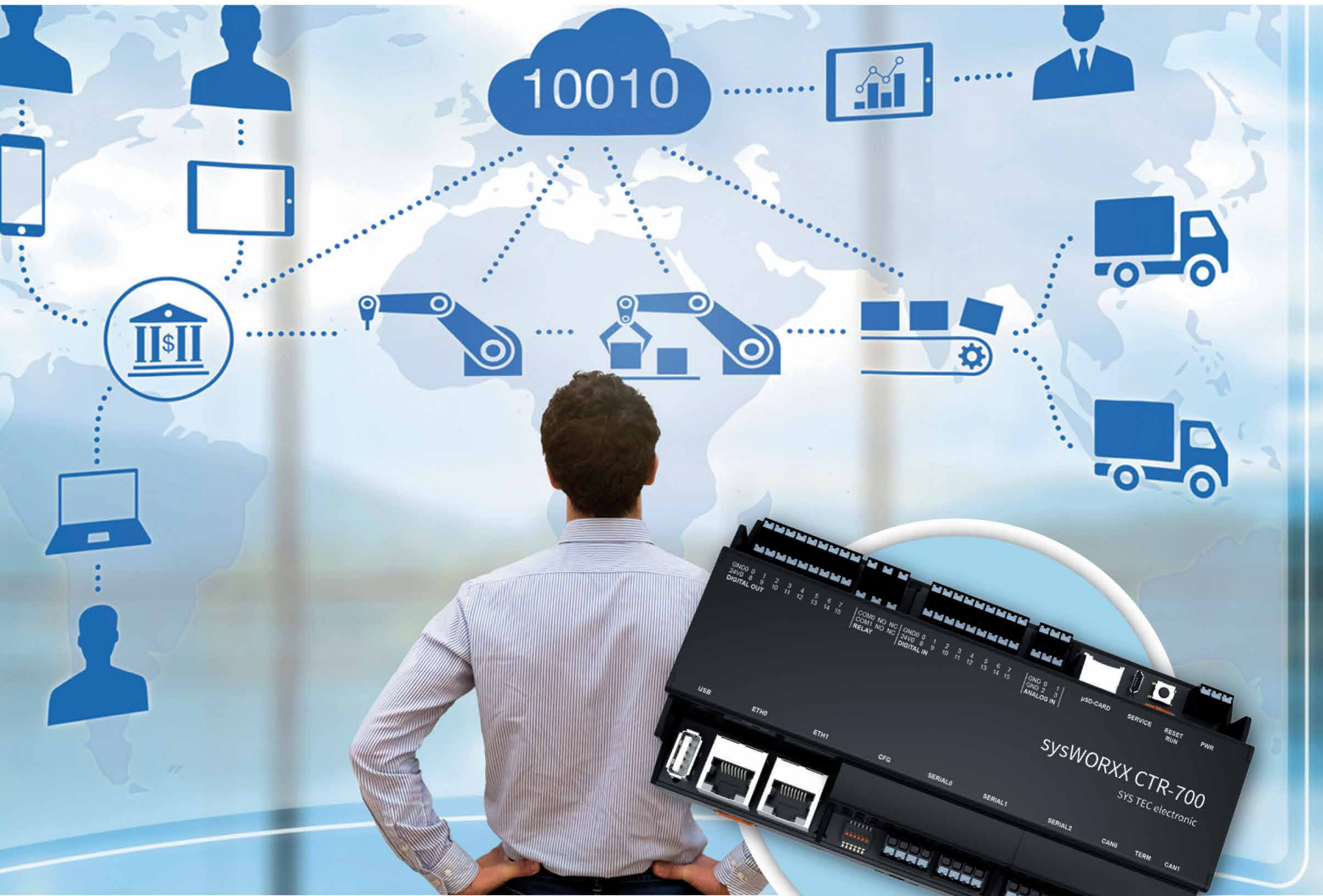




# SYS TEC ELECTRONIC



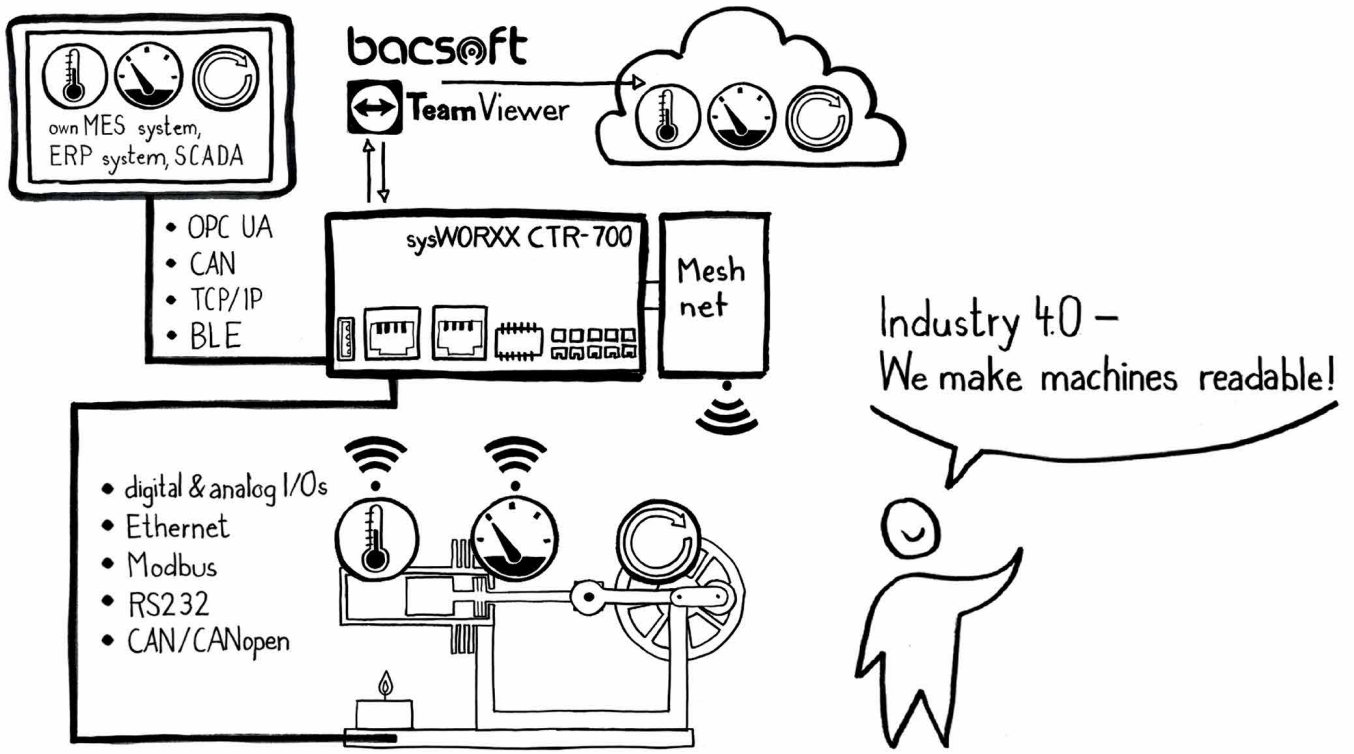
## LIVE MONITORING & PREDICTIVE MAINTENANCE

Fields of application: energy management,  
asset/personnel tracking, production monitoring

sysWORXX CTR-700

a combination of a freely programmable edge controller &  
IoT gateway with direct mesh network connectivity

# WE MAKE MACHINES READABLE!



**Wired and wireless sensors**  
(e.g. mesh networks)



**Fieldbus sensors**

- CAN/CANopen
- Modbus
- Ethernet
- RS232/RS485

```

1100101
110010111001
5B1 h
1010 100100
01100010
6E5 h
1000111000111
1010
8G3 h
    
```

**Sensor Raw Data**  
(digital & analogue I/Os, Ethernet, Modbus, RS232, CAN/CANopen)



```

JSON {
  type: "temperature",
  value: 22.5,
  unit: "°C"
}
    
```



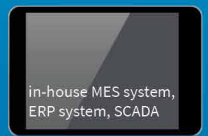
```

JSON {
  type: "humidity",
  value: 84,
  unit: "%RH"
}
    
```

MQTT, OPC UA, {Rest}, CAN, TCP/IP, BLE

```

JSON {
  type: "acceleration",
  value: { x: 0.2,
          y: 1.2,
          z: 2.0 }
  unit: "g"
}
    
```



- Node-RED
- Java
- C/C++
- C#
- IEC 61131-3
- Python

**Edge Computing:**

- M2M communication
- Local Persistence
- Pushing to Cloud



## PRODUCTION MONITORING

Live monitoring & control of machinery/plant data



### SOFTWARE DETAILS sysWORXX CTR-700

#### SYSTEM SOFTWARE

- ▶ Operating system Linux / Debian
- ▶ PLC runtime OpenPCS – IEC 61131-3
- ▶ Wiring editor Node-RED
- ▶ Other programming languages C#, C / C++, Java, Python

#### COMMUNICATION PROTOCOLS

- ▶ IoT data protocols OPC UA, MQTT, TCP/IP
- ▶ Fieldbus protocols CANopen, CAN Layer 2, Modbus & more
- ▶ Mesh network Wirepas via Extension Module

