

## KONTRON KBOX A-330-RPI



### Features / USPs

- ▶ **Raspberry Pi Module CM3+ with huge developer community**
- ▶ Cost optimized design for gateways and control
- ▶ Compact & DIN Rail mounting for control cabinets
- ▶ Various interfaces like ETH, serial, CAN, USB, digital IO, expansion port
- ▶ LTE & WLAN option
- ▶ Long term availability till 2027
- ▶ **Raspbian LINUX support**

### Use case

- ▶ Industrial applications with high software demand and limited budgets



## KONTRON KBOX A-330-MX6

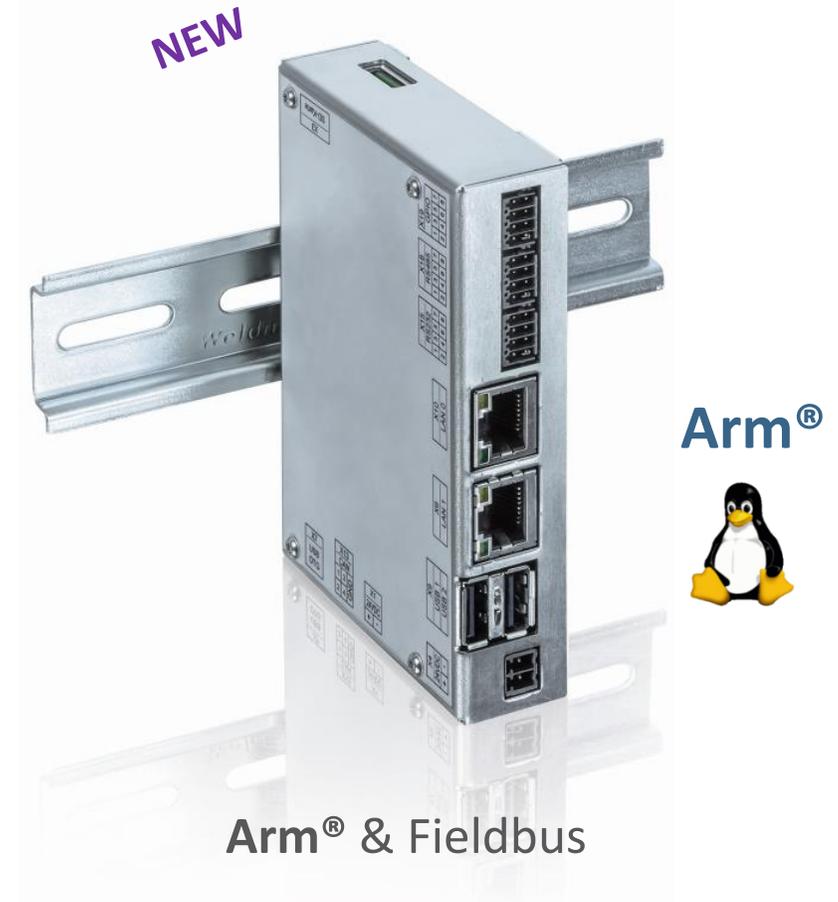


### Features / USPs

- ▶ **Industrial grade NXP i.MX6 processor with fieldbus connectivity option**
- ▶ Cost optimized design for gateways and control
- ▶ Compact & DIN Rail mounting for control cabinets
- ▶ Various interfaces like ETH, serial, CAN, USB, digital IO, expansion port
- ▶ LTE & WLAN option
- ▶ **EtherCAT, PROFIBUS, Modbus, CANopen**
- ▶ Long term availability till 2027
- ▶ **Yocto LINUX support**

### Use case

- ▶ NXP based industrial applications – harsh environment, limited budgets



## KONTRON KBOX A-230-LS



### Features / USPs

- ▶ Cost efficient and easy implementation of TSN technology / IoT gateways
  - ▶ 5 TSN capable 1GbE ports (4xswitched), 1 standard 1GbE port
  - ▶ Integrated switch eliminates cost of external switch
  - ▶ Expansion ports for communication & I/O (e.g. CAN, serial,...)
  - ▶ LINUX software support



