

Saia PCD® QronoX

OVERVIEW

sbc
SAIA BURGESS CONTROLS

Saia PCD® QronoX



QronoX IEC-Controller

AGENDA



- Information about SBC
- Introduction into the QronoX system
- Online demo of the engineering tool
- Reference stories
- HTML5 touch panels
- Roadmap
- Q&A

SAIA BURGESS CONTROLS INTRODUCTION

SBC develops and manufactures programmable logic controller since 1978

- Long and recognized experience in designing PLC systems and components
- Hardware, Firmware and Software

SBC has over 1 million Saia PCD controllers installed worldwide

- Mission critical buildings
- Infrastructure, water, district heating, transport and tunnel
- Machines

SBC is owned 100% by Honeywell Inc. since 2013

- New opportunities for **SBC** and for **Honeywell** in new industries and geographies

PLC is our DNA

- It stands for industrial robustness and compliance to PLC standards (IEC 61131)
- Speed, modularity, connectivity, freely programming
- Security, long life cycle



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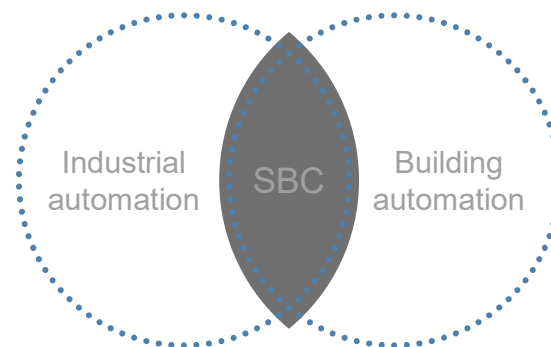
OUR BUSINESS MODEL



Partnership instead of competition

In building and industrial automation

We deliver the technology and products
Our partners provide the solution.

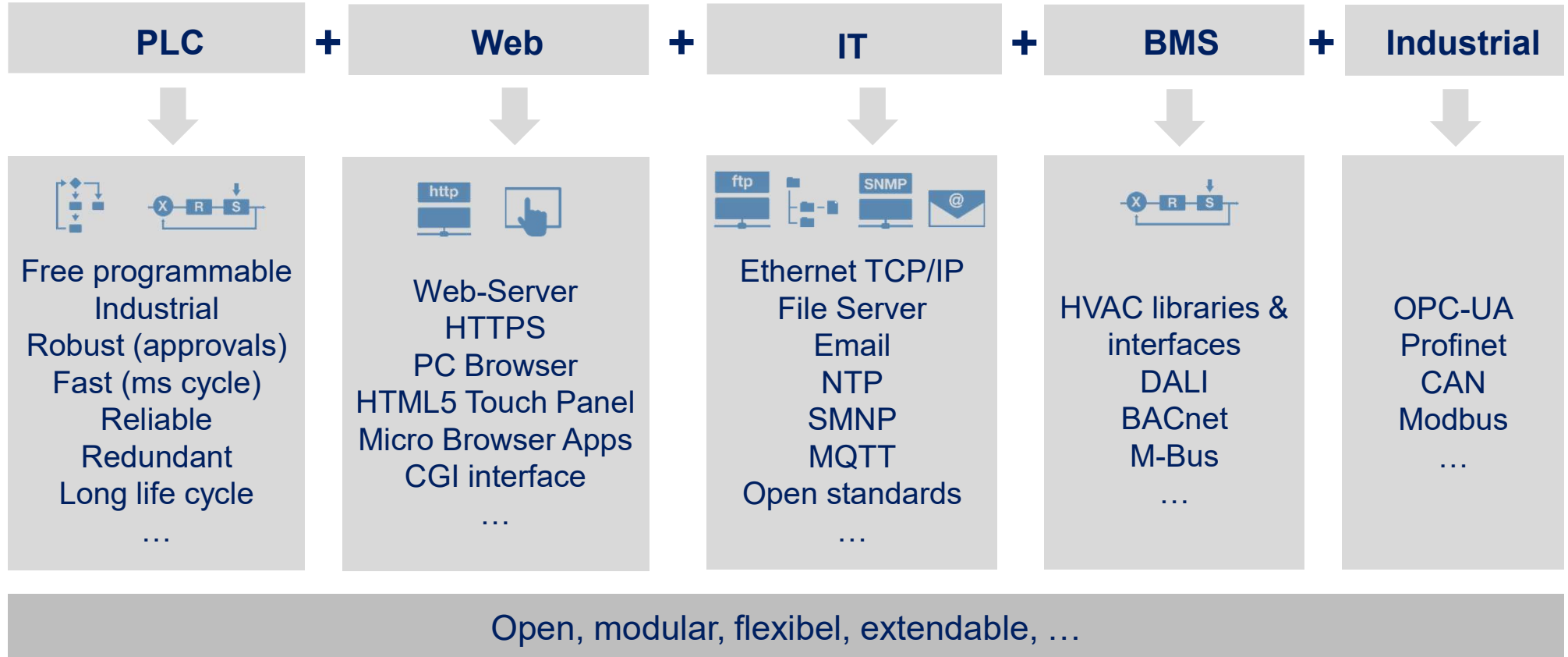


Win-win for our partners as well as for planners, owners, operators and SBC

OUR FIELDS OF APPLICATION INFRASTRUCTURES AND BUILDINGS

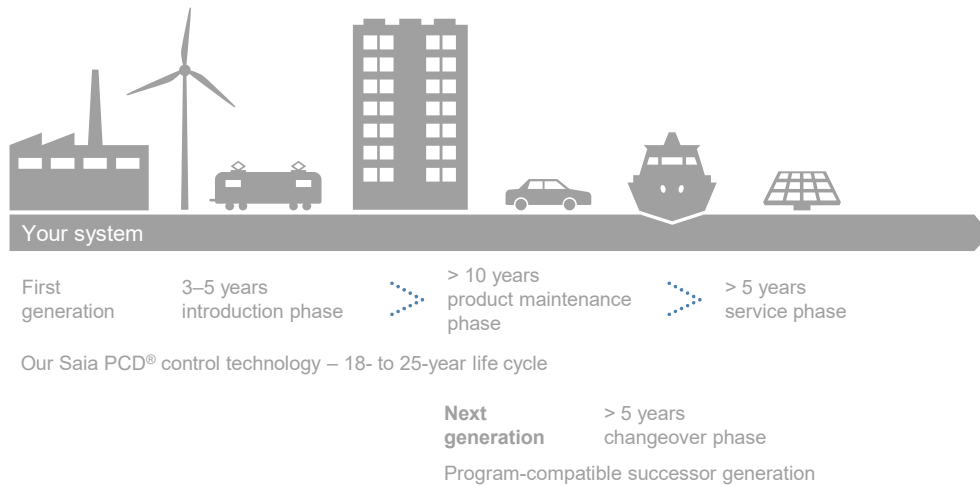


OUR KEY OF SUCCESS



PLC + (Web + IT + BMS) = added key value/differentiator

OUR PROMISE: PEACE OF MIND - INVESTMENT PROTECTION



Designed for long-term availability

Robust, compatible and portable

- ▶ Future-proof thanks to long product life and flexible adaptability to changing requirements
- ▶ For life cycles longer than 20 years
- ▶ PLC standard IEC EN 61131-2 for maximum robustness
- ▶ PLC standard IEC EN 61131-3 open programming standard for best maintainability and long-term compatibility

Profitability throughout the entire life cycle

SYSTEM ARCHITECTURE

#Saia PCD® QronoX

The system itself consisting of hardware, firmware and software

#Saia PCD® QronoX ECS

The software (ECS = engineering and commissioning suite)

#Saia PCD® QronoX IEC controller

The hardware (programmable controller according to IEC 61131-3)



DESIGNED FOR CRITICAL INFRASTRUCTURES

District heating / Cooling

- Distributed Control
- Local Data Logging
- Network



Water treatment / Distribution

- Industrial System
- Network
- IEC 60870-5-104



Tunnel automation

- Redundancy
- Remote I/O
- Web Visualization



Energy production / Distribution

- Milliseconds Cycle
- Sequence of Events
- Network



QRONOX – KEY SYSTEM FEATURES

PLC for cyber secure applications

- ▶ Based on standard ANSI ISA 62443
- ▶ Security level SL3, by time upgrade to SL4
- ▶ Encrypted communication
- ▶ Role based account management
- ▶ Encrypted user filesystem
- ▶ Large storage media for historical data
- ▶ Supports Micro SD cards up to 32GB



