

ControlsNews

Automation with Saia®PCD



Peace of Mind

saia-burgess

Control Systems and Components

20 application references from the entire world

BACnet® on Saia®PCD: A complete success on Frankfurt Airport (Fraport)

Saia®PCD1 – New benchmarks for small controllers

Saia®S-Energy – Capture, visualize and control energy

«Peace of Mind» in automation

= systematically less stress, less troubles and less worries



Peace of Mind in automation – feeling good about the future

Dear readers,

Over the past year, we have used the «Peace of Mind» concept to create more than just a quality label for automation solutions. We have convincingly demonstrated to everybody involved in automation, including our own employees and owners, what automation with Saia®PCD stands for. Ultimately, «Peace of Mind» expresses what should be associated with our name.

For others «Excellence in Automation», «High Performance Automation» or «Total Integrated Automation» occupies the foreground as their business objective. Our approach is different: our first thought is for people as users and operators in automation.

«Peace of Mind» cannot be achieved with short-term, partial optimization, nor with any stubborn or blinkered «carrying on regardless». Nor does Peace of Mind mean relaxed or slow. It stands for systematic, sustained innovation with a forward looking focus.

Peace of Mind is achieved when many years of practical experience is combined with the new capabilities of technical innovations to exploit the challenges of the future.

For us as a manufacturer, this is expressed in our success formula:
 PLC + Web + IT = Saia®PCD.

For customers in the project business of building technology, it is backed up by the value-added chain of Saia-Burgess + Saia® system integrators.

Peace of Mind stands for longer term satisfaction because, when awarding a contract, not only the early initial costs are taken into consideration, but also overall lifecycle costs. A flexible, open automation solution is not at first the cheapest, but systematically reduces to a minimum worry, annoyance, trouble and costs from commissioning through subsequent expansions until final decommissioning.

The «Peace of Mind» logo on the front is intended as a synonym for a sustainably attractive financial investment in automation, giving pleasure to all concerned. That is our aim. ■

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What «Peace of Mind» means and how you can solve the challenges of

- reducing CO₂ emissions
- more automation
- with fewer qualified staff, while looking to a future with less trouble and fewer worries.

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What is an AutomationServer and what are the benefits of having one?

For the «Peace of Mind» quality label, the availability of an AutomationServer in every device for control and regulation is an indispensable basic requirement.

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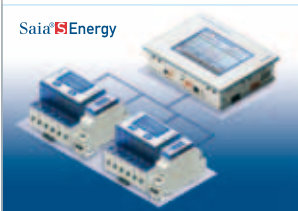
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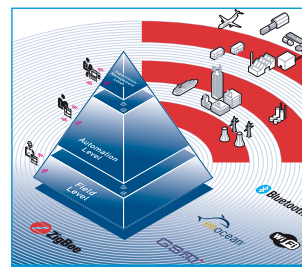
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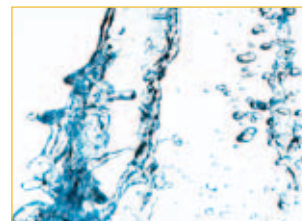
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Saia®PCD pizza line: addition of a small pan pizza

30 years ago the first Saia® controllers were flat in shape. Even then they could be packed with plenty of interface options without changing their outside shape – just like a pizza. It is only the large number of fine ingredients that differentiate a margherita from a deliciousa, not the outside dimensions or relative size. With Saia®PCD the ingredients concerned are plug-in modules for communication, electrical signals or data storage.



Something new
from the bakery

The old Saia®PCD1 was in construction just a half-sized Saia®PCD2. With the new Saia®PCD1 the 2:1 size ratio remains the same, but the housing construction and basic CPU equipment deviate from that of the Saia®PCD2.

This is why here we prefer to use the term «pan pizza», as coined a few years ago by the market leader, Pizza Hut. A pan pizza differs

from the standard product due to its thick, fat base. In precisely the same way, the new Saia®PCD1 has been designed quite differently from the Saia®PCD2. What remains is the possibility of packing the plug-in options of the Saia®PCD2 line onto the new Saia®PCD1. With a new basic concept and many existing plug-in options, much that is truly new has now been created; for every taste and appetite.

Ingredients

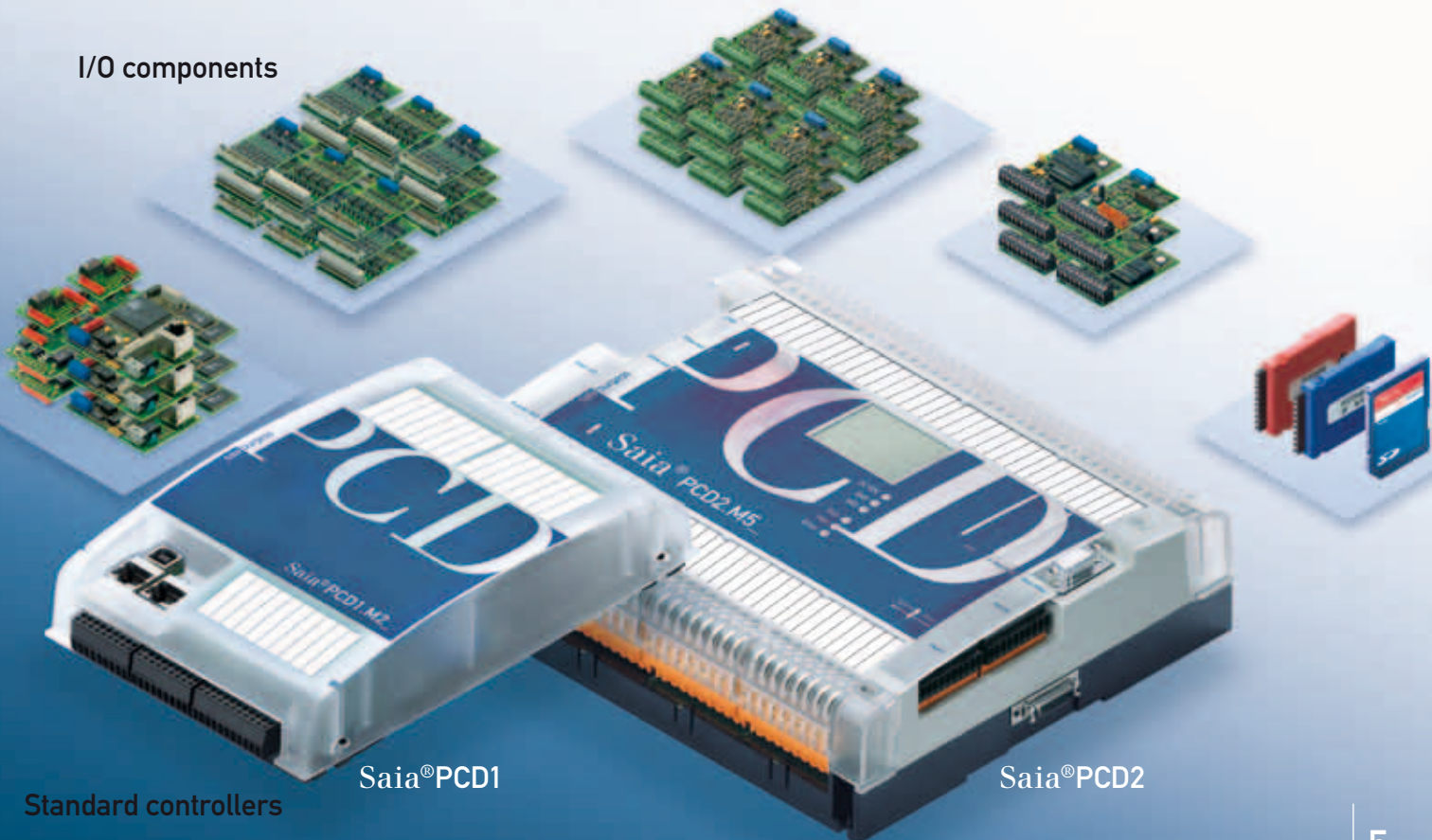


The base

Standard margherita and pan pizza – Saia®PCD1 and Saia®PCD2

Saia®PCD1 and Saia®PCD2 use the same «ingredients», but on a different «pizza base». The «ingredients» (I/O modules) available for use on the Saia®PCD1 and Saia®PCD2 are just as modular and freely selectable as the topping on a pizza base. The same ingredients can be used for the standard margherita and the new pan pizza. Equally, the Saia®PCD2 and the new Saia®PCD1 both use the same I/O components – only the base supporting them is different.

I/O components



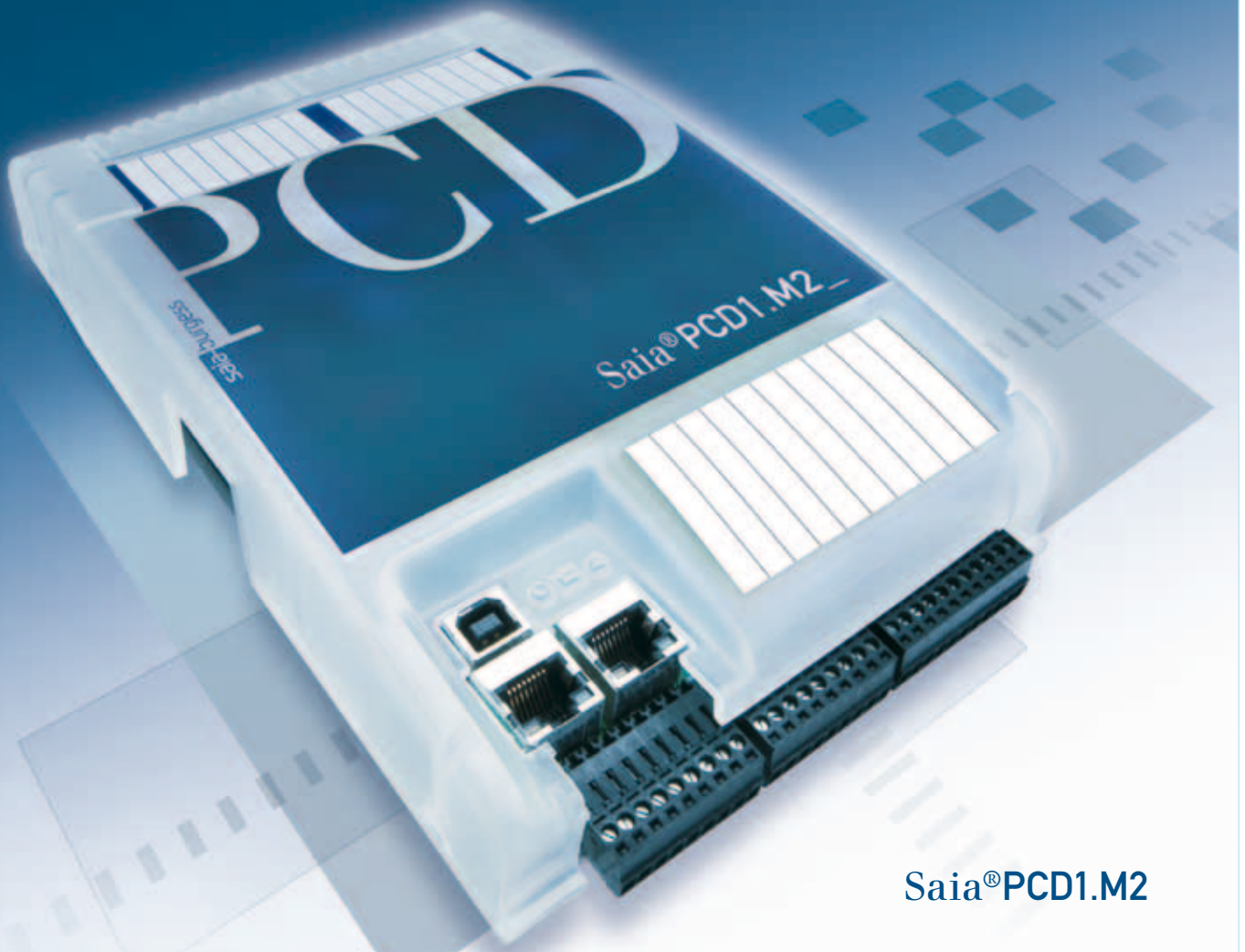
Standard controllers

Saia®PCD1

Saia®PCD2

New Saia®PCD1 – setting new benchmarks for small controllers

The new Saia®PCD1 from Saia-Burgess is not just another small controller. Alongside its standard communications interfaces and integral I/Os, the new PCD1's integral 8 MByte data memory and full web/IT functionality set definitive new benchmarks for small controllers.



Saia®PCD1.M2

The new generation Saia®PCD1 brings web and IT technology to the world of small controllers

The new Saia®PCD1 is a small, compact, freely programmable automation device according to the PLC quality standard IEC 61131-2 with on-board I/Os and communications interfaces. With fully integrated web and IT functionality, all the advantages and benefits of web/IT standards can be used, even for small and low-cost applications. Visualization via web browser, data capture with EXCEL applications, sending emails with attachments, or file access via FTP are just some examples that can be brought directly into designs for networked automation. As the foundation, an 8 MByte file system is provided: enough memory for data logging in Excel-compatible CSV files or

for storing web projects, PG5 archive files, or even manuals in PDF format. Files in the file system can also be processed and managed actively by the PCD1 directly on-site.

An integral Ethernet switch with 2 ports saves time and money. It allows direct connection to an IT network at 100 MBit/s, without having to install an additional switch.

A comprehensive protocol library (Modbus-TCP/RTU/ ASCII, MPI, EIB, M-Bus...) and an integral, fixed, serial RS485 interface ensure nothing now stands in the way of efficient communication

with components from the field level. If that is not enough, the Saia®PCD1 can be expanded with up to 6 further RS485 or RS232 serial interfaces.

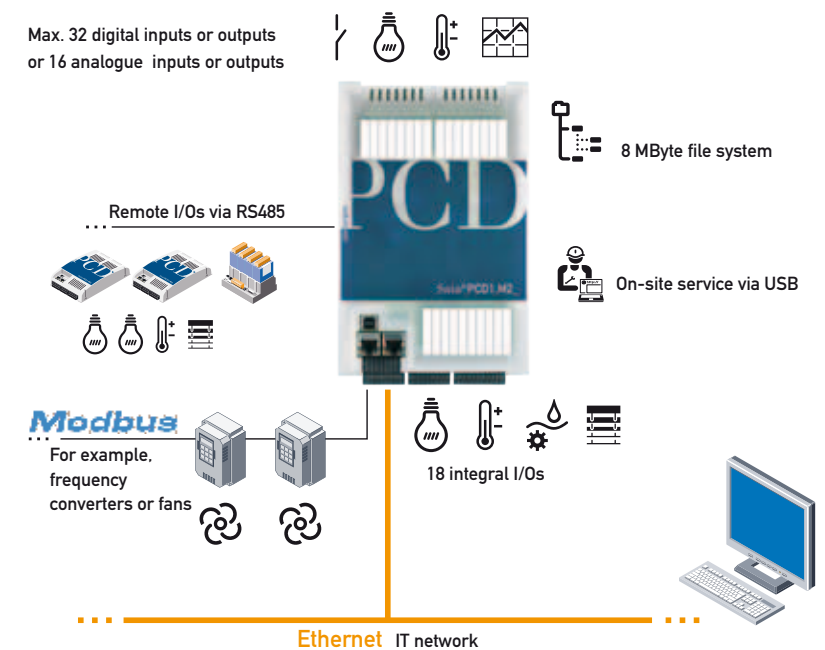
The externally accessed USB connection allows for fast, reliable, on-site service interventions, without having to remove the cover.

Even the basic equipment version of the new PCD1 offers numerous I/Os as digital inputs and outputs, analogue inputs for current, voltage and temperature, plus special functions for interrupt inputs and a PWM output. The combination of 18 integral I/Os on the motherboard and 2 I/O slots for standard PCD2 I/O modules gives the PCD1 enough flexibility to implement countless applications on one low-cost platform. The new Saia®PCD1 can also be used as a RIO-like station (remote I/O) with on-site control and automation functionality.

The I/O configuration of the PCD1 can be expanded in an uncomplicated way with specific connections to RIO stations via RS485 and Ethernet. Even the more complex systems of networked automation are feasible in this way.

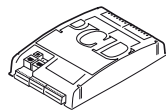
The form of the new Saia®PCD1 has been deliberately developed for simplicity and functionality: the CPU card with integral I/Os has been incorporated in a flat, basic element. The easily removable cover allows for ease of mounting and fast com-

Configuration example with Saia®PCD1



missioning. A low mounting depth of just 50 mm means the new Saia®PCD1 can be mounted even in places where space is restricted. In addition, a large top area provides plenty of room for clear labelling of I/O connections. ■

Saia®PCD1.M2

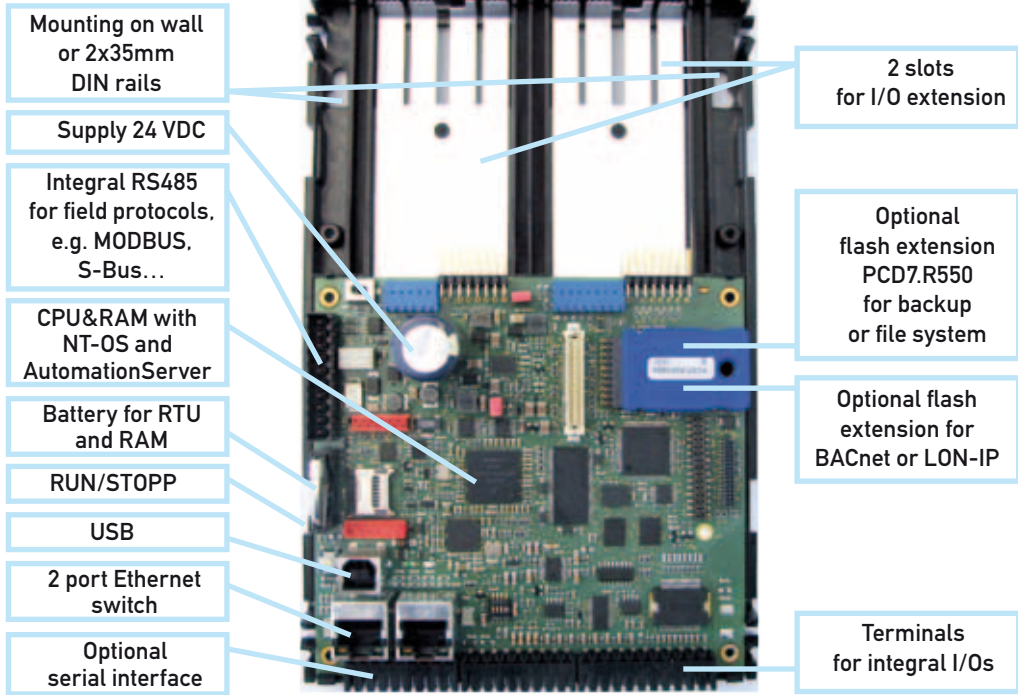


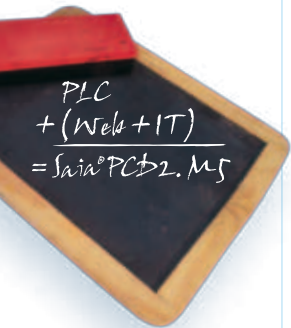
User memory

- 512 KBytes read only for code/text/DB
- 128 KBytes RAM extension
- Backup for user program on integral file system
- 8 MBytes user file system for web, data logging or user manuals

I/O configuration

- 4 digital inputs 24VDC
- 4 transistor outputs 24VDC
- 4 selectable inputs or outputs 24 VDC
- 2 interrupts, can also be used as standard digital inputs
- 1 PWM output, can also be used as standard digital output
- 1 watchdog relay
- 2 analogue inputs 12 bits ±10VDC, 0-20mA, Pt1000 and Ni1000, Ohm





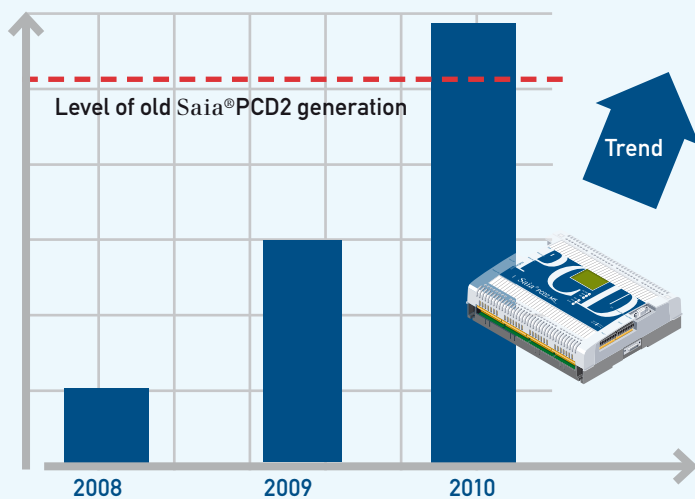
New Saia®PCD2 generation – completed and successful on the market

The great success of the new Saia®PCD2.M5 generation has given us added impetus for the constant development of the modular controller platforms Saia®PCD1, Saia®PCD2 and Saia®PCD3. The new PCD2.C1000 module holder is presented below, together with the options of the Saia®PCD Nano-Browser displays for the PCD2 – probably the smallest browser in an automation setting.



Saia®PCD2.M5

Sales growth of new Saia®PCD2 series



Today, sales of the new Saia®PCD2 generation have already overtaken the previous generation. The generation shift with its renewal of technology has been successful.

Two forms of construction with full functionality
 Since they were launched on the market in summer 2008, the number of PCD2.M5 platforms supplied has been constantly rising. In that period, the Saia®PCD2 has caught up with the Saia®PCD3 in expandability and functionality. Examples worth mentioning here are the TCP/IP extensions and the expansion of AutomationServer functionality with more memory space. This means that both platforms – whether cassette-style or flat pizza-style – are ideally equipped for future projects in infrastructure automation.

PCD2.M5 controllers are used regardless of the facility or branch of industry. They may be found just as readily in HEAVAC applications as in infrastructure automation. The Saia®PCD2 has also proved itself in hydropower plants, shopping centres, office buildings, machine and apparatus engineering, welding machines, refrigeration machines and compact air conditioners.

eDisplay with Nano-Browser (Saia®PCD7.D3100E) the window on the PCD2.M5

For visualization, the HMI project is created with the Web-Editor and displayed either locally via the integral eDisplay or remotely by PC.

The eDisplay is probably one of the smallest web panels in the automation field. In less than a minute the eDisplay can be mounted and ready to run on a PCD2.M5. After powering up the Saia®PCD2, the eDisplay will indicate current device information. Parameters such as the IP address or HTML start page can be adjusted. PG5 is not required for any of this.

The Web-Editor used to create eDisplay web projects is licensed without charge. The functions it provides cover everything one would expect from a small monitoring display. Text and values can be entered and displayed in different formats, including floating point. Graphics and bar graphs can also be displayed. Versatile macro functions make operation easy. The Web-Editor's «Scalable» function allows for the «full screen» visualization of eDisplay web pages on a PC.

The PCD7.D3100E eDisplay with Nano-Browser is supplied individually and for the same price as an RS232 F110 communications module!



eDisplay with Saia®PCD Nano-Browser

- Graphical display
- 4 scales of grey
- Display resolution 128 x 88 pixels
- LED backlighting
- Display size 35.8 x 24.8 mm
- Dimensions 47 x 67 mm
- Joystick for navigation
- Nano-Browser functionality is a sub-set of a Micro-Browser.



The new Saia®PCD2.C1000 I/O module holder with 4 slots – Market readiness: 2011 –

New 4-slot I/O module holder PCD2.C1000 for Saia®PCD2

PCD2 I/O module holders (PCD2.C1000 with 4 slots and PCD2.C2000 with 8 slots) are used to increase the number of I/O points. They allow expansion of the PCD2 to a maximum of 1025 I/O points.

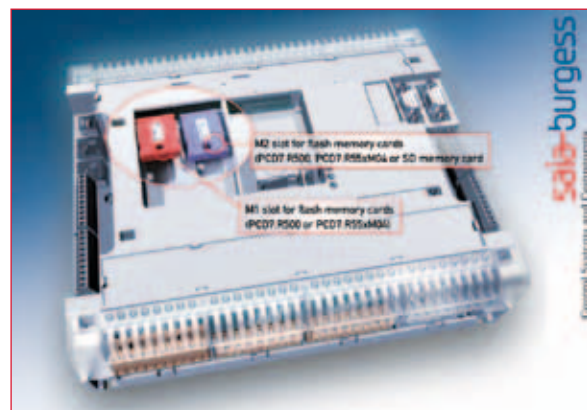
The intention with the new PCD2.C1000 module holder – half a PCD2.C2000 so to speak – is to let I/O expansion occur in smaller steps. This reduction in unit size is a particular advantage where space in the switch cabinet is tight.

Handling the new PCD2.C1000 module is identical to the existing PCD2.C2000:

- External supply: This means that, regarding electricity requirement, you do not have to worry about which I/O modules are used.
- The new module also offers the capability of connecting additional module holders.
- Since PCD3.Cxx expansion racks can be used to expand the system, PCD3 type manual control modules can also be used. ■

Saia®PCD2 Screensaver

The Saia®PCD2 screensaver can be downloaded free of charge under www.sbc-support.ch/pcd2-m5. This informative 3D-animation shows the main features in an attractive form. The Saia®PCD2 screensaver is available in 12 languages.



New Power-CPU for the Saia®PCD3 family

Since launching the PCD3 in 2005, we have continuously expanded the family with new CPU types for the most diverse requirements. Now, with the new Power-CPU, we are adding to our range at the top of the PLC controller performance class. The power resources it provides and functional scope it supports leave nothing more to be desired.



Saia®PCD3.M5560

- 3 times the speed
- Double the user program memory
- Flash file system as basic equipment
- Power for 13 communications interfaces

The new Saia®PCD3.Power

Up to 3 times the speed and double the memory for user programs

The new CPUs have an industrial processor that runs faster than existing PCD3 CPUs by a factor of four. Part of that speed gain is used for new system functions. For the PG5 application speed, a factor of approximately three can be expected.

Available memory resources have been more than doubled. This means that 2 Mbytes of flash

memory are now available for user program and 1 MByte SRAM memory for data blocks and text.

Onboard flash memory with file system

The basic unit already has 16 MBytes of integral flash memory with a file system. If no portable flash memory is required, the user can utilize this memory as desired for web pages, documentation, log data, etc..

Enough system resources for sophisticated tasks

The system's internal memory resources (RAM and Flash) are also generously sized. In addition, the possibility of programming in «Structured C» will in future allow implementation of complex control and optimization algorithms. In association with the increased processing speed, this will also allow very comprehensive and demanding applications to be realized. The CPU supports complex, highly sophisticated tasks, such as simultaneous communication via BACnet® and Lon-IP in a single device.

The CPU's ample system resources (up to 4Gbytes flash memory), its integral AutomationServer, and the many communications protocols it supports make it suitable for tasks that go beyond the use spectrum of a normal automation station. It can therefore be used in association with Saia®Web-Panels as a higher ranking management and control system; integrating, monitoring and controlling different plant groups and products as far as the field level. Today, PC systems with Windows® software and a large number of communications drivers are often used for such tasks. The service and maintenance expenditure on systems of this type is correspondingly high.

Further advantages of Saia®PCD controllers are their industrial production quality and a life cycle of up to 20 years. This saves costs and increases availability across the entire lifetime of an installation.

Fully compatible with existing CPUs

Regarding hardware and software, the new CPU has at least the same functional scope as current PCD3 CPUs. This means that, like all new CPUs, it also supports the AutomationServer with its familiar web/IT functions. Although the programs are processed faster, the CPU is fully compatible. Existing user programs can therefore be transferred directly and will work on the new CPUs.

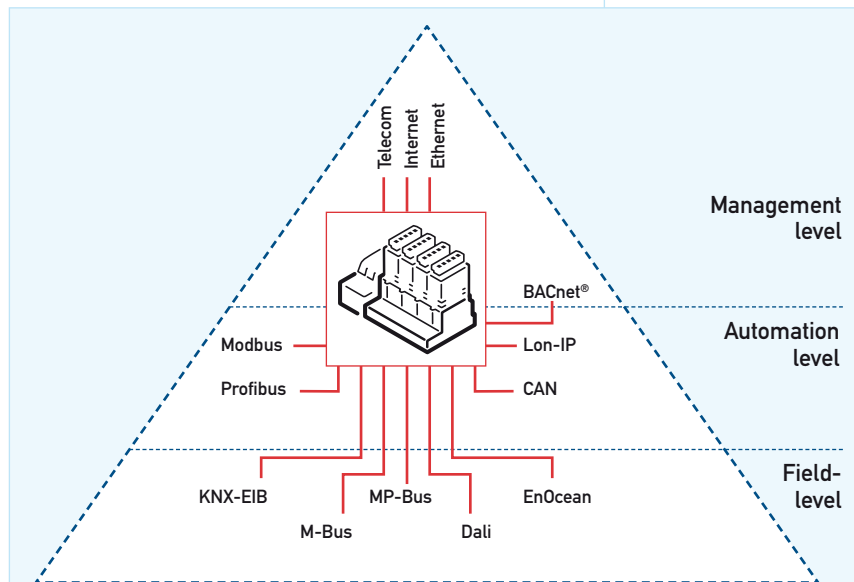
Useful details

The Ethernet plug has two integral LEDs to display connection status and data traffic. The plug connecting the 24VDC supply and the integral RS485 interface is equipped with reverse polarity protection.

Available CPU types

- The new CPU is available in three versions:
- PCD3.M5560 with Ethernet and Profi-S-Net
 - PCD3.M6360 with Ethernet and CAN
 - PCD3.M6560 with Ethernet and Profibus-DP master

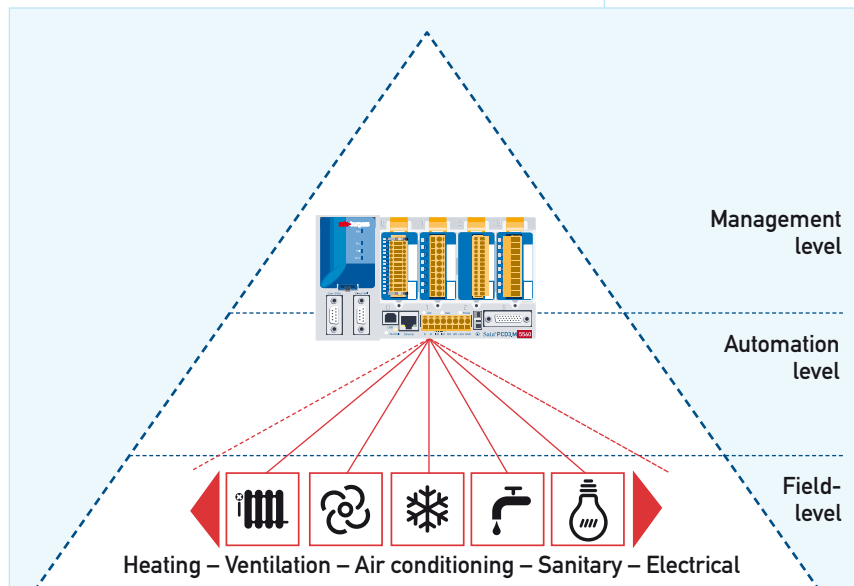
Programming and configuration take place with the engineering tool Saia®PG5 2.0. CPUs are also available in a version that can be programmed with STEP®7.



The Saia®PCD3 Power-CPU has sufficient system resources to run up to 13 communications interfaces on one device. Even the most challenging tasks, like simultaneous communication via BACnet® and Lon-IP, can be reliably accomplished.

High power at low cost

Despite the increased power and functional scope, the new CPUs are only approx. 20% more expensive than their smaller brothers. ■



The generous memory resources (4GBytes) of the new PCD3 Power CPU allow the data and states of all plant groups to be captured/monitored, archived and controlled in the Saia®PCD, even without PC technology and management system software. With the graphical PG5 engineering tool and application-specific software libraries, applications can be comfortably produced for the different plant groups (HEAVAC, sanitary, electrical).

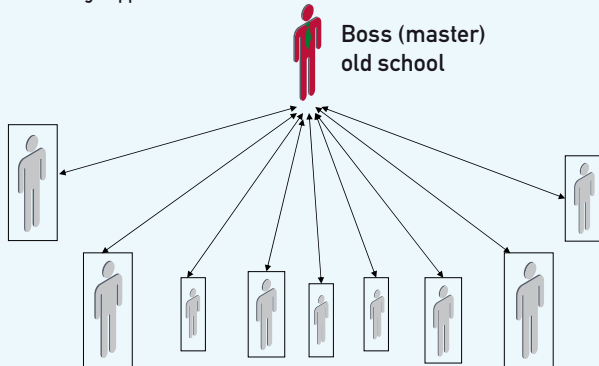
New intelligent Ethernet-RIOs
Saia®PCD3.T665

New Smart-RIOs deliver quantum leap in distributed automation systems

The new Smart-RIOs Saia®PCD3.T665 have unique functional extensions. They allow the S-RIOs to offer significantly more possibilities and comfort than conventional systems, not just with regard to functionality, but also in the areas of programming, commissioning and service. The new device class is a technological step forwards towards more «Peace of Mind» for operators and owners.

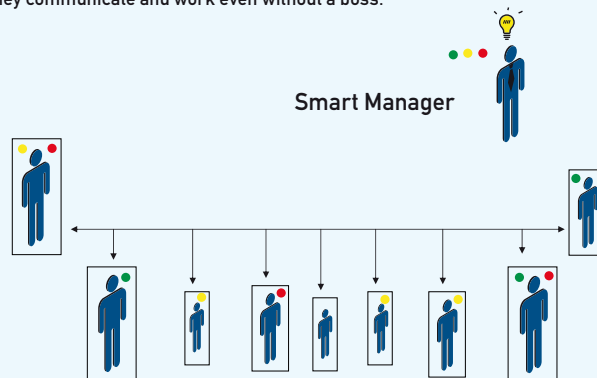
Typical remote I/O work relationship

One central «master», many «mindless slaves».
Nothing happens without the boss.



Smart-RIO work relationship

Stations form groups.
They communicate and work even without a boss.



Smart-RIOs – Why a new device class?

The DDC or PLC device class of automation stations has been around for a very long time. Most of these controllers however are designed as stand-alone devices. It is not possible to use the integral inputs and outputs of these automation stations in a network as remote I/Os. As a result, the implementation of distributed solutions in automation networks is laborious and costly.

For about 10 years there has been the innovation of the programmable RIO (remote input/output) device class. However, in performance and service capabilities, they do not bear comparison with actual automation devices. Even though they can be equipped with a certain «intelligence» via a locally loaded program, in the absence of any permanently available master controller they cannot be used. Applications are not portable from one device series to another. If function is extended at a later date or a fault occurs, enormous expense is incurred.

This limited offering on the market has in the past led to the construction of distributed automation systems using products that were never intended for distributed automation. Anything that was not right from the basic design and construction had to be paid for in more engineering and service costs. The result was many technical no-go areas and lazy compromises for the operator's entire system.

Smart-RIOs «Made for Distributed Automation»

For Saia-Burgess this justified the creation of a novel device class in the shape of its Saia®PCD3.T665 – the Smart-RIOs. They have been designed from the outset for the secure, unlimited and service-friendly operation of distributed automation systems:

- Functionally, they are classical remote I/Os and can also simultaneously execute the Saia®PG5 application programs of automation stations.** This application software is portable and expandable throughout the 25 year lifecycle, in the same way as a PLC.
- Application programs must no longer be loaded and maintained locally at the control cabinet with no controls over who does what, when and where.** A Smart Automation Manager (Saia®PCD CPU or in future any Windows®PC) loads applications onto the S-RIOs, maintains them and monitors execution. When hardware is exchanged, a simple electrician or experienced janitor will have sufficient expertise. There is no need for a service specialist traipsing around the property with a laptop.
- Smart-RIOs are capable of multiple protocols.** They leave the factory with a command of many languages (protocols) and can also learn new ones at any time (application software). S-RIOs can exchange data directly with all other stations in the network. No master or manager is necessary to do this. In parallel with normal, ongoing operation remote services can be carried out via the network.



USB always on-board
Unique features of Ethernet RIOs:
Saia®Smart RIOs always have a USB connection alongside Ethernet. This guarantees easier, faster service access without IP configuration.

What does Saia-Burgess do differently?

Saia-Burgess has simply remained faithful to existing basic philosophies. The aim has always been to have 100% control over the core elements of controllers. To achieve this, attractive technologies are taken from other fields and integrated into devices with industrial lifecycles.