Arm® & TSN

### Use case

- ▶ Gateway between upper network and field level network for standard Ethernet or TSN
- ▶ Everywhere, where real time /determinism is required like motion & machine control

# TSN / OPC UA - THE OPEN STANDARDS FOR INDUSTRY 4.0



## SPS IPC DRIVES 2017

- ▶ PCI Express® NIC card with 2/4 ports & onboard-sw



## Embedded World 2018

- ▶ Pre-installed TSN starterkit



## SPS IPC DRIVES 2018

- ▶ SMARC 2.0 module with NXP Layerscape LS1028
  - ▶ Up to 5 TSN capable 1GbE ports (4xswitched)



## Embedded World 2019

- ▶ KBox A-230-LS based on the SMARC 2.0 module
  - ▶ Up to 5 TSN capable 1GbE ports (4xswitched)



**NEW**

Kontron is a leading provider of TSN / OPC UA solutions

## KONTRON KBOX B-201-CFL



### Features / USPs

- ▶ Powerful Intel® Core™ i7 for AI and POS applications
  - ▶ Multiple video interfaces
  - ▶ High performance in a small box
- ▶ For residential /office environments
  - ▶ Low noise design (<34 dB(A))
- ▶ Emission Class B

### Use case

Image processing, control room, video surveillance and desktop applications



**Performance & low noise**

# COMPLEMENTARY PRODUCTS FROM KONTRON ELECTRONICS



## Control Panel / Web Panel

- ▶ PCAP control panel in high quality design – 4.3”, 5”, 7”, 10.1”, 15.6”
- ▶ Arm® NXP i.MX6 or Intel Atom® E3800 processor
- ▶ Control-Panel: Supports CODESYS SoftPLC
- ▶ Web-Panel: High performance HTML5 and other browsers



## Control Unit

- ▶ Intel Atom® E38xx processor
- ▶ EtherCAT, PROFINET, PROFIBUS, Ethernet IP, Modbus RTU & TCP, CAN
- ▶ CODESYS SoftPLC



## Remote I/O

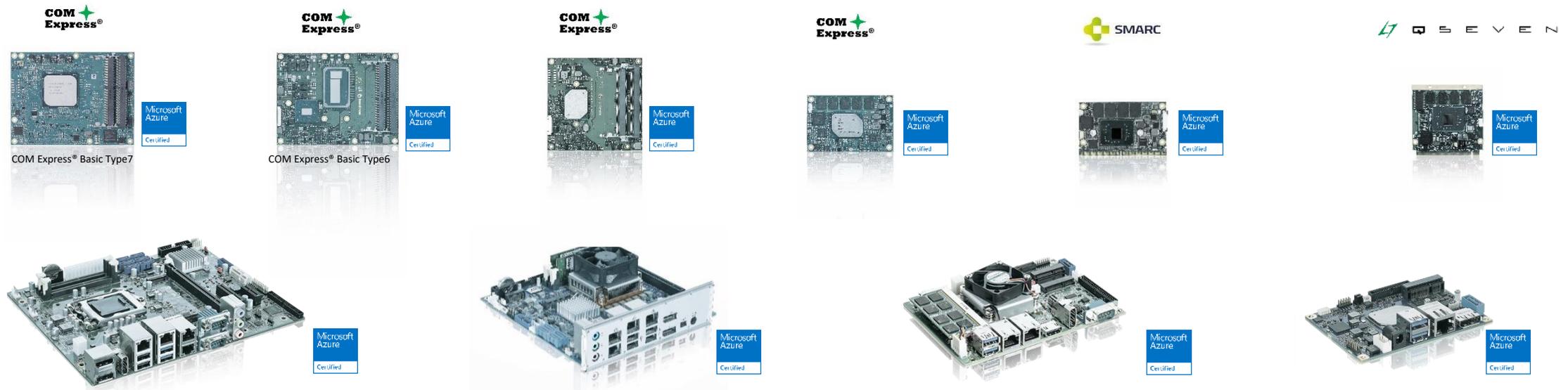
- ▶ Different configurations of digital and analogue I/O, RTD, decoders, counters
- ▶ EtherCAT or CANopen