Powerful network capabilities – full flexibility for integration

- ▶ 2 Ethernet and serial interfaces onboard and extendable
- ▶ OPC-UA server for easy and secure integration
- ▶ Profinet for industrial applications
- ▶ CAN (CAN raw frames, CANopen, CAN J1939)
- ▶ Modbus TCP & RTU the most common standard
- ▶ IEC60870-5-104 for telecontrol in infrastructure
- ▶ M-Bus & DALI support for metering & lighting
- ▶ BACnet SC support in preparation



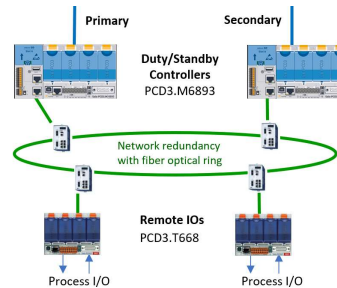
Powerful and efficient engineering

- ▶ IEC 61131-3 industrial standard
- ▶ Object-oriented high-level language programming
- ▶ Benefit from a large programmer community



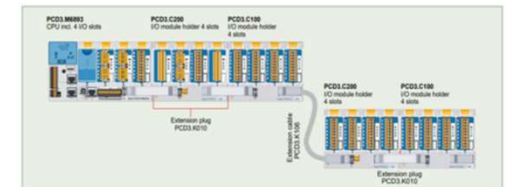
High availability with CPU redundancy

- ▶ Operating critical applications without interruption
- ▶ Hot-Standby operation with bump-less switchover



Compatible with PCD3 I/O system

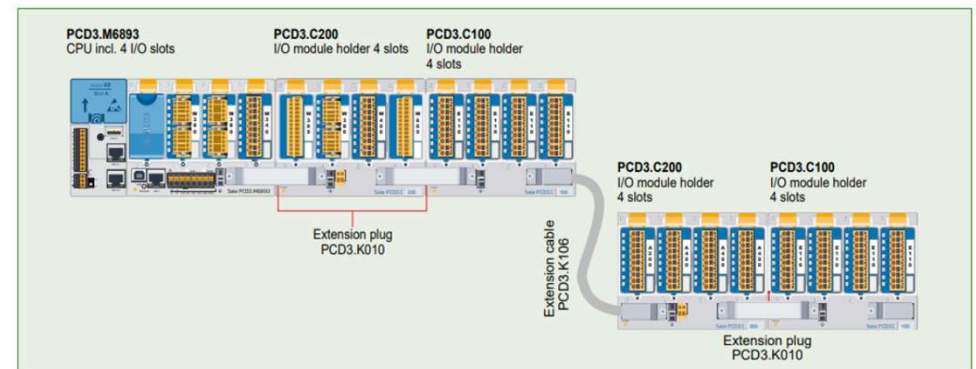
- ▶ Full Modular I/O System, exp. up to 1024 I/Os
- ▶ Reuse of robust and proven modules
- ▶ Easy upgrade of existing PCD3 installations



CONCEPT SAIA PCD3 QRONOX

Mechanical dimensions (181 x 101 mm) for single DIN Rail mounting, 24 VDC power supply

- ▶ Modular IOs; pluggable modules
- ▶ On-Board slots for IO modules and serial communication interfaces
- ▶ Expandable IO-Bus up for up to 64 IO-Modules (1024 digital data points maximum)
- ▶ More than 30 different In- and Outputs modules supporting digital and analogue signals
- ▶ On-Board communication interfaces
- ▶ Removable terminals
- ▶ Integrated micro-controller board with large memory
- ▶ Battery less
- ▶ Real time clock with >10 days clock retention
- ▶ Optional user file system via micro-SD card
- ▶ Compatible with existing PCD3 I/O and PCD2.C1000/C2000
 - ▶ Retrofit of existing installations with latest CPU technology
 - ▶ Less investment and installation cost

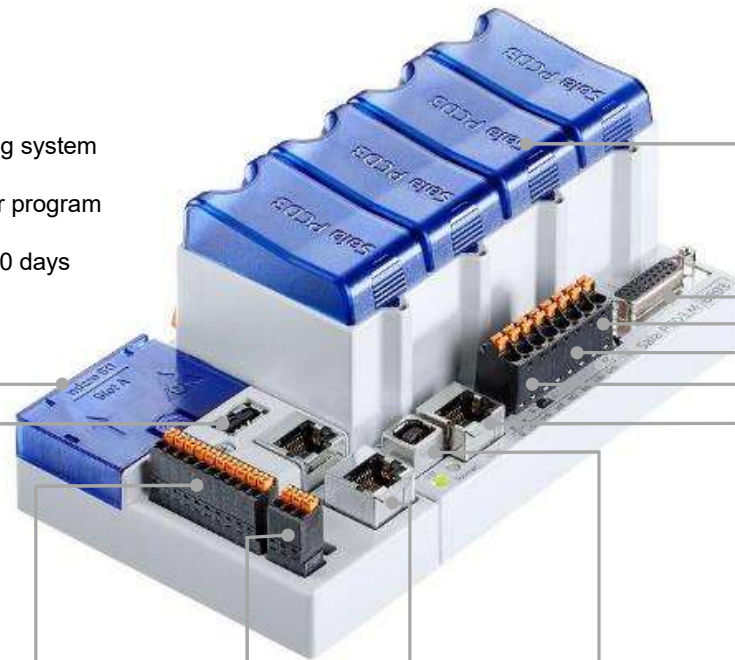


Industrial hardware (IEC 61131-2) plus extended robustness for maritime applications

PCD3.M6893 CONTROLLER

CPU

- IMX6 ARM9 CPU, >900Mhz, QNX7 operating system
- 1 GByte RAM
- 2 GByte Flash for operating system and user program
- 128k Byte retain memory
- Battery less, real time clock back up for up to 10 days



4 I/O Slots for
PCD3.Fx Communication- and
PCD3.Ex, Ax, Wx I/O Modules

I/O Bus Connector for I/O
expansion

Micro SD Card
up to 32GB

USB Host
License Dongle, ...

Com. Interface Slot-A
PCD7.F150S

CAN

Ethernet 2
2 Port Switch

USB Device
RNDIS

Ethernet 1
Single Port

Com. Interface
RS-485

2x Interrupt DI
Watchdog

Power Supply
24 VDC

IO - MODULES

Dedicated IO-Modules for different signals and resolutions

► Digital Inputs

- PCD3.E110, ...E111 8 Channels, 24 V
- PCD3.E160, ...E161 16 Channels, 24 V
- PCD3.E165, ...E166 16 Channels, 24 V
- PCD3.E610, ... E613 gal. Isolation 24 V / 30..60 V

► Digital Outputs

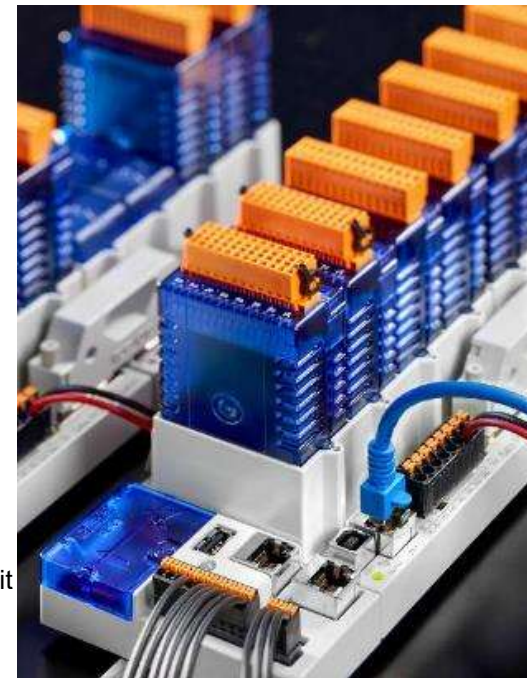
- PCD3.A200, ...A210 4 Ch. Relay, 24V/Line Voltage
- PCD3.A220, ...A251 6 Ch. Relay / 8 Relay
- PCD3.A300 6 Ch. Transistor 24V, 2A
- PCD3.A400 8 Ch. Transistor 24V, 0.5A
- PCD3.A410 8 Ch. Transistor, gal. isolation
- PCD3.A460, ...A465 16 Ch. Transistor 24V, 0.5A