In concrete terms this means that the company's proven «old» PLC technology (interpreted software code) has been combined with the most modern firmware technologies of other «electronic worlds».

In 2001 and 2002, Saia-Burgess in a joint project with companies like Philips and Nokia developed the kernel of its own new Saia®PCD operating system. This took place against the prevailing trend of the day, which was to buy an existing off-the-shelf kernel operating system from one of the American hi-tech software producers. The Smart-RIOs now show clearly why it is sometimes right and important to be outside the mainstream. In the context of this cooperation, a feature of the new Saia®PCD-OS was developed that is unique for automation devices. It can «fly over the network» to modify or change the entire application software.

The new Saia®PCD3.T665 devices are smart and bear the name «Smart-RIO» (S-RIO) with justification. These Smart-RIOs turn a distributed automation system into a smart «Distributed Automation Net» (DAN) – based on LAN and WAN infrastructure.

Integral PLC functionality makes S-RIO a smart automation station

Alongside the functions of a remote I/O station, S-RIOs can also take on more extensive PLC tasks. The functional scope of their integral instruction set for PLC functionality is almost identical to that of a standard Saia®PCD CPU. User programs written with one of the familiar Saia®PG5 program editors (AWL, Fupla, Graftec) are processed in S-RIOs both remotely and independently.

Sophisticated, critical tasks can be processed directly in the S-RIO. If the RIO manager (master) is down, the process (or part of it) will still continue running or can be brought by the S-RIO to a previously saved state. For example, the two interrupt inputs of an S-RIO can remotely monitor, directly evaluate and further process fast tasks. Complex and time-critical control algorithms can also be executed directly in the S-RIO.

Another advantage of S-RIOs is their integral web server. Finished standard web pages support the user with commissioning and diagnosis. In addition, the user's own application-specific web pages can also be edited. This allows direct operation of an installation/machine to be implemented on the S-RIO, independently of the Smart Automation Manager. Even when the connection with the



Smart RIO

Saia®PCD3.T665

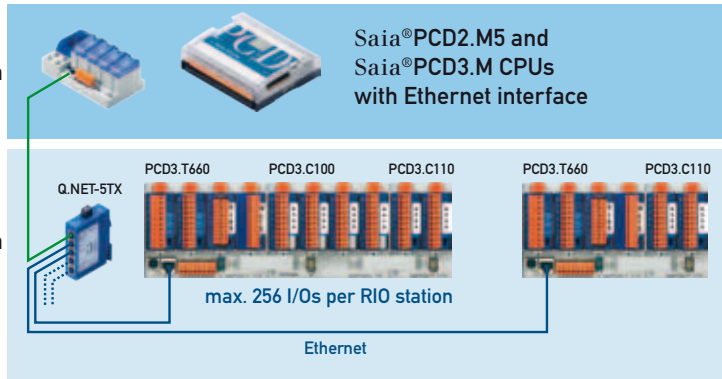
Smart Automation Manager is down, the system can be operated with a directly connected Saia®Micro-Browser panel. Thanks to the fully integrated web concept, it is also possible to access the local web server of S-RIOs via the Ethernet network.



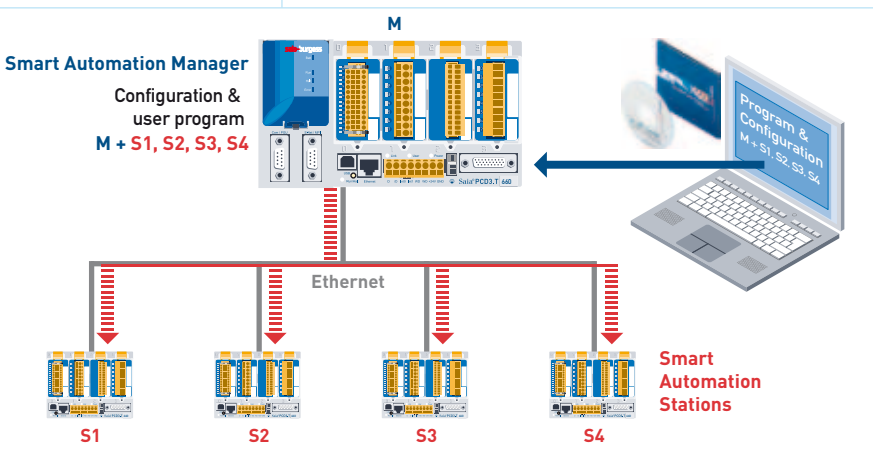
The new Smart-RIO Saia®PCD3.T665 does not just look like a Saia®PCD3.M3-CPU, it can also do more than a conventional RIO station

System structure Distributed Automation Net (DAN)

Smart Automation Manager



The «Distributed Automation Net» (DAN) is constructed with standard Ethernet network components (switches, routers, etc.).



Decentralized processing of programs in Smart-RIOs with central program management in the Smart Automation Manager

Central program management in the Smart Automation Manager saves costs

Programmable RIOs are important in many applications and simplify many tasks. Some of our customers today are using Saia®PCD controllers as powerful central automation stations; for simpler, decentralized tasks non-Saia systems are often used for cost reasons (ostensibly lower hardware costs). The associated additional expenses involved in editing and administrating programs, commissioning and service are most often underestimated. In a single project, the products and programming tools of different manufacturers must be used and maintained. All remote stations must be individually programmed and kept up-to-date. This results in enormous added costs over the whole life-cycle of the installation (project implementation, service, replacement parts, etc.).

This is precisely where the innovative concept of Saia-Burgess differs from other systems. PCD3.T665 Ethernet RIOs are programmable, but program management takes place centrally in the Smart Automation Manager (master station). What does that mean?

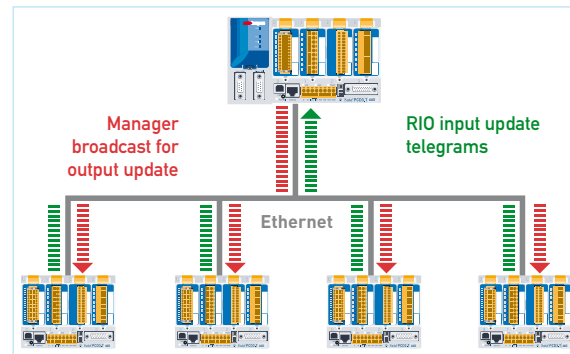
User programs for managers and S-RIOs are written with PG5 and then loaded into the Smart Automation Manager. During initialization, the manager automatically transfers these programs to the S-RIOs. This makes commissioning, updates or exchange considerably easier, because everything is controlled by a central Manager. For example, if one S-RIO must be replaced with another from spare-part stock, the new device can be connected directly and automatically receive its configuration and application program from the Manager. Service personnel require no specific programming tools to do this.

Data exchange with efficient Ether-S-IO protocol

In addition to the Ether-S-Bus protocol, S-RIOs also support the Ether-S-IO protocol, which has been optimized for remote peripherals.

Data exchange between Manager and RIO can be configured in the device configurator with just a few mouse clicks (simple steps). When the configuration has been loaded into the Manager station, data exchange is carried out autonomously by the operating system as a background function. No further user programming is necessary.

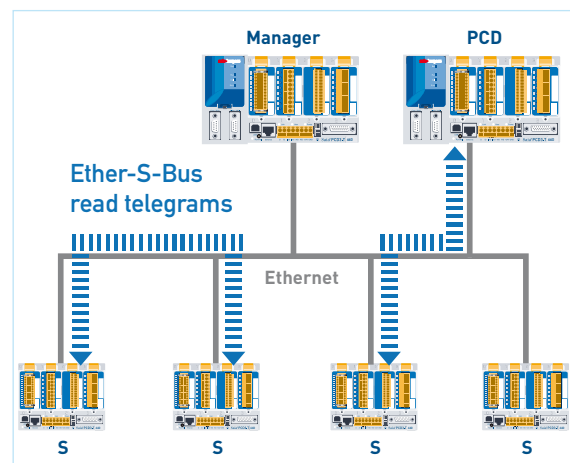
The Manager sends cyclic broadcast and/or unicast telegrams to the S-RIOs to update their outputs. Through the use of broadcast telegrams, data traffic on the network is considerably reduced. For their part, S-RIOs also cyclically send the status of their inputs independently to the Manager. In this way, the Manager is relieved of communications tasks. Cycle times can be configured individually per station, or even per telegram. Time-critical processes or signals can therefore be handled with appropriate priority.



Efficient exchange of data with the Ether-S-IO protocol

Cross-communication with Ether-S-Bus protocol

Parallel to Ether-S-IO communication, the S-RIOs also process read accesses with the Ether-S-Bus protocol. This lets other stations in the network read data from an S-RIO station, as well as the RIO-



The new Saia®PCD3 Smart-RIOs are also capable of cross-communication

Manager. S-RIOs can also read data from another station among themselves. These possibilities offer great flexibility, ensure minimum reaction times and maximum independence from the central Manager. This also increases system availability.

Modular bus coupler with PCD3 I/O modules expandable up to 256 I/Os

The basic device is a bus coupler, local CPU and I/O module carrier in one. It has been built on the proven hardware platform of the Saia®PCD3 family. The base unit already has 4 slots to receive standard PCD3 I/O modules. With local expansion modules, a RIO station can be extended up to 256 I/Os. This can be achieved by choosing from a range of over 40 different PCD3 I/O modules. For example, digital or analogue manual control modules and light/shade modules may be used here.

Another advantage of the Saia®PCD3 family in comparison with other systems is its marked ease of service. All PCD systems have a USB connection that can be used for local configuration, commissioning and diagnosis. This gives the user direct access to RIOs at all times, independently of the Ethernet network infrastructure and IP configuration. The I/O modules' plug-in terminals and ease of mounting allow them to be exchanged quickly and safely during servicing.

Easy configuration and commissioning

S-RIOs and I/O modules are configured simply and efficiently in the PG5 2.0 using the device configurator. The IP configuration can be adjusted via integral web pages using a standard web browser – either locally through the USB connection or across the Ethernet network.

No specific software tools are required for commissioning or service (exchanging a RIO station).

For diagnostic purposes, conclusive information can be called up at any time via the integral web server both in the Smart Automation Manager and the S-RIO. In addition, quick visual diagnosis is possible on site with integral status LEDs on the S-RIO.

What's the next step for Smart DANs? (Distributed Automation Network)

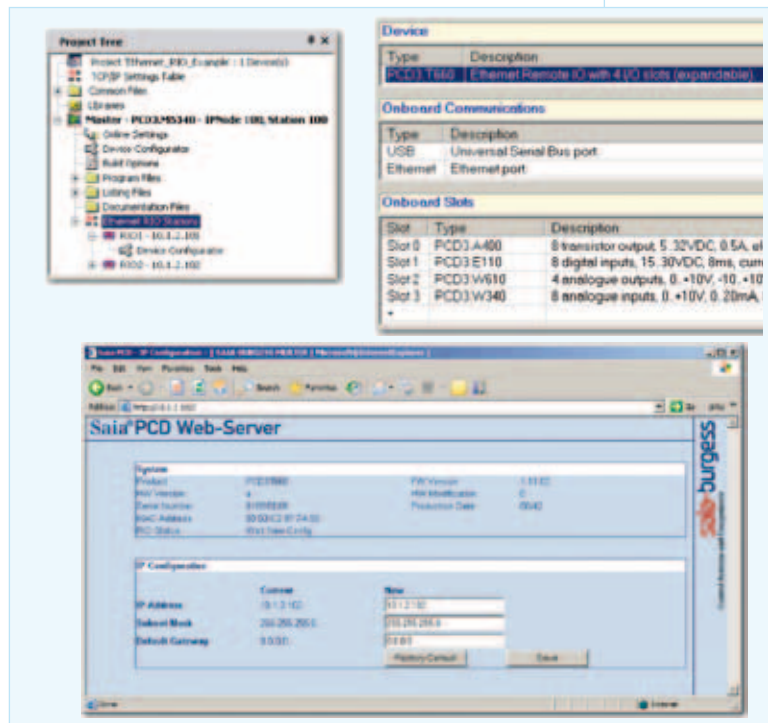
With the new Ethernet RIO PCD3.T665, Saia-Burgess has created a product type whose innovative concept positively differentiates it from the competition on performance, functionality and price.

S-RIOs have been specifically designed for applications in infrastructure automation.

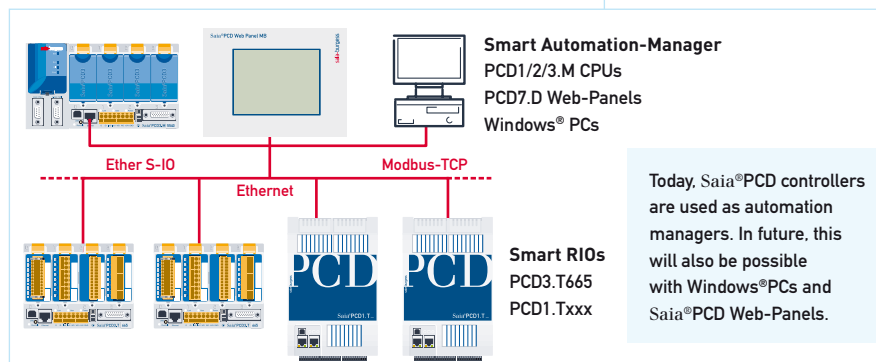
The functionality now available with S-RIOs PCD3.T665 devices can in future also be implemented in flat-style devices based on the new PCD1 platform. ■

Technical data

Number of inputs/outputs	256 (64 I/O in the head-end station)
Number of I/O modules	16
I/O modules supported	PCD3.Exxx, .Axxx, .Bxxx, .Wxxx
Ethernet interface	10/100 Mbps
Data exchange	Ether-S-IO and Ether-S-Bus
USB interface	For configuration and diagnosis
Integral web server	For configuration, diagnosis and connection of a local web panel
Status LED	Visual quick diagnosis
PLC functionality (Smart Automation Station)	Processes PG5 programs (IL, Fupla, Graftec) Program memory: max. 32kBytes
Differences from a normal PCD3 CPU	<ul style="list-style-type: none"> – No battery → no permanent data in SRAM – No RS485 interface – No support for SPI-Bus → intelligent modules like PCD3.F2xxx are not supported – No real-time clock → software clock synchronized by manager
Useable master stations (Smart Automation Manager)	PCD1.M2120, PCD2.M5540, PCD3.M3330, PCD3.M5340/M5540/M6340/M6540

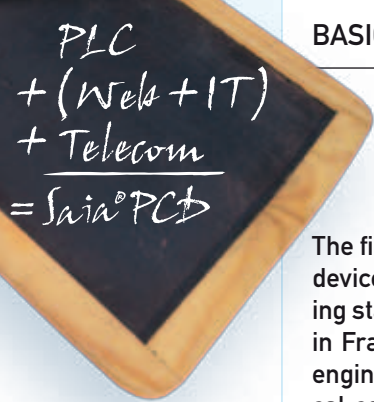


Easy configuration and commissioning with Saia®PG5 tools



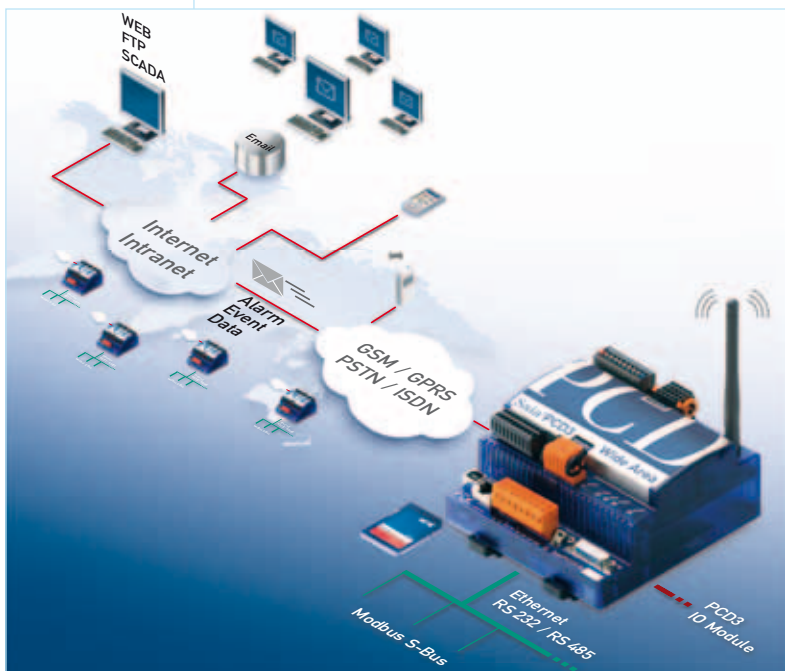
Saia® Smart-RIOs will soon also be available in flat-style construction.

Today, Saia®PCD controllers are used as automation managers. In future, this will also be possible with Windows®PCs and Saia®PCD Web-Panels.



Saia®PCD3 Wide Area Controller (PCD3.WAC)

The field trial phase of this innovative product has recently come to an end. It involved many hundreds of devices in an extremely wide variety of regions and telecommunications networks. For example, pumping stations and drinking water purification were implemented in the Netherlands; solar plant monitored in France; and the energy consumption of public street lighting was optimized in Portugal. Apparatus engineers – who sell their products throughout the world but still want access to controllers during local commissioning or troubleshooting with a customer – have also opted for compact solutions with Saia®PCD3.WAC controllers and an integral modem. Through all these projects, we have learned that it is important to consider carefully the access mechanisms via internet to automation stations. The following is therefore intended as clarification.



checks» the controller can periodically verify whether the internet connection is still live. If the connection is interrupted, for example by a mains fault, the controller can reinitialize the connection to the internet.

Diagnostic parameters can, however, also be used to monitor communications individually for a specific application, for example, to avoid unintentional roaming costs. Parameters can also be made accessible via web pages, which are then called locally via USB or remotely checked online via internet.

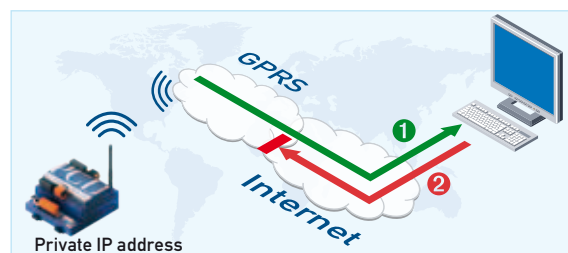
GPRS connections to internet via telecoms provider

One of the problem areas with GPRS connections is choosing the right internet access. Many GPRS providers offer several ways of making M2M (machine to machine) applications directly available via internet. The main differentiation is drawn between private and public IP addresses.

Private IP address

A controller with a private IP address is not visible on the internet. This means that the controller can itself exchange data with stations on the internet (1), e.g. via Modbus, SNMP traps, email or through other protocols. However, stations on the internet cannot reach the controller directly (2).

If, despite this, one still wants to access the controller from the internet, additional «visible» servers are required to ensure that controllers can be reached. This is particularly useful for keeping monthly costs to a minimum and for the central management of access protection to controllers in the GPRS network.

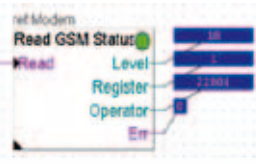


In the majority of applications implemented, preference was given to the use of GPRS technology as a way of achieving independence from local wired networks and fully exploiting the integral AutomationServer via internet.

Full modem control during operation and commissioning

Compared with using external modems, integral modems offer the best possible control and diagnosis of communications during runtime. Operators therefore benefit from reliable, more stable communications while improving the availability of their systems.

Diagnostic parameters like signal quality, current provider, connection status and network registration are transferred directly from the modem to the PCD firmware. The Saia®PG5 provides comprehensive FBox libraries that allow these parameters to be utilized in the user program. The controller independently takes over the checking of communications. By means of so-called «life



Modem check with FBox

Public IP addresses

At little extra cost, this possibility also offers direct access by internet stations to the controller. The essential benefit here is that, as long as the controller's IP address is known, it can be accessed from any chosen PC with internet access.

Many GPRS network operators no longer assign fixed, public IP addresses as standard practice. An alternative is to intercept the dynamic assignment of the IP address by means of the DynDNS service. This service allows the controller to be reached via a fixed name. Monitoring and control of the DynDNS function can be comfortably implemented directly in the user program via FBoxes.

Cost comparison with Swisscom

Private IP address

Often the lowest-cost option for connecting the controller to the internet at CHF 10.- per month + CHF 2.50 per MByte

Public IP address

approx. CHF 10.- + CHF 5.- per month + CHF 2.50 per MByte

Flatrate subscriptions can be obtained from CHF 50.- per month.

Private networks

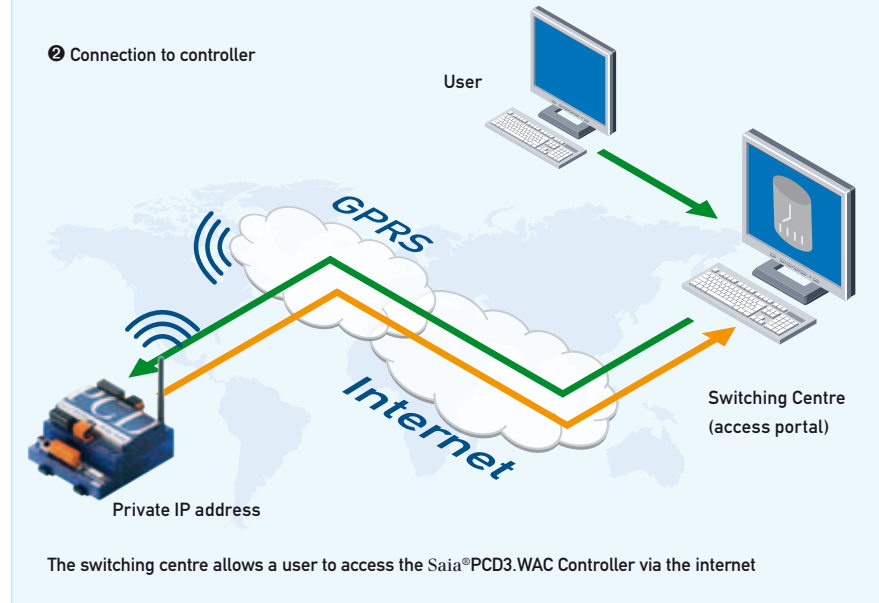
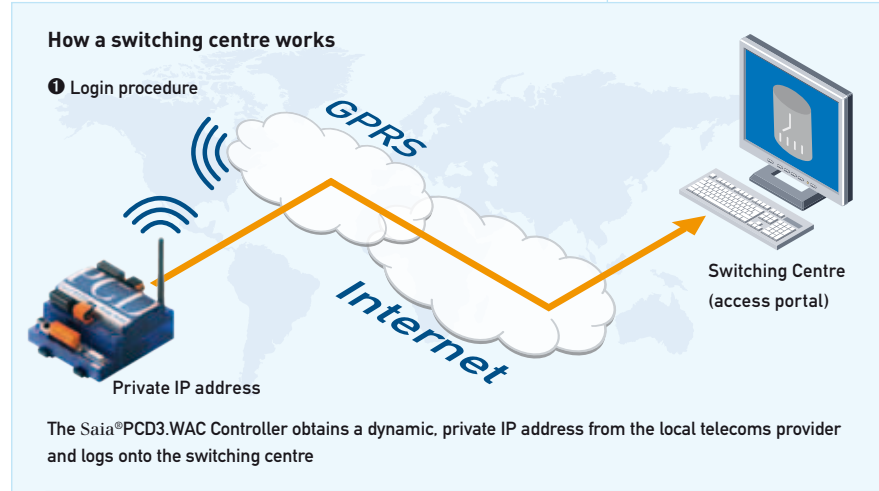
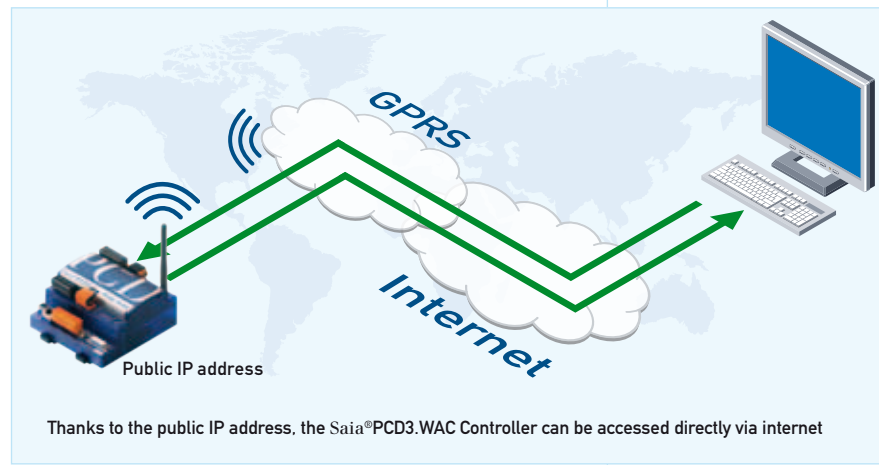
Telecoms providers or external partners (e.g. Mdex) also offer ways of connecting GPRS stations to each other via private networks, often with protocols similar to VPN. The controllers can then be reached across clearly defined access points. This type of solution offers the greatest access protection and, in addition, the data transferred is encrypted.

How a switching centre works

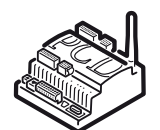
A switching centre is used to make several stations accessible from a central location in the internet. This means that every access to a controller takes place across the switching centre. Passwords and access rights are administered centrally in so-called station tables.

1 First, the controller obtains a dynamic private IP address from the local telecoms provider. Then, once the procedure to log onto the GPRS network has been successfully concluded, the controller will automatically log onto the switching centre via internet. During this process, the «identity» of the controller is verified.

2 A user on the internet can now, via this server with switching centre, establish a virtual connection



tion to the controller in the GPRS network. The identity of the user is first rechecked and then, using the so-called station tables, access to the appropriate stations is enabled. ■

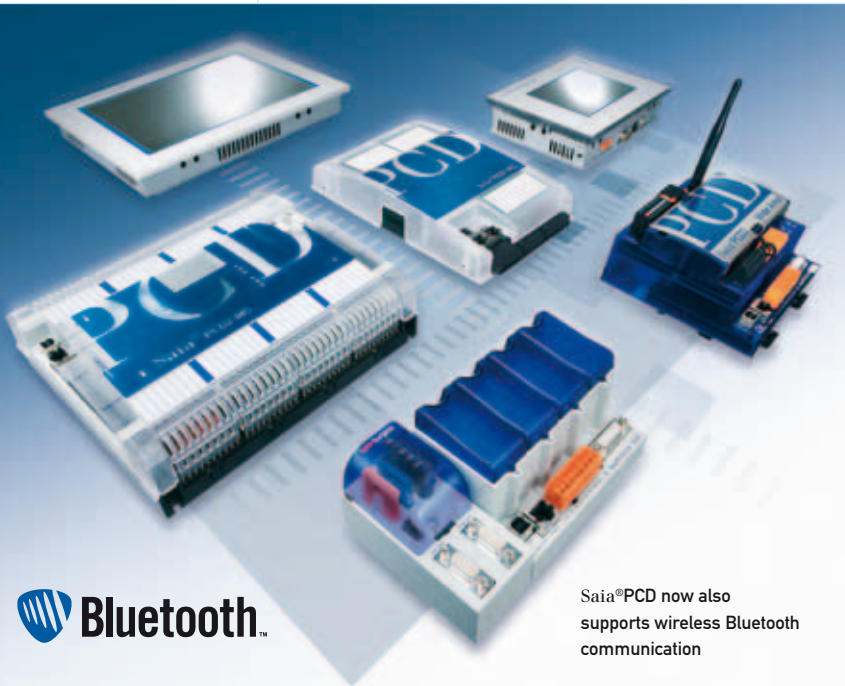


Saia®PCD3.WAC



Bluetooth integrated in the Saia®PCD world – classic strength in communication expanded with new technology

From their beginnings more than 30 years ago, Saia® controllers have been distinguished by high level communications capabilities. With USB, Ethernet, Profibus, CAN, M-Bus, etc. + max. 8 RSxxx ports, Saia®PCD devices have now achieved the maximum number and variety of conventional communications interfaces for general automation. This has allowed us to set new benchmarks for communications with our modular controller series: Saia®PCD1, Saia®PCD2 and Saia®PCD3. But we were still not satisfied! Nothing less would do than to transfer the profile and strength of Saia®PCD automation devices to include wireless communication. The industrial grade implementation of open standards like Bluetooth unlocks for the user new possibilities and options.



Saia®PCD now also supports wireless Bluetooth communication



ed, individual devices, but as a modular solution throughout all Saia®PCD controller platforms. In implementing Bluetooth for industrial use, it has been optimized to avoid any need for an additional antenna. This is an invisible difference, but a valuable and important one.

To offer customers even greater benefit, we will now make the transition towards including «unconventional» interfaces among those that can be used in Saia®PCD automation systems. These are primarily wireless communications interfaces. The integration of the Bluetooth option for all Saia®PCD devices has been just the first step. Further steps are sure to follow. Through attractive and perhaps even surprising innovations, Saia-Burgess will make sure that Saia®PCD remains the measure of all things to do with communication long into the future.

The first step has been taken

The Saia®Bluetooth module integrated in a Saia®PCD enables:

- Wireless access to the web-HMI project with PDA
- Wireless program installation and system maintenance through the steel switch cabinet, without opening it
- Configuration of Saia®PCDs, allowing them to send and receive data wirelessly

As before with the integration of web and IT technology into the Saia®PCD world, Saia-Burgess has again looked for maximum functionality in implementing Bluetooth. Wireless transmission via Bluetooth is not just offered in select-

Due to the reliability of communication and simplicity of configuring its wireless installation, Bluetooth has gained acceptance and popularity in automation. The new Bluetooth module can be used on all the more recent Saia®PCD stations (in cassette and flat-style construction). It allows for wireless communication over a distance of up to 100 meters in the open. Per CPU up to four modules can be used. This covers most application requirements. Fupla FBoxes are available for configuring communications, enabling settings to be adjusted at any time from within an application or process.

Bluetooth = industrial?



Bluetooth technology

Why has Bluetooth technology become so prevalent?

Our own tests and the investigations of experts at Germany's Electrical and Electronic Manufacturers' Association (ZVEI) have demonstrated that Bluetooth technology is more than just suitable for toys. This technology simply always works – even in unfavourable and noisy environments. You can read more about it in a technical article entitled «Wireless in automation» from page 68.

PPP communication with PDA and PC

In addition to the wireless exchange of data between Saia®PCD controllers, the Saia®Bluetooth module also offers the possibility of using the same module to communicate wirelessly via PPP with a PC or PDA. This means that all IP-based protocols are supported, including HTTP and FTP. A laptop with Bluetooth can be used as a wireless PG5 programming station with full access to all PG5 resources. Web or FTP access to logging files and web-HMI projects is equally possible. Access of a PDA is also supported: the «F160, Bluetooth» module is dispatched with a micro-browser licence for Windows® Mobile.

Network any choice of devices with Saia®PCD via Bluetooth

With Bluetooth increasingly spreading into PCs and mobile devices, it is now becoming possible to access a Saia®PCD system extremely easily with these devices. The only requirement is a Windows® operating system that supports the corresponding Bluetooth interface.

Easy installation – plug it in and it's ready to go

Installing the Saia®Bluetooth module is just as simple. The antenna is integral; no add-on is required. This module is one of the first to include automatic hardware recognition. This feature will in future be engineered into the whole Saia®PCD system; the PCD will then automatically recognize and configure all additional expansion modules as they are plugged in. In the case of the Bluetooth module, the PCD automatically installs PPP communication for an inserted Saia®PCD3/7.F160 Bluetooth module. Immediately, the user has full access to PCD resources without having to plug in a cable to do so.

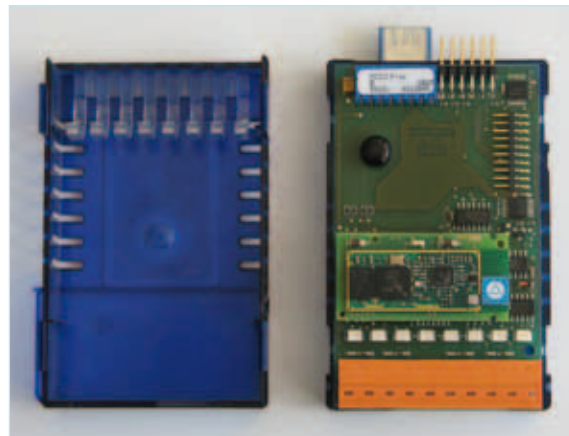
Application possibilities

Using the Saia®Bluetooth module will always be most advantageous in situations where it is difficult, costly or impossible to lay a cable.

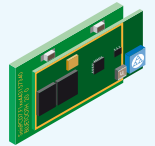
- Retrofitting existing installations
- Communication with mobile machines or equipment
- Communication with hard-to-access systems
- Communication through closed spaces
- Wherever there has been unreliable planning, or where flexible layouts are required

Available in two form factors

- **PCD3.F160** – for use in slot 0 with PCD3.Mxxxx (hardware version D or later)
- **PCD7.F160S** – for use in slot A with PCD1.M2xxx, PCD2.M5xxx, PCD3.M2x30V6.



Saia®PCD3.F160 module (opened)



The Bluetooth module Saia®PCD7.F160S can be used in slot A with Saia®PCD1.M2, Saia®PCD2-M5 and Saia®PCD3.M2



Saia®PCD7.F160S module in slot A of a Saia®PCD2.M5



The following protocols are supported

- PPP
- S-Bus
- Serial MC1 character mode ■



Bluetooth example from the Saia-Burgess production hall

Why would any lean production with one hall containing many production cells and machines in a flexible arrangement let itself be expensively «tied up» with fixed Ethernet cabling?

If every station has a Saia®PCD with Bluetooth, visualization, data exchange and programming can take place wirelessly.

Production flow can be reconfigured with great ease and speed – to say nothing of the cabling and discussions with the IT department.

Web-HMI – recent innovations for the successful Saia®PCD Web-Panel family

The Saia®PCD Web-Panel range, which enjoys great popularity on the market, has been steadily expanding in recent years. Web-HMIs have grown continuously, with innovations and added functions making their construction even more attractive to users. Our introduction of new haptic technology into automation as a world first earned us the bronze metal at the 2009 Automation Awards with an impressive third place. This competition takes place under the auspices of Europe's largest exhibition for electric automation: SPS/IPC/DRIVES.



Saia®PCD Micro-Browser Web-Panels

New CPU for 5.7"-10.4" Web-Panels already in development

In 2010 we will offer a new CPU for the 5.7" – 10.4" Saia®PCD Web-Panel MB. This will be mainly distinguished by offering more power. This power can be used to enable a Saia®PG5 or Siemens®STEP®7 logic controller function to run in parallel with the browser. This will also make the Saia®PCD Web-Panels freely programmable. Within this context, the parallel operation of numerous foreign protocols will also be supported. As a result, it will be possible to integrate a totally diverse inventory of existing equipment into the open web/IT world via the Saia®PCD Web-Panel.

12" Web-Panel

When you just need a large control area and no Windows functions are called for, industrial grade Windows®Panels will usually be too expensive and administratively too costly. Increasingly, therefore, customers are asking for a Saia®PCD Micro-Browser Web-Panel with a Display larger than 10.4". Before the end of 2010 we will offer a 12" Web-Panel to meet this demand. The most important construction requirements were a low-cost way of mounting it on a wall and a freely adaptable front panel design. You can see a first draft design of the 12" device below (graphic: new Micro-Browser CPU).

Next stage of innovation for Saia®Web-HMI

With the fundamentally new approach of always using a Web-Browser as the standard application for control devices, Saia-Burgess has taken its first big innovative step in the field of control and monitoring. On the basis of this innovation, we have begun successful development and production of the first touch-panels in the Swiss factory.

In 2009 we made our second great innovation with the use of TFT and VGA technology in the small 5.7" panels as standard. This brought us stable growth, even in the economic crisis.

Now we arrive at a third step in innovation with haptic touch technology. This brings users added safety and more fun when operating machines and equipment. ■



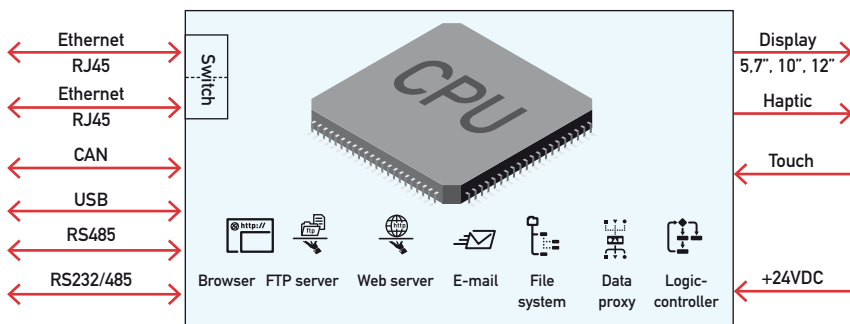
The ability to display trends on a small panel with browser and web or IT interfaces is the secret of the Saia®PCD Micro-Browser Web-Panel's success.