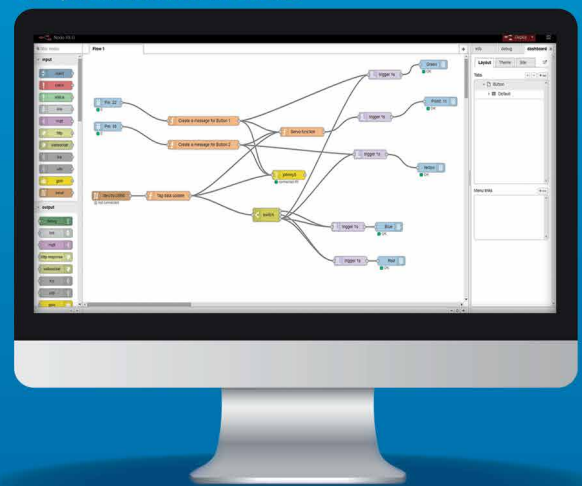
#### VISUALISATION

- ▶ PLC default SpiderControl / IniNet (*commercial license*)
- ▶ Alternative visualisation Node-RED (*free license*)

#### REMOTE ACCESS

- ▶ System services SSH / Telnet, SFTP / FTP, HTTPD

Example of visualisation in Node-RED



## ENERGY MANAGEMENT

Intelligent meters & reduction/smoothing of electrical load peaks



### BENEFITS sysWORXX CTR-700

- ▶ Combined edge controller & IoT gateway
- ▶ Edge controller: local pre-processing of data from various fieldbuses & wireless networks
- ▶ IoT gateway: data forwarding to the cloud and HMIs
- ▶ Freely programmable in the following languages:
  - IEC 61131-3 (*OpenPCS*)
  - Node-RED
  - Java
  - Python
  - C#
  - C/C++
- ▶ Various different digital & analogue interfaces
  - Direct connection of sensors and actuators
  - See hardware details
- ▶ Direct connectivity to mesh network module
  - Transmission via Wirepas wireless technology
- ▶ Can also be fitted with wireless modems from a wide range of manufacturers
- ▶ Suitable for DIN top-hat rail mounting
- ▶ Strict separation of enterprise IT & shop floor OT