► Analogue Inputs

- PCD3.W200, 210, 220 0-10V, 0..20mA, Pt/Ni1000
- PCD3.W220Z03, ...Z12 NTC 10k / mixed
- PCD3.W300,310 0-10V, 0..20mA 12Bit
- PCD3.W340,350 Mixed 0-10V, 0-20mA, Pt, Ni
- PCD3.W380 Universal, configurable
- PCD3.W305,315,325 7 Ch. gal. isolation
- PCD3.W745 4 Ch. TC type J,K, 4-wire Pt

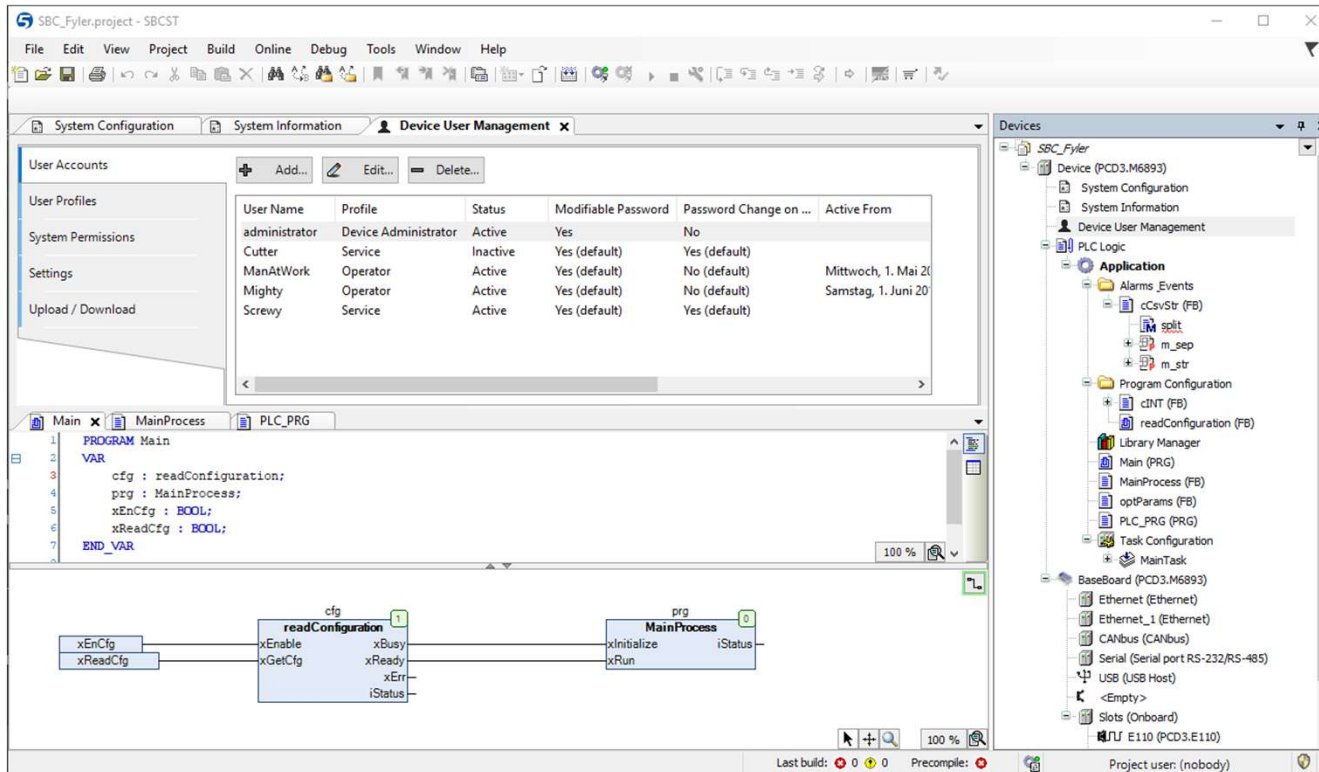
► Analogue Outputs

- PCD3.W400, ...W410 4 Ch. 0-10V, 0..20mA
- PCD3.W600, ...W610 4 Ch. 0-10V, 0..20mA, 12Bit
- PCD3.W605, ...W625 6 Ch. 0-10V / -10...+10V, 10Bit
- PCD3.W615 4 0..20mA, 4..20mA, 10Bit



Wide range of industrial signals supported

POWERFUL AND EFFICIENT ENGINEERING



IEC 61131-3

- Full flexibility
- Large programmer community
- Reuse of published code
- Programming languages provided by the engineering tool
 - Ladder Logic (LD)
 - Continuous Function Chart (CFC)
 - Function Block Diagram (FBD)
 - Sequential Function Chart (SFC)
 - Structured Text (ST) – High Level Language incl. object oriented methods
 - Instruction List (IL) – deprecated from the standard, still supported
- Language Elements
 - Tasks with adj. priorities for Free wheeling, Cyclic adj. cycle time >2ms, Event and Interrupt.
 - Programs, Function Blocks, Functions, Libraries, Online-Help

Complete language support incl. object oriented programming

PCD3.M6893 NETWORK - FULL FLEXIBILITY

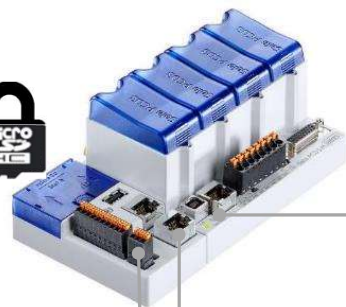


IPv4
IPv6



OPC UA

Cloud
SCADA



USB - RNDIS

Engineering Tool



CAN



Serial Interfaces
Field Device
Remote I/O



PROFINET **Modbus** Hot Standby

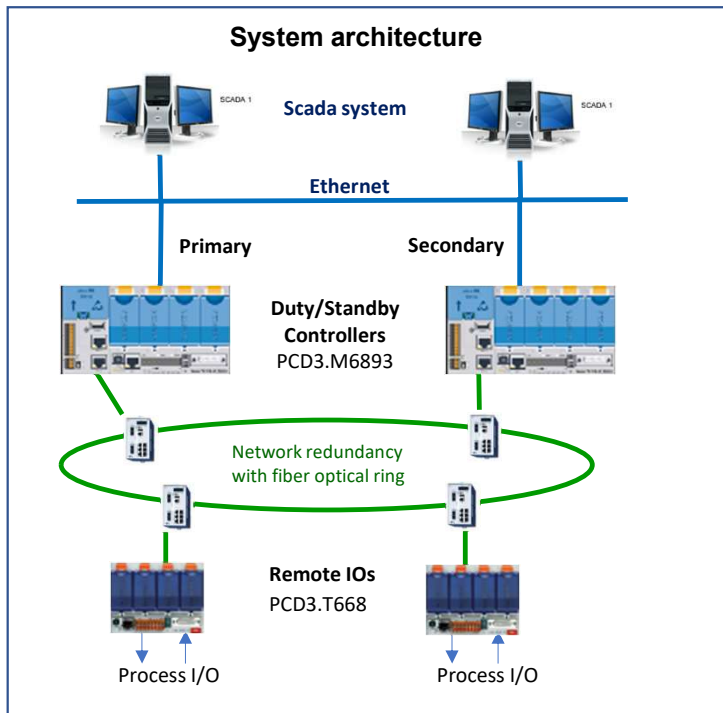


Application Libraries like S-Bus, MQTT,...