Success with innovation for 5.7" Web-Panels

The screen's high brilliance, its good readability from all angles, and its outstanding trend and text display contribute to the great success of the 5.7" Saia® Web-Panel. Saia-Burgess was the first HMI manufacturer to make such high screen quality, with TFT-LCD and VGA resolution, its standard for the 5.7". Previously, the market level had always kept to the moderate quality of STN-LCDs and ¼ VGA resolution.

Despite the economic crisis in 2009, we were able to achieve significant growth for Saia®PCD Web-Panels with Micro-Browsers. The ability to display trends was probably decisive in this.

New Micro-Browser CPU with more power, full AutomationServer functionality and logic controller



Saia®PCD Haptic Web-Panel – the new dimension in HMI

With the new Haptic Web-Panels, Saia-Burgess provides the HMI world with a third dimension. In the past, industrial HMI devices only addressed two of our five senses: seeing and hearing. Now the sense of touch has been added. Haptic allows you to feel both machine and process.



- Classic keyboard feel for touch-screen entry?
- Sensation of motor speed?
- Detectable warning when limiting values are exceeded?

With the new haptic Web-Panels from Saia-Burgess all this is now possible.

What do the haptic functions offer?

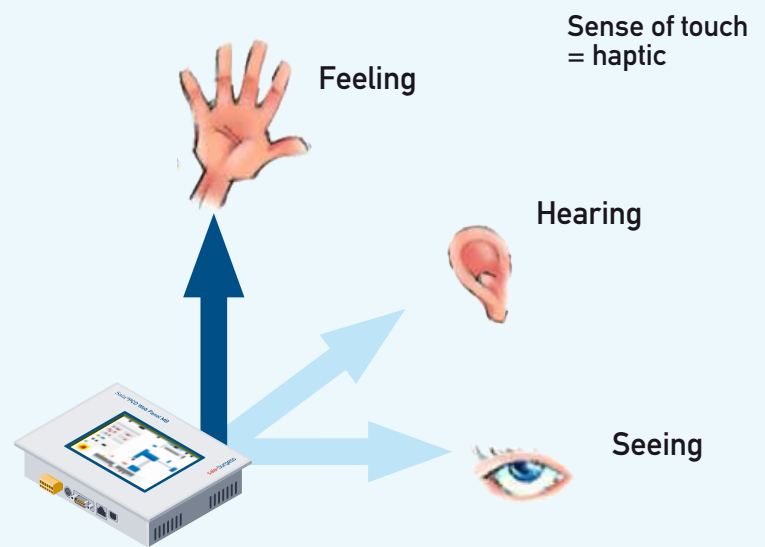
More intuitive operation

The operator can feel the machine through the haptic touch-panel, for example during positioning, speed adjustment or commissioning. This unlocks completely new possibilities for creating a graphical interface, because the sense of touch now also contributes to user prompting.

Safe, simple operation

A poor view of the process or none at all and loud noise – even in rugged industrial environments this clearly felt confirmation will work.

Third interface dimension with haptic



Ergonomic

The operator can concentrate all his visual attention on what is happening in the machine, receiving feedback through his fingers. Since the key on the touch-display feels like a proper key, ergonomic operation is possible.

Easy activation of haptic functions

Activate the haptic effects and «feel» the process. Existing HMI applications do not have to be reprogrammed. In addition, the haptic effects are flexible to adapt and can be modified in run time. This ensures that the right effect is always used, depending on the process state.

Technology:

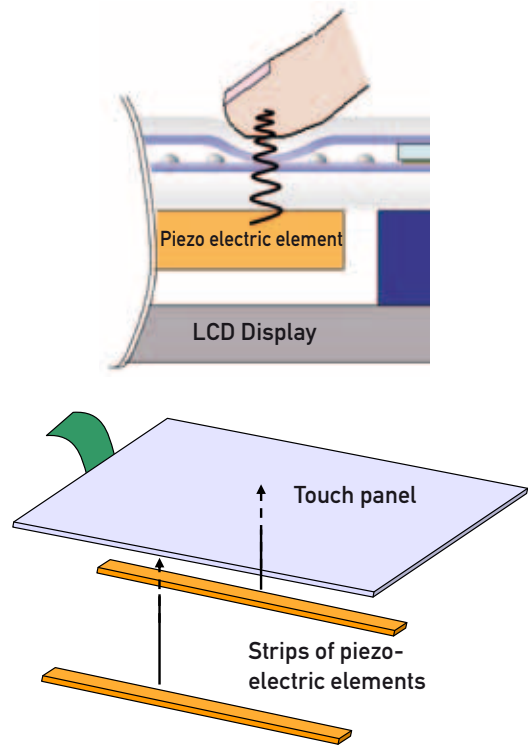
Piezo-electric actuators generate the haptic effects

Piezo-electric actuators generate changes of shape on the device's touch-screen surface through high frequency oscillations, which are felt by the finger.

Bronze medal for the Saia®PCD Haptic Web-Panel at the 2009 Automation Awards

At Europe's largest fair for the electrical automation industry (SPS/IPC/DRIVES) the 5,7" Saia®PCD Haptic Web-Panel was nominated for

Piezo-electric technology in 5,7" Saia®PCD Haptic Web-Panels



Haptic effects are generated by piezo-electric strips positioned directly beneath the tactile membrane

the 2009 Automation Award. Our presentation of haptic technology as a worldwide innovation in automation met with great interest from users. Following this wide visitor awareness and their very positive comments – and despite strong competition – we found ourselves awarded a fantastic third place. ■



Receiving the «third place» certificate for the Saia®PCD Haptic Web-Panel



Product features of Saia®PCD Haptic Web-Panels



- Display / Touch**
- Haptic touch-screen
 - VGA resolution
 - TFT technology
 - Fine pixel (3000/cm²)
 - Mounting position vertical and horizontal
 - White LED backlighting



- Processor/OS**
- Coldfire processor
 - Saia®NT OS
 - FTP server
 - Web server
 - 4MB of memory for local web data
 - SD card (optional)



- Communication**
- Ethernet
 - RS485 serial interface
 - USB

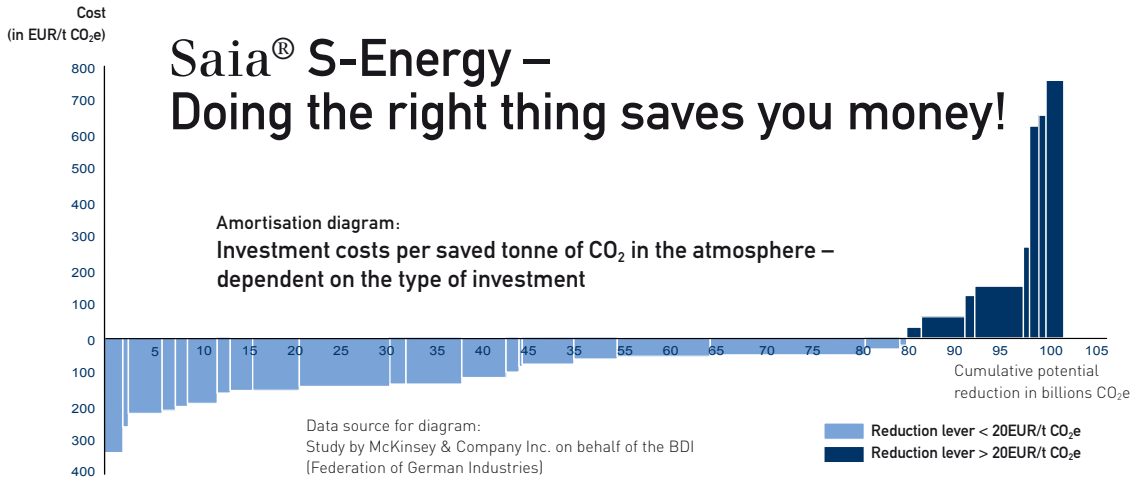


- Software tool**
- Saia®Web-Editor



- Browser**
- Saia®Micro-Browser





Global problem

Increased energy efficiency contributes significantly to the reduction of global CO₂ emissions. The greatest challenge here is not the technology in itself, but the economic viability of the relevant investments. One component of cost effectiveness is the initial investment. This has been the subject of a study by the BDI (Federation of German Industries), seeking to optimize the CO₂-reducing effect of investment support programmes (see picture). For the investor, however, it is not just a question of having the financial resources for an initial investment. The decisive question for him is how fast that investment will pay back a return. A temporary drop in the energy price will soon result in very unattractive periods of 10 – 12 years, even with an idealized calculation of reduced consumption.

If the technology used for energy efficiency is complex, high maintenance and prone to error, an investment that subsidies had made apparently attractive can also rapidly become a source of trouble or discontent and the cause of an ongoing rise in operating costs.

Even when all the parameters for an energy efficiency project are positive, there often still remains one massive stumbling block. Are there enough competent people available in the company and on the market to be able to execute technical innovation projects? Here the limitation lies in the available human resources.

The Saia® route to a solution

The facts set out above have led Saia-Burgess not to be content with offering Saia® energy meters as just good quality, attractively priced control cabinet components. The route by which such components are finally integrated into regular operation can be a very long and costly one. Whether the final customer has actually made a good economic investment with Saia® meters is very far outside the influence of a component supplier. For this reason, we have decided that, on the subject of energy efficiency, we will not just act as a component supplier.

er. Where energy is concerned, we will even go beyond our role as system supplier: here for the first time we now also supply ready-to-use solutions for energy management.

Through ready-made, predefined system solutions, there is a considerable reduction not only in the complexity of innovation projects but also in their initial investment costs. The technology used has a life cycle to match the technical installation and is implemented in industrial PLC quality.

Although the system solutions are ready-to-use, their functionality can at all times be adapted and expanded to suite individual requirements – either by the client himself or by one of several hundred specialized system integrators trained to do so. This is in accordance with the motto of Saia® automation technology – No Risk, No Limits. For our customers this means solutions they can trust.

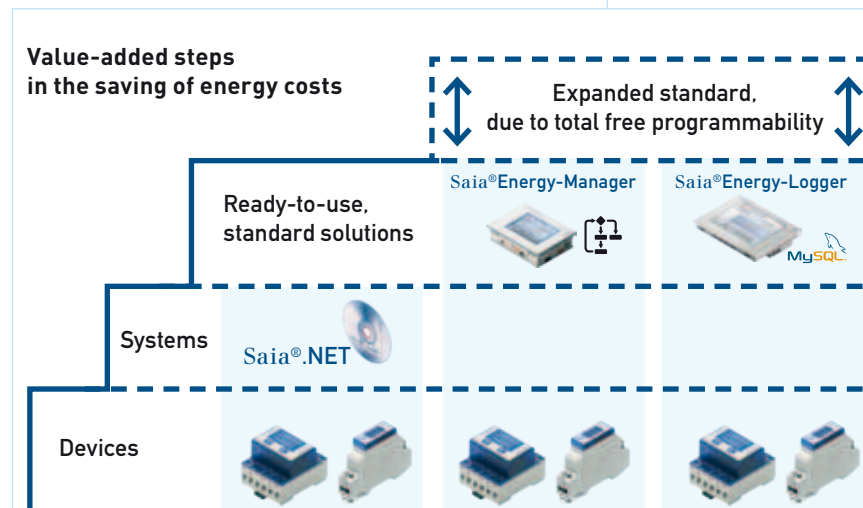
In 2010 we are now at the start with the first products for Saia®S-Energy. Like a product, Saia® S-Energy itself also has a life cycle. It begins now and will end when the world has managed the global reduction of CO₂ emissions. ■

Saia®S-Energy

Saia®S-Energy stands for immediately ready-to-use solutions for the reduction of energy costs

- Efficiency in energy and investment
- Energy saving that pays a profit
- « Peace of Mind » in energy efficiency

* BDI = Bundesverband der deutschen Industrie (Federation of German Industries)





Saia® S-Energy Manager Capture, visualize and control energy

If the words «transparent capture of electrical consumption values» make you think of bulky electric meters, complex software solutions and substantial engineering costs, you can stop worrying now; because, with Saia® S-Energy Manager a compact device is on its way for the capture, visualization and control of electrical consumption.

Saia® S-Energy



Saia® S-Energy Manager
– direct connection of energy meters via S-Bus or 50 output

In the form of a Micro-Browser Panel, Saia-Burgess offers a compact device for energy management. Within the dimensions of a 5.7“ control panel there hides a ready-to-use solution for the capture, display and control of electrical consumption values. Priority here has been given to maximum ease of handling, without laborious configuration – there-

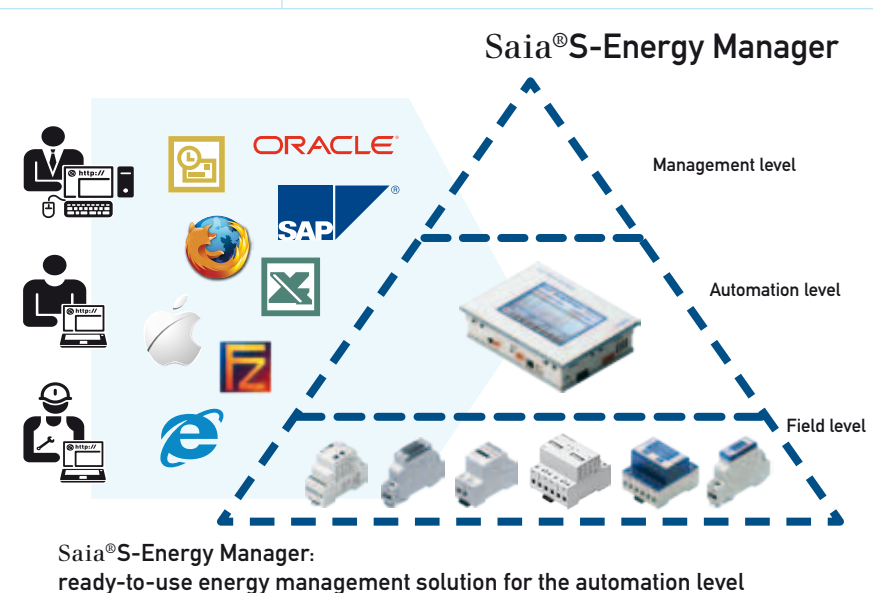
fore no special software tools are needed for commissioning; all settings can be made directly on the device.

Unpacked and ready-to-use

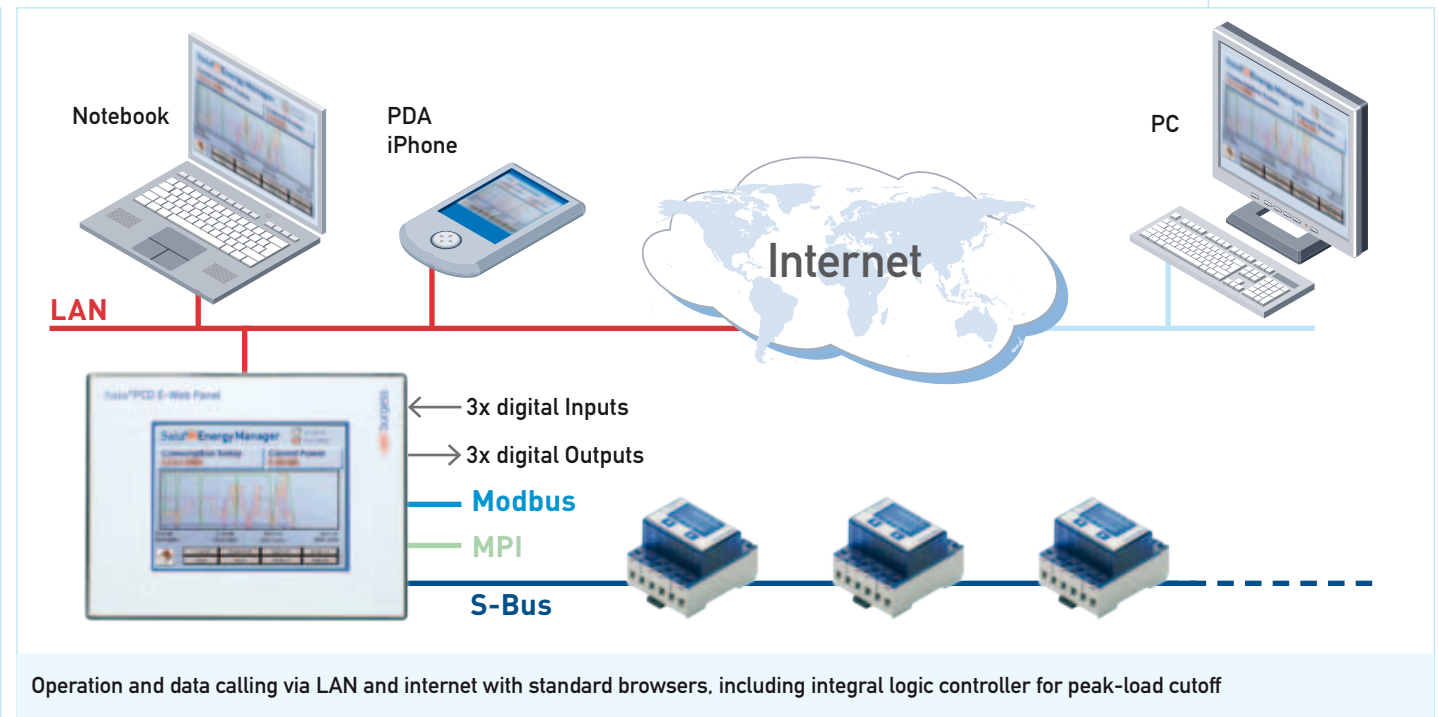
What can the S-Energy Manager do? For a start, it can read electrical consumption values from S-Bus-compatible energy meters. For this purpose, the Energy Manager can rely on its integral S-Bus interface. Once the energy meters have been connected to the Manager, it is all quite easy. The integral autoscanner automatically recognizes all the connected energy meters and includes them in the visualization. Regarding visualization, the Manager includes a user interface to display read values directly within its delivery contents. This allows you to select individual energy meters and display their data, both in the form of clear charts and with convincing trend diagrams. Nor is display limited to just the raw data from meters, but instead it also places at your fingertips – thanks to touch control – such calculated values as average consumption, totals or costs.

Operated via network with a standard browser

The user interface of the Energy Manager has been implemented as web visualization and can therefore be comfortably called via LAN or internet, even from normal PCs. The maintenance supervisor will be happy; after all, he can now keep an eye on all meter states in his building from the comfort of his control centre and no longer has to waste time reading every meter individually in the dingy cellar.



Already included in the standard: quick overview of consumption and costs with language switching



Flexible, expandable functionality

Implementing the interface as a normal Web-Editor project has yet another advantage. For the experienced Web-Editor user, it is simple to adapt the interface to one's own taste, or even completely replace it with a design of one's own. This great flexibility allows system integrators to adapt the appearance of the S-Energy Manager to their own company design, making it possible to generate a competitive advantage of one kind or another.

Consumption is not just captured, but controlled

A manager would not be a manager if it only collected data, but did not intervene in events. Consequently, the S-Energy Manager not only records consumption, but can also influence the process.

An integral logic controller, freely programmable with STEP®7, provides the Manager with the necessary flexibility to monitor even complex process sequences and identify critical states with confidence. This allows it to detect, for example, costly peaks in consumption and prevent them in future through active intervention.

Regardless of whether you just want the transparent capture of electrical consumption values, or if you require peak-load cutoffs to save energy costs, with the Saia®S-Energy Manager for the first time a device is available that convincingly combines flexibility with maximum ease of handling – compact, uncomplicated and web-compatible.



Weekly consumption trend displayed individually for each meter



Monthly costs viewed at a glance with colour differentiation between high and low tariff

Cost transparency and energy optimization made easy

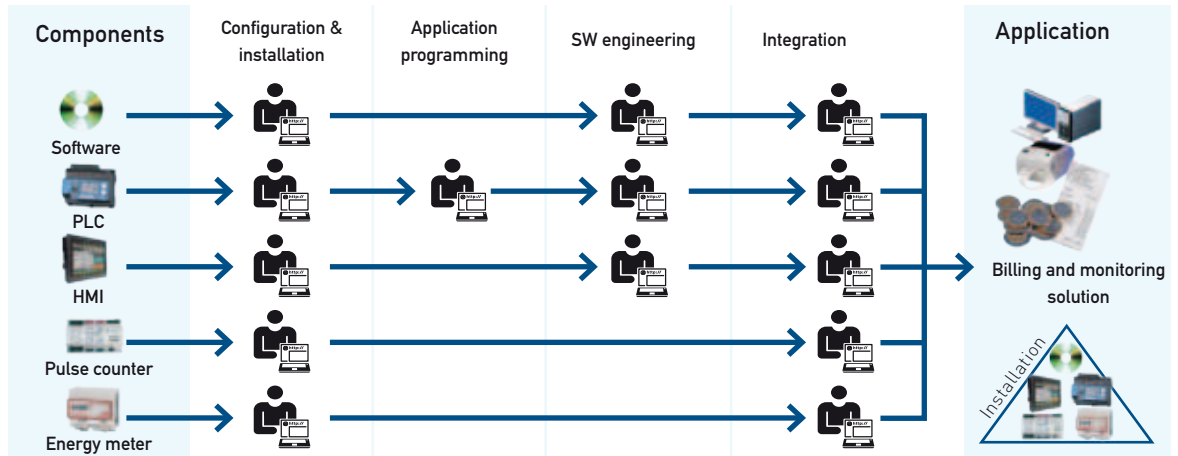
Analysis comes first: recognizing waste, identifying potential savings and revealing ways to optimize. For this, the actual state must be captured in full. Installing, operating and evaluating numerous energy meters, however, requires much effort to integrate when conventional technology is used. The result is usually complex, high-maintenance and prone to error – a recipe for trouble.

With S-Energy the complexity is considerably

reduced. The S-Energy Manager offers more functionality for fewer components. The entire installation becomes readily comprehensible; maintenance and operating overheads are reduced to a minimum, while energy costs can be assigned and billed depending on consumption. This makes saving energy and protecting the environment doubly worthwhile – doing the right thing saves you money!

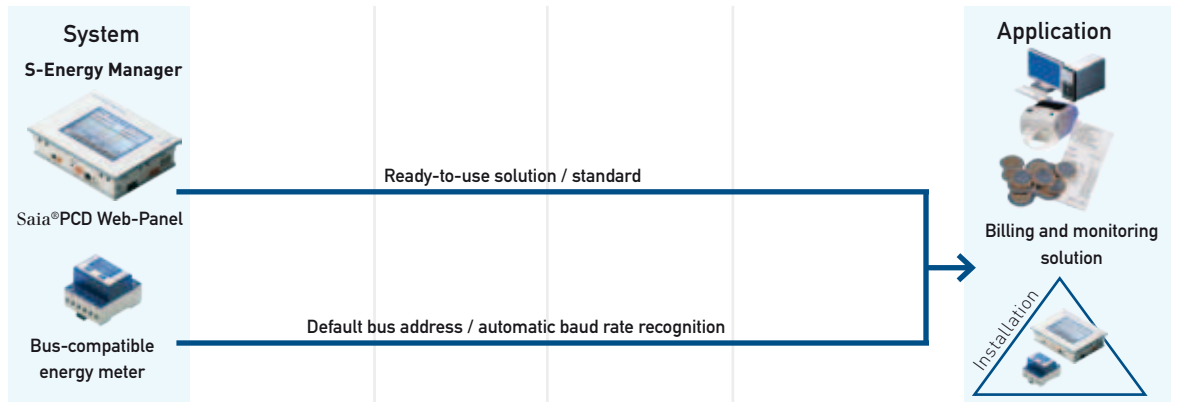
Today's situation: non-homogeneous mix of components

The large number of different components from various manufacturers leads to high complexity, requiring considerable expense and effort to integrate them.



S-Energy: the ready-to-use solution

Energy monitoring and management that is ready-to-use straight from the box, without expensive engineering. Connected energy meters and communications parameters are recognized automatically – measured values can be read straight away.



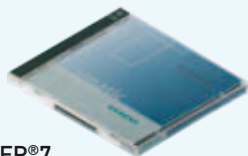
Individually expandable and flexible

If the standard functionality is not enough, the S-Energy-Manager can be individually structured and expanded with additional functions.



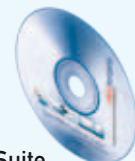
S-Web-Editor

A convenient software tool (S-Web-Editor) allows the integral user interface to be adapted, expanded or completely rebuilt according to one's own design, as required.



STEP®7

Additional control functions, such as peak-load cut-off, can be implemented with the built-in logic controller. Programmable with STEP®7 from Siemens® and equipped with an MPI interface, it integrates successfully into the S7 world – including communication with SIMATIC® controllers.



PG5 Controls Suite

If the logic controller is programmed with the PG5 Engineering-Suite, it is child's play to add energy management functions to existing and new projects from building and infrastructure information. ■

Saia®S-Energy Logger – for the capture, visualization and IT-friendly provision of energy data

It is one thing to capture and display consumption values, but to log them and make them available in an IT-friendly way is something else. This is where the emphasis of the Saia®S-Energy Loggers lies: it writes captured values to an SQL database.



Saia®S-Energy Logger – measurements from the meter are transferred directly to an SQL database

These days, a modern IT environment would be inconceivable without databases. So what could be more obvious than S-Bus-compatible energy meters from Saia-Burgess that provide consumption values in an SQL database? This is exactly where the S-Energy Logger comes in, which targets data-oriented applications in which consumption values must be logged and prepared for further IT-style processing.

What is the S-Energy Logger?

Basically, the S-Energy Logger is a tailor made software solution for Windows®-based Web-Panels from Saia-Burgess. This solution is capable of running on all panels with an LX800 CPU (PCD7.D5/6..TL..) – under both Windows®CE and Windows®eXP. A particular advantage of the S-Energy Logger is the fact that it is preinstalled: there are no licensing costs.

How does the S-Energy Logger work?

S-Bus-compatible energy meters are connected to the Web-Panel. All energy meters will then be read cyclically during run-time. Values captured will subsequently be made available as follows:

- Transmitted to a Saia®PCD web server or Web-HMI server
- Logged in a CSV or report file
- Stored in a MySQL database

Consumption values captured in MySQL

All values can be stored in a MySQL database. This database may be located in the local network

(LAN), on internet, or even installed locally on the Web-Panel. In the database, a table is required for each meter with its selected values. The S-Energy Logger will store read values in it, providing them with a timestamp. If many meters are connected, table editing would quickly become laborious and prone to error. All tables can therefore be conveniently generated at the touch of a button by configuration software.

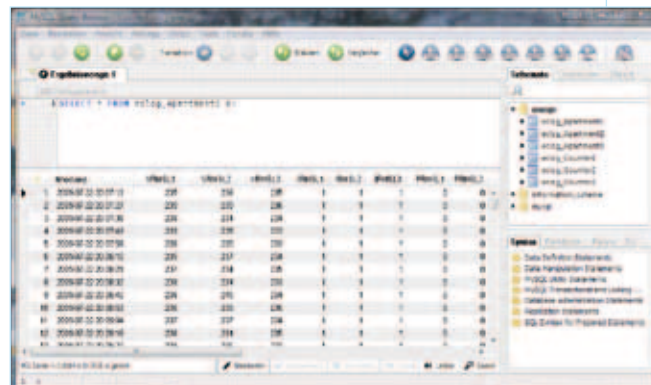
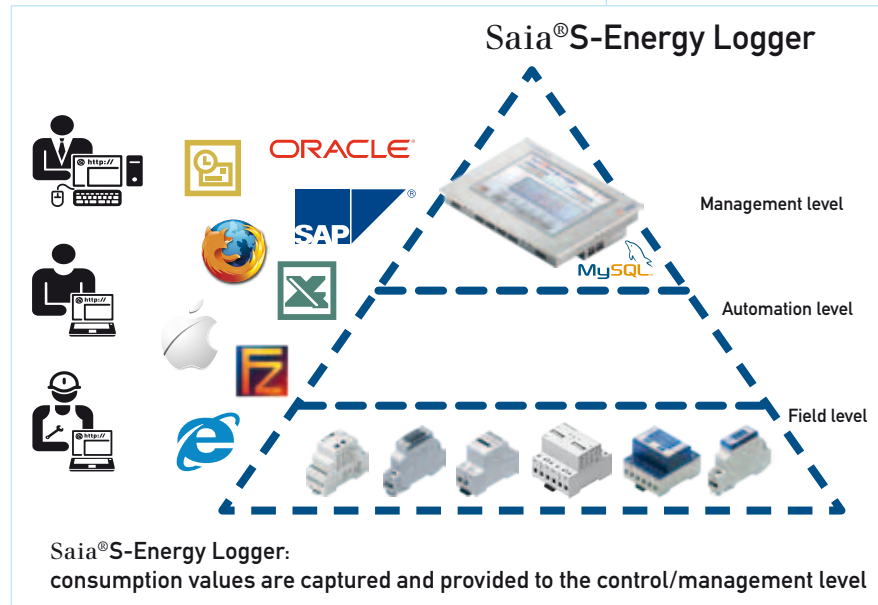
Once the consumption values of energy meters have been stored in a MySQL database, it is a simple task to integrate them into web pages using normal web designer methods. In addition, a wide range of commercial billing software is available and, as a rule, this will have an interface to an SQL database. ■



Local control, including: quick overview of consumption and costs with language switching



Can also be called via network: costs in monthly view



MySQL database with six energy meters, displayed in the freely available MySQL Query Browser



Saia® S-Energy with Saia®.NET Energy capture with PCs and high level language

It is not absolutely necessary to have a controller or panel to capture electrical consumption values – the convenient Saia®.NET-Suite development package makes it easy for high-level language programmers to address S-Bus-compatible energy meters from any standard, commercial PC.



Saia® S-Energy

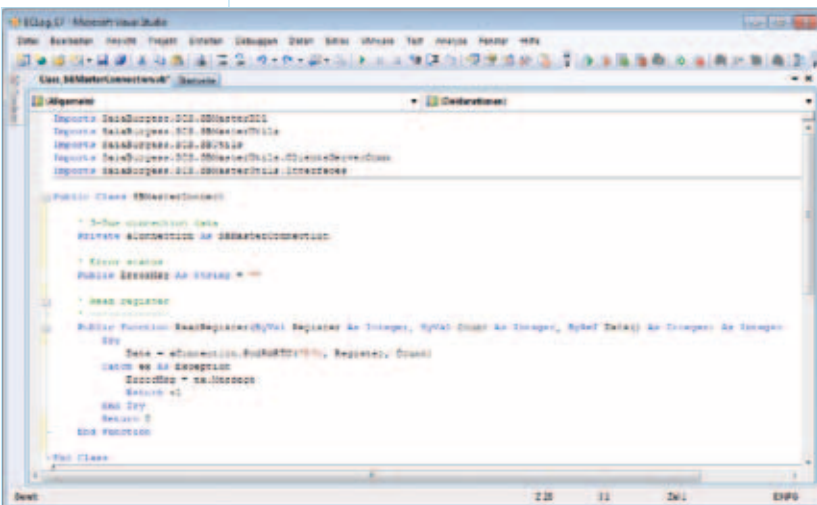
High level language programmers have at their disposal a development framework that allows Saia® automation technology to be integrated into their own product ideas.

Programming with Visual-Studio and Saia®.NET-Suite

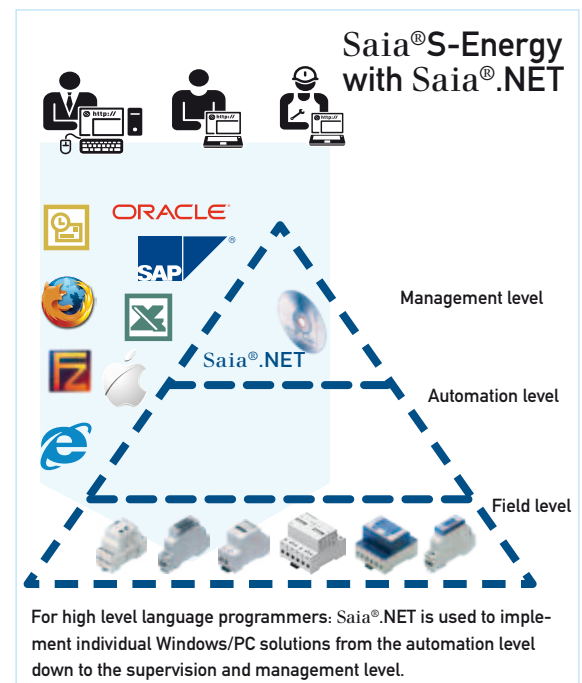
From the point of view of a software engineer, an energy meter is just another S-Bus slave – like a suitably configured Saia®PCD controller. Therefore, accessing the meters requires the functionality of an S-Bus master. Saia®.NET-Suite contains ready-made functions to implement an S-Bus master under Windows®. The complete functionality can be integrated in the form of DLLs within one's own application software. Executable program examples in Visual-Basic and C# illustrate its use.

Energy meters have 41 registers containing current consumption values and status information. The S-Bus address can be specified via the display on the meter itself. Baud rate does not have to be adjusted explicitly – it is recognized automatically. The S-Bus master functions of Saia®.NET-Suite are called with these parameters. Nothing more is required to establish communication with the energy meters. ■

Sometimes more is required. When ready-made, standard solutions do not offer enough, it is even possible to integrate S-Bus-compatible energy meters into personally developed software applications. With the Saia®.NET-Suite, high level



Reading energy meters with an S-Bus-Master function from the Saia®.NET-Suite with Visual-Basic



For high level language programmers: Saia®.NET is used to implement individual Windows/PC solutions from the automation level down to the supervision and management level.

Bus-compatible Saia® energy meters, the basis for energy monitoring and management

As a reliable supplier with a quality product, we have in recent years succeeded in becoming one of the largest manufacturers of DIN-rail mounted electricity meters. Many internationally recognized, major brands trust us to develop and produce their meters in Switzerland. In 2009 we made the transition from energy meters as standalone components to bus-compatible system elements. This opens the way from pure data capture to the monitoring and management of energy flow.



Until recently, remote access could only offer pulses as a proportion of power drawn (via S0), but no absolute values or additional information.

During development of the new LCD energy meter, which came on the market in 2009, the possibility of communication with the outside world was planned right from the start. To this end, a communications interface that can be fitted with an

interface module was implemented on the energy meter's main board.

The first step was to develop the RS485 communications interface with the S-Bus protocol, to allow communication with Saia®PCD devices or the new Energy Manager. In this way, the user has access on his PCD or in the Energy Manager to all the values included on the energy meter's LCD: effective power, voltage, electricity purchase, power, idle power and cos Phi. In case of high idle power, the user can switch to a compensation load as a way of reducing his electricity bill. The meter can be partially zeroed via the interface. This is very useful for billing applications in hostels or on camping sites.

This communication is available either as a 3-phase version with 70mm housing (direct measurement or current converter) or as a 1-phase version with 17.5mm housing.

The add-on board
for interface
communications
makes meters bus-compatible





42 Saia® S-Bus energy meters and Saia®PCD3.M3120 controller for energy capture in the airport data centre

In parallel with this, the M-Bus communications interface has been developed in accordance with the standard EN 13757-2. This interface allows energy meters to be connected to a system with gas or water meters, plus the complete integration of all the meters in a building.

For full integration into the PCD environment and utilization of the entire scope of possibilities offered by the new S-Net V2.0 concept, additional communications modules have been or are being developed. The aim is the complete integration of energy meters into the world of Saia®PCD and automation.

Application example:
energy meter with S-Bus interface and Saia®PCD3

The Hanover-based company AirIT looks after Hanover Airport's data centre. AirIT is one of the first companies anywhere in Germany to have integrated an energy monitoring system based on Saia® technology in its data centre. The first step is to capture data on consumption from the various server systems and store it in a CSV file using HD-LOG. Data obtained in this way allows conclusions to be drawn about whether it would be worthwhile replacing the existing server systems with new ones. The next step is to start thinking about demand-based billing for tenants. Technology from Saia-Burgess is ideally suited to this. The simple

positioning of an FBox makes for very low engineering costs and requires no special expertise, as for example with M-Bus energy meters. With web-IT technology from Saia®PCD, consumption data can be accessed at all times from anywhere in the existing network. Storing the data in CSV files ensures ease of subsequent processing with standard Office tools, such as Microsoft® Excel. ■



Data centre of Hanover Airport in Germany

Saia® S-Energy: systematic energy efficiency and transparency

By combining S-Energy components with standard Saia®PCD controllers, innovative energy management can be integrated to fit perfectly into classical building automation projects – added value that quickly pays for itself in reduced building maintenance.