Kontron is now able to offer the full range from CLAMP to CLOUD

# SCALABLE EMBEDDED / IOT PLATFORMS - SECURE & CONNECTED

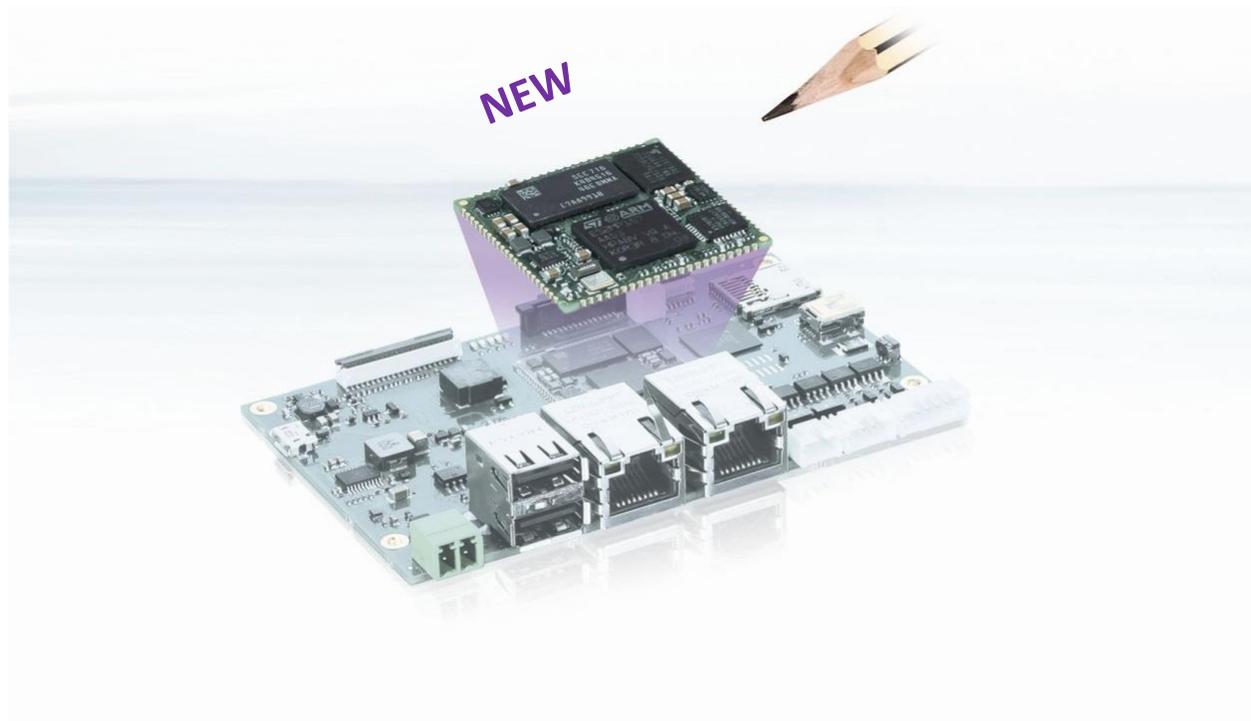
- ▶ Leading Computer-on-Module standards: COM Express<sup>®</sup>, SMARC<sup>™</sup>, Qseven<sup>™</sup> - *new*: SOM
- ▶ Scalable Embedded Motherboards | SBCs: FlexATX, Mini-ITX, 3.5", 2.5" – *new*: 4.3" (slant) SBCs
- ▶ All are MS Azure certified and provide Kontron secure systems solution
- ▶ Scalable performance based on Intel<sup>®</sup>, AMD and NXP processors – *new*: STMicroelectronics, Raspberry Pi



Innovative IoT platforms to match different performance, space & thermal requirements