QronoX - Redundant Controllers

Cyber secure PLC for critical infrastructures

The redundant QronoX IEC controller PCD3.M6893 supports interruption free and secure operation of critical installations

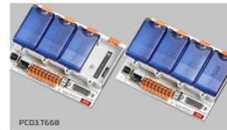


Redundant PLC PCD3.M6893

- Hot-Standby operation with bump-less switchover
- Automatic task and data synchronization
- Redundant and non-redundant (local IO) application execution
- Supports single and path redundancy (2 networks)
- Fully cyber secure acc. ANSI 62443-3-3 SL3
- Programming language acc. IEC61131-3

Remote I/Os

- The input/outputs (process signals) are connected to the PCD3 standby controllers via PCD3.T668 Ethernet smart RIOs (up to 16 IO modules per RIO) and controlled through them. The remote I/Os are for both controllers together and therefore do not require redundant I/Os and sensors/actuators.
- Moreover, for RIOs with path redundancy (2 x ETH), local program execution, additional ser. interfaces and extended IO (up to 64 IO modules) also the PCD3.M6893 can be used as RIO station.

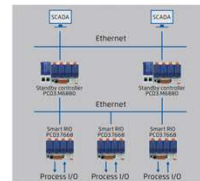


Powerful and efficient engineering per IEC 61131-3

- All programming languages (LD, CFC, FBD, SFC, ST, IL) acc. Standard including object-oriented methods
- Multi application and multi tasking supported
- Web-Editor for graphical user interfaces (HTML5, HTTPS)

Easy system set-up in a standard Ethernet network

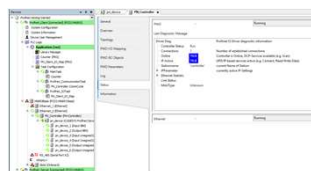
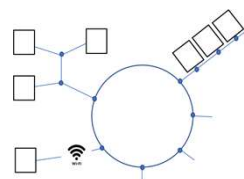
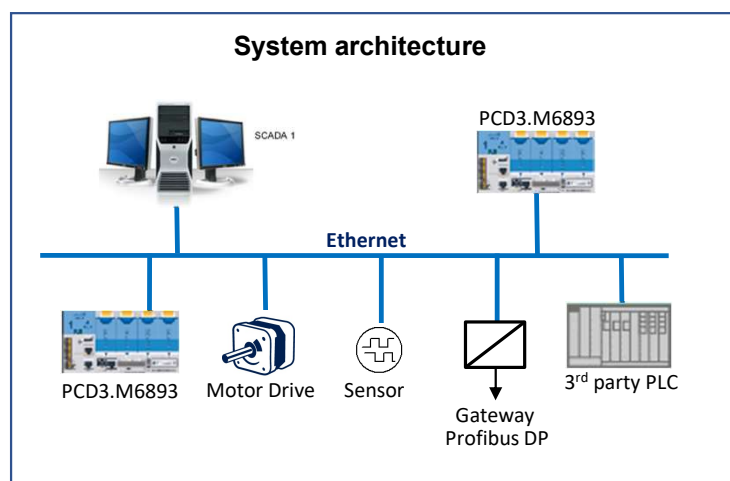
- The redundant automation solutions based on standard network infrastructures.
- Single and dual synch port supported for increased availability. To increase network availability, we recommend setting up ring topologies with fibre optic components.
- Standby to active PLC switchover typically < 100ms (no change of outputs)



QronoX - Profinet Interface

Cyber secure PLC for critical infrastructures

The QronoX IEC controller PCD3.M6893 can be used as Profinet Master and Slave for 3rd party device integration.



PLC PCD3.M6893 with Profinet interface

- Fully cyber secure acc. ANSI 62443-3-3 SL3
- Programming language acc. IEC61131-3
- Master (IO-Controller) and Slave (IO-Device) operation
- Profinet version: IEC61158-1
- Profinet conf. class: A (non-real-time applications)

Flexible network topology and increased availability

- Flexible line, ring and star structures based on standard Ethernet wired and wireless
- PROFINET conforms to the existing plant situation → easy integration

Powerful and efficient engineering per IEC 61131-3

- Protocol wizard for easy configuration
- CIFX Runtime configuration (file import/export)
- Online device scan
- All programming languages (LD, CFC, FBD, SFC, ST, IL) acc. Standard including object oriented methods

Performance/limits

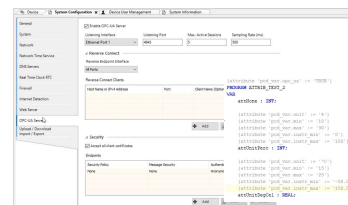
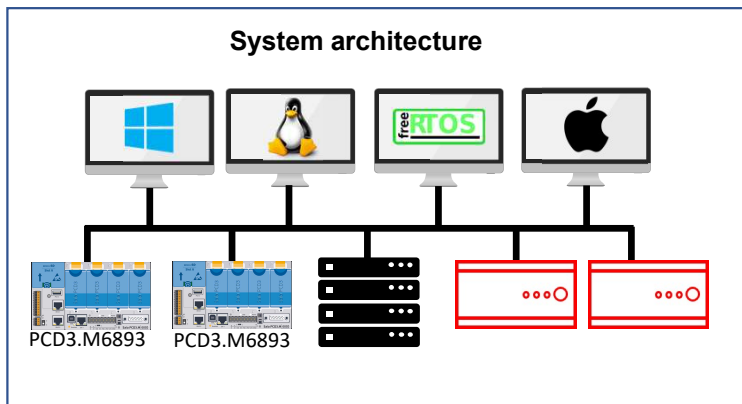
- 3rd party device types: Profinet standard (respecting time limits)
- Max number of devices: recommended up to 32
- Update rate: average 2ms/slave. See table on the left
- Typical cycle times: depending on no. of slaves. See table on the left
- Important to know: Other IP communication (e.g. OPC-UA, HTTPS, Modbus TCP, ...) can impact Profinet performance and may need adjustment of timing settings.

Num. Slaves	IO-Task Cycle Time	Send Clock	Reduction Rate	Resulting I/O Update Rate	Per Slave min. 2ms?
1	2	1	2	1ms * 2 = 2ms	2ms/1 = 2 OK
2	4	1	4	1ms * 4 = 4ms	4ms/2 = 2 OK
3 ... 4	4	1	8	1ms * 8 = 8ms	8ms/4 = 2 OK
5 ... 8	4	1	16	1ms * 16 = 16ms	16ms/8 = 2 OK
9 ... 16	4	1	32	1ms * 32 = 32ms	32ms/16 = 2 OK
17 ... 32	4	1	64	1ms * 64 = 64ms	64ms/32 = 2 OK

QronoX – OPC-UA

Cyber secure PLC for critical infrastructures

The QronoX IEC controller PCD3.M6893 supports the OPC-UA protocol for the secure and easy integration into platform independent SCADA systems



PLC PCD3.M6893 with OPC-UA interface

- Fully cyber secure acc. ANSI 62443-3-3
- Programming language acc. IEC61131-3
- Supports OPC-UA server with data access

Benefits / Features

- Easy and secure integration of Qronox PLC in Saia PCD Supervisor and other SCADA systems
- Cyber secure with certificate-based authentication and encryption
- Platform independent. Supported by any operating system
- Embedded 2017 UA Server Profile
- Data Access Facet and Complex Type Facet (read/write and subscriptions/monitored items)
- PLCopen OPC UA Information Model for IEC 61131-3 version 1.01.09
- Authentication: Anonymous, Username/password
- UA-TCP UA-SC Binary, Reverse Connect

Powerful and efficient engineering per IEC 61131-3

- OPC-UA address space according to PLCopen model
- IEC program symbols directly mapped to OPC-UA interface
- Easy configuration by symbol attributes
- All programming languages (LD, CFC, FBD, SFC, ST, IL) acc. Standard including object oriented methods

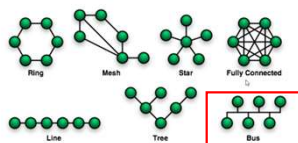
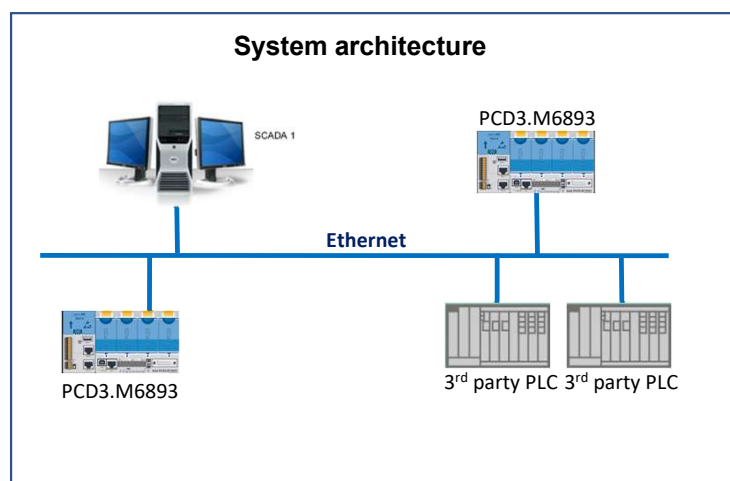
Not supported yet

- OPC-UA historical data access
- OPC-UA alarms & conditions
- OPC-UA with global certificate management (facet)
- OPC-UA PubSub (internet transport layer by MQTT and AMQP)
- OPC-UA client

QronoX - Modbus Driver

Cyber secure PLC for critical infrastructures

The QronoX IEC controller PCD3.M6893 can be used as Modbus Master and Slave for 3rd party device integration on both Ethernet or RS485 support.