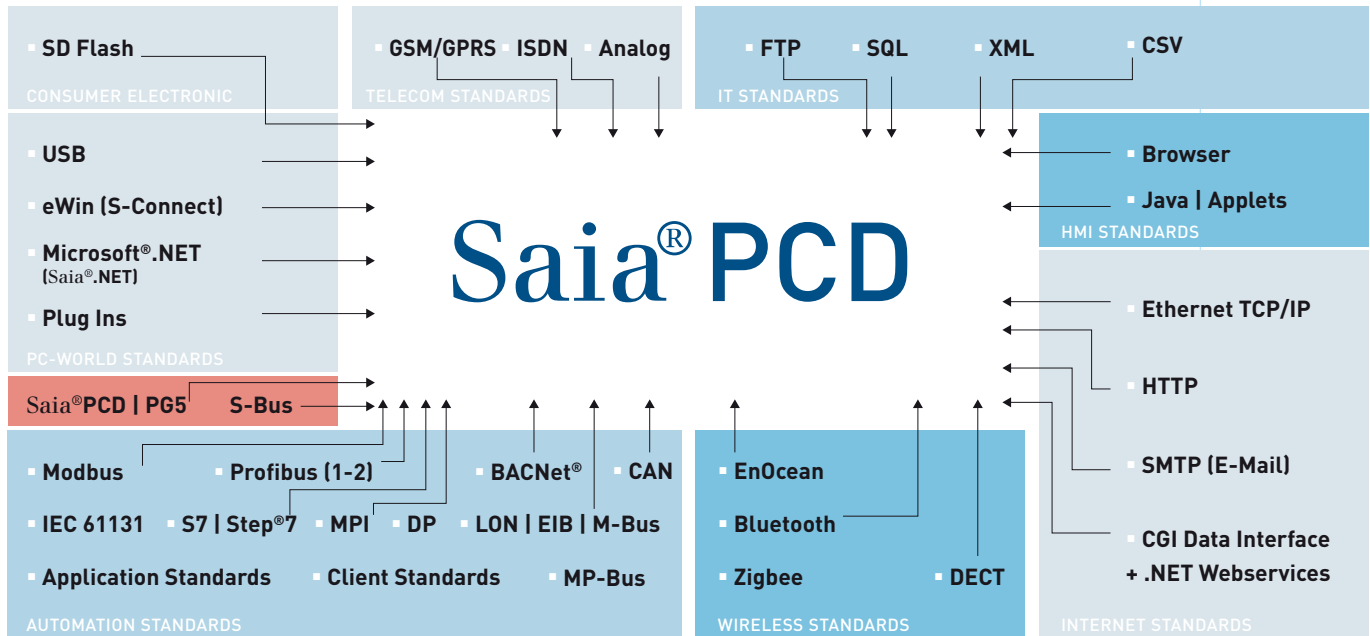


It is one thing to measure energy; but to monitor consumption and integrate energy management in an automation environment is something else.

Thanks to its roots in control technology, S-Energy is clearly destined for energy management in an automation environment. S-Energy components, such as energy meters or the S-Energy Manager, are readily combined with standard controllers or Web-Panels from the Saia®PCD range. This allows the implementation of even complex control and management requirements, or the effortless remodelling for energy efficiency of pre-existing automation solutions (e.g. in building technology). The distinctively strong communications capabilities of the Saia®PCD controller system proves a great advantage here. Whatever the interface required - BACnet®, GSM, M-Bus, Modbus or even just RS232 – S-Energy can always find a connection. The new diversity of communications around S-Net 2.0 also benefits S-Energy: energy values are measured and provided using all transmission routes – tethered, with power-line technology, or wireless engineering. ■

Saia®S-Net V 2.0 ?!

- The step towards interaction and cooperation in distributed automation systems beyond geographical limits.
- The step towards limitless interaction and cooperation in distributed automation systems, without high complexity or costs



After Bluetooth, the worldwide standard communications technologies DECT and Powerline are now also being integrated into the Saia®PCD system.

Background history

In 2004 Saia -Burgess launched Saia®S-Net as a new communications system for the Saia®PCD world. One of the outstanding features of the first version of Saia®S-Net (V 1.0) was its complete integration of Profibus technology directly in the operating system of every new Saia®PCD CPU. It enabled multi-protocol operation, cross traffic and freely programmable communications for wired communications across RS 485 connections. Via an existing Profibus cable system and in parallel with Profibus-DP operation, Saia®PCD controllers were not only able to exchange input/output signals, but also data files or web pages on the same connection.

With this step, boundaries were broken down between the Ethernet and RS485 worlds.

Saia-Burgess became the pioneer of functional integration of the management level into the field level and back again. This is something which Siemens® has also for some considerable time tried to propagate under the name «Profinet» based on proprietary microchips.

The Saia®S-Net concept (V 1.0) has been consistently implemented in the new Saia®PCD3 series since 2005. The very great and ongoing success of the Saia®PCD3 series is based to a large

extent on the innovative communications concept of Saia®S-Net version 1.0.

What is behind S-Net V 2.0 ?

In 2010 a great many new Saia® S-Net functions will be integrated into the Saia®PCD system. This can be compared with the internet transition to Web 2.0. None of the innovations is by itself revolutionary, but together they deliver totally new possibilities and methods for building and operating geographically distributed automation systems. Here, rather than a complex feat of technology, the prime objective is «resource-conserving automation». It is the ideal way to conserve an operator's personal and financial resources, in just the same way as the resources of our planet are conserved. This resource conservation is matched by economical, comprehensive consumption monitoring, to which Saia®S-Net V 2.0 attaches particular weight.

Steps from V 1.0 to V 2.0

As a first step, the full industrial integration of Bluetooth technology into all Saia®PCD automation devices is currently under completion. Everything that is possible through cable now also works via Bluetooth. As a side effect, PDAs and Smart Phones become a «natural» part of the automation system.



Saia® S-Net

Saia® S-Net 2.0

Values, attributes and culture of PLC technology are transferred to automation networks.

Top priority: always running – all stations always accessible.

Saia®PCD devices form ad hoc networks with each other.

In the same sense, existing power supply and telephone networks in buildings are integrated into the Saia®S-Net as a «natural» extension of LAN and RSxxx connections.

The integration of DECT and Powerline technology into Saia®PCD systems is imminent.

The new Saia®PCD1 has already been designed to allow its equipment with the «230V power supply» option, including Powerline. Thanks to this design concept, with the next version of the Saia® energy meter a Saia®PCD1 will be able to capture data without extra add-on components or costs, and without additional bus cabling. Alternatively, a thick concrete wall or ceiling, which represents an impregnable obstacle for Bluetooth, is penetrated simply by means of the 230V mains cable.

The Saia®S-Net promise

Saia®S-Net is not a tangible product that Saia-Burgess produces, packs up and ships out with operating instructions. Saia®S-Net is a system that only comes into functional existence with its integration into an existing technical installation.

In the context of Saia®S-Net, we are also unable to guarantee that Powerline will always work, or

that with wireless there will be no stoppages due to faults. Unfortunately, the limits of physics apply even to Saia-Burgess.

None of the «old» technologies, like DECT or Powerline, are capable on their own of meeting the requirements of industrial automation. This is why they have so far failed to become prevalent here, despite their enormously high potential.

To unlock this potential, a stable base is required of three crucial fundamentals:

1. Industrial grade lifecycles
2. High modularity and expandability
3. Free programmability

Everything that Saia®PCD technology stands for!

Saia®S-Net V 2.0 is not about designing today a distributed automation system that will last for more than 15 years. Instead, it is more about the enormous flexibility that S-Net V 2.0 brings to Saia®PCD CPUs. With the diversity and abundance of communications channels in Saia®PCD controllers, different existing technologies can be combined and used in parallel for security. If surprises occur or changes are made during commissioning or the use phase, it is possible to respond to all eventualities without great expense by replacing a module and slightly modifying the program. The motto is: «can't be done» doesn't exist in our vocabulary!

For example, if in five years' time a new technology comes onto the market, there will also be the appropriate plug-in modules for it. If system parts become superfluous, they can be replaced without changing the basic system.

Saia®S-Net V 2.0 stands out not just for the diversity of its communications routes and their possible combinations. The large number of very diverse protocols and behaviour profiles integrated ex factory within the Saia®PCD operating system instead make Saia®S-Net V 2.0 more an interaction and co-operation system than just a communications system. This can be compared with Web 2.0, which has made possible completely new forms of social interaction and cooperation, whereas Web 1.0 was more just an information system to allow the attractive display of static web pages from anywhere in the world on a browser.

With 2.0 that is still possible. But there is more, much more! ■

What does open communication mean in the Saia®PCD world? Nothing is impossible!

Guaranteed interaction and cooperation with the overall technical environment throughout a life cycle of over 15 years: this is our requirement when we develop and build Saia®PCD control devices. The basis for interaction and cooperation is communication. We have therefore decided to take an in-depth look at this topic in the context of Saia®PCD automation systems. If the technical basis is broad and stable, it can be to your automation solution like the foundation to a house.

What is communication?

As in daily life, automation too has few subjects that can remain isolated and manage without any interaction with other subjects. Subjects or automation devices usually show up in groups/communities. They interact/cooperate and so build networks to perform together the tasks assigned to them according to their properties.

A precondition of collaboration between distributed automation systems is communication between the systems, i.e.: the systems must have interfaces to exchange information and the capability to interpret that information.

Systems that have the maximum number of different interface types and can process many information formats (languages or protocols) can be used with great flexibility anywhere. They can even be used as «interpreters» for other, less communicative devices.

Comfortable with communication from the beginning

As appropriate for a product from Switzerland with its four national languages, communication has always been a strength of Saia® controllers. In the early 1980s, when others would still be unable to «talk» for a long time, the first PCA controller already had a freely programmable serial RS232 interface that enabled information to be exchanged with other devices. For our customers, this resulted in application possibilities that were unattainable with other products.

We have continuously extended the communication capabilities of our controllers. New technologies and standards from automation, the IT world and telecommunications (wired and/or wireless) have been exploited early and integrated into our devices with industrial quality.

Modular expansion with up to 16 interfaces in one device

Today, even the basic versions of our systems (controllers and control panels) have numerous interfaces (USB, Ethernet, RS232, RS485) that allow information to be exchanged with other systems at no extra cost. Depending on the area of use, the basic version is also available in a variety of forms



with specific interfaces, such as Profibus, CAN, modem (PSTN, ISDN, GSM/GPRS) and others. In addition, all our systems are always capable of modular expansion with add-on interface modules from a large construction kit. In this way, the modular expansion of a Saia®PCD controller can provide up to 16 communications ports (PCD2.M5 CPU) in one compact, space-saving housing.

Communications protocols

Physical interfaces (cable or wireless) connect subjects/devices and allow information to be exchanged. Communications protocols define the language and rules by which information is safely transmitted and understood by participating stations.

Like human beings, automation too has different cultures and application segments that each have their own, specific languages and protocols. People who only speak one language have a limited radius of action and can only converse and interact with people who speak the same language. Today, however, it is necessary to be able to make oneself understood in other cultures and multiple languages. If one always needs a translator to do this, communication may still be possible, but it is laborious, slow and expensive.

People who speak several languages have a much easier time. They can tour other countries, get to know other cultures and perhaps work there. They can read foreign language literature and use the different communications media, such as telephone and internet. In summary: they are significantly more flexible in their private and professional lives, more independent and can be deployed in many functions.

The same applies to communications protocols in the automation world. Devices that only support one protocol can only exchange information with devices that share this «language», which means they can only be used in the application segment for which they are intended. In contrast, devices that support several application protocols across different types of interface are much more universal and flexible, and are ultimately more economical to use.

Saia®PCD controllers have many physical interface types in one device. Communication via point-to-point connections in a local network or across large distances is therefore easily possible with the same device.

The operating system of Saia®PCD controllers already supports a large number of protocols as standard. The integration of these protocols into

the operating system makes their use very simple and efficient. The protocols are available at no extra cost and can be utilized as required by the user, even simultaneously and across different types of interface. If another protocol has to be used on an existing system, it is enough to upgrade it with the corresponding interface module. There is no need to change the base unit, nor update the operating system. In this way, a previously installed PCD can be expanded at any time into, for example, a BACnet® or/and LON-IP station.

In addition, most interfaces are fully user programmable.

What does this mean? If a Saia®PCD controller does not «speak» a particular language/protocol, the PCD can be taught it by the user, who implements the protocol in the user program itself. The language skills of Saia®PCD devices are not, therefore, limited by fixed programming. Instead knowledge of languages can be individually extended as desired directly by the user. In this way, many specific communications protocols (EIB, IEC870-5-104, Modbus, etc.) have already been implemented for Saia®PCD controllers.

No Risk, No Limits

If you opt for Saia®PCD, you get maximum functionality, openness, flexibility and reliability at an extremely attractive price. The result for you will be matchless, new possibilities and opportunities.



Communications protocols understood by SaiaPCD

Below is a list of the communications protocols that are currently available with Saia®PCD.

In addition, very many protocols exist that have been implemented by customers and users them-

selves but which are unfamiliar to us and not available through Saia-Burgess Controls. ■

Protocol	Description	Type/Implementation	HW interface
http	Hyper Text Transfer Protocol Web-Server	AS, FW	Ethernet, (with PPP also serial)
FTP	File Transfer Protocol FTP-Server	AS, FW	Ethernet, (with PPP also serial)
SMTP	Simple Mail Transfer Protocol E-Mail transmission	AS, FW	Ethernet, (with PPP also serial)
SNTP	Simple Network Time Protocol synchronization from central server	AS, FW	Ethernet, (with PPP also serial)
DHCP, DNS	Dynamic Host Configuration Protocol, Domain Name System. automatic IP configuration	AS, FW	Ethernet, (with PPP also serial)
SNMP	Simple Network Management Protocol Integration of PCD systems in an SNMP manager	AS, FW	Ethernet, (with PPP also serial)
Modbus-TCP (Client & Server)	Quasi-standard, allows data exchange with many foreign systems	AS, FW	Ethernet
PPP	Point-to-Point Protocol Allows IP protocols to be used via serial interfaces, i.e. AutomationServer can also be accessed via serial interfaces..	AS, FW	Serial
S-Bus	Saia® system protocol	(AS) FW	Ethernet, USB, serial
BACnet	Standard in building automation	FW	Ethernet
Profibus-DP, MPI	Standard in industry	FW	Serial
Can, CanOpen	Standard in industry	FW	Can
Open Data Mode	Freely programmable IP socket interface. Allows the implementation of IP based application protocols (e.g. IEC870-5-104) in IL	FW, IL	Ethernet, (with PPP also serial)
Mode C	Frei programmierbare serielle Schnittstelle. Ermöglicht die Implementierung von beliebigen seriellen Applikationsprotokollen (z.B. EIB) in AWL	FW, IL	Serial
LON on IP	Standard in building automation	FW	Ethernet
Modbus ASCII, RTU	Quasi-standard, allows data exchange with many foreign systems	FW	Serial
KNX, EIB	Standard in building automation (electrical plant)	IL (Mode C)	Serial with ext. converter
MP-Bus	Belimo drives	IL (Mode C)	MP-Bus
EnOcean	Wireless standard in building automation	IL (Mode C)	Serial with ext. converter
Dali	Building automation lighting	IL (Mode C)	Serial with ext. converter
M-Bus	Metering bus	IL (Mode C)	Serial with ext. converter
P-Bus (Modbus-TCP)	FBox library for Modbus communication with ext. P-Bus gateway	IL	Ethernet with ext. gateway
IEC870-5-104	Standard in energy and telecontrol engineering	IL (Open Data Mode)	Ethernet

IL: Implementation in user program on IL basis (or FBoxes)

Serial: Onboard or interfaces expandable with F modules

AS: AutomationServer
FW: Implementation in firmware



AutomationServer - brief guide to a successful concept

In the last issue of ControlsNews in 2009, the AutomationServer was one of the defining key topics. It was so important that we even dedicated the front page to it. Over the past year, many technical journalists have picked up the subject and published numerous articles about the AutomationServer. The utility of this concept was obvious and so there was great interest in it. For the «Peace of Mind» quality label in building automation, the availability of an AutomationServer in each control/automation device is an indispensable precondition.

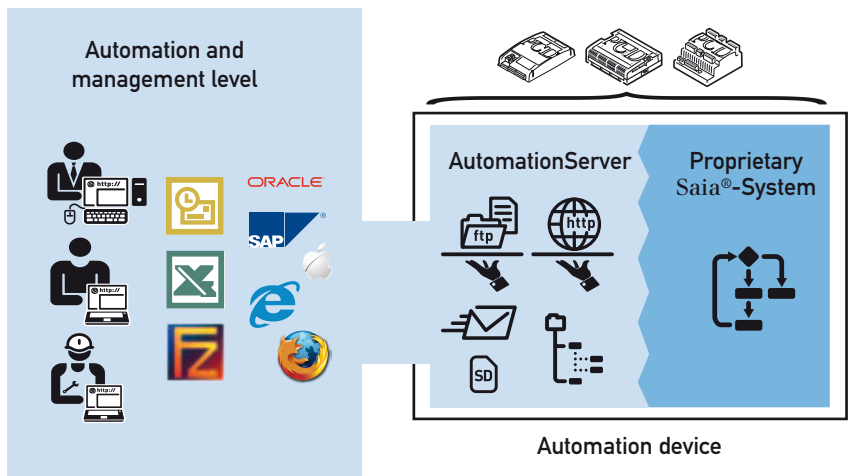
The term «AutomationServer» is used in many of the contributions to the current issue of ControlsNews. For this reason, the concept of an AutomationServer is briefly summarized here, both to refresh memories and as a quick-start for any first contact with the idea. For ease of understanding, this summary takes the form of an interview. It does not aim to be an exhaustive treatment of the subject.

Why is the AutomationServer so attractive for users and final customers?

With the AutomationServer it is possible to rely purely on capabilities and tools that are already available in-house and known to everyone for the operation and maintenance of an automation system.



tem that is open to the outside world and can be accessed directly with Windows® and programs like Microsoft® Excel.

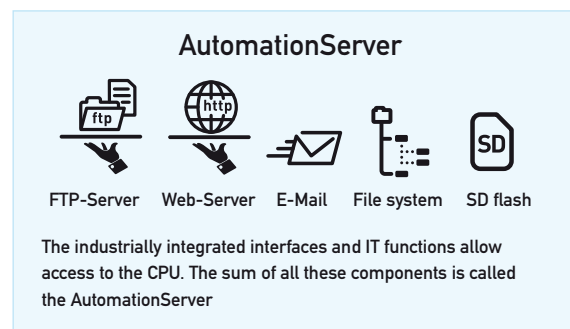


All users can access the automation device directly for operation and maintenance. They do not need any special software for this, but just use their standard software tools.

What is an AutomationServer in functional terms?

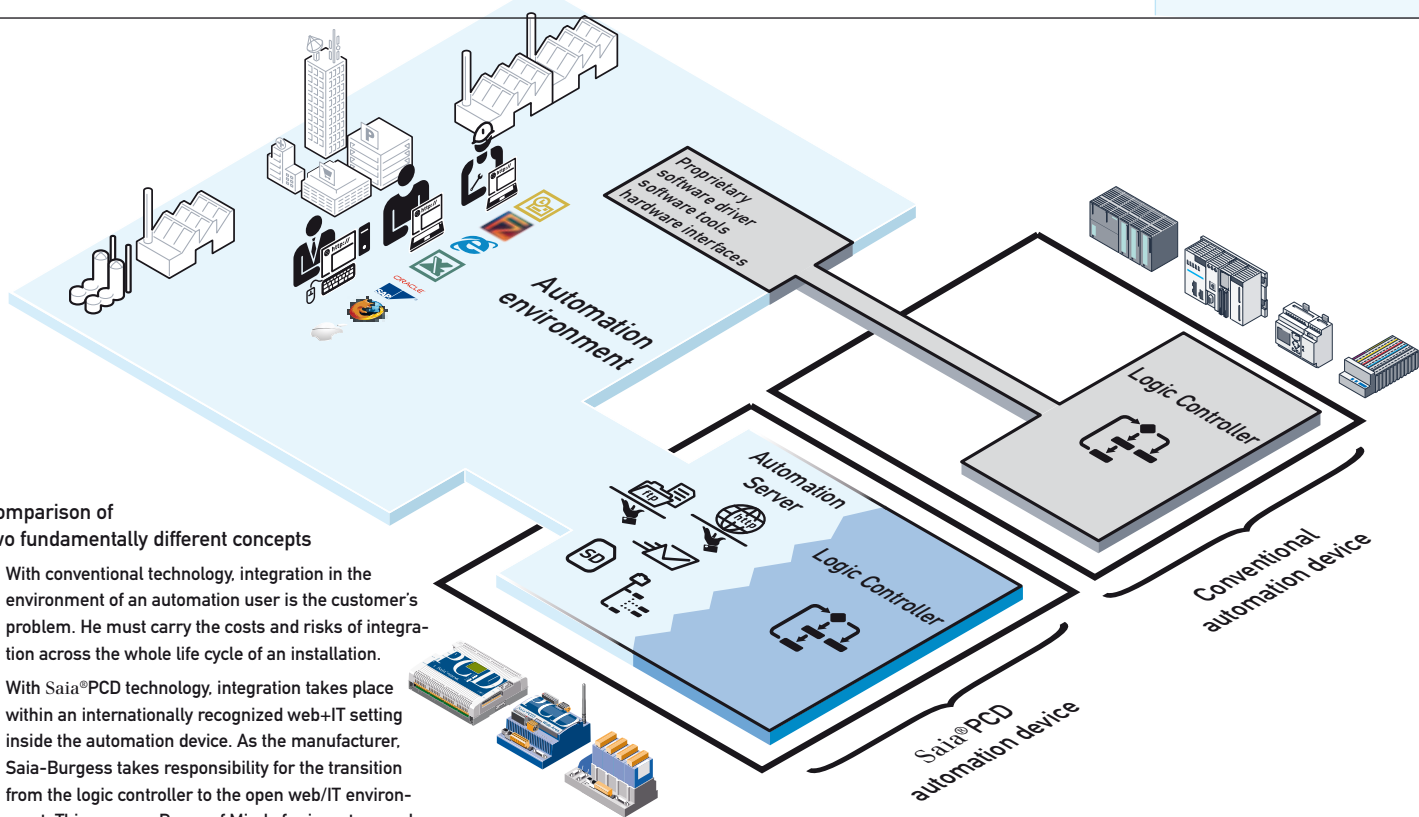
It is a combination of web and IT functions that have been fully embedded in an automation device. The formula in the context of the automation world is: Web + IT = AutomationServer.

The AutomationServer offers several server functions at one time. These are: an FTP server, web server, SNMP server, e-mail service, etc. In addition, the AutomationServer contains a file sys-



If a device offers all these functions, does that mean it also has an AutomationServer?

No. These functions are a necessary precondition, but not sufficient in themselves. To achieve the essential benefit for the user, it is necessary to have these servers fully integrated in the actual automation/logic control application. All data, functions and objects of the proprietary automation device are made available by the AutomationServer in a non-proprietary, internationally known way.



Comparison of two fundamentally different concepts

- With conventional technology, integration in the environment of an automation user is the customer's problem. He must carry the costs and risks of integration across the whole life cycle of an installation.
- With Saia®PCD technology, integration takes place within an internationally recognized web+IT setting inside the automation device. As the manufacturer, Saia-Burgess takes responsibility for the transition from the logic controller to the open web/IT environment. This means «Peace of Mind» for investors and operators – now and in the future.

Is the AutomationServer sufficient to allow access to an automation device throughout its life cycle?

No. For programming and debug purposes, one still has to know the internal resource model of an automation device's logic controller and be able to bypass the AutomationServer to access the logic control side directly. Developers of applications software have to deal with this during the innovation phase, but nobody else. Throughout the utilization and maintenance phase, users/owners can access automation applications directly from their own environment, without special software or additional middleware, to operate, document and monitor them.

Where does the difference now lie compared with previous conventional approaches to automation?

Until now, manufacturers of automation technology have behaved as if the whole world revolved around them and their proprietary technical standards. Every user had to adjust himself to the proprietary interfaces and standards of all the devices on his premises. The complexity of interaction between different automation devices was further increased by costly and cumbersome quasi-standards for specific industries and segments.

The AutomationServer reverses the situation. Manufacturers have to adapt themselves and their device interfaces to universal, widely known web/IT standards. That is simpler and much more sensible than the old way which, in contrast, passed on the work, risk and any difficulties over the entire life cycle to the buying customer.

How do customers use the AutomationServer concept with existing old installations?

They modernize the management and automation levels, along with the whole control concept, by setting up Saia®PCD automation devices with their integral AutomationServer as «technology gateways» over the existing automation technology. In the Saia®PCD logic controller, the different proprietary protocols and resource models of the old devices are mapped onto the Saia®PCD model. This means that the entire installation's data and states are available via the AutomationServer. It is therefore possible to economize on maintenance for the many proprietary manufacturers' standards present.

What does the future look like for the AutomationServer?

It will become a universal standard provided on ever smaller platforms, even for field devices. Progress in processor and memory technology makes the added cost for full integration vanishingly small. Web and IT standards stand open to integration by every manufacturer. This is not technical wizardry. The greatest stumbling block to achieving currency for the AutomationServer is the healthy profits and comfortable tie-in with customers enjoyed by many manufacturers, purely because they limit their customers and users to their own proprietary world. ■



The current situation in automation is very similar to conditions in the Middle Ages, when tolls had to be paid each time a border was crossed. Throughout the life cycle of an installation, proprietary software drivers, software tools and hardware interfaces must be maintained for the automation system installed. Automation manufacturers make every effort to keep their customers close and achieve more add-on sales.

Peace of Mind: what does that mean?

«Peace of Mind» signifies a deliberate departure from the widespread «Cheap in Mind» decision process. With «Cheap in Mind» it is an absolute priority to squeeze construction costs by every means possible until the property reaches commissioning. Price is everything. The aim is simply to minimize construction costs, without regard to any negative consequences or side effects. However, this cost area (including planning) accounts for on average less than 17 percent of life cycle costs (source: FM Symposium on Industrial Construction, 2008). In contrast, the aim of «Peace of Mind» is to minimize 100 percent costs, along with worry and troubles, throughout the life cycle costs of a building.



The main push for economies here is directed at the building's utilization and operation phase – because that is where the great unexploited potential can be found! However, this potential can only be unlocked if planning and integration work is seen as the essential key to reducing costs, problems and worry. There is enormous potential added value in planning and integration. With the «Peace of Mind» approach, this potential can be exploited thoroughly and reliably.

It should no longer be normal practice for device manufacturers to apply cost pressure to planning companies and use «free» preliminary planning work as a way of placing their obsolete, completely proprietary automation technology.

Once these device manufacturers have a foothold in a property, many attractive income streams become possible for them over the whole life cycle of an installation.

In addition, a «Cheap in Mind» philosophy during the construction phase draws the operator/user of a property into dependency on the big automa-

tion companies. They can afford to subsidize initial costs with very favourable prices, while looking forward to high subsequent receipts during the operating phase.

These traditional market mechanisms lead to very low profitability for the property and therefore also to dissatisfied users and operators. They also act as a block to progress and innovation in the technical equipment of buildings. However, progress and innovation are precisely what are needed to meet the challenges of the future.

Only the developer or investor can resolve this muddled situation. He must be able to apply the same technical measuring tool to all automation solutions offered. And this measuring tool must be vendor-neutral when showing him what is technically feasible and useful. It must therefore define the technology that will systematically minimize for him all trouble, risks and worry over the whole life cycle. This is the technology that will result in his «Peace of Mind» regarding building technology. The vendor-neutral «Peace of Mind» tendering texts that we make available to planners and developers have since become a proven means by which, in the planning and contract award phase, the legitimate interests of users and the investor can be asserted. The «Peace of Mind» logo has been registered as a quality mark for building automation solutions and may be used by all who in their submission adhere to the specification according to «Peace of Mind» tendering texts.

A further step is being taken in 2010 with the introduction of a certification procedure for the implementation and handover of «Peace of Mind» automation solutions. This involves inspection and assessment by a neutral body, after the commissioning phase, to determine the extent to which «Peace of Mind» has been implemented in the finished property. The client is not only certain of having a good automation system in the property, but also receives confirmation in black and white of how well it has been implemented and delivered.

The combination of «Peace of Mind» tendering texts with the «Peace of Mind» implementation audit will bring all solution suppliers into open, honest competition and give developers powerful leverage for their legitimate interests.

Test plaques for switch cabinets and audit report.

Graded according to quality of «Peace of Mind» building automation solution.

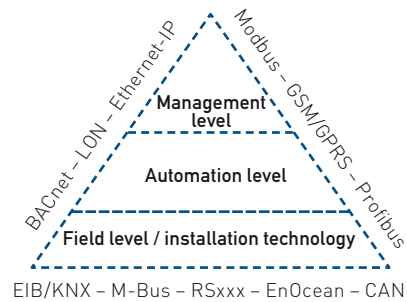


What are the main pillars of «Peace of Mind» in building automation?



1. Openness and flexibility in all directions combined with generally applicable technology standards

Building automation is not a separate world with its own special ways defined by a particular supplier, but open, inwardly and outwardly porous, and capable of diversity in its arrangement.



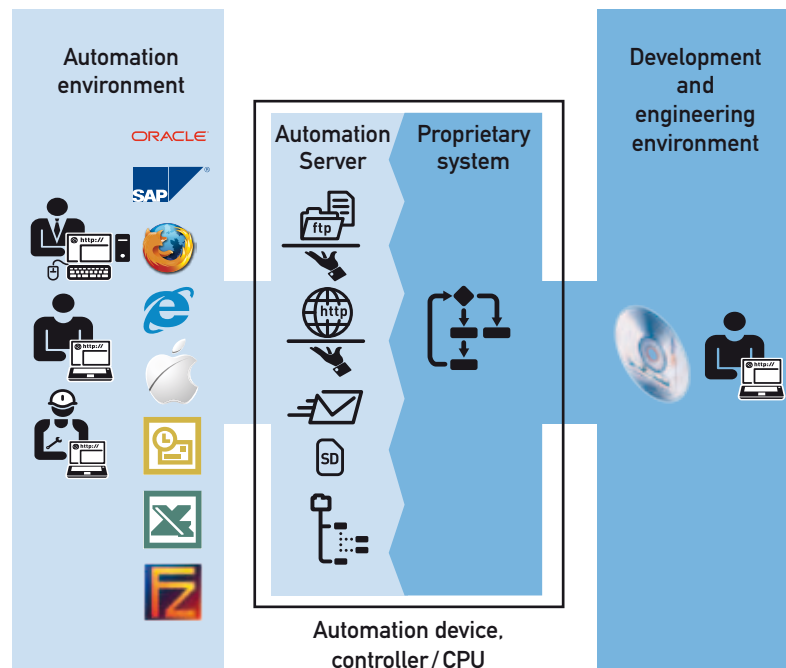
Target model of an automation system – no limits, no obstacles!

2. Differentiation between the development process of an automation solution and maintenance / normal operation

The user and operator should not have to use proprietary software or hardware for maintenance and optimization. His existing in-house technology and standard software are sufficient. A technician will only still require proprietary development tools for development work. All other groups of people will not be concerned with it.

3. Application software at all levels is freely expandable by many engineering companies

For the operator, this means a free choice of service and solution provider – and the confidence that someone will always have time for him when he needs help.



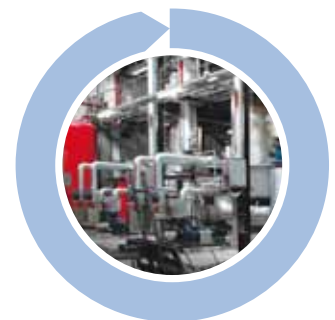
Operators and users view automation technology through their own lens with their own methods. Only the application developer still needs complex, dedicated software tools.

4. Modular hardware with life cycles to match the installation – no risk, no limits

In the automation of buildings, the unpredictable is always there during construction, commissioning and optimization phases. Requirements in the utilization phase are changed, standards and the technical equipment installed call for adjustments to the building automation. This must always be quickly and easily feasible – and without risk. Therefore, in your building you only install technology that is capable of modular expansion, which can be changed any time over the life cycle of the installation. Compact, dedicated automation devices can suit production machinery and other machines, but not building projects.



Freedom and flexibility due to high level of modularity and compatibility across all product families



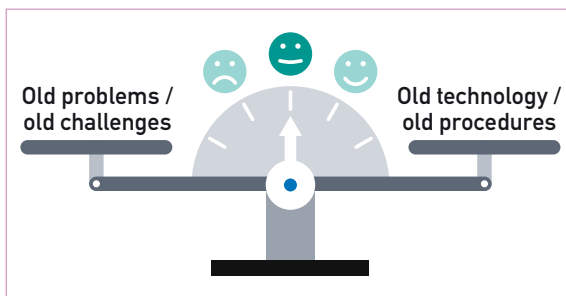
Automation devices and system both have a life cycle of 15 – 20 years

Strategic considerations

«Peace of Mind» today and in future – thanks to innovation

Most operators and investors today can more or less live with their building automation technology, but are not really satisfied. Closed, proprietary technology, expensive control engineering, and the high costs and risks of making changes already add up to a rather uneasy feeling.

The operator/investor can still more or less live with the situation. Problems – solutions are almost evenly balanced.



However, the future will bring operators and investors a few additional, inescapable challenges:

1. The CO₂ emissions of the industrialized world must be reduced

According to the G20 summit of June 2009 a reduction of 82% is necessary by 2050. By 2020, i.e. in the near future, more than 50% of that must be achieved. This will definitively change building engineering.

2. The age pyramid of the western world is already having a marked effect on the job market

In 10 years' time, for every experienced professional retiring from the technical workforce in building engineering, there will only be half of one newly trained person coming onto the job market. By this time, all new projects currently being planned will be barely half way through their life cycle.

What you have now, and what you need to renovate in the meantime, must be capable of continuing to run reliably with half the technical staff.

3. Requirements for flexibility, comfort and functionality in buildings are rising

The means to satisfy these higher demands are still hard to find.

In view of these serious and inescapable challenges, the mood of operators and investors is shifting significantly out of its state of equilibrium.



What to do? Technical innovation is called for
For investors and operators, the question now is what counterweight to place on the scales at least to achieve equilibrium again.

Is it just going to be more pressure on existing suppliers, more motivation, more pressure on staff, etc? These methods hold out little promise of success when one considers the severity of the challenges and the fact that, in most companies, pressure on performance is already high.

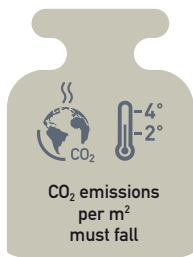
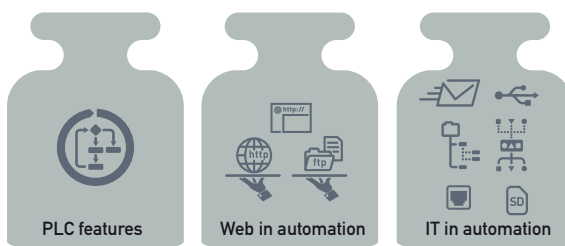
The only realistic way of looking forward with peace of mind to the future is technical innovation. This has always been the case throughout human history.

But what are the technical innovations that will allow operators and owners of buildings to come to grips with a future that will confront them with both old and new challenges?

There is a combination of three technical innovations which, in total, weigh more than all the new challenges together. One or only two are not enough to return to equilibrium. But if one uses all three, the scales are tipped towards a more positive and happy mood, come what may!