# SYSTEM ON MODULE (SOM): ARM STM32MP157

- ▶ STM32MP157: Dual Cortex A7 + Cortex M4
- ▶ 2x USB 2.0 / 1x USB as OTG
- ▶ 1x 10/100 Mbit Ethernet
- ▶ LCD Interface 1x DSI, 1x RGB
- ▶ Up to 2x CAN
- ▶ Up to 8x UART
- ▶ Up to 6x I2C
- ▶ Up to 6x SPI
- ▶ Up to 98x GPIO
- ▶ Up to 17x Analog IN
- ▶ Up to 4x PWM, 2x DAC
- ▶ 3 x SDIO 4.0, 8 bit
- ▶ RTC
  
- ▶ Embedded LINUX



Arm®



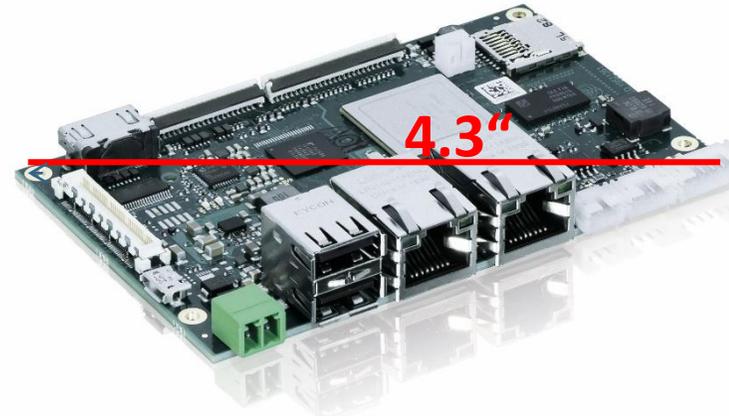
3 processor cores + flexible industrial I/O on small size of 1 inch x 1 inch / 2,54cm x 2,54cm

# COMPLEMENTARY PRODUCTS FROM KONTRON ELECTRONICS



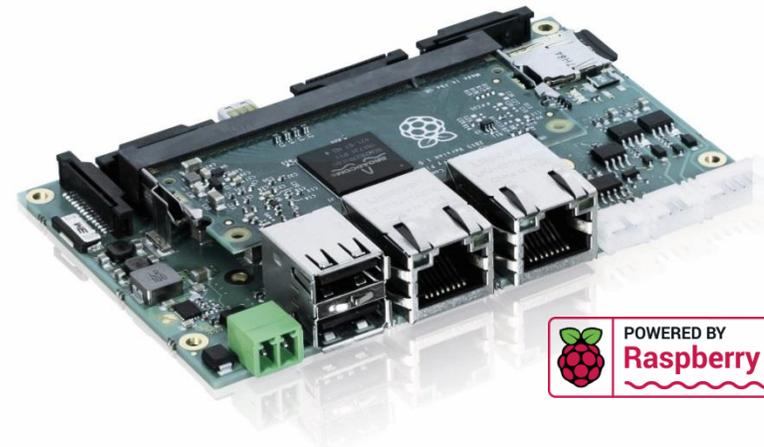
## 4.3" SBC with NXP i.MX6

- ▶ NXP i.MX6ULL / Solo / Dual  
CAN, RS485, 232
- ▶ GPIO
- ▶ LINUX, CODESYS V3



## 4.3" SBC with Raspberry PI

- ▶ Raspberry Pi Compute Module CM3  
or CM3L (without Flash)  
BCM2837 CPU @ 4x 1,2 GHz ARM-CORTEX A53
- ▶ 1x CAN or 1x RS485
- ▶ 1x Camera-interface CSI (2 line)
- ▶ 1x Raspberry Pi GPIO-Header 40Pin (PI HAT)
- ▶ Industry standard peripherals
- ▶ Raspbian software from community



# IOT AND EMBEDDED LEADERSHIP



- ▶ Driving Open Standards through active memberships

- ▶ Strong Technology Partners

					
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Open standards and innovative technologies reduce time-to-market

SINCE MORE THAN 20 YEARS ARE COMS THE PERFECT FIT



Let's have a look at „The future of COMs“



**kontron**

S&T Group

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For more questions visit us in hall 1, booth 478

OUR CHANGING WORLD IS FILLED WITH  
**BOUNDLESS OPPORTUNITIES**

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**WE LOOK FORWARD TO  
EXPLORING THEM WITH YOU**