Modbus Protocol Specifications :

- <https://modbus.org/specs.php>

Network Topology

- For TCP/IP, according to communication rules
- For RTU, RS485 installation rules should apply and only bus topology should be used. Star or Ring topologies are prohibited.

Licensing

Fully integrated to QronoX ECS – No need of additional license

Powerful and efficient engineering per IEC 61131-3

- Configuration interface for easy setup
- All programming languages (LD, CFC, FBD, SFC, ST, IL) acc. Standard including object-oriented methods
- Modbus TCP and Modbus RTU are implemented into the QronoX CODESYS runtime.
- MODBUS is managed by the firmware



Performance/limits

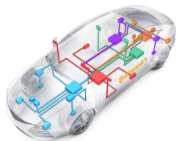
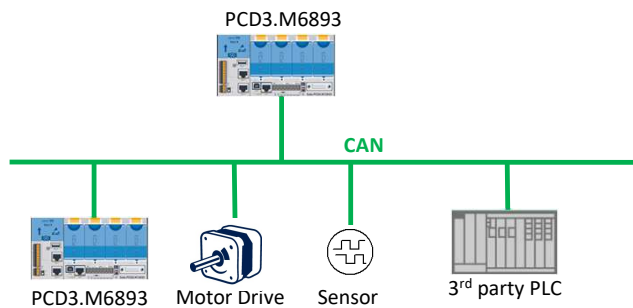
- Modbus TCP Client / Server available on Eth1 and Eth2
- Modbus RTU Master / Slave available on RS485 port 1 and 2
- Max number of devices: recommended up to 32 per segment without repeater and according to driver load.

QronoX – CAN Interface

Cyber secure PLC for critical infrastructures & industry

The Controller Area Network (CAN bus) is designed to exchange fast small messages between electronic devices like Sensors, Controllers, actuators via simple 2-wire cable in rough environments.

System architecture



CAN

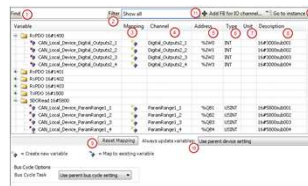


PLC PCD3.M6893 with CAN interface

- Fully cyber secure acc. ANSI 62443-3-3
- Programming language acc. IEC61131-3
- Supported protocols: CAN raw frames, CANopen, CAN J1939
- Baud rates: from 10kbps up to 1Mbps
- Interface galvanically isolated incl. termination resistor

Benefits / Features

- Multi-Master architecture. Collision protected transmission.
- Special "Master" device for communication management is not required
- Realtime, efficient reliable
- CAN provides a cost efficient, reliable network that enable multiple CAN devices communicate with one another. Simple wiring and low installation cost



Powerful and efficient engineering per IEC 61131-3

- CAN Configurator for general settings, devices, messages, ...
- CAN IEC library for direct message handling by the application program (w/o the need of the configurator)
- All programming languages (LD, CFC, FBD, SFC, ST, IL) acc. Standard including object-oriented methods

Performance/limits

- CAN 2.0a and 2.0b supported
- Important to know:
 - Risk of message lost under heavy network load at 1Mbps

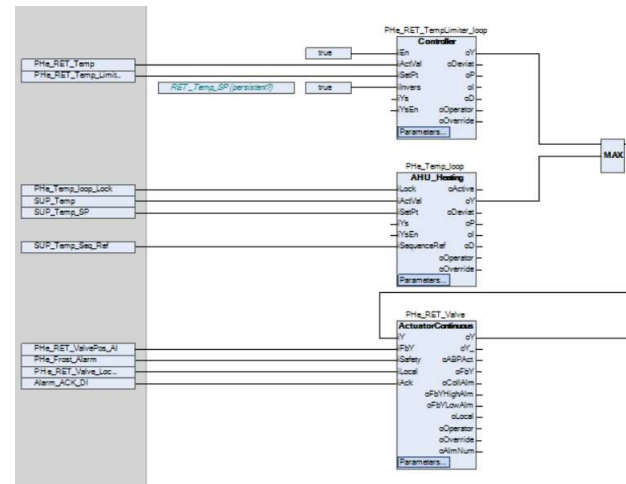


QronoX – Application Libraries

Application development the easy way

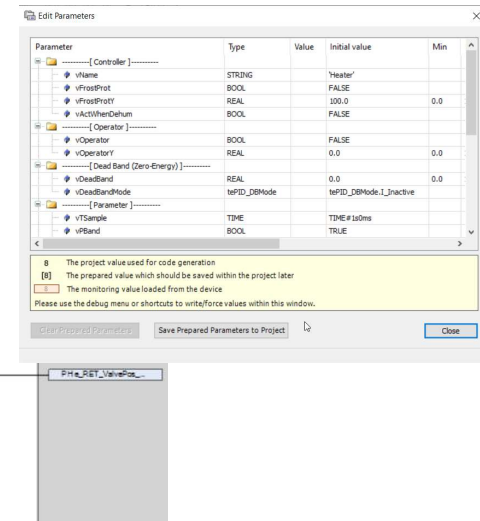
The QronoX Software contains libraries designed by SBC for efficient engineering of different infrastructure automation tasks like HVAC, District Heating, Chillers and others.

- Alarming
 - Alarm1 (FunctionBlock)
 - Alarm10 (FunctionBlock)
 - AlarmHist (FunctionBlock)
 - AlarmList (FunctionBlock)
 - AlarmNum (FunctionBlock)
 - AlarmOverview (FunctionBlock)
 - AlarmPCS_Def (FunctionBlock)
 - AlarmPCS_Mod (FunctionBlock)
 - AlarmProcess (FunctionBlock)
 - AlarmSystem (FunctionBlock)
- Application
 - ActuatorAndSensor
 - AirHandlingUnit
 - Controller
 - Energy
 - Filters
 - General
 - Heating
 - HotWater
 - Monitoring
 - MotorsAndDrives
 - Override
 - SetPoints
- DateAndTime
 - Chronometer
 - Clock (FunctionBlock)
 - Schedule
 - Timer
- Device
 - Files
 - IQ
- General
 - Conversion
 - Select
 - Strings
 - Test
 - Trigger (FunctionBlock)
- Global
 - Const (GVL)
 - GVL (GVL)
- Library Information
 - GetLibVersion (Function)
 - GetLibVersionNumber (Function)
 - IsLibReleased (Function)
- Types
 - Enum
 - Structure
- VersionHistory (Function)



Benefits / Features

- Extensive library that covers lots of functions in Infrastructure Automation
- Additional FBoxes for Standard Functions like File Handling, Hdllog Trending, State Definitions
- Intelligent design with Inheritance of information's from low to top level
- Easy to configure with Parameter Window
- Integrated Alarming
- Integrated Plant Coding System for Alarming
- CFC templates / corresponding webtemplates
- Easy creation of own libraries possible
- Hundreds of additional libs available on Codesys Store



Online Demonstration



TRAINING MATERIAL



September 29, 2020 1524

Training presentations

General SBC QronoX features Training See detailed module on power point format below: 00_H...