The three separate innovations are:

1. Consistent use of the technical features, values and life cycle of PLC technology also applied to building automation
2. Full integration of web technology across the automation system
3. Full integration of IT technology across all automation devices

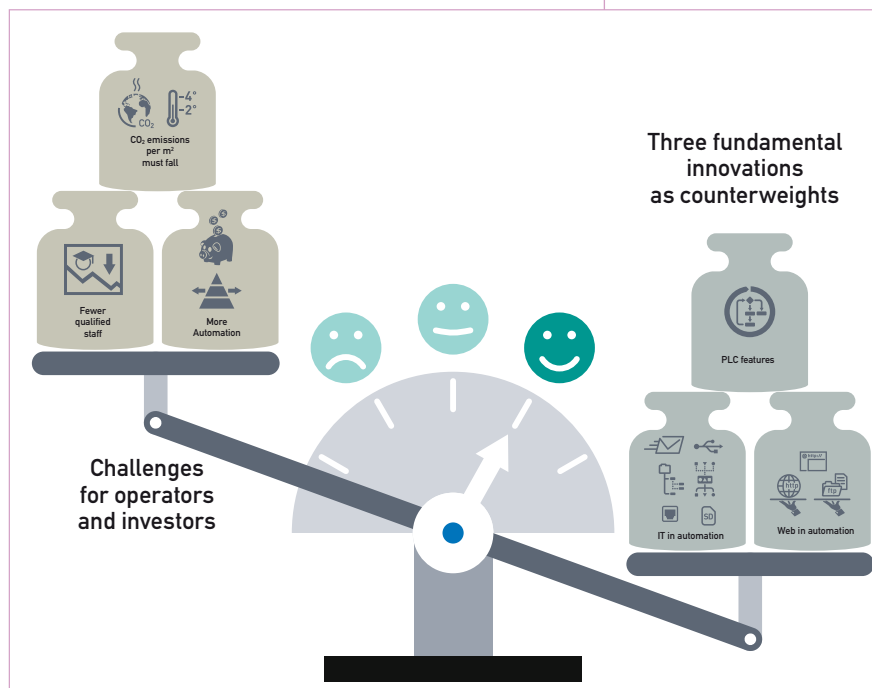


These three innovations do not depend on proprietary or closed technologies. On the contrary: they are widespread all over the world as familiar and accepted standards. The individual achievement of Saia-Burgess has been in each case to be the first to bring these technologies to the market in a consistent and fully integrated way. In addition, by the skillful use of these three technical innovations, we can achieve significant added value.

By the mid 1990s, Saia-Burgess was already the clear front-runner for the use of PLC technology in building automation. At the automation level, dedicated cheap controllers were dropped and a move was made instead towards open, freely programmable technology in industrial quality.

At the turn of the 21st century, Saia-Burgess started with web technology and even then implemented a web server as an integral core element of all new automation devices. Then, from 2005 and once again fully integrated across all device types, diverse IT functions were added in industrial quality.

With the combination of these three innovations we are highly successful, because their customer benefit is very convincing and much greater than with comparable conventional systems. It is a complete paradigm change for users and operators.



As a consequence, in 2008 und 2009 Saia-Burgess was able to grow in its core infrastructure automation markets by 20% and 10% respectively, and gained massively in market share. ■

Peace of Mind

«Peace of Mind» is a new, vendor-neutral quality label (guarantee mark) in building automation. It can only be used for non-proprietary, open automation solutions and not for any specific product. «Peace of Mind» stands for the systematic minimization of worries, trouble and toil for operators and investors through the concrete, technical definition of permitted automation technologies – to apply throughout the whole life cycle of an installation. Anyone using the «Peace of Mind» guarantee mark for quotations and project planning is obliged to satisfy all the specifications of the preliminary tender texts (LV preliminary texts).

It is left up to every interested planner, investor or operator whether they adopt the «Peace of Mind» specification for themselves in full or only in part. No indication of origin/source is required. By adopting the texts, they can effectively and confidently call for state-of-the-art technology from contractors for their projects.

«Peace of Mind» tender texts are available under www.pom-automation.com

Everyone who satisfies the POM guidelines is entitled to use the «Peace of Mind» logo.

www.pom-automation.com



TÜV Süd: front runner for quality in building automation



The German Association for Technical Inspection TÜV Süd is a neutral company with worldwide involvement and over 30 000 employees. It includes a wholly owned business unit that carries out the certification and technical inspection of building technology. Alongside the traditional subject of safety, an important role is also played here by quality testing. In this case, quality is understood to be the delivery of features and expectations promised in the tendering and contract award procedures.

In the planning phase of construction projects, vendor-neutral tender texts are used in accordance with the «Peace of Mind» guarantee mark (www.pom-automation.com) for building automation solutions. In collaboration with Saia-Burgess as owner of the guarantee mark, TÜV Süd has developed and standardized a practical, efficient inspection and assessment procedure for the sustainability of building automation solutions. The test has been designed for simplicity and efficiency. Small and medium-sized projects should be inspected in less than one day on site.

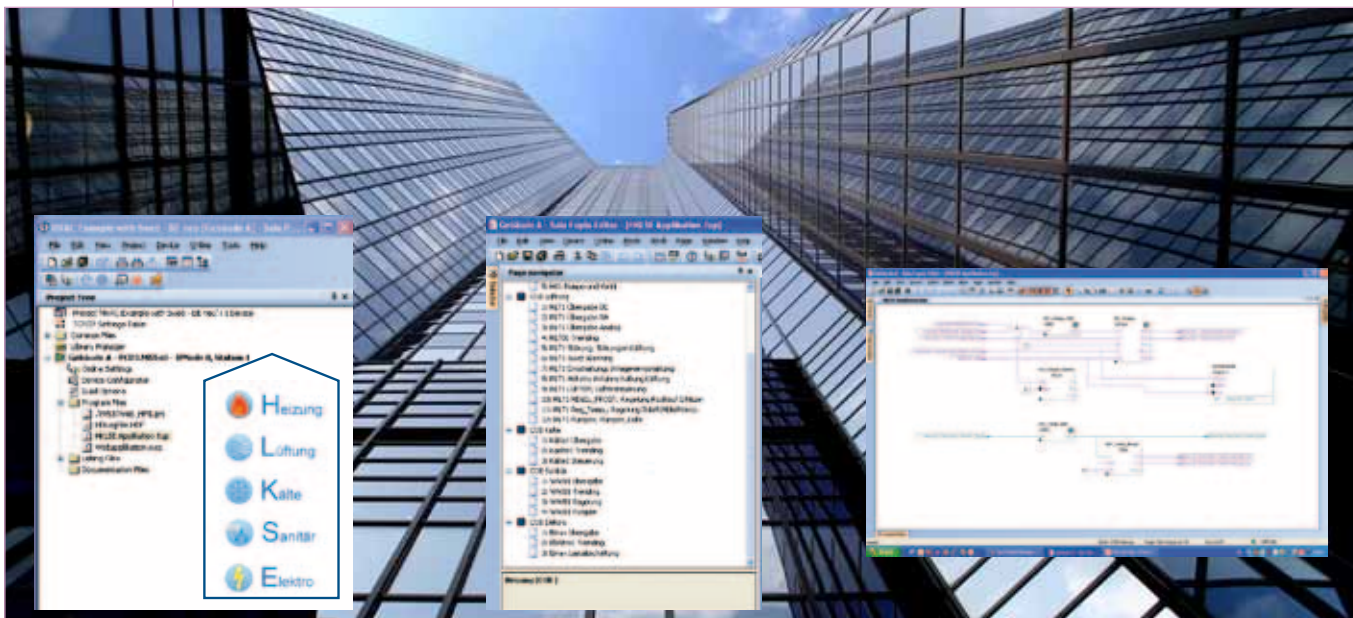
To ensure vendor-neutrality throughout, from tendering process to on-site inspection and ultimate certification, a client can on request obtain the «Peace of Mind» test plaques in complete anonymity from TÜV Süd. Saia-Burgess, as owner of the guarantee mark, has delegated this authority to TÜV Süd in the official regulations governing the mark. In this way, Saia-Burgess will not learn when or where in the world a building automation solution from Siemens, Kieback&Peter, Sauter, etc. is being tested according to POM criteria.

Project Engineering – Part 2

Easy, cross-facility automation with Saia®PG5 V 2.0

The last issue of Controls News described over five pages the fundamental mechanisms and procedure for combining Saia®PG5 Controls Suite and Saia®PCD devices in the implementation of automation projects (see box).

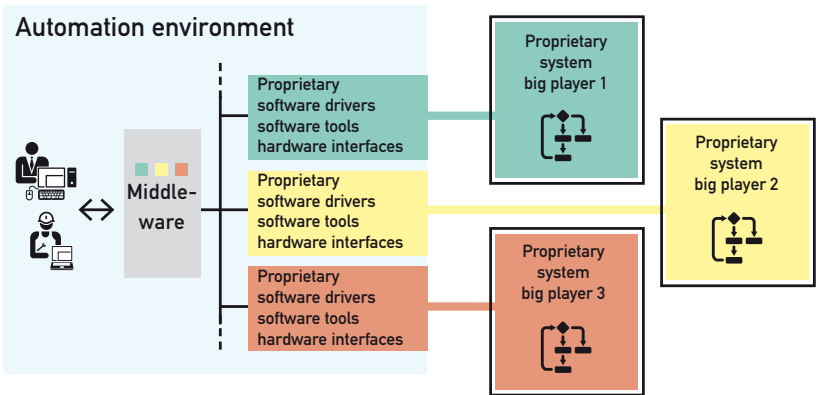
In this article we will pay particular attention to the subject of cross-plant automation. This is an extremely important hot topic at present, particularly in the context of increasing the energy efficiency of buildings.



An extreme case of the classical way
 With dedicated automation devices, usually by different manufacturers, automation takes place separately for each plant group. The «plant crossing» is then implemented with a combination of middleware-software (e.g. OPC server) and management system software. This involves transporting field level data and states up via the automation level to the management level, where they are convert-

ed and passed back down to the automation level for cross-plant automation. The system technology of this cross-plant automation solution is quite shaky, prone to error, and has many bottlenecks. Moreover, its life cycle will be short. The repeated investments and difficulties associated with it are determined by its shortest lived member. This will usually be the middleware and management system software, running on Windows® operating systems.

Since cross-plant data and states can only be mapped via the management system, it is necessary to have PCs with costly software licences and high maintenance charges to the central IT department as operating stations.



An extreme case of the classical way: the client with his management system software and all the complex communications paths becomes a middleware operator

The Saia®PCD way
 Saia®PCD automation devices, with their large number of interfaces and protocols, can read the field level data and states of all plant groups to be processed and make them available to all applications as an open resource. Large local memory volumes (up to 4 GBytes) allow the data and states of all plant groups to be archived in the Saia®PCD, with no PC technology or management system software at all.

Based on the resources now available in the Saia®PCD automation device (I/Os, virtual data points, parameters, history data, alarms, etc) applications can now be created with «graphical engineering» for the different plant groups (HEAVAC, sanitary and electrical).

This is also precisely as represented in the project overview of Saia®PG5 V.2.0.

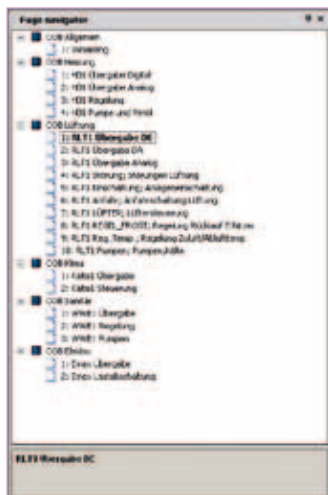
Alongside the plant groups that will often classically be planned and installed separately, it is also possible to create overarching virtual «plant», which by definition will «cross» the entire automation pyramid. Examples of this are data management and wide-area automation via telecommunications networks.

The particular advantage of having different plant groups integrated within a single automation station is also evident in local control and monitoring. Every application (plant group) shown in the Saia®PG5 also possesses a web application in the Saia®PCD web server.

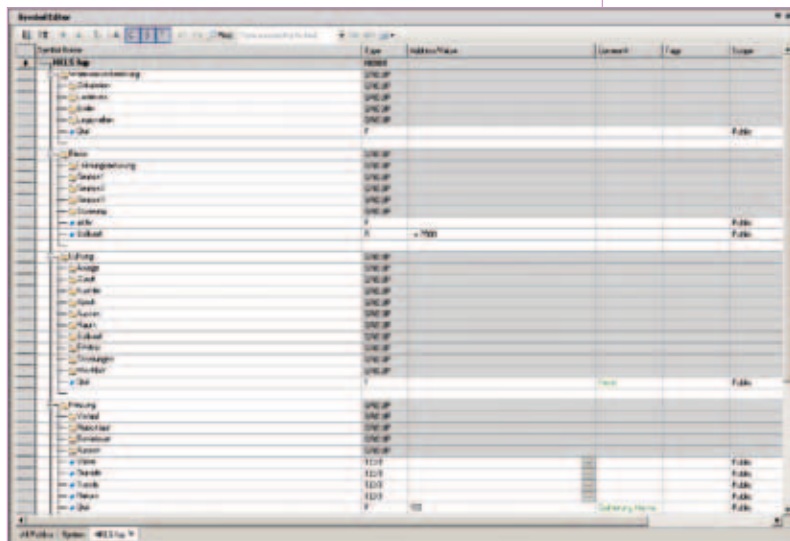
Cross-plant control and monitoring can take place with any browser-compatible device, including Saia®PCD Web-Panels. No PC or special software is required.

If a realistic period of more than 15 years is considered during integration of plant groups at the automation level, life cycle costs and expenses are significantly lower than with the conventional, classical approach. These are the cornerstones of «Peace of Mind» for users, operators and owners.

Go to web address http://s-web-demo.sbc-support.ch/Start_de.html, where you can access a live cross-plant application and also download the relevant Saia®PG5 project. ■



Each plant group can be implemented in its own part of the project on a single Saia®PCD CPU. The resource/symbol pool is automatically used in common.



Resources from widely differing plant groups in a Saia®CPU represented in the Saia®PG5 V.2.0 symbol editor

Summary

Infrastructure automation, project engineering – part 1;

Controls News 11, page 34–38

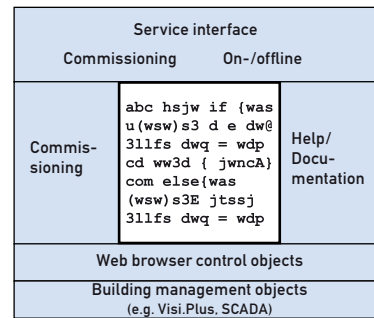
1. Saia®PG5 offers a way of solving even highly complex, individual automation with purely graphical engineering and no text programming at all. A large library of fine-grained to highly modular graphical automation projects forms the basis of this.

2. The graphical automation objects are not black boxes, but can be opened, read and functionally modified in their program code. A programmer can use this modified code – or code of his own – to generate further new graphical automation objects and engineer a graphical solution.

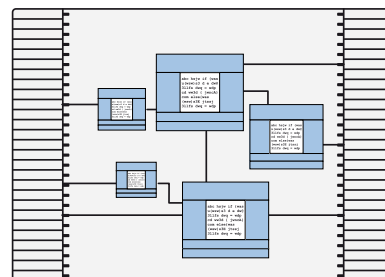
3. Like Java and Microsoft®.NET, this automation object program code is also interpreted as code on the target platform. This means that application software is not hardware dependent, but can be ported across various hardware platforms and possibly used for many decades.

```
abc hsjw if {was
u(wsw)s3 d e dw@
311fs dwq = wdp
cd ww3d { jwncA}
com else{was
(wsw)s3E jtssj
311fs dwq = wdp
```

Text forms the basis of every program code



A Saia®PG5 automation object – PLC program code encapsulated with everything necessary for purely graphical automation engineering.



A Fupla page with logically linked automation objects (FBBoxes) maps the control and automation of part of an installation.

Rejuvenated and given a new lease of life – LonWorks is the latest thing again



«Is LON still around?» That is the question interested people put to us in some places as they leafed through the Saia®System catalogue and suddenly discovered a double-page spread full of innovations for LON. The new LON integration for Saia®PCD systems consists of a new LON configurator (seamlessly integrated into PG5 software) and flash memory module with LON-PCD firmware.

The LON memory modules (PCD7.R581 with user file system and PCD7.R580 without) can be used on all PCD3.M5 and PCD2.M5 systems with an Ethernet port. For the PCD3.M3 series, functionally compatible I/O modules (PCD3.R58x) are available for slots 0-5.

Fewer mouse clicks per data point

The LON configurator allows for a fundamentally new engineering procedure: fewer mouse clicks per data point! Three windows arranged side-by-side and a clearly set-out tree structure make editing a LON configuration as intuitive as writing from left to right. In the left-hand window, templates for individual LON data types or entire function profiles can be loaded and then used – in the middle window – to derive one's own templates. Once they have been edited in this way, the templates can be stored in separate XML files and reused at any time, even in other projects. It is in the right-hand window that the actual LON configuration takes place. Just a single entry is needed to generate at a mouse-click as many instances as desired of a template in the PCD configuration.

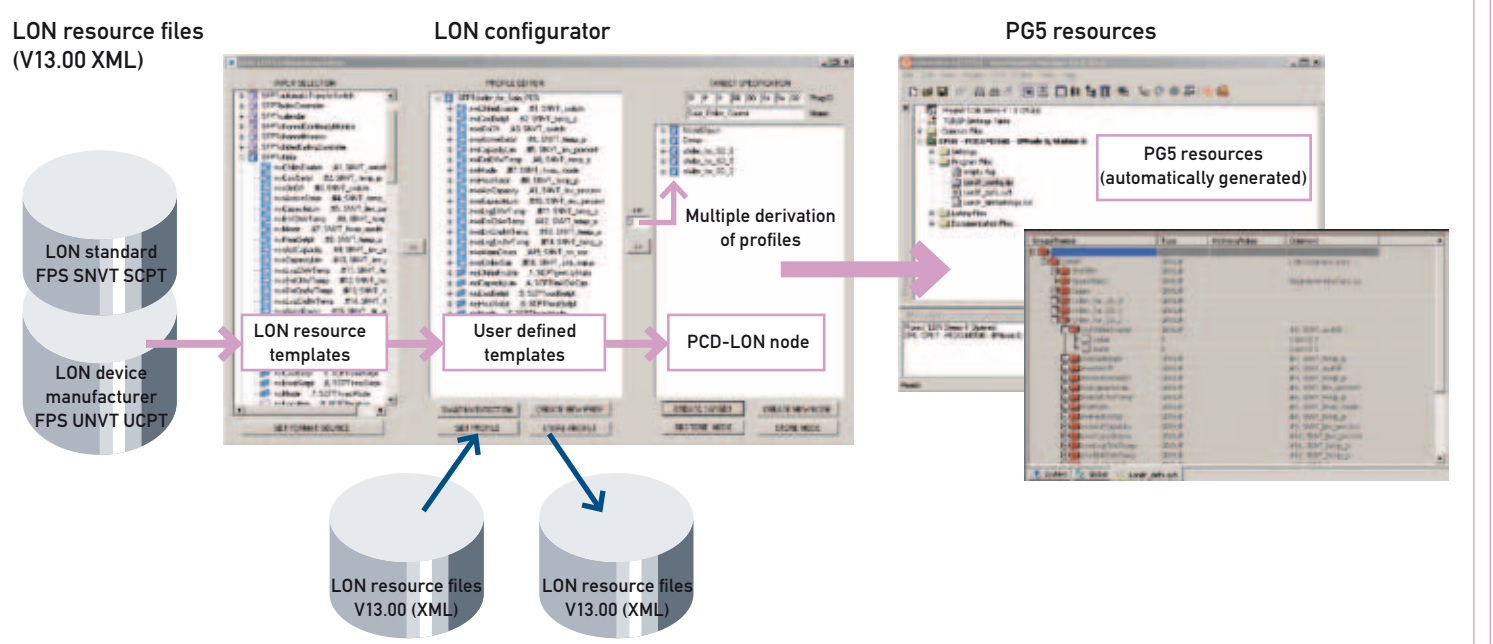
Capabilities that were previously unknown outside object-oriented software development

are now available in user-friendly form to Saia®PCD system integrators: encapsulation of functions in templates, reuse of existing ones, using the familiar to make something new, and finally transferring it as often as required into the PCD configuration. Global symbols as the interface from the configurator to the PCD program (Fupla, IL..) are generated automatically. In this way, LON configurations can be produced flexibly as required and with astonishing efficiency throughout! This has again enabled Saia®PCD to take the lead among freely programmable LON controllers.

Why does Saia® invest in LonWorks technology?

Does LON really have a future? We say, yes it does! On 3rd December 2008, ISO/IEC elevated LonWorks to an international standard as a communications protocol in building automation (standard 14908). This represents an important milestone for acceptance on the market. The discussions are now finally over regarding whether the BACnet®, LON or KNX-EIB protocol will prevail: all three will remain, because each protocol offers special advantages in its own field.

LON IP, efficient engineering with templates



But that is not all: standard 852 has defined a LonWorks communications protocol based on Ethernet/IP. This means that transmission speed bottlenecks are conclusively a thing of the past. Today, thanks to standard IP technology, LON networks can be operated in parallel with BACnet®, KNX-EIB and web services on the same infrastructure. Saia®PCD systems can, of course, be seamlessly integrated here.

Parallel to this, LonWorks has defined a new «Resource Format» in version 13 for the standardized description of data points and function profiles. This resource is a fully XML-based description of standard and user-specific data points and function blocks.

We have seen how LonWorks has significantly grown in functionality and early responses from the market confirm that LON-based automation solutions are once again gaining market share.

What a resurgence! Thanks to the fully integrated, innovative implementation of LonWorks, BACnet® and KNX-EIB standards throughout all Saia®PCD systems (PCD3.M, PCD2.M5 and the new PCD1.M2120) a planner can now seek out the right protocol for his application without risk.

Peace of Mind with LonWorks and Saia®PCD

«Peace of Mind» (POM) is primarily directed towards the end users, operators and planners of installations and buildings. It is a concept that shows how much added value can be obtained over years of operation if one follows a few principles, starting from the planning phase.

The purpose of POM is to protect investment in such a way that an installation's life cycle is considerably extended through better maintainability while, at the same time, the possibility of including new technologies is always retained.

Over a period of 10 to 15 years, most buildings will change. It is good if building automation can cooperate flexibly with these changes. The right choice of control and automation systems plays a crucial role here. Only a system that is freely programmable and whose «program» remains compatible and expandable across device generations can be considered for such use. The same also applies to the choice of communications interfaces.

Let us look at the example of LonWorks: more than eight years ago, Saia® made available an innovative LonWorks interface for the PCD1, PCD2 and PCS. Installations dating from that time can today still be maintained and extended with the Saia®PG5 Engineering Suite. The integration of current controllers (e.g. PCD3, PCD2.M5) is, of course, also possible with LonWorks.

LonWorks unlocks growth

The LonWorks market today is rather like a fan club. Products can only join the club if they have



LonWorks integration as their entry ticket.

So this year, in response to the publication of our new LonWorks solution, we have already been able to gain new customers in France, Germany and Switzerland. It should be particularly stressed that these companies were not unfamiliar with Saia®PCD, but the previous lack of a LON interface prevented them from using it. We are all the more delighted with the lively demand for pilot projects and with our positive experiences, which already amount to more than thirty.

Example Austria

The company Hölzl is known for innovative building automation and has relied for many years on Saia®PCD and LonWorks. They were the first to use our «Lon-on-IP» solution in Austria for famous Hotels and in the Ukraine for the automation of a luxury villa.

Example France

In April 2009, Carrier Service arranged for their staff to be trained on Saia®PCD systems. They are entering the market with projects in France, Italy (Milan) and Morocco.

Example Germany

In Berlin the company Fichtl und Neumann GmbH combines single room control and lighting based on LonWorks with Saia®PCD systems; while in Hüfingen the company Schmid Schaltanlagen provides innovative audio/video media control and single room automation combined with Saia®PCD3.M5540 controllers. ■

New BACnet® standard 2008 – We keep our BACnet® solution up-to-date and expand functions

BACnet® is the only open standard in building automation to have been developed cooperatively by the building technology industry in America, Asia and Europe. This licence-free protocol for «Building Automation and Control Networks (BACnet)» allows systems from different manufacturers to work together across plant groups. BACnet® looks after the fully integrated flow of data from management technology, through digital control systems, all the way to sensors and actuators. This brings economic advantages, investment security and a head-start in installation, expansion and operation. It builds up powerful building systems that match the new economic and ecological requirements. The advantages are vouched for by the fact that, for example, major end customers in Germany depend completely on BACnet®.



BACnet® is a living standard. Last year, BACnet® certification occupied the foreground, but in 2009 a new milestone was already reached: the new BACnet® standard was published as ANSI/ASHRAE standard 135-2008. New BACnet® objects and services have been added and the BACnet® test plan (BTL) was also revised. In technical circles, it is taken for granted that these innovations will also be included in the DIN EN ISO standard 16484-5. Even after this growth, there are no limits to the standard's dynamism. Lighting control, improved access control, an add-on for the Japanese market, XML data formats and a much expanded set of BACnet® profiles and functionalities are all in preparation.

BACnet® is programmed for the future. Important extensions to Saia®PCD systems will therefore be available by summer 2010:

- The engineering will again be considerably improved by a new BACnet® FBox library. These FBoxes automatically generate the BACnet® configuration, connect PCD resources (registers and flags) with BACnet® properties and so blend the BACnet® configuration with the PCD program.
- For the seamless integration of BACnet® in web projects, the PCD will receive an additional BACnet® CGI and HD log interface. This will allow parameters to be set for trend data, scheduler programs and calendars to the full extent, even via the web.
- Multi-trach trend plotting. Something taken for granted with HD log will now also be possible

through BACnet® with the new Trend-Log-Multiple object.

- A new BACnet® object called «Event-Log» allows events to be logged directly on the PCD and called via BACnet®. No more alarms will be unobserved and lost when communication is interrupted – very interesting for the networking of distributed properties.
- A key factor for the networking of a building with energy suppliers is the integration of load control. It allows energy consumption to be controlled to match demand. Bringing peak loads in the supply networks under control is becoming ever more important. We can track this trend directly in the encouraging results for Saia® energy meters with S-Bus interface. With the help of Saia®PCD, an intelligent program and the new BACnet® Load-Control object, an innovative overall system can be created for energy optimization.
- A designation key for object names is good for orientation as to which systems and components are located where in any building. However, the interpretation is often not self-evident. The new Structured-View object displays a map of a property in its different structural and system parts. Existing BACnet® objects can now be assigned to this structure according to their function. This lets SCADA systems call target data from specific parts of a system without prior engineering.

The fact that BACnet® picks up innovative ideas and defines them in the standard is the reason investors can rely on it. Saia®PCD systems with BACnet® will accompany an installation throughout its life cycle.

More extensive literature and the ANSI/ASHRAE standard 135-2008, BACnet® – A Data Communication Protocol for Building Automation and Control Networks ISSN 1041-2336 will be found on the homepage of BACnet® Interest Group Europe (www.big-eu.org). ■

Saia®PCD BACnet® controllers gain approval for use in Fraport AG airports

Fraport AG is the operator of Germany's largest airport, Frankfurt am Main, and also co-owns and operates other airports throughout the world. In 2008 Frankfurt handled 53.5 million passengers and around 2.1 million tons of freight, excluding airmail. The airport zone comprises an area of approx. 21 square kilometres.

Over the next few years, Fraport plans comprehensive modernization and reconstruction activities with an investment volume of 7 billion Euros. Building automation will continue to have an important role in this investment, as it has for many years.



By using the most modern building automation technology and networking all controllers, energy consumption is to be reduced and CO₂ emissions consequently lowered. Another aim is to standardize building automation and so minimize operating costs for the service and maintenance of properties.

This will be achieved through the systematic implementation of integrated technology throughout, using only components with the appropriate approval.

As early as 2005, Fraport opted for the open BACnet® data communications protocol, not just to allow standardized technical communication between separate automation stations and from them to the building automation management level, but also to avoid dependence on individual manufacturers.

Furthermore, requirement profiles were defined by Fraport for the BACnet® objects and BACnet® services that were to be supported, in order to cre-

ate a uniform technology standard for the use of automation stations from different manufacturers within the BACnet® field.

To ensure that the requirements defined were met by manufacturers, Fraport set up its own BACnet® test laboratory, which checks whether automation stations adhere to the specifications for use in Fraport building automation.

In September 2008, the company Saia-Burgess Controls Ltd was invited to undergo comprehensive tests with a PCD5.M5540 BACnet® controller.

After intensive trials, the test laboratory confirmed that Saia®PCD satisfies the technology standards of Fraport with regard to BACnet® objects and services.

On 19th June 2009, the Saia®PCD2.M5 and Saia®PCD5.M BACnet® controller were granted approval for use by Fraport. ■

The current economic crisis sees much greater value attached to the subject of renovation

In times of economic difficulty, major projects are often postponed or even cancelled because of financial uncertainties. Renovation projects have acquired a correspondingly high relative value as a way of guaranteeing reliable, energy efficient operation in existing installations with obsolete technology. When planning any renovation, the greater demands must be reconciled with the available financial context. In addition, new regulations often apply to the operator, such as the European Directive EnEV 2009, which regulates heat recovery in devices for ventilation and air-conditioning technology.

Renovation projects confront system integrators with diverse tasks and challenges. To measure up to them, Saia-Burgess Controls offers wide-ranging possibilities for the efficient conversion of old installations. A typical renovation project was carried out by the company Inga, based in Hamelin, Germany in the course of building alterations to the hospital on the river Weser in the city of Hamelin. Here the old stock of Landis+Gyr equipment was converted on the controller side to Saia®PCD systems. The advantage of this was that all existing data point modules in the old installation could remain in use. Only the controllers were replaced. Gateways from the company Persy are used to couple data point modules from the P-Bus via Ethernet to a Saia®PCD. This has the benefit that the existing switch cabinet can be retrofitted at minimum cost. The use of Saia®PCD systems as the new controller level then allowed connection to an open communications standard like BACnet®/IP and access to the web and IT world. Through the Saia®PCD's

integral AutomationServer, it is possible to implement cross-system control functions, alarm management with forwarding via email and history data management on SD-Flash cards with access via an FTP client. This measure enabled the economic migration of existing controllers onto the available IBS8 building management technology provided by the company INGA, Hamelin.

The Saia®PCD portfolio offers versatile ways to implement projects quickly and at minimum cost in the area of converting, extending or renovating existing installations. Another example of the efficient extension of existing installations is provided by Hanover Airport. Here too the company INGA has made successful use of Saia®PCD controllers. The relevant application report will be found from page 78 in this edition of ControlsNews. ■



Overall view of switch cabinet including existing Landis+Gyr data point modules



Activation of gateways via Saia®PCD3-CPU



New paths in electrical installation: Saia®PCD with bidirectional EnOcean wireless technology

The new bidirectional EnOcean communications library for Saia®PCD systems in the form of function blocks (FBoxes) opens up new solutions for electric plant in particular. All EnOcean components obtain their energy from their environment. For a button, finger pressure is enough; for a temperature sensor or room control unit, a small solar cell suffices to transmit information. This system can be installed anywhere without wiring and reduces to a minimum the emission of electrical energy (electrosmog). Through bidirectional technology, new possibilities emerge. This means that, in addition to receiving EnOcean signals, switch and adjust commands can also now be sent directly from the automation station to valves or light actuators.

Bidirectional EnOcean technology therefore provides a uniform system for electrical and HEAV-AC plant. EnOcean buttons, HEAVAC room control units, remote control units and security components for windows and doors cover the entire spectrum of room automation components with switch actuators and control valves.

For smooth interaction between all installations within a building, Saia®PCD systems can at

any time be extended with open communications standards, such as BACnet®, LONWORKS or EIB/KNX. So that system data too can be managed, stored historically, optimized and forwarded, every Saia® automation system has an AutomationServer (www.saia-pcd.com/AutomationServer). This allows all system data to be accessed and visualized via standardized web/IT interfaces. ■

New Windows® CE and Windows® eXP Web-Panels for wall mounting

The new Windows®-Panels with LX800 CPU are now available in the practical wall mounting set. An ingenious fastening technique ensures fast, efficient mounting. The front frame can be styled by the user for seamless integration into every interior setting.

Mounting a control panel in a switch cabinet is relatively easy. Using a template, draw an opening on the switch cabinet door, cut it out, fasten the panel with the enclosed clips – finished. Mounting on a wall, however, is a much more challenging task. While lack of space makes it hard to do the job with millimetre precision, at the same time aesthetic concerns play a decisive role in living rooms and areas open to the public.

Wall mounted panels are mainly used in living rooms and areas open to the public. Compared with switch cabinet mounting, the determining factors that prevail here are completely different: energy efficiency, shallow depth of device, and an aesthetically appealing front design.

Efficient CPU reduces heat loss

Modern processors usually also produce a considerable amount of waste heat. Wall mounting does not leave much air around the panel, which can lead to excess temperature and system failure. The use of a fan with the CPU is out of the question – a panel in any living space must be absolutely noiseless. The new Saia®PCD Web-Panels have therefore been equipped with a particularly energy saving processor from the Geode LX800 range. They need no fan and are therefore ideally suited to being mounted on walls.

Practical mounting technology for the professional

In switch cabinets, mounting depth is scarcely an issue – on walls however it most certainly is. The fact that some walls may be only 10 cm thick prohibits the use of displays with a projecting CPU backpack. The CPU platform has therefore been specially revised for wall mounting. The result is a maximum mounting depth of 6.8 cm – even for a 15 inch Display.

Anyone who has tried to mount a flush wall socket knows that precision work in masonry is no trivial matter. The wall boxes for insertion of the displays therefore offer a range of practical details that make mounting easier. The first of these to mention is an integral bubble level to assist with the perpendicular mounting of the box in the wall. The display itself can be aligned both horizontally and vertically inside the wall mounting box – allowing small imperfections in the mounting of the wall box to be easily offset. Even the mounting depth can be adapted; such unpleasant surprises as plaster that has been applied to thickly present no problems.



Particular attention has been paid to the positioning of terminals. Sufficient space has been provided for all connectors. Cables can be laid with the correct bending radii inside the box. This cannot be taken for granted with the usual flush mounting panels available on the market.

In the case of mounting solutions that comprise a wall box, display and front frame, particular attention should be paid to logistics. In any building project, the mounting box will be fitted first by the electrical installation engineer. Many months may then pass before the ICA technology – including the display – is installed by the system integrator. To avoid any damage, it is advisable if the front frame is only fitted right at the end. With this kind of job sequence, the box, display and front frame can be purchased separately, saving warehouse and reducing locked up capital.

Individually adaptable front design

Front frames can easily be snapped onto the displays. Apart from the standard aluminium frame, simple frame supports made of metal are also available for finishing. The metal support provides a base for individualized front frames with great diversity of design and material (e.g. wood, glass or stone). This allows displays to be perfectly adapted to room fittings and decoration, creating particularly aesthetic solutions.

Property is a long-term investment. As with every installation in the construction field, it is advisable to ensure that the control panels used are of high quality and that components will continue to be available in future. With wall mounting sets from Saia-Burgess, the construction field has high value, energy efficient control panels that can be freely adapted to the interior in question. They will be a source of satisfaction for many years to come. ■

Standard PC or Web-Panel?

There are numerous reasons to use a Web-Panel instead of a standard PC. The small additional cost of purchase pays for itself many times over in the form of added value for increased functionality and a longer life cycle. A Web-Panel in the wall takes up no space and needs no table. Nobody can manipulate it unintentionally (add-on software, etc.) or simply take it away. Web-Panels are designed for continuous use 24 hours a day / 7 days a week. Further information is available under http://www.sbc-support.ch/ti/26-506_EN.pdf



Enough room for plug connectors



New video for wall mounting set

<http://www.youtube.com/watch?v=HDNgOAE3-I0>

The new Saia®PCD7.L79x system of compact room controllers increases individual comfort and the energy efficiency of your building

The greatest potential for saving energy is in the field of networked room automation and its parameters of use. For this, four new room controllers are offered in compact form.



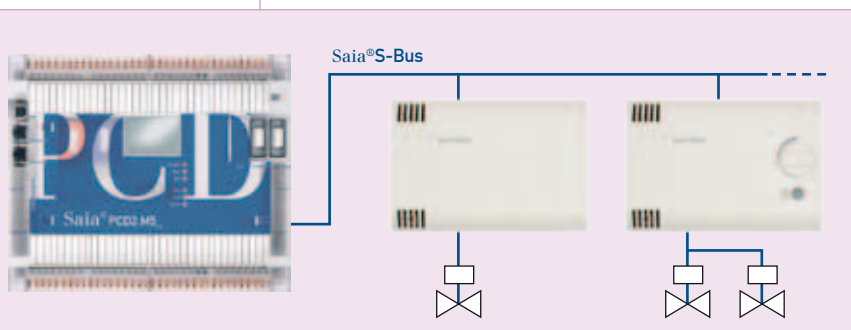
The new Saia®PCD7.L79x series of «compact room controllers» allows for outstanding networkability to the Saia®PCD world via an S-Bus interface. This ensures maximum synergy between the different HEAVAC and electrical plant groups. The four product variants in the PCD7.L79 portfolio give users the necessary flexibility to fulfill specific requirements with the best price-performance ratio. Thanks to their closed housing and compact form, these room controllers save space and are flexible to use, even providing economies in installation costs.