wireless extension module  
sysWORXX SRN-GW1

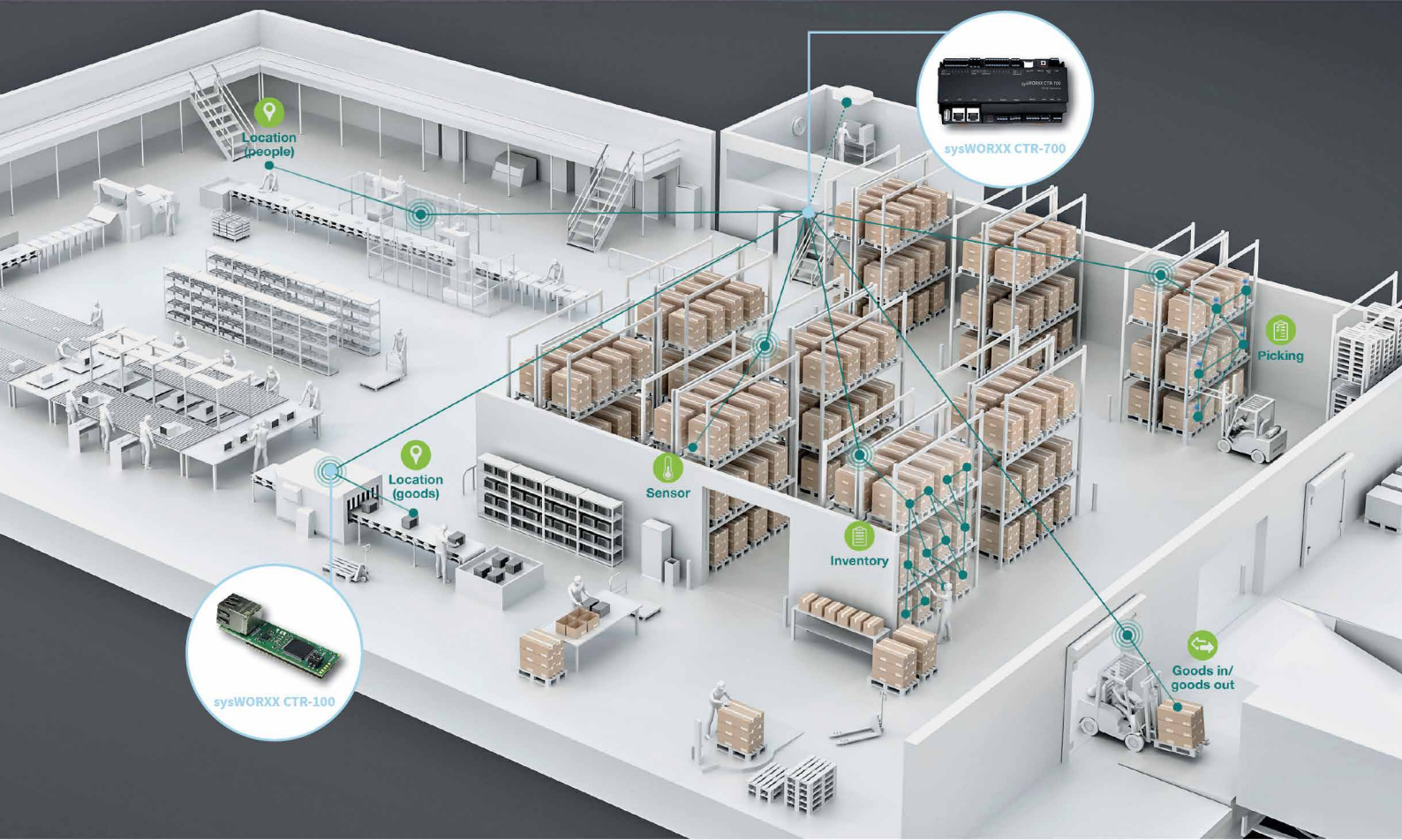




# INDUSTRY 4.0 APPLICATION EXAMPLES

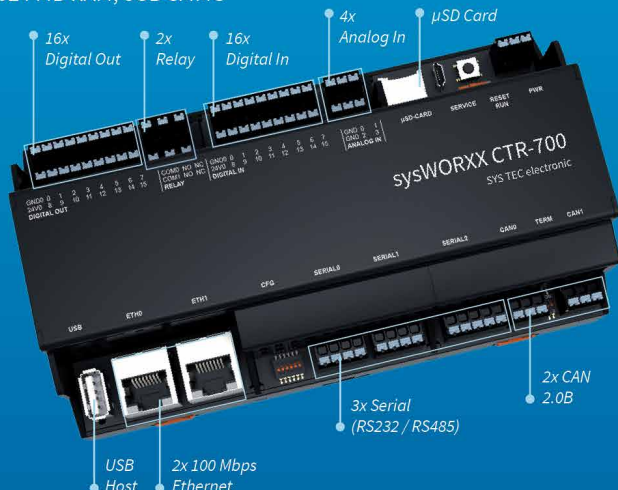
## GOODS TRACKING

Increased efficiency through monitoring in industry/production



### HARDWARE DETAILS sysWORXX CTR-700

- ▶ Suitable for DIN top-hat rail mounting
- ▶ NXP i.MX 7 / Dual Cortex-A7
- ▶ 1024 MB RAM, 8GB eMMC

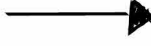


Power supply 24V / 1,5A	SPT-THR 1,5mm <sup>2</sup> / 3pol
Service (console)	USB 2.0-Micro Type B
Ethernet 0	RJ45
Ethernet 1	RJ45
USB-Host	USB 2.0 Type B
µSD-Card	µSD card holder
CAN 0	SPT-THR 1,5mm <sup>2</sup> / 3pol
CAN 1	SPT-THR 1,5mm <sup>2</sup> / 3pol
Serial interface 0	SPT-THR 1,5mm <sup>2</sup> / 4pol
• RS232	
• RS485 (MODBUS)	
Serial interface 1	SPT-THR 1,5mm <sup>2</sup> / 4pol
• RS232	
• RS485 (MODBUS)	
Serial interface 2	SPT-THR 1,5mm <sup>2</sup> / 5pol
• RS232	
• RS485 (MODBUS)	
Backplane bus	SPT-THR 1,5mm <sup>2</sup> / 18pol
• UART	VCC / GND / signals
• SPI	
4 analogue inputs	SPT-THR 1,5mm <sup>2</sup> / 6pol
• 0...20mA / 4...20mA	2GND / 4Ch.
• 0...10V	
16 digital inputs	SPT-THR 1,5mm <sup>2</sup> / 18pol
• 1 as CNT configurable	24V / GND / 16Ch.
• 1 as A/B-Encoder configurable	
16 digital outputs	SPT-THR 1,5mm <sup>2</sup> / 18pol
• 2 as PWM configurable	24V / GND / 16Ch.
2 relays	SPT-THR 1,5mm <sup>2</sup> / 6pol
• Changeover contact	COM / NO / NC

block diagram sysWORXX CTR-700

# FROM YOUR IDEA TO SERIAL PRODUCTION

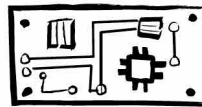
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1. Concept



2. HW-Design



3. SW-Design



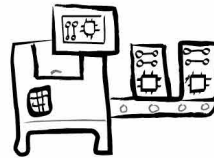
4. Casing



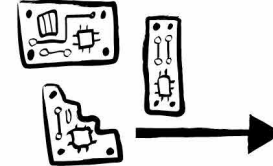
5. Prototype



6. Series



7. EMS



**SYS TEC  
ELECTRONIC**