↓ 00_HW presentation_V3...
3.56 MB | pptx

↓ 02_Qronox interface_v1...
7.84 MB | pptx

↓ 04_Product Security_v1...
2.82 MB | pptx

↓ 06_Device user managem...
4.12 MB | pptx

↓ 07_IO configuration_v1...
4.97 MB | pptx

↓ 08_Network configurati...
5.28 MB | pptx

↓ 09_WebDAV_V1.2.pptx
4.93 MB | pptx

↓ 10_Backup-restore_v1.1...
2.82 MB | pptx

↓ 11_Storage Management...
2.98 MB | pptx

↓ 13_WebServer_V1.3.pptx...
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↓ 14_WebEditor_v1.1.ppt...
6.40 MB | pptx

↓ 16_Profinet_v1.1.pptx
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↓ 17_Interrupt_v1.pptx
5.25 MB | pptx

↓ 19_OPC-UA_v2.05.pptx
4.84 MB | pptx

↓ 22_Licensing_v1.02.ppt...
5.48 MB | pptx

↓ 27_ModbusTCP - RTU_v1...
3.25 MB | pptx

All ToolsFirmwareSoftwareInformationExamplesLibrariesTrainingGetting StartedLibraries



PCD_STD2 Example: Override Detection

April 29, 2021 623

[Read More](#)



PCD_STD2 Example: FileSystem

April 29, 2021 605

[Read More](#)



PCD_STD2 Example: Strings

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PCD_STD2 Example: HDLog

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PCD_STD2 Example: Alarming

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pcd_STD Example: HDLog

March 30, 2021 1098

[Read More](#)



May 13, 2020 4062

Tutorials

Find how to use some feature with the help of video tutorials 02

↓ 02_Connect_to_control...
8.66 MB | mp4

↓ 07_IO_Configuration.mp...
4.32 MB | mp4

↓ 08_Firewall.mp4
9.07 MB | mp4

↓ 13_Webserver.mp4
3.71 MB | mp4

↓ 14_WebEditor.mp4
12.21 MB | mp4



WebEditor Getting Started

June 30, 2020 711

[Read More](#)

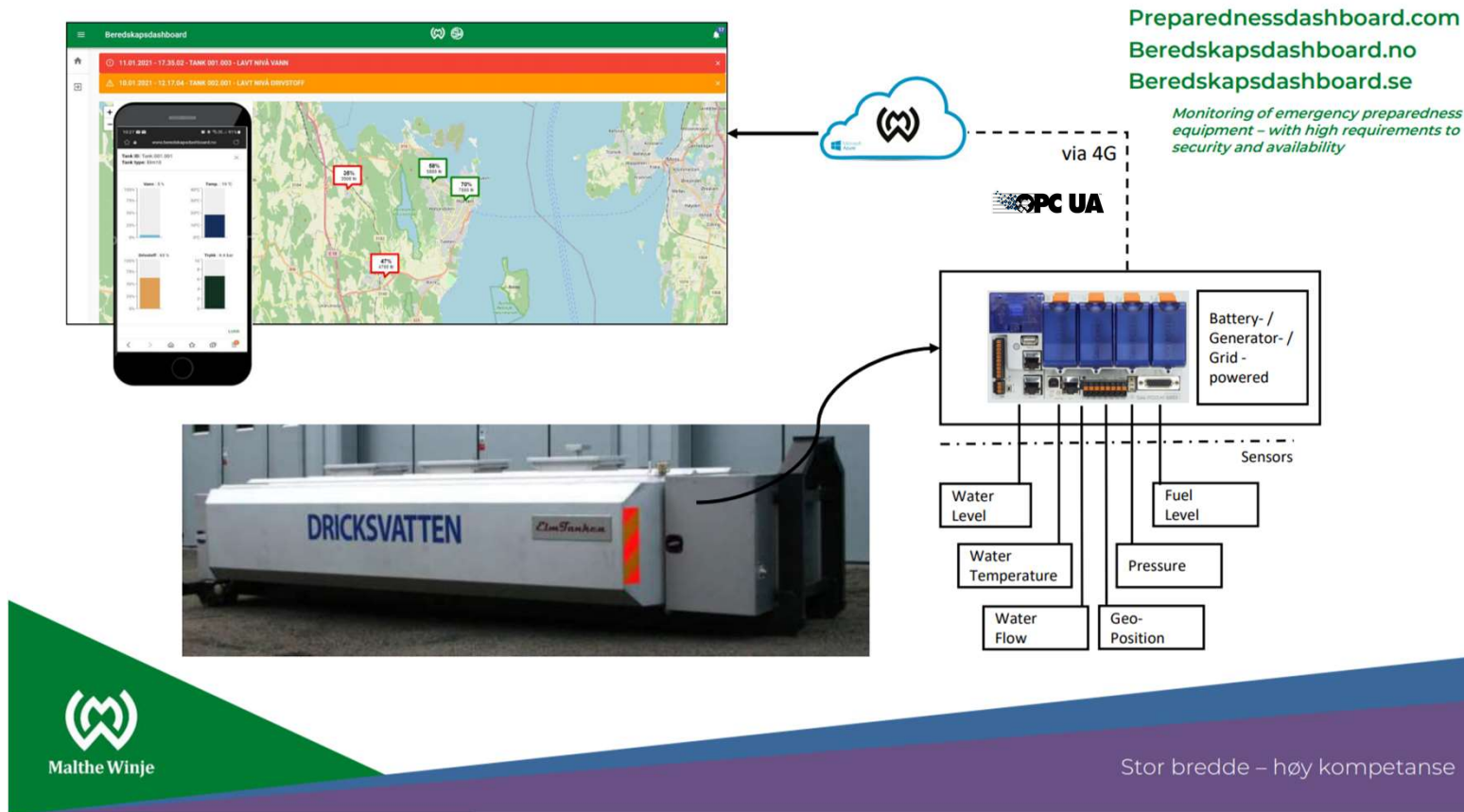


Modbus Getting Started

May 13, 2020 671

[Read More](#)

REFERENCE CASE «WATER TANK MONITORING»



REFERENCE CASE «LIGHTING CONTROL & MONITORING»

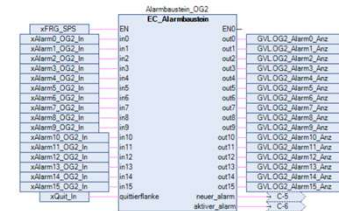
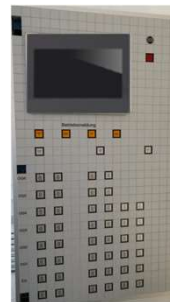