Engineering and networkability

The room controller's integral software modules have parameters that can easily be set for the most diverse application areas by means of the automation system's integral function blocks (FBoxes). This allows the user to implement widely differing applications on the basis of one controller platform.

These practical function blocks (FBoxes) cut engineering time and simplify commissioning, as configuration data can be sent in a single step across the communications port to up to 127 controllers.

Easy networkability and comfortable engineering with Saia®PCD7.L9



PCD7.L79x compact room controllers are software-compatible with the existing PCD7.L6xx family. They may be combined with one another and operated in parallel. This means there is a philosophy of full integration for all room controllers.

Possible uses

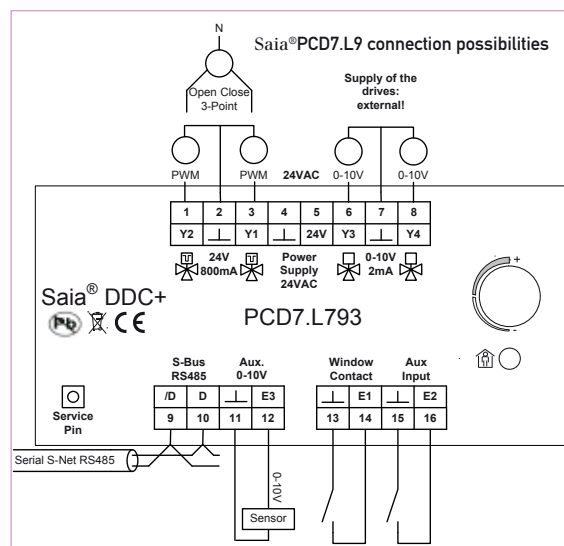
The PCD7.L79 portfolio comprises four product variants. The maximum variant contains in one housing controls for presence and set-point, the room temperature sensor, and valve or damper triggering.

These room controllers have been designed to be able to drive all the usual heating and cooling units, such as:

- Radiators for heating/cooling with change-over
- Combinations of radiators and cooling ceilings
- Underfloor heating
- Systems with variable volume flow (VVF)

It is possible to drive the following valve types:

- thermal valves
- 0-10V valves
- 3-point valves



Such great flexibility at an attractive price and the additional savings in engineering time result in a good price-performance ratio for applications in the field of hotels, hospitals, offices, apartments, schools, etc. ■

24VDC power supply with integral battery charger module for mains-independent accumulator supply with high availability

Wherever high availability is demanded, a mains-independent power supply is necessary to maintain the required function even in case of a power failure. With the Q.PS-ADB-2405 supply device, this can be guaranteed.

Do you use industrial accumulators? Have you already experienced how hard it is to ensure operational reliability when working with them, or to obtain timely information about maintenance or replacement? From now on you can breathe a sigh of relief, lean back and relax when you use the Q.PS-ADB-2405 power supply from Saia-Burgess.

Thanks to the microprocessor controlled, clocked supply device, it is possible to optimize accumulator recharging and lifetime. Features such as firmware-controlled speed and maintenance charging, plus monitoring of accumulator status (lifetime check during runtime) allow for reliable operation – even with continuous duty.

Three functions in one device

With the Q.PS-ADB-2405 three different functions can be covered by one device:

- Battery charger with three charge levels: speed, maintenance and regeneration charging
- Stabilized, clocked supply of current
- Delivery of voltage and current that supplies a load without interruption, similar to an emergency power supply in case of power failure

Advantages of clocked power packs

The power supply is based on the technology of a clocked power pack and offers the following advantages over linear power supplies:

- Higher efficiency
- Compact size
- High voltage stability
- Integral short-circuit and overload protection

Behaviour on power failure

The power supply has two control outputs (potential-free changeover contacts) for error indication and for accumulator monitoring. These control outputs are connected to the controller inputs, therefore making alarms and error visualization possible. This lets the operator arrange for the accumulator to be replaced before and power failure occurs.

Indication of operating status

Via the LED control lights on the front of the device, it is possible to read the operating status. (See adjacent illustration.)

Accumulator types

The following types of accumulator may be used: open lead battery, sealed lead battery, lead-gel battery and Ni-Cd battery.

Accumulator monitoring

Accumulator status diagnosis comprises the following points:

- Check of elements for short circuit
- During maintenance charging, connection quality (terminal contact resistance) is measured approx. every 20 seconds and accumulator impedance approx. every 4 hours
- Accumulator connection voltage is checked to prevent the connection of an incorrect type of accumulator
- End-charging check
- Reverse polarity check

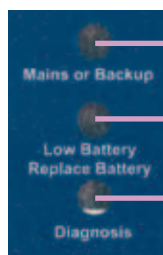
The Q.PS-ADB-2405 power supply can even regenerate the accumulator when voltage has dropped to almost 0V. This smart feature of accumulator monitoring and lifetime diagnosis ensures a high level of functional and operating reliability.

Applications

- Ideal for use as an interruption-free power supply for the Saia®PCD3.WAC (Wide Area Controller)
- Power supply for PLCs where maximum demands are placed on operating reliability and availability for an installation
- Power supply for remote measuring stations
- As a mini emergency power supply in industrial applications
- As a simple accumulator charger
- For the controlled power-off of a controller during a power failure so that, for example, valves are switched to a safe state that will prevent problems arising at the next start-up. ■



Power supply module Q.PS-ADB-2405



Mains power failure

- Mains voltage present, accumulator fault
- Mains power failure, accumulator capacity below 30%

Dual function:

- Maintenance or speed charging
- Error indication by different blink rhythms

Our success factors for OEM business

Over the past two years, Saia-Burgess has won numerous design-ins with manufacturers of standard production machines and equipment. Even in a time of economic stagnation, Saia-Burgess will in the next 2 – 3 years achieve 20 – 30% sales growth in large-scale production business.

The formula Saia®PCD = PLC+Web+IT results in technically innovative and attractive products. For good, fruitful collaboration with production customers however, significantly more is needed than high technical competence and product quality: the companies' strategic orientation and business models must match each other. This is precisely where the strength of Saia-Burgess lies.

Why this strength?

1. All the technologies of Saia®PCD products are developed in-house.
2. The entire chain of added value and competence is united in one location.
3. PLC device quality proven over 30 years – according to IEC 61131-2

A manufacturer of standard production machines or devices works for the long-term and controller technology always represents a major step into «dependency». Therefore predictability, accessibility, control and the supplier's thorough technical competence are important.

Saia-Burgess develops all the core elements of controller technology, such as the operating system, web server, software tools, boards, housing and TCP/IP stack centrally in one location in Switzerland. The same location also houses the full production of automation devices and technical support for customer applications. Another major advantage is the fact that those with overall responsibility for the whole value added chain sit in open offices in the midst of their staff and can always be reached.

For production customers this arrangement has a lasting attraction, particularly when compared with the alternative possibilities offered on the market.

The large global players with their high prestige factor may indeed also have all the basic elements in-house, but they are scattered geographically. Global players are experienced as intangible, virtual organizations with their responsibilities distributed and rather opaque. For such a company, even a customer with a purchase volume of one million units will be of negligible size.

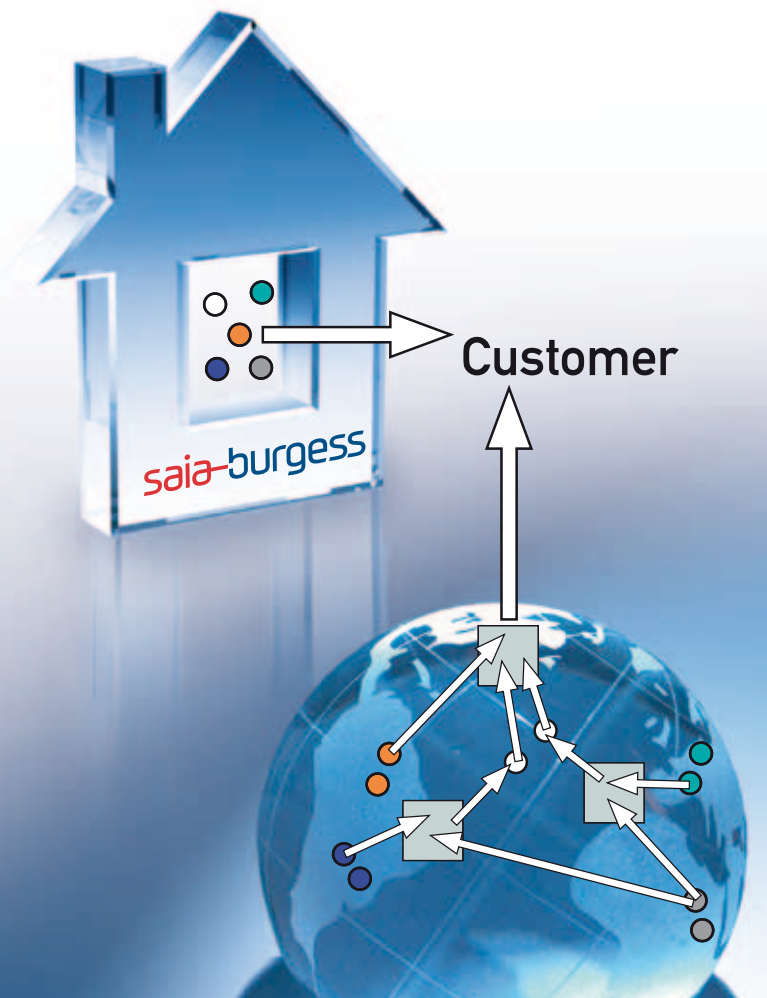
At the other end of the scale of alternatives are those small, flexible companies that have specialized in integrating bought-in technology components and boards. Responsibility for them is small and device lifecycles are uncertain. The costs of maintenance fall entirely on the shoulders of individual customers.

Your success factors for your machine and equipment business

Saia-Burgess strives for long-term relationships as the partner of customers and for lasting success. As the basis for this, we have chosen the strategy of developing and controlling all the core elements for OEM products in-house. The entire chain of added value for automation devices is united in one place.

To ensure that we ourselves can determine the lifecycle of our products, we have excluded American operating systems, Taiwanese superboards and cheap soft-PLCs from our control and automation devices. In this way maximum independence is ensured, in your interest also.

Errors are, of course, not excluded – even with us: we are only human too. But we learn from our



mistakes and correct them ourselves, instead of passing them on to «others» within a world-wide organization. This is what makes the difference.

As a production customer you will have more «Peace of Mind» with us. However, if a problem does ever arise, you will be systematically in the best position with us, because we will help find its cause and remedy it – even though the «fault» is not usually ours.

Saia-Burgess supplies three different types of product for standard production machines and equipment. Common to all these special devices is the fact that they are based on standard Saia®PCD technology components and designs. The competence and stability of these products is therefore correspondingly high.

Customized or embedded Saia® products are based on the same fundamental elements as fully standard products. Software tools and application libraries are also the same. This provides two important advantages for «mySaia®Controller»:

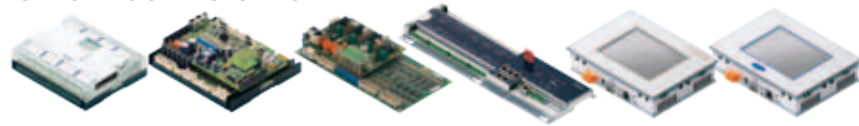
1. Lifecycle costs for the future development and care of mySaia®products are not borne by OEM customers
The costs are shared between all standard and OEM versions of Saia®PCD products.

2. Fast start and easy, safe migration route
Based on the large Saia® standard construction kit, new ideas can be implemented quickly with-

Control Components



Smart Controls PCD



Adapted standard, customer designs

Saia®PCD



Standard products

out wasting resources. When volumes rise and the solution is stable, hardware construction and costs can be safely and easily optimized – without any new development or risks on the part of the customer. ■

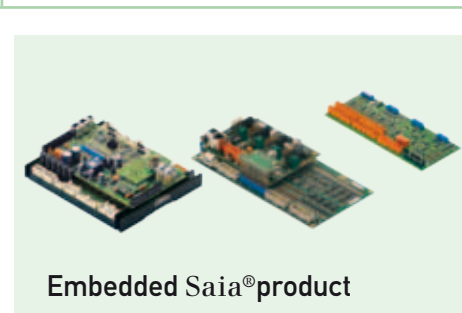


Standard Saia®product

mySaia®Controller



Customized Saia®product



Embedded Saia®product

$$\text{Saia}^{\circledR}\text{products} = \sum \text{Saia}^{\circledR}\text{standard technologies and designs}$$



Renewable
energies

Change in the heating market – with Saia®PCD technology

Energy suppliers and heating engineers all agree: current developments in the energy requirements of buildings on one hand and rising energy prices on the other are creating favourable competitive background conditions for a wide variety of novel, efficient and environmentally friendly technologies.

By 2020 the need for room heating is expected to fall to 50 percent of today's value, whereas massive price inflation is expected over the same period for convenient but declining fossil resources, such as oil and gas.

For customers, there is a confusion of choice. Apart from the old, familiar air/air and air/water heat pumps, today genuine innovations are on the point of breaking through:

- In 2010 **BAXI Innotech** is putting its **fuel cell heater**, which is almost ready for mass production, through field tests. The planned start date for production is 2012.
- **Vaillant** is pushing the **micro combined heat and power plant** of a Japanese car manufacturer as a heating system for private houses. The first several hundred systems will have been installed by the end of 2010.
- **Swissmetal** is producing **bronze roof tiles** and using ambient warmth to heat the building. This novel energy concept is called ATMOVA. Having equipped five prototype projects in 2009, a broad based pilot series starts in 2010.
- **Panotron** is using **roof tiles** to produce simultaneously electrical energy and hot water for heating and/or general hot water requirements. Here too, after successful trials in show houses, a wide market launch has begun.
- **Agila Solar** integrates **thermal collectors and storage systems**. Their use extends from private homes to large area installations for commercial/industrial exploitation. Solar heating or solar cooling –environmentally friendly solutions for every need, all over the world.
- **Elektro Hofmann's Värma heat pump** was developed in collaboration with **Bartl heat pumps**. Using their own special plant construction, these serve to heat buildings and simultaneously cool server rooms.

All these solutions are reliably controlled and regulated round the clock by Saia®PCD controllers in association with Saia®Energy meters. Even the smallest systems for private houses will therefore be equipped with web visualization, sending fault messages by email to customer services, logging data with the file system, and accessible from any preferred location via internet/intranet. The same systems offer large installations expandability as required and diverse communications possibilities for building integration: KNX, EIB, LON, BACnet®, Dali, EnOcean, Profibus, Modbus, CAN, etc.

These suppliers have understood that it is not enough to look just at the manufacturing costs of their systems. It is crucial to consider total costs, including operation and maintenance throughout the entire lifecycle. Therefore the controller used as a core is not the cheapest one but a Saia®PCD, whose longevity and support for open standards are convincing arguments.

Swissmetal: heat from bronze roof tiles

In Lucerne, Switzerland, the «House of Energy» is the centre of excellence for the environment and sustainability and serves as an information hub, platform and meeting point for interested citizens. On the north-western side (Mühlenplatz) and at the rear (courtyard side) ATMOVA roof tiles have been laid on various parts of the roof surface. These are enough to generate sufficient heat for the whole house, including its restaurant. This installation shows how well ATMOVA roof tiles blend themselves in, even in a heritage area and on a listed house. For Swissmetal Design Solutions Ltd, this is their primary sales location. With the help of this



Haus der Energie: denkmalgeschütztes Haus aus dem 13. Jahrhundert

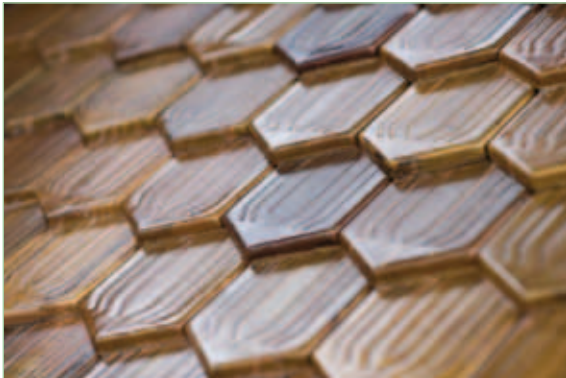


Fuel-cell heating unit
from BAXI Innotech



The ATMOVA system
from Swissmetal ex-
tracts heat from bronze
roof tiles. The installa-
tion is controlled with
Saia®PCD technology

System controller



Bronze tiles extract energy



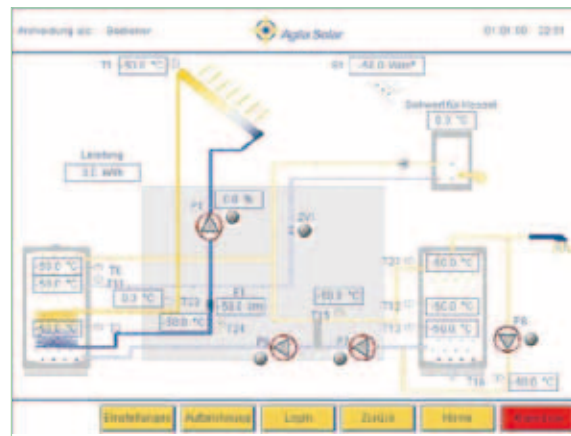
Standardized ATMOVA switch cabinet equipped with a Saia®PCD3.M90 controller (OEM product), a Saia®Energy meter, Saia®Switch, Saia®Supply unit and Saia®HMI

demonstration project, anyone can feel the heat generated by the ATMOVA system and find out how it works. On closer observation, the Saia®PCD controllers and control panels can also be seen which, according to Martin Heuschkel, Managing Director of ATMOVA, provide this innovative system with crucial added value.

Agila Solar:
everything revolves round the sun

Agila Solar is a solar company established by specialists with many years of experience and a passion for solar energy and regenerative building technology.

As a system supplier for regenerative, complete systems, Agila Solar implements highly efficient solar-thermal solutions for private houses as well as large-scale and specialized systems for industry and agriculture.



Visualization of the Agila solar application

Agila Solar sees Saia-Burgess Controls as the ideal partner for its innovative collection and storage systems. Their intelligence is contained within the Saia® products: energy meters, PCD controllers, micro-browser panels.

Private houses

In private houses, the focus is on efficiency, security, «plug and run» and investment costs – the Saia®PCD1 and monophase energy meter ideally satisfy these requirements.

Large-scale systems

Larger installations make use of bigger controllers and triphase energy meters. The core components of large-scale systems are Saia®PCD3 and Saia®ALE5. ■



Typical switch cabinet of a large Agila installation with Saia®PCD3, Saia®Energy meter and Saia®Switch



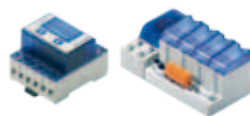
Solar installation on a detached house



1-phase energy meter Saia®ALD1 and Saia®PCD1 controller



Industrial solar installation



3-phase energy meter Saia®ALE3 and Saia®PCD3 controller

Danfoss relies on Saia®PCD

Danfoss in Nordborg (Denmark) is a world leader in the manufacture of district heating systems. Existing Danfoss controllers were no longer suitable for the demands now placed on modern, large-scale heat transfer stations. To safeguard its strong market position for the long term, in 2008 Danfoss carried out a broad-based evaluation for its future generation of controllers – and decided in favour of Saia®PCD.




One of over 100 heat transfer stations ready for despatch to the Iasi project in Rumania

Crucial to this decision was the leadership of Saia-Burgess in web automation technology. Other substantial criteria were its open controllers combined with high quality 5.7" Micro-Browser panels, its support for many different field bus protocols (M-Bus, Modbus, etc.) and the system's almost

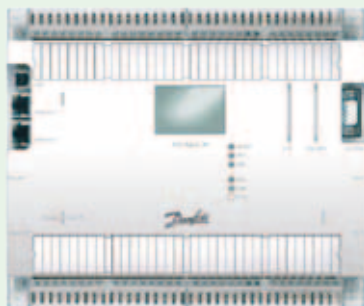
unlimited capacity for expansion. Although the Saia®PCD OEM basic configuration is enough for most stations, for special requirements suitable expansion is possible with any choice of standard function modules and standard I/O modules.

Saia-Burgess Controls Murten supplies the following OEM products to Danfoss District Energy Nordborg



ECL Apex web panel

based on the Saia® Micro-Browser 5.7" VGA panels



ECL Apex 20

based on the Saia®PCD2.M5540 controller

Also ideally positioned as a company

For a globally active company like Danfoss, decisive importance is attached to the international orientation of its partners, alongside high product quality. Saia-Burgess offers a world-wide service with local sales companies and agents. Such services as workshops and support are offered and take place practically everywhere in the relevant local language. Standard modules to complement the basic configurations are supplied locally directly to the Danfoss partner concerned. These are the best possible prerequisites for efficient, long-term cooperation all over the world. ■

The Aquathek from Aequilibrium – healthy water for your wellbeing



Innovative water dispenser with Saia®PCD system ensures purest drinking water

Oil is precious, gold too, but we can more or less live without these things. However, life without water is impossible. Water is our life source – just like the air. Human beings are made up of approx. 70% water – indeed our brains are almost 90% water. Every day, several litres of water pass through our bodies. Losing water equal to just 2% of our body weight will reduce our capacity for physical or mental work by 20% - reason enough for the German company Aequilibrium to devote itself to water: the elixir of life.

Aequilibrium holds a patent for the purest water filtration – with no chemical additives. The Aquathek, developed in collaboration with the Swiss companies SIGG and GALENICA, is an innovative dispenser of the purest water for maximum health and enjoyment.

Enjoyment begins with operating the dispenser

The Aquathek is a visual showpiece. Its attractive overall design is matched by comfortable operation using a 5.7" Saia® Micro-Browser Web-Panel with haptic technology: see – feel – enjoy.



The Aquathek – a visual and technical masterpiece controlled with Saia®PCD3.Compact

However, the Aquathek is also a technical masterpiece. Thanks to the Saia®PCD systems with integral web and IT technology, devices can be managed world-wide via the internet. Even links to the most diverse payment systems via a central database were easy to implement. The open Saia®PCD3.M2157 compact system ensured reliable process control. Many systems from other manufacturers were unable to satisfy the high demands for compactness and communications capabilities: integral Ethernet, CGI interface, web server, file system, data-logging, diverse communications capabilities for integration into an overall system – and all united within a compact format under conditions that suit this price-sensitive volume device. Saia®PCD was the only automation system to cover these requirements in their entirety.

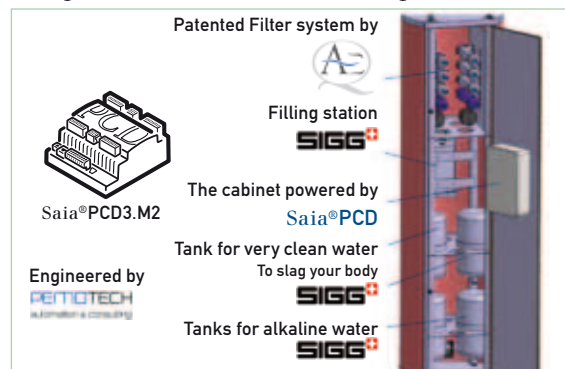
You can now enjoy healthy water from the Aquathek on a visit to the following companies: SIGG, LOEB, Intersport, Douglas, GALENICA, various pharmacies and Saia-Burgess Controls. Numerous visitors to our exhibition stand at Light & Building 2010 in Frankfurt have already had the chance to experience live the innovative Aquathek. ■



An Aquathek from the latest generation with Saia®PCD Haptic Web-Panel



The Aquathek in an Intersport store



ERSA has new automation with Saia®PCD

In spring 2009 the economy was in a deep crisis. The market for money had dried up and up to 100% of machine building was on short time working. This was the environment in which Saia-Burgess started to invest in machines. The largest single investment was a new reflow oven for the Saia®CPU production line. With a budget of CHF 250 000 we approached the market and had some interesting experiences.



The new machine line with Saia®PCD technology, as advertised on the ERSA website and already presented at trade exhibitions.



The new, small ERSA soldering machine with Saia®PCD2.M5 and 5.7" Web-Panel MB in the Saia-Burgess factory in Murten

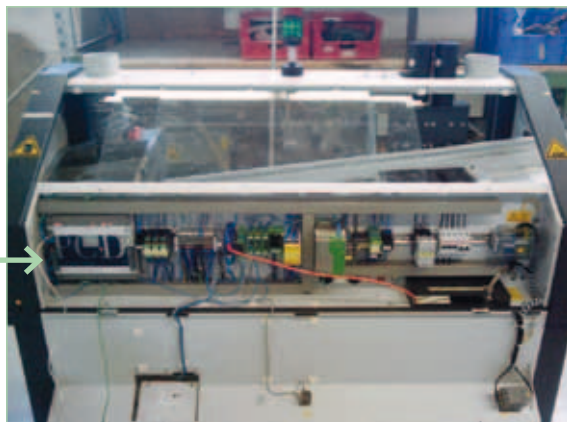
Necessity is the mother of invention. We were reminded of this old proverb when various suppliers listened very attentively to our automation presentations: they liked what they heard so much they began equipping their own production machines with Saia®PCD as standard.

A successful example of this is ERSA's new, small soldering machine. Instead of a few big «dinosaurs of soldering technology», a higher number of small, flexible wave soldering machines are used in line



5.7" Saia®PCD Web-Panel MB. This Web-Panel allows the machine to be integrated into the company network

Saia®PCD2.M5



with lean production methods. They must be capable of easy, secure handling and maintenance by any employee, while also guaranteeing good process reliability and traceability. Additional preconditions were the requirement for locally held data and the possibility of full integration into the company network.

ERSA already had plans to improve these small machines and so, particularly in a time of crisis, saw good opportunities for such «lean machines». Saia Burgess offered to carry out the field trial in its own factory for the new ERSA machine with integral Saia®PCD2.M5 and Saia®PCD Micro-Browser Web-Panels. The result can be seen in the accompanying pictures.



ERSA machine with Saia®PCD 10" Micro-Browser Web-Panel

What happens next?

The company ERSA has just commenced delivery of a second machine type with Saia®PCD technology. In addition, ERSA is interested in creating still more machine innovations with Saia®PCD technology.

There is every chance that ERSA will be the first machine building company in the world to bring to market a production machine with touch-panel and haptic feedback. «Feel the difference between ERSA machines and the competition». This has clearly strengthened the machine builder's claim to market leadership precisely at a time when the market is being squeezed. ■



ERSA soldering machines, controlled with Saia®PCD, in the Saia-Burgess factory in Murten. Comfortable operation with Saia®PCD Web-Panels.

More innovative workflows thanks to web and IT technology in Saia-Burgess' production

The innovative wireless network built on the Saia®PCD2 (see right) enables continuity of workflows throughout production at Saia-Burgess Controls in Murten. This allows, for example, the capture of operating data from all ERSA machines. Continuous monitoring and logging promotes security and increases efficiency. If the machine goes down, the person responsible for that line will be informed by telephone or mobile device unless he has already promptly intervened in the process. All the operating data from all the machines, including alarm messages, can be called up through the company's internal PCs and mobile devices. Any device with a browser that is included in the network is capable of accessing this plant data. Production staff can use the freely accessible Saia®PCD Web-Panels (see below right). For testing purposes in the mobile field, Apple iPods are used. Ultimately an App was developed for plant data capture and a stable, industrial-grade cover for the iPod hardware. The use of these industrially packed iPods is soon to become standard in the Production Department of Saia-Burgess.



Wireless network



Industrial grade housing as «packing» around iPod



Plant data capture visualized on the iPod and as statistical evaluation



Freely accessible Saia®PCD Web-Panel

New counting and motion control modules complement the modular Saia®PCD construction kit



The first machine with the new «H» modules at an exhibition. A Saia®PCD3 controls the DURRER machine

Saia-Burgess is constantly expanding the Saia®PCD construction kit. The new «H» counting modules H112 and H114 allow fast signal capture up to 150 kHz with two or four counters. The new H222 motion control module is used to drive stepper motors. It supports two independent axes up to 20 kHz with reference and limit switch inputs plus asymmetric start-up and braking gradients. Here too Saia-Burgess has understood the needs of machine building customers and developed a solution that best suits them.

The Swiss company «DURRER Special Machines Ltd» (www.durrer.com) is a Saia®PCD customer of many years' standing and one of the first to use the new 'H' modules in a machine for after-print processing. DURRER is a market leader in the field of thumb-index processing and manufactures machines that punch, print and coat the indexes. They provide practical added value for such products as user guides, catalogues and similar printed items. The counting procedure in particular is relatively fast with these machines: up to 50 sheets per second, i.e. one sheet every 20ms. Accordingly, the buffer motor for the counting motor has to perform one movement each time. In extreme cases, the time available will only be approximately 3-5ms. To control this application 'H' modules from the Saia®PCD construction kit are used.



The module takes place across the I/O bus. The new «H» modules are suitable for counting, for example, revolutions, distances and volumes and for the measurement of frequencies by counting pulses over a defined unit of time. The module has two inputs A and B that are used as counting inputs. The functions: Trigger, Counter Enable, Counter Preset or Counter Reset can be assigned to the configurable input C. The module recognizes in count modes x1, x2 or x4 the rotational direction of incremental encoders. Count direction (up or down) can be selected with a counter flag.

When counting is over, the CCO (Counter Controlled Output), which is directly controlled by the counter, can also be used for the precise triggering of external switching processes or to set off an interrupt. The CCO output is set or reset via the CCO flag.

New «H» motion control modules

These low cost modules can be plugged in to any preferred I/O slot on a Saia®PCD2 or Saia®PCD3. They serve to drive the power stage for a stepper motor axis up to a frequency of 20 kHz. The control and monitoring of the motion process of a stepper motor with asymmetric start-up and braking gradients in S or trapezoidal form is fully autonomous. Each module controls two independent axes and supplies a monophas pulse train that is forwarded to the appropriate drive electronics. ■

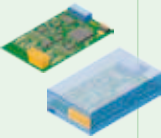
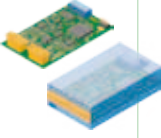

New fast «H» counting modules

The new «H» counting modules H112 and H114 complement the Saia®PCD construction kit with new, advanced modules for typical applications in production and process machine engineering. Since early 2010, fast motion control modules have been available for Saia®PCD2, Saia®PCD3 and the new Saia®PCD1.

The «H» counting modules are universal in application and allow fast counting functions up to 150 kHz for Saia®PCD controllers. Communication between the controller and the motion control mo-

- H112 / H114 counting module features**
- 2 (H112) or 4 (H114) counters per module
 - 1 Counter Controlled Output (CCO) per counter
 - 2 inputs per counter
 - 1 configurable input per counter
 - Counting range 0...16 777 215 (24 bit)
 - Selectable digital filter for all inputs (10kHz...150kHz)

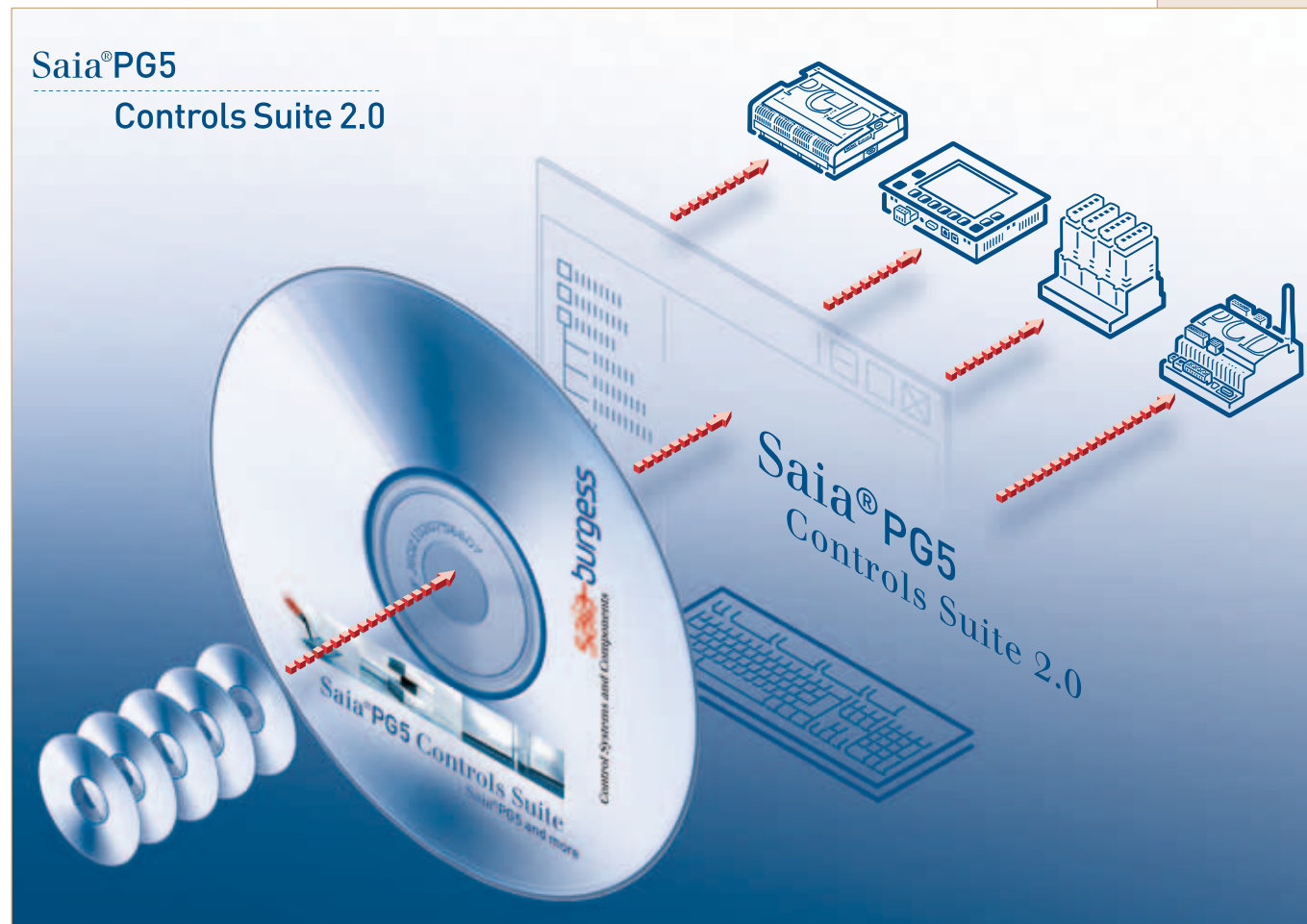
- H222 motion control module features**
- 3 inputs per axis (1 reference and 2 limit switches)
 - A common emergency stop input
 - 3 outputs per axis (Pulse, Dir, MotEn)
 - Parameter setting for S curve or trapezoid with asymmetric start-up and braking gradients
 - 1 configurable synchronizing input/output per axis

	PCD2.H112 PCD3.H112	Fast intelligent counting module, 150 kHz, 2 counting channels with incremental encoder inputs
	PCD2.H114 PCD3.H114	Fast intelligent counting module, 150 kHz, 4 counting channels with incremental encoder inputs
	PCD2.H222 PCD3.H222	Motion control module for 2 independent axes with reference and limit switch inputs, synchronization connection, asymmetric start-up and braking gradients

TECHNICAL SUPPORT

Working with Saia®PG5 2.0

Compared with the transition from previous versions of the PG5, the switch from PG5 1.4 to PG5 2.0 is associated with more changes. This article highlights the main innovations implemented to simplify application engineering.



The new user interface

PG5 handling has been improved in many respects by the integration of a new GUI (graphical user interface). The new GUI allows a uniform handling of the different PG5 components and is intended to help simplify the creation of applications. Since these changes, also entail a change in operator habits, it is important to understand the differences so that their full benefits can be enjoyed.

Desktop Docking and Auto-Hide

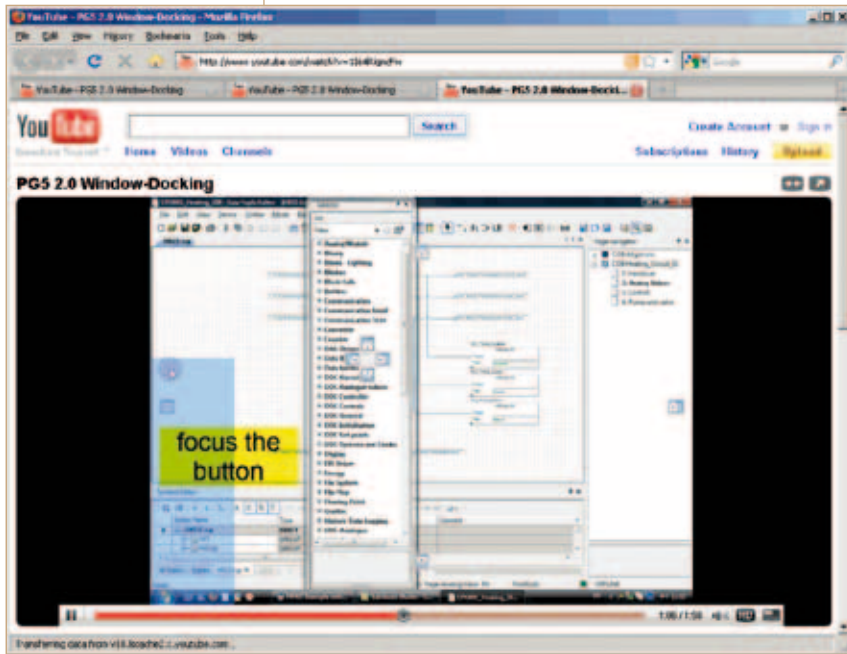
The first innovation is obvious as soon as one sets up the work station to meet individual needs. The various sub-windows (such as the «Message Window» or «Project Tree») can be positioned as required by dragging on the relevant symbols and simply arranging them.

The Auto-Hide of these component windows is very practical for making optimum use of the screen. Since the same windows are not needed during programming, such settings as the positions for offline and online operation are switched whenever a change is made between the online or offline modes.

Since in this case pictures or videos say more than words, you can look at a video of this and other functions on Youtube.com (easy to find with search words «SaiaTCS» and «Window-Docking»).

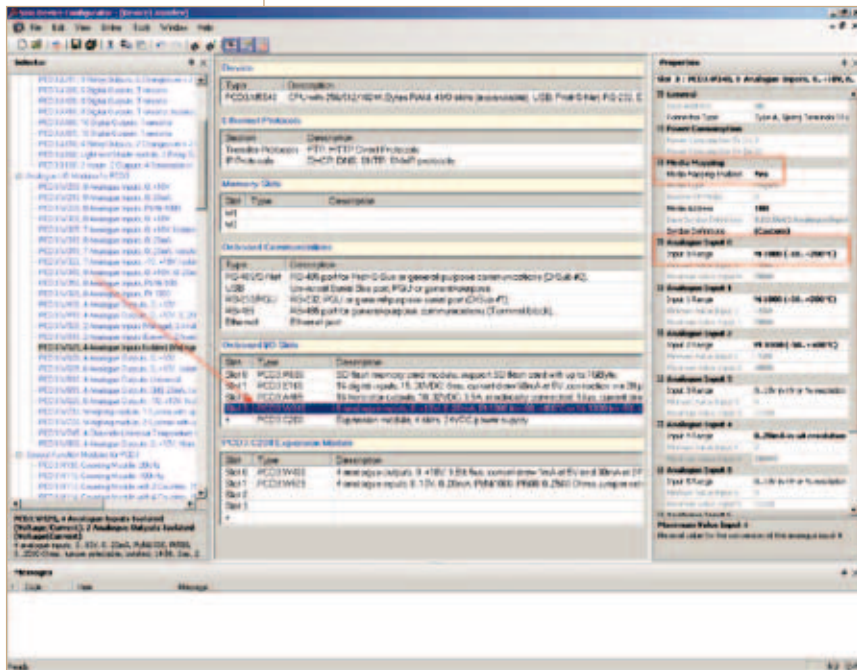
Desktop Docking allows the desktop to be quickly «shared» between such applications as the Project Manager and Fupla by double-clicking on the window's title bar.

Tip: Desktop Docking has been designed for working with one screen. If numerous screens are used, we recommend that you switch off Desktop Docking (under «Tools» → «Options»).



Working with the Device Configurator

The Device Configurator replaces the Hardware Settings window, offering in addition the possibility through intuitive drag-and-drop of I/O modules in the slots. This includes automatic checking that all the rules for modules' location have been followed.



Easy positioning of I/O modules in the Device Configurator

As a direct result, a central overview of all modules offers information about which modules are used on the PCD. In addition, the integral, automatic calculation of the I/O modules' power consumption means you don't have to do that manually.

The label generator that has also been integrated allows you to edit and print labels that can be attached to the hardware.

You can, of course, also create comprehensive documentation for all modules used in the system by pushing a button. This documentation will list all Saia® components used and their settings.

The main advantage of the module list mentioned is the new possibility of configuring media mapping (or process image) for Saia-NT systems (e.g. PCD5). It dispenses with the need to use FBoxes for reading modules.

The firmware independently reads any hardware signals present and copies them at the start of the program cycle to the configured PCD media (registers or flags).

This allows you to create templates that are independent of the physical I/O configuration and can therefore be used on different Saia®PCD systems. In order to use these templates, it is merely necessary to assign the resources provided earlier from the Device Configurator.

Another new function of the Device Configurator is its automatic calculation of the «Memory Allocation» (partition of memory among program memory, text/DB memory and extension memory). If an unsuitable allocation is noticed when downloading a program, PG5 2.0 will correct the allocation automatically.

The last – but also very valuable – function to mention here is the possibility (from firmware version 1.14.25) of configuring Ethernet protocols in a simple way (Web and FTP server, DHCP, DNS, SNMP, etc.)

Tip: The Device Configurator is multilingual and can be adjusted directly within the Device Configurator itself under «Tools» → «Options».

Library Manager

Another new component of the PG5 2.0 is the «Library Manager» for the administration of libraries used in a project. FBoxes and now also FB or system function libraries can be installed or uninstalled as packages. This is particularly interesting for IL programmers.

An import function for converting old libraries to a PG5 2.0-compatible format is, of course, available. However, it should be noted that licence-protected libraries (e.g. M-Bus from Engiby) cannot be updated for the PG5 2.0 by the «Library Import».

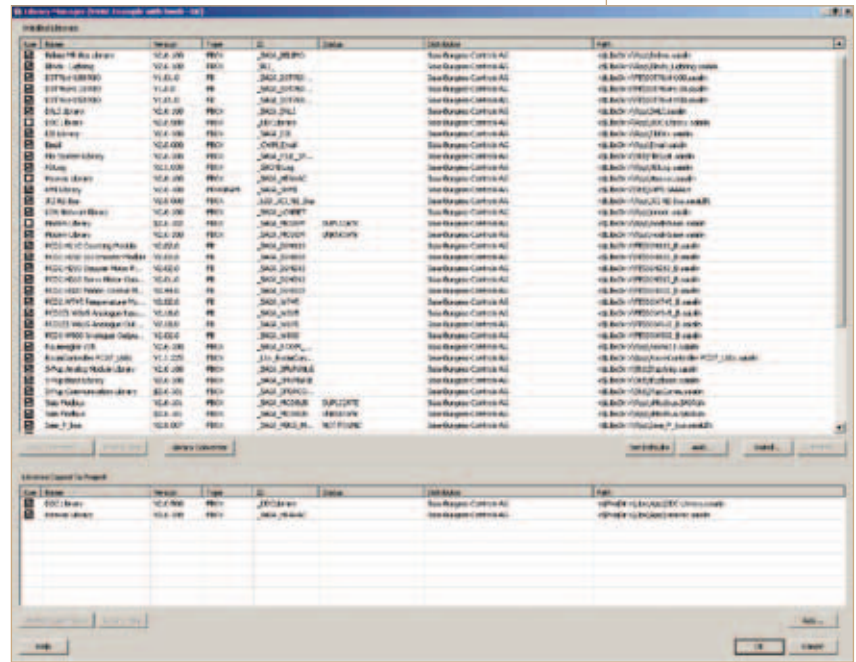
Libraries can be selected very easily and added locally to the project. Being local in the project means that FBox libraries are an integral part of the project and therefore also of a backup.

Working with the Symbol Editor

Very soon after setting up the interface and hardware configuration, you will come into contact with the new Symbol Editor and therefore also with its new symbol handling. You will quickly notice that the new editor behaves differently compared to the PG5 1.4. The functionalities of the new editor lean heavily on the established tool Microsoft® Excel; if you are not sure how to edit symbols, it is useful to think about how it might be done with Excel.

Following a few tips:

- To modify the type, address or name of multiple symbols, one symbol can be defined accordingly and then that field can be «dragged» as in Excel.
- To drag a symbol into Fupla, it must be «grabbed» at the first cell in a line (since clicking inside a cell switches it to «Edit Mode»)
- To insert a new symbol, the last line (edit line) of a group should be used.
- It is still possible to re-address a selection of symbols with the key combination Ctrl-Alt-F9 (based on the first symbol selected).
- The Symbol Manager now includes «Find and Replace», which can be opened from the Context menu or with Ctrl-H
- In the new Symbol Navigator, filters can be created and applied to the symbol list.
- Copy/Paste can be used to copy symbols directly to Microsoft® Word or Microsoft® Excel.
- An Undo/Redo function allows actions in the Symbol Editor to be undone or redone since the last «save».
- When moving symbols in groups, a small blue tooltip window indicates the group into which symbols are being moved.



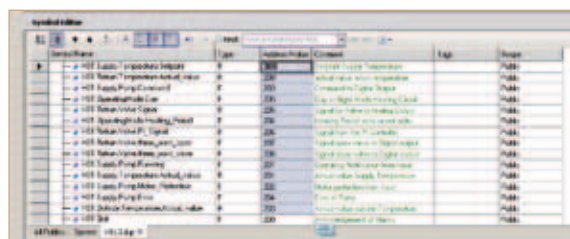
With the help of the Library Manager, libraries can be administered easily

New symbol management

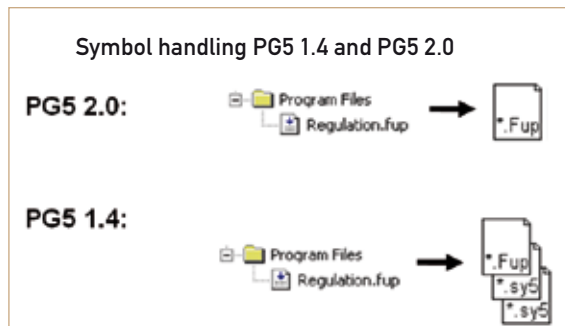
The greatest changes in the new software are apparent in the symbol management. In the past each program file (e.g. Fupla) had a hidden file containing local symbols. For each PCD there existed a global symbol file that was invisible to the user. This structure led to problems when copying a program file to another project (or CPU). The structure was also not suited to the seamless integration of new technologies such as the «Media Mapping» and the «Ethernet RIO Configurator».

PG5 2.0 therefore now offers the possibility of defining all symbols directly in the program file. As a result, when a program file is copied to another project, symbols will remain fully preserved.

Symbols used in other editors (e.g. S-Web Editor) must be declared as «public» symbols in PG5 2.0 (this corresponds with «global» symbols of PG5 1.4). Each time the program is saved, all symbols defined as «Public» will be collected in the back-



Excel-like handling in the Symbol Manager



ground with a «Background Build» and then displayed in the Symbol Manager tab «All Publics», from where they can be dragged into the program. In the local symbol tab you always have an overview of all symbols that are used in the program (also the externally defined ones).

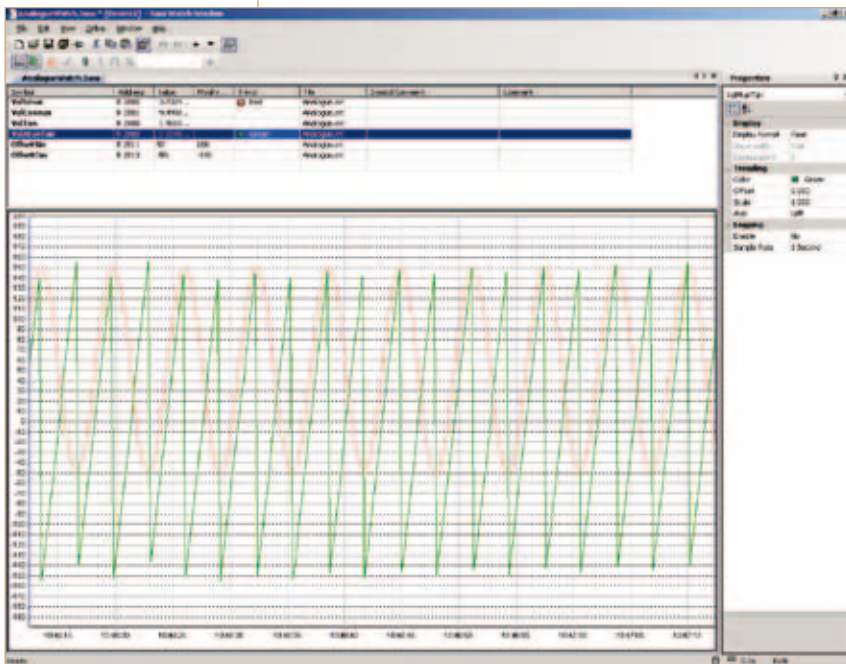
The use of the new name «public» instead of «global» emphasizes the fact that they are stored in the program file (and not in separate, hidden files).

It is, of course, still possible to work with the global symbol file (which makes sense when processing symbols outside PG5 2.0). Unless this is the case, we recommend saving symbols directly in Fupla or an IL file (standard in PG5 2.0).

Trend plotting in Watch Window

Trend plotting has been integrated in the Watch Window. Values are displayed in a chart and logged data can also be exported as a .csv file.

This provides a useful commissioning aid that can, for example, help optimize control circuits during commissioning or demonstrate the control accuracy of an installation over a certain period.



Trend view in the Watch Window

Changes in Fupla

In the Fupla editor too, many details have been improved. FBoxes can now be marked in colour if they have an older version than the FBoxes currently installed. This immediately shows whether, for ex-

ample, FBoxes provide new functions (such as the automatic insertion of a time stamp in SMS texts). If a newer version is available a replacement can be made with the «Update» command from the FBox Context menu.

Parameter window

FBox parameters can be adjusted in the «Property Window». The content of this Property Window changes automatically depending on whether one is online or offline. This means the user always has the right data available in just one window (e.g. there is no standard online display of «Offline Parameters» because they cannot be modified in on-line mode).

When the «Auto Hide» function is used, the «Property Window» is opened by double-clicking on an FBox. This speeds up the setting of FBox parameters, without having to keep closing pop-up windows in the meantime. Of course, it still remains possible to use the old FBox adjust window with an appropriate setting, if you do not want to change your practices.

☞ One very helpful innovation is the ability to copy «Adjust» values from one FBox to another. This is possible with the «Copy Adjust Parameters» function by right-clicking on an FBox. This function is interesting for the synchronization of «Adjust» values in frequently used FBoxes.

FBox Selector

The «FBox Selector» has been completely restructured. One can now view all FBox families in one list or switch between standard, application and user FBox families, as with PG5 1.4.

☞ An integral search function can be used to find the required FBox quickly. The search can be adapted to various criteria. Wildcards in search terms can be used too. To do so, use an asterisk (*).

FBoxes can also be stored as favourites and one's own groups created.

Comments

Multi-line comments can now be placed on Fupla pages. They can be folded out. This provides an improved way of documenting specific functions in a program, transparently allowing all staff in a company to understand them. When these texts are folded away again, page clarity is still retained.

☞ *Tip:*

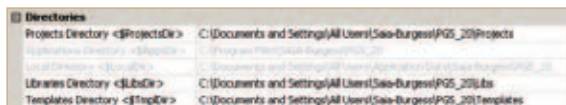
Line breaks are inserted with «Ctrl-Enter».

New standard paths for PG5 and projects

To guarantee full compatibility with Microsoft® Windows® Vista and Windows®7, the standard paths for user-specific files have been adjusted in line with Windows® specifications. All the files that a user can write to are therefore located in user directories.

The advantage of this is that you can now work with PG5 2.0 as a user. Administrator rights are only necessary for installation.

If required, paths can be modified under «Tools» → «Options».



New standard paths of directories

Points to remember when importing a project

The function «Project» → «Import» allows projects to be imported from PG5 1.4 to 2.0. This does not involve modification of the source project. Instead it is copied and subsequently converted. As an alternative, the backup of a PG5 1.4 project can also be imported to PG5 2.0 with «Restore».

If libraries have been stored directly in a project, they may either be imported or replaced with PG5 2.0 libraries (if such libraries exist in PG5 2.0).

To transfer any corrections made to libraries, it is recommended that PG5 2.0 libraries should be used.

As mentioned, the global symbols of a PG5 1.4 project will be available in the «Globals.sy5» file.

Experience in the support department shows that the following are the most frequent causes of problems with project import:

- Licence-protected libraries, which are not supplied by Saia-Burgess, are not present in Saia®PG5 2.0.
- GSD files of Profibus components have not yet been imported in the PG5 2.0 S-Net configurator

(the library of imported GSD files can be optionally copied to the backup at the same time as the project backup is made).

How to maintain systems that are not supported by PG5 2.0

Since PG5 2.0 cannot be used to work with multi-CPU systems (PCD6 and PCD4), the S-Bus RIO PCD1.T240 or Profibus FMS configurations, PG5 1.4 will still remain available in future. This will guarantee continued maintenance for installations equipped with such systems. PG5 1.4 can of course also be used on Windows® Vista and Windows®7 operating systems. For details see FAQ 100710.

Interesting FAQs concerning PG5 2.0

- A list of PG5 2.0 shortcuts compared with those for PG5 1.4: FAQ 101357
- Additional information on media mapping (functionality, minimal firmware): FAQ 101356
- Use of the «Adjust Parameter» window as in PG5 1.4: FAQ 101348
- Marking FBoxes that can be updated FAQ 101369
- Overview of new functions of PG5 2.0: FAQ101282 ■



Firmware news

From firmware 1.14.23 for the PCD3 and PCD2.M5, 14336 flags are now available. PG5 2.0 SP1 is the prerequisite that allows these to be used.

With the same versions it is also possible to configure the S-Web and FTP server, DNS, DHCP or PPP directly in the Device Configurator.

Since initial versions of PCD3 CPUs were equipped with less memory for firmware, it is only possible to load firmware 1.14.23 on PCD3 systems from hardware version D (for PCD3.M3020 and PCD3.M3120 systems the minimum version is E48). For older PCD3 systems, firmware 1.10.51 is the last available version.

An overview of current firmware versions is continuously updated in FAQ 101'304.

Experiences with the S-Web-Editor 5.14

The last issue of ControlsNews contained a report about the officialization of S-Web-Editor version 5.14. Since January 2009, very intensive training has been carried out by the Saia®Support department on the new version S-Web-Editor and, since July 2009, it has been used in the field by our customers for their projects. On the basis of many group and individual training courses, it can be said that S-Web-Editor training is a current «bestseller» among our workshops’.

Step by step:

a tutorial covers S-Web Editor capabilities

Based on experience acquired, we have produced a step-by-step tutorial that will be steadily maintained with ongoing additions. This tutorial, which includes a PG5 project, passes on tips and tricks for working with the S-Web-Editor purposefully and with an orientation towards solutions.

☞ This tutorial document, including PG5 project example, can be found on our Support homepage <http://www.sbc-support.ch> under the «Getting Started» heading. In the same place you will also find the tutorial for the «HDLog into flash file system function» with a programming example.

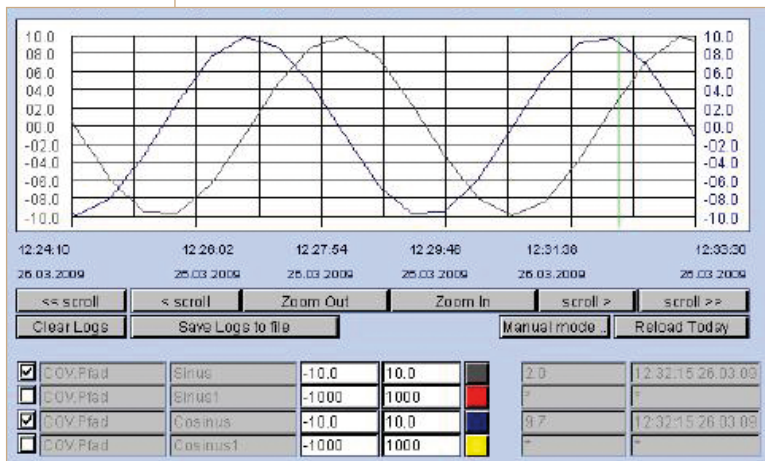
Web and S-Net examples	Level	PG5 version	MB Files
Step by Step tutorial for the S-Web Editor Advanced version (V1)	☺☺☺	V 2.0.110	8.8
Historical data logging to PCD file system (V3)	☺☺☺	V 2.0.110	3.0

Numerous FAQs concerning Web-Editor

Our FAQ Manager on the support site (Services/FAQ manager) is also continuously expanded with new S-Web-Editor questions. With the help of the FAQ Newsletter, you can conveniently receive new or modified FAQs concerning the S-Web-Editor by email.

History trend data logging on the PCD flash file system

The tutorial naturally also goes into some detail about «HDLog to Flash» for the appropriate FBoxes. «HDLog to Flash» allows them to record history



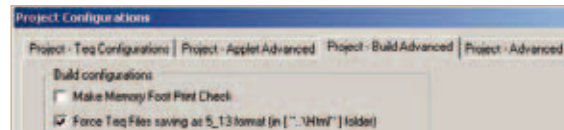
data long-term in Excel-compatible CSV files and to carry out long-term archiving on the PCD. Up to 4x 1 Gbyte of process data can thereby be stored on one PCD5. The Excel-compatible CSV files can be generated daily, weekly or monthly and read by a standard FTP client. These log files, up to 1 Mbyte in size, can be sent as email attachments.

The new, specific S-Web-Editor trend macros are best implemented with the help of the workflow described in the step-by-step tutorial.

To delete CSV files generated by the system, it is necessary to trigger the corresponding FBox input. The file will then be deleted in the background. We are currently working on an automatic, definitive solution to the deletion of files generated. Until then, FAQ #101 276 still applies «What’s the best way to manage with HDLog file creation, saving and deleting?».

New, more intuitive macro configuration dialog

The convenient new macro dialog interface needs and generates a new TEQ format which, unfortunately, cannot be understood by older Micro-Browser versions. All TEQ files are stored in this new format by default with S-Web-Editor 5.14. To guarantee compatibility with older firmware versions of the Micro-Browser panels, these TEQ files can be manually stored in the older format. The check-box below is set for this purpose.



You can, of course, also simply download the latest Micro-Browser firmware from our Support homepage.

Whatever the case it is important to note that in any S-Web-Editor project, files for use in the PCD user program, PCD and Micro-Browser flash file system, or WebConnect may only be taken from the «html» directory.

Modifying/personalizing and saving macros

☞ In association with this new macro dialog interface, a new workflow must be followed. If you want to adapt existing macros to your own needs and

would like to use the convenient new macro dialog interface to do this, you should proceed as follows:

- Go to «Library → Modify Macro from Library»
- Separate the macro into its individual parts, modify and regroup
- Via «Library → Insert Object Into Library» save the macro under a new name

Macro dialogs can now also be stored and distributed with the project backup. This allows them to be used by other programmers. Go to «Project → Project configurations → Project – Build Advanced» and select the following functionality manually: «Add Macro files in project sub-folder».

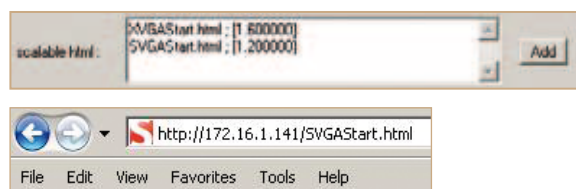
Add Macro files in project sub folder

Expanded log-in macro and transfer of the user level

In the expanded log-in macro it is now possible to enter and query a user name alongside password entry. In the context of logging onto a local controller, requests have often been made for the user level to be transferred during the URL jump from local to remote PCD. With the new session container variables, this is now possible. Details about how to write programs using this special container variable can be learnt in our step-by-step tutorial already referenced at the head of this article.

Autoscaling for larger screen resolutions

The new scaling function recalculates in runtime each required resolution for every browser. You therefore define and program your S-Web-Editor project in just one default resolution, for which you specify the size of elements. For additional resolutions, you generate additional «Scalable html» files in «Project Configurations». With any browser call of these expanded html files, the resolution will be calculated in real time. Practice shows that this function is helpful when used for scaling up only. Reduced web pages very quickly and obviously lose their ergonomic value to users.



Efficient find/replace for whole S-Web-Editor project in one step

When you rename a variable in the PG5 project, you no longer have to make laborious adjustments in the S-Web-Editor via the S-Web-Editor-Cross-Reference file. Instead, under «Project → Project

info replace» you can implement a change throughout the project in a single step. This is a very efficient way of replacing variables of the type: PPO, container, string, HTML tags, FILE, etc.



Recommendations for S-Web-Editor in connection with the Micro-Browser VGA touch-panel

It is already well known that the IMasterSaia5_xx_xx.jar file is not necessary for displaying web pages with the Micro-Browser Panel. In addition, the TCR file is the only one that must be located in the PCD's user program. To improve performance, other files can also be stored locally on the Micro-Browser. To achieve even shorter load times, the Micro-Browser Panel's caching can be switched on. A few recommendations should be followed for maximum efficiency when working with Saia® VGA Micro-Browser Panels in practice. For details, please refer to FAQ #101 340 «S-Web-Editor recommendations for VGA Micro-Browser Panel projects».

Current firmware for the online trending functionality is available from our Support homepage <www.sbc-support.ch>.

General advice for enhancing user comprehension

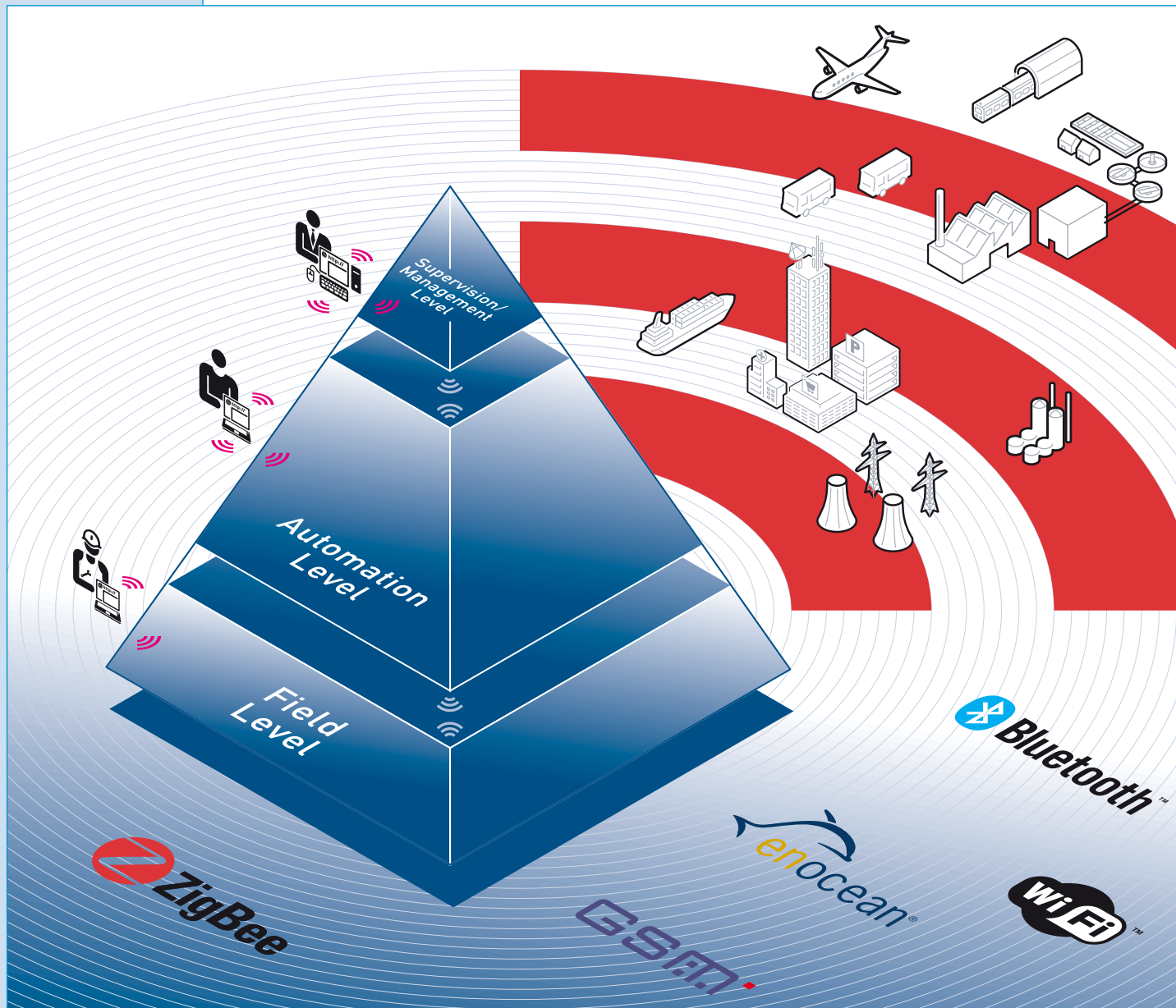
In web environments, pictograms increasingly replace text information. Icons are more easily remembered and do not have to be translated into different user languages. The look of a web page is becoming an ever more convincing argument, giving the project enormous added value and giving an impression of professionalism. We therefore recommend a pictorial structure for web pages, because icons are often much easier to understand, more self-explanatory and livelier than text information.

Preview of future improvements

- Service Pack 5.14 with error corrections
- Alarm list indicating priorities and groups, with ability to show or hide columns
- Event list handling with saving to the flash file system ■

Wireless in Automation

Many wireless transfer techniques, with origins in consumer electronics and the office environment, have become established in the automation sector. Today, every notebook has a WLAN connection that we can use to latch into the network, whether in our office or an airport. Mobile telephones and PDAs have a Bluetooth or infrared interface that can be used for connecting a hands-free device or to synchronize data with a PC. In particular, consumer electronic goods like televisions and digital picture frames allow modern wireless solutions continuous connectivity without the usual cable clutter. Wireless communications also offer many advantages for the automation sector, with the result that wireless technologies are encountered ever more frequently across industry in recent years.



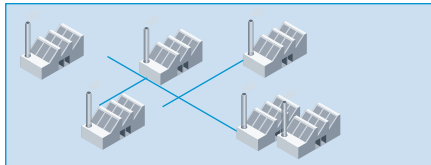
The field of automation, however, is fundamentally different from that of consumer electronics: automation is concerned with calculable, long-term availability, investment security and, last but not least, industrial-grade product quality. This ap-

plies not only to hardware, but also software and technical support.

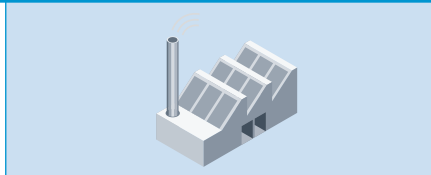
What technology should be chosen? What type of transfer is right and will deliver most technical and

The right wireless technology for every level

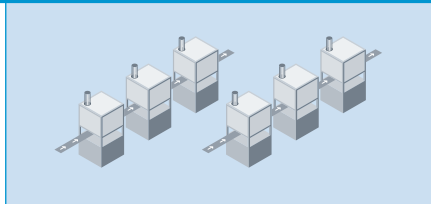
Wide Area Automation
 Wireless wide area network - WWAN
 Wireless metropolitan area network - WMAN
 IEE 802.16, GSM, GPRS, UMTS



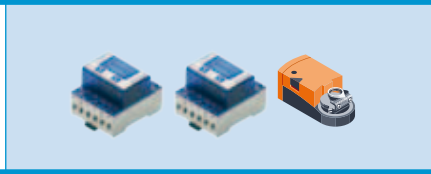
Local Area Automation
 Wireless Local Area Network - WLAN
 IEEE 802.11 / Wi-Fi



Machine / Plant Automation
 Wireless Local Area Network - WLAN
 IEEE 802.11 / Wi-Fi
 Wireless Private Area Network – WPAN
 IEC 802.15 – Bluetooth, Zigbee



Field Automation
 Wireless Private Area Network – WPAN
 IEC 802.15 – Bluetooth, Zigbee



economic benefits? These are the questions manufacturers and users have to ask themselves.

But the fact is, no technology exists that will meet all requirements 100%.

The right technology for every level

In the following, we would like to take a closer look at wireless communications in the automation setting together with its users, leaving the usual automation pyramid on one side.

Wide Area Automation

The «Wide Area» level is the obvious choice. This is where existing mobile wireless networks are used. GSM/GPRS can be found everywhere and offer excellent availability. The installation and maintenance of a suitable network infrastructure on this level is prohibitively expensive and in many countries not legally possible either. The way in which mobile wireless technology should be used depends on the actual use case. For example, whereas in one visualization application access via internet is necessary, in other cases email or SMS messages will suffice. In such cases, only ordinary, pack-

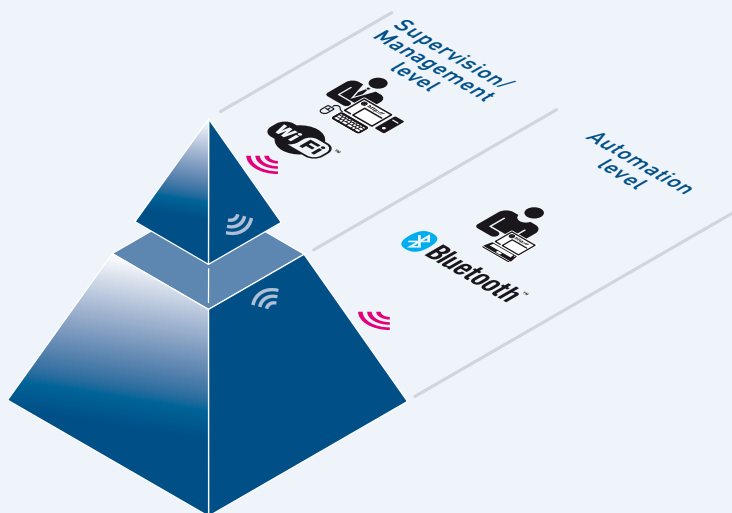
age-oriented services will be used, which means you only have to pay for the volume of data actually transferred. It should also be stressed that these networks are not only suitable for «classical» management, such as management systems, but also allow machine to machine (M2M) communication, for example when two controllers must exchange data while remaining physically very remote from each other.

Local Area Automation

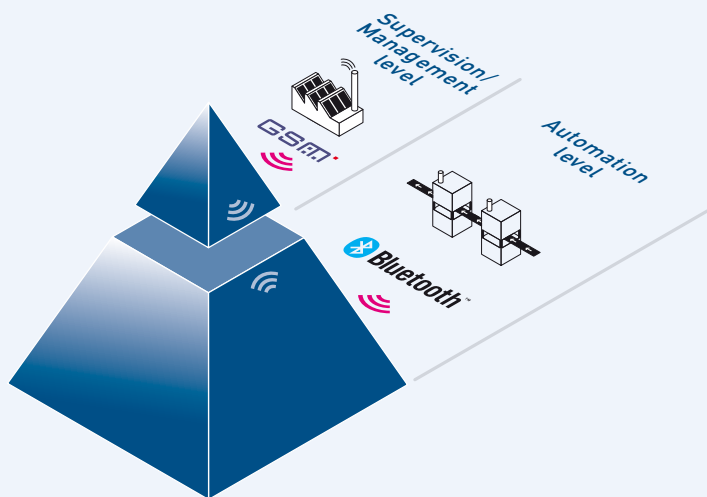
Beneath the «Wide Area» level is the «Local Area». Here it is necessary to examine and differentiate between different use cases for machines and installations. For cases when the installation must be integrated into an existing (management) network, practically the only one to consider is WLAN/WiFi technology (IEEE 802.11), with which it is possible to bridge «the last mile» by wire, i.e. Ethernet. If however a narrower band width is sufficient or if only a point-to-point connection is required, other technologies are also possible.