Lighting control & alarm monitoring for
Peek & Cloppenburg clothing store

Old installation



New installation



Own created
function boxes

Lock

PCD1 E-Line IOs



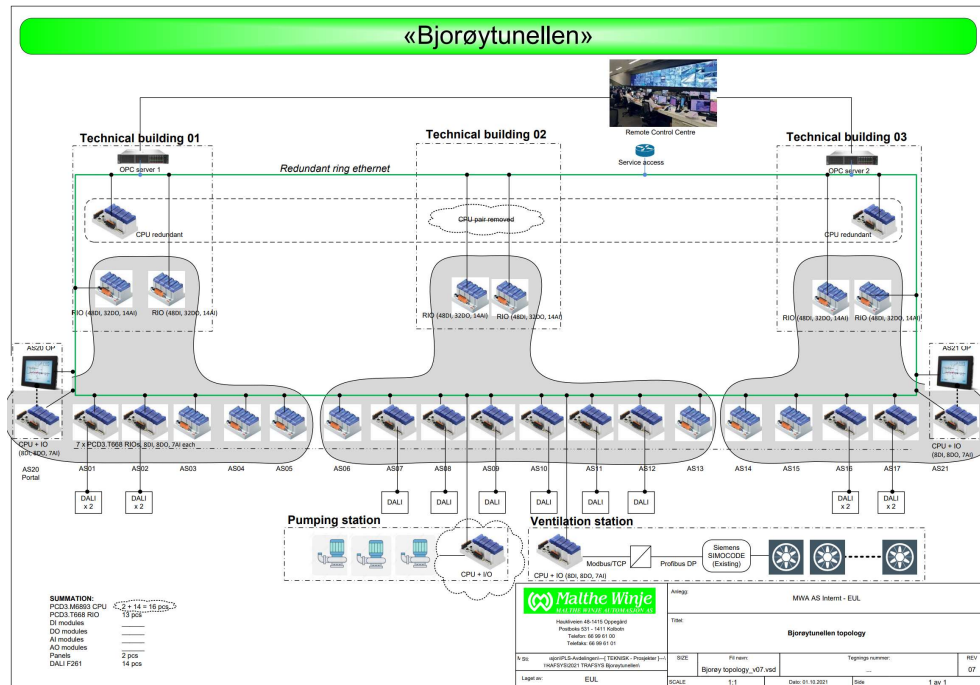
Alarm monitoring



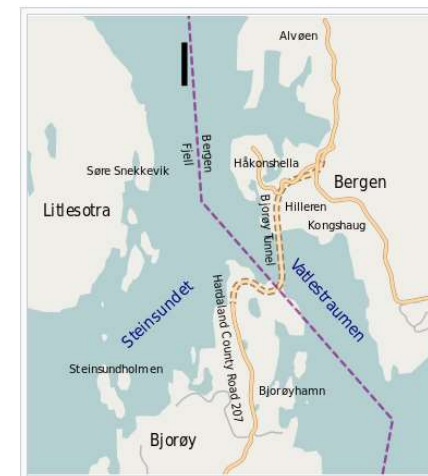
Light control

REFERENCE CASE «BJORØYTUNNELEN – NORWAY»

- 6x PCD3.M6893 QronoX controllers with CPU redundancy
- 10x PCD3.M6893 QronoX controllers with DALI
- 13x PCD3.T668 Remote IO
- 2x 10" HTML5 touch panel

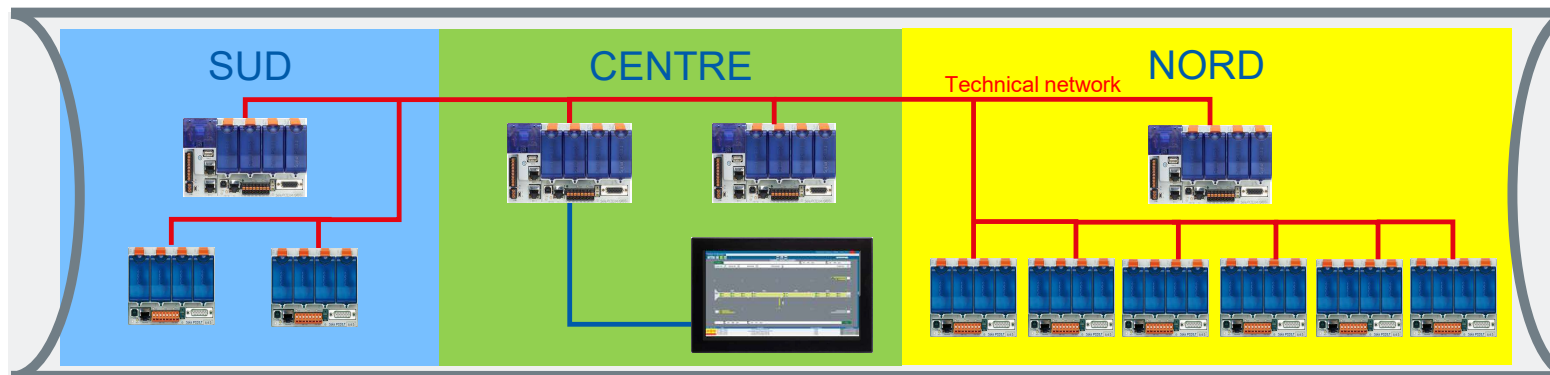
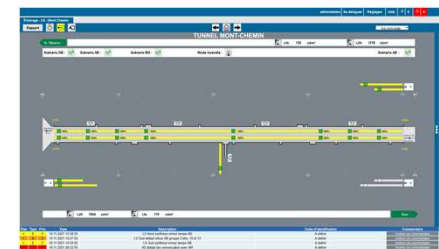


Renovation of road tunnel
88 meters below sea level



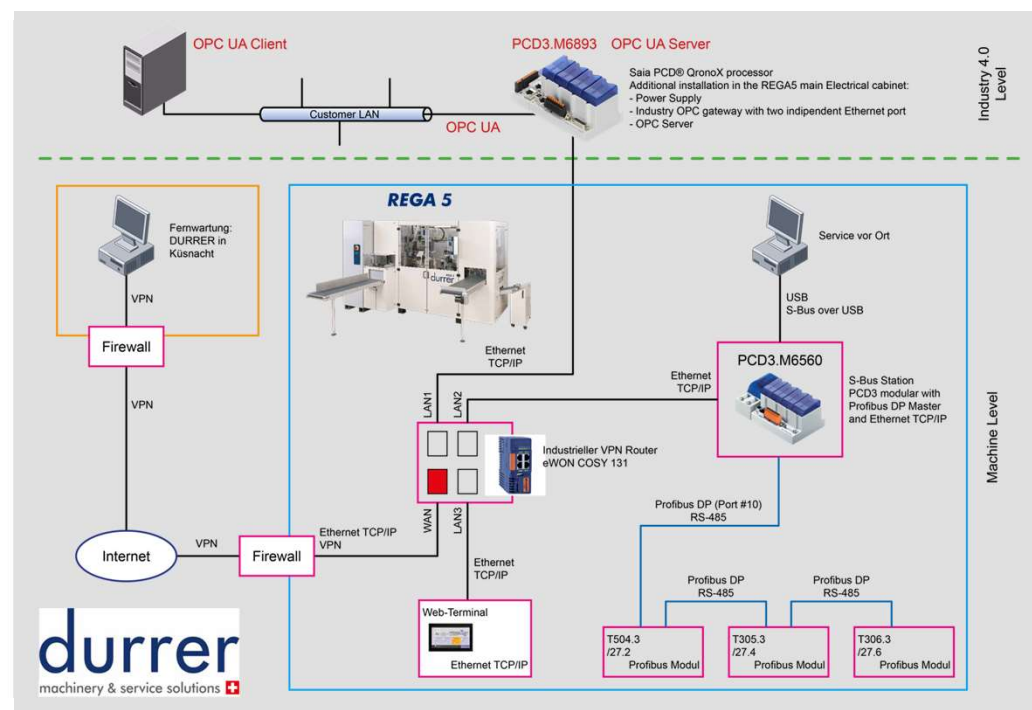
REFERENCE CASE: «ROAD TUNNEL MONT-CHEMIN»

Customer: Officine Rigamonti SA
Vertical: Infrastructure
Country: Switzerland
Win Reasons: QronoX PLC with OPC-UA interface for the integration into the Scada system
LOB: Saia Burgess Controls AG
Offered systems: 4 pcs. PCD3.M6893 (primary system), 8 pcs. PCD3.T665 (Ethernet-RIO)
Short description: In a first phase, the lighting system was renewed (crossing lamps and adaptation lamps); then the command control of the same system was replaced



REFERENCE CASE: «STEP INDEX CUTTING MACHINE»

Customer: Durrer machinery & service solutions
Vertical: Industrial
Country: Switzerland
Win Reasons: QronoX PLC with OPC-UA interface
Short description: The QronoX controller is used as gateway for the integration of the machine into the production management system



REFERENCE STORIES IN FRANCE

HOSPICES CIVILS de LYON Biggest Hospital in Lyon



10 Qronox controllers

Used for surgery rooms (HVAC and Water assets)

- Program Download in Run
- Cyber Security
- HVAC libraries

BIOMNIS Laboratory Medical analysis



3 Qronox controllers

Used for HVAC and Water assets

- Cyber Security
- Program Download in Run
- HVAC libraries

BOIRON Pharma industry



3 Qronox controllers

Used for HVAC and chillers in the production area

- Cyber Security
- Program Download in Run
- HVAC libraries

PLC for cyber secure and interruption free operation

VARIOUS REFERENCES

PCD3.M6893



Cooling central for Ice hockey & Curling Sweden
(IEC61131-3 programming, OPC-UA, Modbus TCP)



Data Center in Germany
(Cyber Security & Redundancy)



Boatlift Italy / CHP Nederland
Design-in of IEC controller in boat lifts / Power generator
(CAN interface & Cyber Security)



HTML5 TOUCH PANELS

- Display sizes:
4.3", 7", 10", 15", 21"
- Touch technologies:
resistive and capacitive
(multi touch) versions
- HTML5 Chromium Browser
to access PCD Web-Server
or Saia PCD Supervisor
- Flush mounting
- IP66 from the front
- Operating temperature
-20°C to +60°C
- Display resistant against scratches,
UV and chemicals

Product overview

						
	PCD7.D543RF	PCD7.D570RF	PCD7.D570CF1	PCD7.D510CF1	PCD7.D515CF1	PCD7.D521CF1
System Resources						
Display - Colors	4.3" TFT, 16:9, LED, 64 K	7" TFT, 15:9, LED, 64 K	7" TFT, 15:9, LED, 16 M	10.1" TFT, 16:10, LED, 16 M	15.6" TFT, LED, 16 M	21.5" TFT, LED, 16 M
Resolution	480 x 272	800 x 480, WVGA	800 x 480, WVGA	1280 x 800, WXGA	1366 x 768, HD	1920 x 1080, full HD
Brightness	200 Cd/m ² typ.	200 Cd/m ² typ.	500 Cd/m ² typ.	500 Cd/m ² typ.	400 Cd/m ² typ.	300 Cd/m ² typ.
Dimming	Yes	to 0 %	to 0 %	to 0 %	to 0 %	to 0 %
Touchscreen	Resistive	Resistive	True Glass Projected Capacitive, Multitouch	True Glass Projected Capacitive, Multitouch	True Glass Projected Capacitive, Multitouch	True Glass Projected Capacitive, Multitouch
CPU	ARM Cortex-A8, 1 GHz	ARM Cortex-A9, dual core, 800 MHz	LMXBM Mini Quad ARM Cortex-A53	LMXBM Mini Quad ARM Cortex-A53	LMXBM Mini Quad ARM Cortex-A53	LMXBM Mini Quad ARM Cortex-A53
Operating System	Linux	Linux	Linux	Linux	Linux	Linux
RAM	512 MB	1 GB	2 GB	2 GB	2 GB	2 GB
Flash	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB
Real Time Clock	Yes	Yes	Yes	Yes	Yes	Yes
RTC Back-up	Yes	No	Yes	Yes	Yes	Yes
Buzzer	Yes	No	Yes	Yes	Yes	Yes
Interface						
Ethernet port	1 (port 0 = 10/100)	1 (port 0 = 10/100/1000)	3 (port 0 = 10/100/1000, port 1 = 10/100, port 2 = 10/100)	3 (port 0 = 10/100/1000, port 1 = 10/100, port 2 = 10/100)	3 (port 0 = 10/100/1000, port 1 = 10/100, port 2 = 10/100)	3 (port 0 = 10/100/1000, port 1 = 10/100, port 2 = 10/100)
USB port	1 (Host v. 2.0, max. 500 mA)	1 (Host V2.0, max. 100 mA)	2 (Host V2.0, max. 500 mA)	2 (Host V2.0, max. 500 mA)	2 (Host V2.0, max. 500 mA)	2 (Host V2.0, max. 500 mA)
Serial port	Not supported	No	Not supported	Not supported	Not supported	Not supported
SD card	No	No	Not supported	Not supported	Not supported	Not supported
Expansion	No	No	Not supported	Not supported	Not supported	Not supported
Ratings						
Power supply	24 Vdc (10 ... 32 Vdc)	24 Vdc (10 ... 32 Vdc)	24 Vdc (10 ... 32 Vdc)	24 Vdc (10 ... 32 Vdc)	24 Vdc (10 ... 32 Vdc)	24 Vdc (10 ... 32 Vdc)
Current Consumption	0.25 A max. at 24 Vdc	0.3 A at 24 Vdc (max.)	0.7 A at 24 Vdc (max.)	1.0 A at 24 Vdc (max.)	1.2 A at 24 Vdc (max.)	1.7 A at 24 Vdc (max.)
Input Protection	Automatic	Electronic	Electronic	Electronic	Electronic	Electronic
Battery	Yes (With Supercapacitor)		Rechargeable Lithium battery, not user-replaceable	Rechargeable Lithium battery, not user-replaceable	Rechargeable Lithium battery, not user-replaceable	Rechargeable Lithium battery, not user-replaceable
Environment Conditions						
Operating Temp	0 ... +50 °C (vertical installation)	0 ... +50 °C (vertical installation)	-20 ... +60 °C (vertical installation) Plug-in modules and USB devices may limit max temperature to +50 °C	-20 ... +60 °C (vertical installation) Plug-in modules and USB devices may limit max temperature to +50 °C	-20 ... +60 °C (vertical installation) Plug-in modules and USB devices may limit max temperature to +50 °C	-20 ... +60 °C (vertical installation) Plug-in modules and USB devices may limit max temperature to +50 °C
Storage Temp	-20 ... +70 °C	-20 ... +70 °C	-20 ... +70 °C	-20 ... +70 °C	-20 ... +70 °C	-20 ... +70 °C
Operating / Storage Humidity	5 ... 85 % RH, non condensing	5 ... 85 % RH, non condensing	5 ... 85 % RH, non condensing	5 ... 85 % RH, non condensing	5 ... 85 % RH, non condensing	5 ... 85 % RH, non condensing
Protection Class	IP66 (front), IP20 (rear)	IP66 (front), IP20 (rear)	IP66 (front), IP20 (rear)	IP66 (front), IP20 (rear)	IP66 (front), IP20 (rear)	IP66 (front), IP20 (rear)
Dimensions and Weights						
Faceplate L x H	147 x 107 mm (5.78 x 4.21")	187 x 147 mm (7.36 x 5.79")	187 x 147 mm (7.36 x 5.79")	282 x 197 mm (11.10 x 7.76")	422 x 267 mm (16.61 x 10.51")	552 x 347 mm (21.73 x 13.66")
Cutout A x B	136 x 96 mm (5.35 x 3.78")	176 x 136 mm (6.93 x 5.35")	176 x 136 mm (6.93 x 5.35")	271 x 186 mm (10.67 x 7.32")	411 x 256 mm (16.18 x 10.08")	541 x 336 mm (21.30 x 13.23")
Depth	29 + 5 mm (1.14 + 0.19")	29 + 5 mm (1.14 + 0.19")	47 + 8 ... 8.5 mm (1.85 + 0.31 ... 0.33")	52 + 8 ... 8.5 mm (2.05 + 0.31 ... 0.33")	56 + 8 ... 8.5 mm (2.20 + 0.31 ... 0.33")	56 + 8 ... 8.5 mm (2.20 + 0.31 ... 0.33")
Weight	Approx 0.4 kg	0.875 kg	1.5 kg	2.5 kg	4.1 kg	6.1 kg
Approvals						
CE for installation in industrial environments	Emission EN 61000-6-4, Immunity EN 61000-6-2	Emission EN 61000-6-4, Immunity EN 61000-6-2	Emission EN 61000-6-4, Immunity EN 61000-6-2	Emission EN 61000-6-4, Immunity EN 61000-6-2	Emission EN 61000-6-4, Immunity EN 61000-6-2	Emission EN 61000-6-4, Immunity EN 61000-6-2
CE for installation in residential environments	Emission EN 61000-6-3, Immunity EN 61000-6-1	Emission EN 61000-6-3, Immunity EN 61000-6-1	-	-	-	-
UL	ANSI/UL 508	ANSI/UL 508	UL 61010-1, 3rd Edition and UL 61010-2-201, 1st Edition	UL 61010-1, 3rd Edition and UL 61010-2-201, 1st Edition	UL 61010-1, 3rd Edition and UL 61010-2-201, 1st Edition	UL 61010-1, 3rd Edition and UL 61010-2-201, 1st Edition

THANK YOU FOR YOUR ATTENTION

Ready to automate everything with you



QUESTIONS

&

ANSWERS