Bluetooth, in accordance with IEEE 802.15.1, is a widely used wireless standard and present in almost all notebooks, netbooks and PDAs as part of their standard equipment. It is robust, has ad-

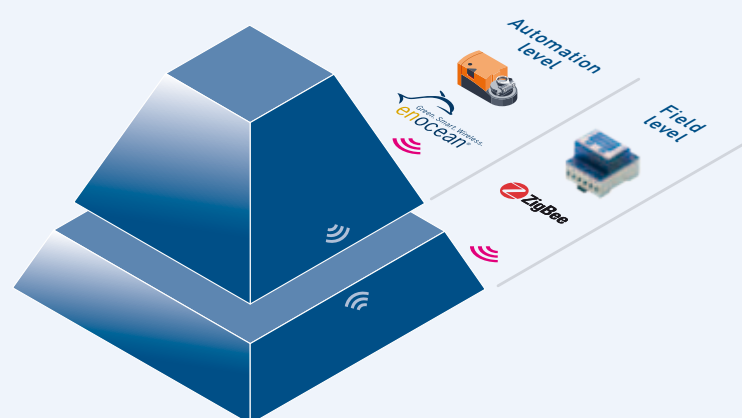
Wireless technologies in automation



For communication between the management and automation levels, the wireless standards WiFi and Bluetooth are used



Installations use GSM and Bluetooth for communication between the management and automation levels



EnOcean and ZigBee have proved themselves in the automation and field levels

equate transmission speed and, with a clear view, a range of up to 100 meters. For service personnel, Bluetooth is a replacement for cable through which controllers can be maintained and programmed. PDAs with integral Bluetooth and web technology can be used by the operator as a mobile HMI device, with no additional software, for quickly checking a system or fetching data. Communication is of course also possible between PLCs or between PLC and HMI.

Machine and plant automation

At the «Machine/Plant» level, individual machines and parts of the installation are considered. WLAN/WiFi and Bluetooth are the only technologies that can be used in an IT setting without having to include proprietary software or add-on hardware in networked PCs.

For communication between individual automation devices, however, other wireless technologies are also suitable, which can sometimes also be used at the field level. Alongside proprietary solutions, the presence of which can certainly be justified in this area, Zigbee ought to be highlighted. Zigbee is based on the standard IEEE 802.15.4 and has gained importance in the last few years. The reason for this is the recent availability of standard application profiles for smart metering and building automation. These application profiles guarantee interoperability, which for a long time was Zigbee's Achilles heel. When BACnet via Zigbee is defined as standard – if not sooner – this technology will probably receive further impetus. Originally conceived for sensors and actuators, Zigbee has only a low requirement for energy. In addition, the possibilities for forming mesh networks, particularly in the field of buildings or independently moving objects, have proved very advantageous. Due to low bandwidth and small package sizes, a Zigbee network is not suitable for transferring large log files of many megabytes. But it is outstandingly well suited to the exchange of small volumes of data between automation devices or for linking up sensors, counters and energy meters. Its biggest disadvantage should not, however, be left unmentioned. If the coordinator in a Zigbee net goes down, in the absence of additional software this will lead to a power failure.

DECT should also be mentioned in this context. This familiar technology from cordless telephones uses the 1880 MHz to 1900 MHz frequency band and is interesting because the infrastructure it needs in the form of base stations or telephone switchboards is encountered in many buildings. It is important to ensure that the DECT modems used are compatible with installed infrastructure, so that they can be connected to the existing switchboard. Otherwise excessively high costs may quickly result.

Field level

The «Field» level is the lowest of all. Here fast transmission rates and high data throughput are not so crucial, except for a few applications that require hard (and fast) real time. At this level, ease of installation and commissioning, low energy requirements and high reliability are important. Alongside the above-mentioned Zigbee, a couple of other very interesting technologies are to be found here: Z-Wave and EnOcean. Whereas Z-Wave stands in direct competition with Zigbee, EnOcean has gained particular currency in room and building automation. The principle behind EnOcean is the fact that, when a sensor captures measurements, its energy status will change. When a button is activated or a temperature changed, enough energy is produced to transfer radio signals across a distance of up to 300 meters (in the open). The wireless protocol has been designed to transfer information using little energy but with great security.

Drawbacks

It would be too perfect if all these technologies always worked in «Plug&Play». Unfortunately, they do not. In practice, a few problems and obstacles may crop up. Most of them could be avoided by careful clarification of the surrounding conditions before commissioning.

One of the first points one comes into contact with is range and - often associated with that - also band width. All information about range and data throughput relates to a clear view without obstacles and is therefore rather theoretical in nature. In reality, it is often necessary just to try and see if it works. Even small changes in the environment can have a large influence. For example, a metal frame in the wrong place near an EnOcean or Zigbee sensor can completely block communications. However, the reverse is also possible: a new obstacle can suddenly mean you are no longer in a blind spot with your Bluetooth PDA, because the waves are now being broken favourably.

It is also particularly important to include the end user's technical departments as early as possible in the planning stage. For example, if the customer's IT department only accepts wireless routers from approved manufacturers or the use of wireless frequencies is specified in-house, one may have to revise one's own design - and in some cases implement the connection to the central management level in an unbureaucratic way via a GPRS/EDGE router.

Finally, no-one should underestimate possible faults or the overloading of wireless frequencies. Most standards share the 2.4 GHz range (see table) and occasionally interference may occur there.

Saia®PCD and wireless

The support of Saia®PCD for open standards and its versatile communications capabilities have always been important differentiating features.

These features come into their own at the field level in particular, where no dominant technology prevails in the way WiFi does with LAN. Here it is important to support as many technologies as possible. Off-the-shelf, industrial gateways make it especially easy to connect Saia®PCD to any wireless network. For example, in the case of EnOcean, ready-made FBoxes exist for the purpose of exchanging data, or one can program them oneself. This is possible in IL or by creating one's own FBox with the FBox-Builder. Saia-Burgess is currently evaluating DECT and Zigbee technologies with the aim of integrating them into Saia®PCD controllers.

Another wireless member has recently been added to the Saia®PCD family: the PCD3. F160/PCD7.F160 Bluetooth module, which is presented on pages 18-19 of this issue of Controls News. The PCD3.WAC with integral GSM/GPRS modem was presented previously in Controls News issue 11. ■

Frequencies used in Europe by automation technology

(Source: www.zvei.org)

Frequency in MHz	Type of use	Conditions of use/output power	Characteristics
433...434	Licence free (ISM)	Output power max. 10 mW ERP*, max 10% occupancy time**	Good penetration, reduced data rate
448 und 459	Subject to licence	Output power max. 6W, synchronized, unlimited occupancy time**	Good penetration, low data rate, extensive ranges
410...470	Subject to licence	Output power depends on assigned frequency, typically 6W / 12W for mobile devices, channel spacing typically 12.5 kHz / 25kHz	Good penetration, extensive ranges
863...870 (USA: 902...928 as ISM band)	Licence free	Output power 5...500 mW ERP*, channels partly with 25 kHz band width, occupancy time** sometimes only 0.1%	Extensive ranges
1880...1900	Licence free according to DECT standard	Output power 250 mW peak ERP*, time slot and frequency multiplex process	Good availability, high output power
2400...2483.5	Licence free (ISM)	Output power 10 mW (100 mW when spread spectrum technique used, inside buildings used without restrictions), no limits on occupancy time**	Available almost worldwide, large band width, already strongly used
5150...5350 5470...5725	Licence free (partly ISM)	Partly output power of up to 1W, partly output control and dynamic frequency selection required	Good penetration von walls, quasi-optical spread, large band width

* ERP - stands for the effective radiated power emitted at an antenna

** The occupancy time describes the relative period of use of a medium, which is subject to certain restrictions in a few frequency bands.

Annual report 2009 for our customers...

2009 was a very difficult year for the economy as a whole. Saia-Burgess Controls also had to struggle against a strong head wind and many uncertainties. Despite this, our company made very good progress even under troubled and adverse conditions. We find ourselves in a better position than 12 months ago and have sunny prospects for growth in the coming years. This is an enormously important message for all stakeholders in Saia-Burgess Controls: whether they are customers, staff or the owners of the company.



Saia-Burgess Controls
Headquarters
at Bahnhofstrasse 18
in Murten (Switzerland)

As a customer, you have great interest in a strong and well established business partner; a company whose economic success is based on a steadily expanding customer and service portfolio. This significantly sets us apart from other competitors, who must make their profits through the systematic optimization of margins in a stagnant business environment.

Compensating the decline in sales

For Saia-Burgess Controls the decline in sales in 2009 proved relatively modest at 2%. New products with high growth and added value «made in Murten» almost offset the strong decline in products with small margins, in particular traded products and contract manufacture.

Overall, despite the decline in sales, we were able to maintain internal added value at the level of the previous year. Through a moderate adjustment to advertising expenditure and reduced staff recruitment, in 2009 the profitability of Saia-Burgess Controls was even slightly higher than in 2008.

The main stakeholders
in the company:
Executive Board of
Saia-Burgess Controls Ltd.
J. Lauber, P. Marti, A. Spicher



Jürgen Lauber

Patrick Marti

Adrian Spicher

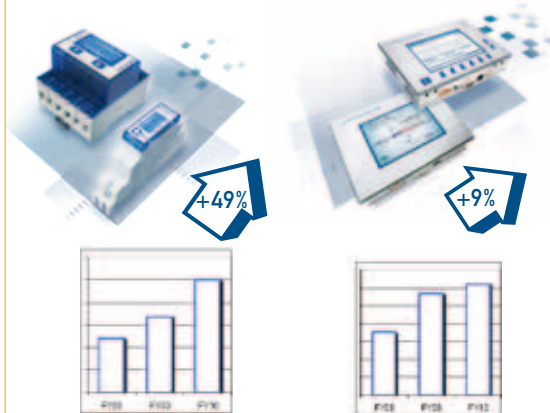
Innovation as a means of countering the crisis

The crisis among customers in the production machine branch has also led to serious drops in our own business. We too had machine building customers whose purchase volumes fell from the previous year's millions to barely more than 100 000 Euros in 2009. Some of our customers even had to withdraw completely from the machine building business.

Against this background, Saia-Burgess was helped by the fact that its innovative approach of «Web + IT + PLC» was especially well received by system integrators and OEMs (large-scale manufacturers of standard machines and equipment) in infrastructure automation. This market segment was stimulated by the economic programs of governments and, thanks to innovation, we even managed to achieve double-digit growth.

Growth in this market segment was borne in particular by the new energy meters and new Saia®PCD web panels.

Sales of energy meters and web panels for projects in buildings



Progress in production – lean production

On the basis of the factory structure in Murten established in 2008 with two autonomous production departments for Saia®CC (small devices) and Saia®PCD (controllers/HMIs) we changed over all SMD production and the whole of energy meter production to «lean production», following the Toyota model. There has been enormous progress in efficiency and quality. It has been possible to

increase production output still further. If you go to www.youtube.com and enter «lean production + Saia» you will find some impressive videos on the subject.



Assembly of energy meters and other control components as «lean production»

Saia-Burgess has bucked the trend completely and made major investments in technical equipment. A new reflow oven for the CPU production line is just one example of this. We have used it to improve process reliability, particularly in the soldering of BGA components.



« In 2009, our owners provided us with all the financial resources we asked for »

Company development

Even in the worst economic crisis of the last 50 years, we were able to invest on a large scale. This shows we have a good entrepreneurial environment for Saia-Burgess Controls. As the Executive Board, we do not have to engage in acquisitions or risky expansion ventures to satisfy the expectations of our owners. We shall simply continue on our existing path. In staffing policy, however, we introduced an important change in 2009. Here we have begun systematically recruiting young people to our company and actively supporting their development. They will grow into the philosophy and culture of Saia-Burgess Controls and learn from the outset to work in an innovative and dynamic business environment. Experienced people from the market, especially from large companies, struggle to adjust after many previous years spent living with other priorities and structures.



As a consequence, we want young people to handle our growth. This is our way of laying the cornerstone that will keep Saia® vital and evergreen in the long term – just as vital and evergreen as our corporate and individual relationships with you and your company. ■

Jürgen Lauber
Managing Director

Patrick Marti
Deputy Managing Director

Adrian Spicher
Director Finance and Administration

Exhibitions / fairs



31st Aug. – 3^{rs} Sept. 2010
AADECA 2010, Buenos Aires, Argentina (AG)

14th – 16th September 2010
Energetab, Bielsko-Biala, Poland (PL)

15th – 17th September 2010
Intelligent Building, Shanghai China (CN)

5th – 8th October 2010
Industry & Automation, Utrecht, Holland (NL)

19th – 22nd October 2010
ETIF 2010, Buenos Aires, Argentina (AG)

26th – 28th October 2010
Scanautomatic, Gothenburg, Sweden (SE)

23rd – 25th November 2010
SPS/IPC/DRIVES, Nuremberg, Germany (DE)

4th – 8th April 2011
Hanover Fair, Hanover, Germany (DE)



Direct communication allows genuine dialogue

In 2009 Saia-Burgess redesigned the communications market. The aim was to communicate directly with decision makers and investors from the building services engineering sector and have better contact with the technical press. Since then Saia-Burgess has, with over 20 events aimed at different target groups, created many possibilities for direct interchange and discussion with the company headquarters in Switzerland. Close contact with our regular customers and the technical press for automation has made genuine dialogue possible. Good relationships have improved mutual understanding and with it also our image and awareness level. Communication will be further expanded to carry the good message further across the world and permanently increase awareness of Saia®PCD.

EVENTS

Presse conferences



April 2010

OIP days



SI forum



September 2009



SW camp



February 2009



Roadshows



January 2009



Workshops



September 2008



BA forum



Trade fairs / exhibitions



Discussion forums



Customer contact



Press contact

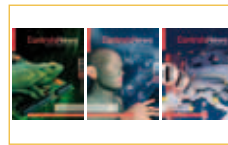


MEDIA

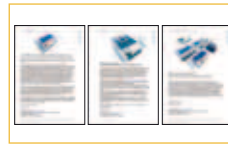
Controls E-News



Controls News



Press releases



Internet



Media presence



Increase awareness and bring Saia®PCD closer
This is our basic idea behind every occasion. Over the past year, numerous events were organized on our own premises and platforms used. Such open communications allowed us to reach even those customers and interested parties with whom we had had no relationship for a long time. The aim is close dialogue with users, decision makers, operators, planners and the technical press.

The most important factor for the success of Saia-Burgess is the customers, i.e. Saia®PCD users. They must be supplied with first-class products that meet customer requirements in the best possible way. Dialogue with users is best promoted through workshops, software camps and the SI forum as a platform for exchange. Their experiences can their directly influence the improvement of Saia®PCD products.



Customer visit to Saia®PCD production in Murten

Since Saia-Burgess is not itself involved in project business, we have not until now focused on the end users, operators and planners. At various OIP* days, the «Peace of Mind» concept was presented to this target group, for which it was directly tailor-made. Feedback was also very good at the «Forum on building automation and sustainability».

Press conferences promote dialogue with the technical press. At regular events for the press, attractive topics and current trends are now revisited. Such contacts are continuously fostered and further expanded. An increasing presence in the technical press can already be detected. ■



A site visit to an installation was an impressive experience for all customers and interested parties at our events.

*OIP = operators, investors, planners



Hands-on product demonstrations promote understanding and are a welcome chance to pick up and try out the products



Imprint Controls News issue 12

The Controls News customer magazine is published periodically in six languages:

English, German, French, Italian, Dutch and Chinese.

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Printed in Switzerland

We would like to thank our customers and partners who have provided us with pictures and project information for use in this publication.

Editorial team Controls News 12



A face to fit our profile! – New packaging design for Saia®PCD



Since the beginning of 2010 a new packaging design has been introduced continuously for Saia®PCD controllers and the entire Saia®HMI range. This means that the orange boxes used since 2001 are no longer in service.

The new design strengthens the Saia®PCD image and simplifies logistics, since the number of different pack types has been reduced by a factor of three. To provide customers with added simplicity, it was also decided to integrate the standard plug connector (terminal) for all PCD5 modules into the module packaging. This now means that, for everyone, there are fewer items on each order, fewer errors in orders, and less expenditure. As a result, everyone has more time and greater ease to pursue their actual business.

With the visually attractive styling of these new packages, we signal to everyone concerned that Saia-Burgess Controls is much more than an ordinary supplier offering programmable logic controllers.

Saia-Burgess Controls is, in every respect, a reliable and innovative developer and manufacturer of a complete product range of the most modern controllers and operator panels.

For Saia-Burgess Controls, the typical Swiss values of «robustness», «precision» and «quality» continue to have top priority. ■

Moving from Switzerland to China



SBC wishes Austin all the best and every success with his new challenge in China



Austin Wang and his father Patrick Wang during a visit to a Saia® system integrator in December 2009

In the meantime he has become a seasoned Saia® professional. This was noticed and recognized by all those who met him at our stand (see picture from PLC exhibition) or during visits to customers.

He has achieved much as Product Manager for Saia®PCD and had responsibility for the haptic touch-panel and Bluetooth projects within the Saia®PCD system.

At the start of 2010 Austin returned to his home country. As Managing Director Sales for Saia-Burgess Controls he will further develop the market in Greater China (Taiwan, Hong Kong and China). We have established a strong foothold there with a stable team of 15 people and have laid the foundations for significant growth.

We are happy to have Austin working on our behalf to help unlock the enormous growth potential in OEM and system integrator business in Asia, so that we can develop another strong pillar of Saia®PCD business alongside the European one.

We wish Austin every success and satisfaction in the expansion of our activities in Greater China. ■

In the last edition of ControlsNews we wrote about Austin Wang, only son of our Group CEO and main proprietor Patrick Wang. From September 2008, Austin worked as the Technical Product Manager for Saia®PCD at the Head Office of Saia-Burgess Controls Ltd in Murten (Switzerland).



Austin at the PLC exhibition in 2009, Nuremberg, Germany

Infocontrol and Saia-Burgess – 22 years of successful cooperation

The company «Infocontrol» was founded in 1984 in Rio de Mouro, Portugal. It specializes in marketing components and systems for the industrial automation and building automation sectors. For Saia-Burgess, Infocontrol in Portugal is a competent system partner that has been using Saia®PCD products for over 22 years.



Due to the many advantages of the Saia®PCA family (e.g. parallel sequential program execution in real time, easy control of analogue processes, data memory and serial interface) Infocontrol was able to exploit various niche markets 22 years ago. This was the start of a successful collaboration.

With the market launch of the Saia®PCD family in 1990, further milestones were achieved with the PCD6 and PCD4 series: parallel CPU processing, up to 28 independent serial interfaces, remote programming by modem, full PSTN modem support, leased lines and wireless connections, servomotor axis control, large data memory and floating point instruction set. Helped by these advantages, «Infocontrol» gained additional market segments, for example:

- Remote monitoring of drinking water distribution networks with communication via modem
- Control of drinking water and sewage treatment plant via modem
- Remote operation of air traffic control systems
- Statistical real-time calculations in chemical process technology and to detect changes in demand for power supply and adapt capacity in due time
- Self-learning axis control
- AutoCAD file support for automatic cutting machines

The PCD1 and PCD2 controllers were added later and are fully compatible. They support a large number of different serial protocols and TCP/IP communication, capabilities which have enabled further strong expansion of the Saia®PCD area of application, such as the use of remote gateways for:

- Remote monitoring of telecommunications equipment

- Remote monitoring of railway stations
- Remote operation of charging units for high voltage transformer stations
- Remote operation of emergency power generator sets
- Gateways with IEC 60870-5-101/104, Modbus, LON, EIB and countless proprietary protocols

With a complete service for turnkey solutions, «Infocontrol» has also been able to establish itself successfully in building automation, e.g. warehouses, hotels, multiplex cinemas, multi-storey car parks and office buildings. Saia®HEAVAC libraries have played a special role in this, as well as the support of Saia®PCD controllers for additional protocols, such as BACnet®, Dali, EnOcean, KNX, MP-Bus, M-Bus, Johnson Controls and Fidelio. A positive stimulus to Infocontrol's business also came from complementary devices for individual room climate control with operator panels, as well as simple, decentralized controllers with the appropriate inputs and outputs.

New company head office

A very fine example of successful building automation is to be found in Infocontrol's new, three-storey company headquarters near Lisbon. This Ethernet-based automation system utilizes 16 Saia®PCDs, 11 displays in different rooms and three micro-browser panels to provide full web navigation among all controllers.

The expanded IT functionalities built into Saia®PCD controllers allow for seamless, comprehensive integration within the existing IT landscape.

A central argument favouring this successful story, however, is without doubt the upward compatibility of the Saia®PCD family. A program written for Saia®PCD6 in the 90s will still run today even in a brand new Saia®PCD3, as well as any other, older PCD type.

Over 22 years of continuous success and enormous potential for future growth: this is exactly what Infocontrol values so highly about Saia-Burgess, describing the relationship as a true partnership. ■



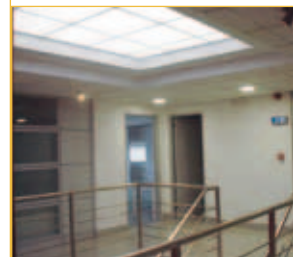
Infocontrol Lda

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A view inside
the new company headquarters
of Infocontrol in Portugal



One of the Saia®PCD3 controllers
in the premises
of Infocontrol Lda



Saia®PCD Micro-Browser
Web-Panel in office



BACnet®-certified automation system in use at Hanover Airport

Rising energy prices and a change in environmental awareness call for the ecological, energy saving operation of buildings and property. For this, an essential precondition is intelligent building management with fully integrated building automation across all plant groups. In practice, however, the solutions encountered are vendor-specific islands with different communications protocols that can only be tied up to a central management system with great difficulty. These «old woes» of the sector are increasingly unaffordable and unmanageable. Today, the demand is for integrated concepts that, with one click, can give operators of an installation an overview of all plant in a building or property. In future, modern technologies with open standards will be used here. An example is BACnet®, the vendor-neutral protocol standard for unified communication across different plant groups. There is a particular challenge if BACnet®-compatible devices only gradually come into use for sanitary tasks and if old, proprietary systems have to be tied into central building management technology within a defined period. The following article describes how such a challenge was successfully overcome in the example of building automation and management technology at Hanover Airport.



The new shopping centre Airport Plaza at Hanover-Langenhagen Airport in Germany



Terminal A hall



The company Flughafen Hannover-Langenhagen GmbH took the decision to install a BMS fit for future needs to manage and control all facilities like i.e. HEVAC, cooling, sanitation, electrical, combined heat and power, boiler house, aircraft deicing and ground filter systems. At the same time they started the planning for the new Airport Plaza shopping center. It was the right moment to specify the entire project around an open BMS. Therefore, the decision to go for an open and recognized communication standard like BACnet® was obvious.

In search of BACnet®-compatible controllers

The aim was therefore to build complete building management for the new Airport Plaza shopping centre with BACnet®-compatible automation stations and simultaneously integrate pre-existing plant groups from existing parts of the building within the new BACnet®. So the first step was to find controllers that support this standard. This involved a tender call and multi-stage qualification process to determine the suitability of suppliers for the management and process levels. To check that the BACnet®-compatible controllers actually de-

livered in practice what they promised in theory, four controller suppliers were invited to an on-site test set-up on their automation stations. All stations were programmed with a room-air system that had a heating function. Compulsory functions included: starting after return of mains power, operating time adjustment via a time switch catalogue, switchover function via management level, temperature control, fire alarms, pump and fan control with V-belt watchdog and filter monitoring, frost start-up and air/water frost protection.





Finding a suitable management system

Even with the use of BACnet® in the airport's new building, a central management system is necessary to monitor and control both new and existing installations. Implementation of the management level was awarded to the Hamelin-based company INGA (Ingenieurgesellschaft für Gebäudeautomation), but only after it too had proved itself against four competitors. This involved integrating the test set-ups into the management system and then demonstrating numerous compulsory functions: e.g. device and network management, data sharing (between substations), event-oriented alarm forwarding (change of value), scheduling, at least six priority levels for messages, trend plotting in five-minute increments, plus implementation of a defined, 30-character address key. INGA won approval with its economical proposal both for integration and any subsequent work arising. Additional advantages were the modern control concept based on web technology, the use of standard tools for operation and maintenance, and the excellently matched INGA-IBS management software. One further plus: as a Saia-Burgess system integrator, the company is of course also perfectly acquainted with the chosen Saia®PCD3 automation systems.

Visualization with the INGA-IBS management system



Heating

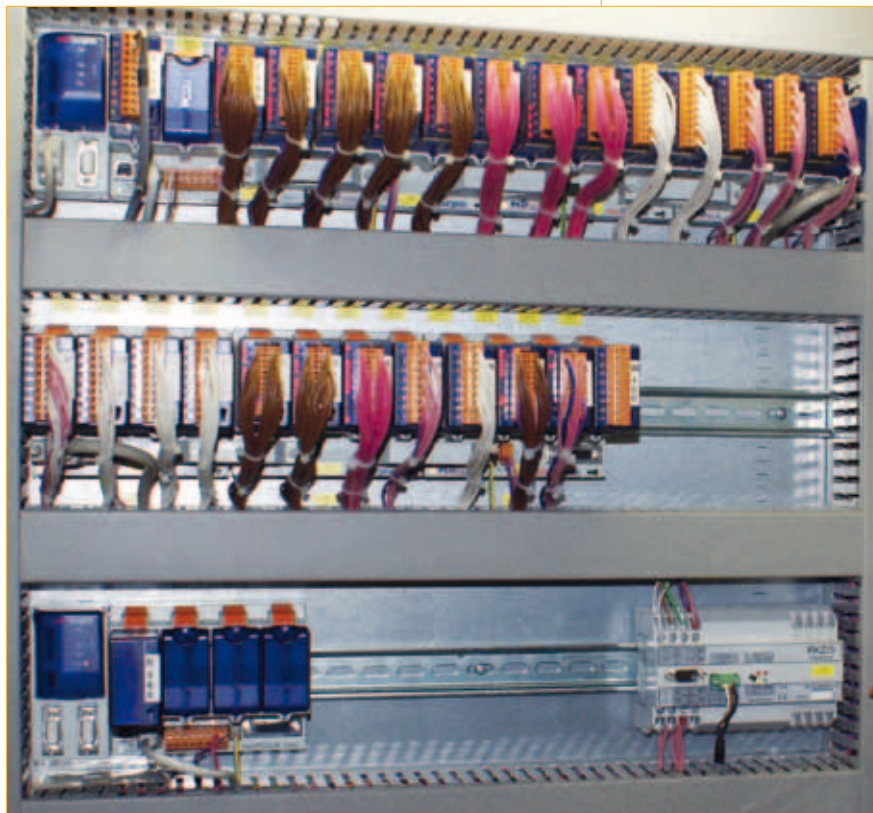


Mixed cooling system



Ventilation

The automation stations from type Saia®PCD3 made by Saia-Burgess fulfilled all specifications to customers' entire satisfaction and were selected for our project after a standard neutral tendering procedure. In addition, users liked the system's easy, intuitive operability and were won over by its very comprehensive BACnet® implementation, which far exceeds the standard and is unique in the market. Across the board, the entire Saia®PCD automation system family has been certified as BACnet® Building Controllers (B-BC) according to ANSI/ASHRAE 135-2004 to allow for open, cross-plant building automation. The automation stations are BACnet®-certified and bear the global BTL mark of tested BACnet® conformity. Support is provided for the BACnet® data-link layer, BACnet®/IP and BACnet®/PTP, plus 23 data objects in line with the ANSI/ASHRAE 135-2004 standard for data exchange, for BACnet® programs and BACnet® services. In all this, the standard functions of the Saia®PCD family are maintained in full. These include, for example, support for numerous interfaces, an integral web server, the ability to add extra IT memory modules (processed using standard tools) and comfortable programming via the PG5 Controls-Suite programming environment. Last but not least, the family's modular structure makes for flexibility in adapting to individual solutions. Thanks to the automation library DDC-Suite Version 2.0, all the necessary BACnet® objects for an application are generated automatically.



Saia®PCD3 controllers as BACnet® Building Controllers (B-BC) according to ANSI/ASHRAE 135-2004 allow for open, interoperable building automation. Automation stations BACnet®-certified and carry the global BTL mark of tested BACnet® conformity.



Airport Plaza parking deck

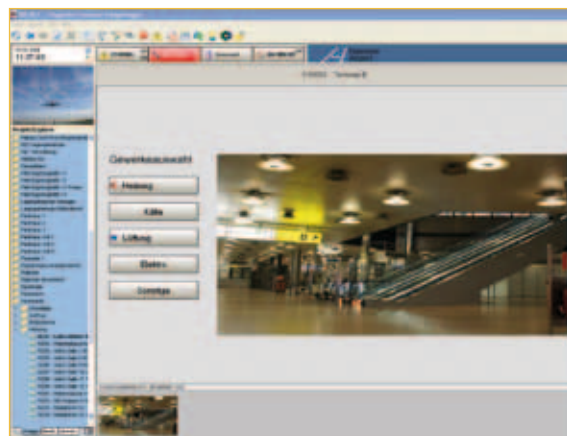
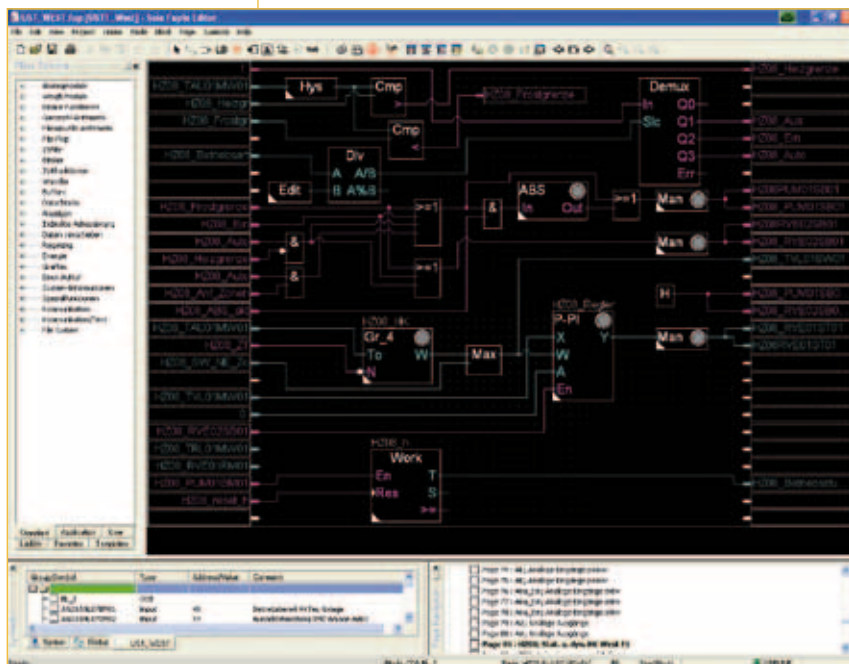


In the new Airport Plaza shopping centre at Hannover-Langenhagen Airport, all building management plant groups are controlled by BACnet®-compatible automation stations of the Saia®PCD3 type

The present meets the future
 At the start of this upgrade to the new communications standard there were barely 70 automation stations from a variety of manufacturers in the entire premises. One way of integrating these existing stations into a BACnet® was to retrofit appropriate interfaces. However, that would involve much work and considerable costs. A crucial advantage of the vendor-neutral INGA-IBS management software and Saia®PCD automation system used at Hanover Airport is the capacity for simultaneous connection of different automation devices and bus systems from various manufacturers on a uniform user interface, or to network them with each other. Thanks to an integral interface, it is possible to integrate directly BACnet® objects, new PCD3 controllers, and conventional automation stations. The work required to connect existing systems remains similar to that for the alternative solution with retrofitted interfaces, but proceeding in this way avoids the cost of purchasing suitable interfaces for existing devices.

The management system now connects 75 automation stations and a total of 866 installations, 136 different system images have been implemented and seven stationary operator positions created.

The FUPLA programming environment in Saia®PG5 provides for programming comfort



The complete system now manages over 17 000 data points. This means that the management software also offers a good solution for systems that are being upgraded to BACnet® step by step, because devices without BACnet® are only replaced gradually because of the cost or excessive effort involved. The example described here shows that this will also work in practice. For some time now, new BACnet®-compatible Saia®PCD3 controllers together with pre-existing automation stations from various manufacturers have been reliably monitored by a central process management system. At Hanover Airport, a future-proof solution is in use that can easily be expanded and adapted to every new requirement. ■

Thanks to a Saia®PCD web server, «KF Real Estate» receives daily data relevant to the optimum operation of its store in Norrköping (Sweden)

As a property company, «KF Real Estate» designs, owns and operates attractive, profitable stores with a combined sales area of approx. 500 000 m² and market value of over 600 million Euros. At every site, «KF Real Estate» establishes active, innovative, customer-oriented communities of commercial interest, with the aim of becoming the leading property company for the retail trade in Scandinavia.



An important aspect of this is maximum cost efficiency in building operation. In the «Coop Forum» store, for example, three Saia®PCD5 systems have been installed for this purpose. They control, monitor and measure the entire energy consumption of the building. In winter, for the comfort and safety of customers, the floor is heated in the area of the entrance. In addition, wind direction and strength are measured to prevent excessive cold air from penetrating the building.

All temperature values measured are stored in the three Saia®PCD5 systems. Using the integral web server, it is possible to indicate the current status on two 15" PC panels or to poll it via internet. Registered data and any alarms that occur are sent to «KF Real Estate» and «Sodexo Facilities Services AB» every day by email.

«Sodexo Facilities Services AB» is one of Sweden's leading suppliers of property services, including development, system integration, management, operation and maintenance. The company has concluded service contracts with over 200 customers and employs more than 160 people, achieving a turnover of around 22 million Euros. The «Coop Forum» in Norrköping is one of these service customers.

For «Sodexo Facilities Services AB» as system integrator, the intelligent solution in Norrköping's «Coop Forum» was a success primarily because of its transparent access to all relevant management data through the integral Saia®PCD web server, and because of the successful integration of Saia®PCD controllers within the existing environment.

Alongside its food retail chain, Coop operates Sweden's largest «store-in-store» malls. Its own food business is joined by up to 42 other businesses offering a broad range of goods and services. With a turnover of more than 3.1 billion Euros and 7300 employees, Coop's 21% market share makes it one of the largest food retailers in Sweden. ■



«Solar Islands»: Saia®PCD3 in use for an innovative concept to exploit solar energy across a large area

Among the many renewable energy sources, the potential offered by solar energy exceeds every other energy source by at least one hundred times. With solarthermic installations, extra-flat solar module concentrators (EFCs) offer an economically advantageous solution. However, precise orientation towards the sun is a genuine technical challenge. This does not involve the tracking of the sun's position by individual modules, but instead by the entire «island», which measures 80 metres in diameter. The Saia®PCD, with its high computing power, is ideally suited to this.



Solarthermic «island» in the United Arab Emirates at Ras Al Khaimah (RAK)

The «solar island» concept has been developed by CSEM, an applied research centre in the Swiss city of Neuchâtel. Its essential advantage is the fact that all solarthermic components on the island are on fixed mountings, i.e. they do not have to be moved to make them track the sun's position. Instead, the entire island is rotated so that it is precisely oriented towards the sun. For this purpose, the platform floats in a water-filled, circular channel. The steam produced by reflected solar radiation can be used to generate electricity, fresh water or hydrogen.

Saia®PCD controllers, with their superior computing power, could almost have been predestined for this ingenious concept. A prototype installation of these «solar islands» is located in Ras Al Khaimah (RAK) in the United Arab Emirates. Measuring 80 metres in diameter and weighing 250 tons, this facility generates 1.2 GWh of energy per year. Whereas this test installation has been built on dry land, in future significantly larger installations are possible which may also be built at sea.

The platform must follow the position of the sun extremely precisely. This is achieved with an extremely accurate algorithm that combines the GPS-derived position and time of day directly in a Saia®PCD3 controller, so that the platform positioning motors can be controlled.

This position is highly critical. The error should not exceed 0.0267°, which corresponds to 2 cm above the external wall. The first platform rotation tests were convincing. The platform, with its weight of 250 tons and surface area of approximately 5500 m², moves through 280 degrees at a speed of 8 cm/s. Further tests are still required before steam generation is examined.

Alongside the positioning of the platform, the Saia®PCD3 must regulate the air pressure below the membrane, which supports all the mirrors and maintains the water level in the external chan-



Solar island is controlled with Saia®PCD



15" Saia®PCD Web-Panel eXP

nel. For this the controller relies on a PCD3.T665 RIO Ethernet network. It simplifies the wiring to all sensors and actuators located on or near the periphery of the island.

CSEM Ras Al Khaimah opted in favour of Saia-Burgess because of the great flexibility of Saia®PCD controllers in utilization and computing power and the availability of support from both the local system integrator and the manufacturer. ■



Operation using a 15" Saia®PCD Web-Panel eXP

Applications

- Control device for 4 motors that position the island via Profibus-DP
- Control of day and night motion in all weathers
- Connection to GPS receiver for transmission of time of day and position
- Control of air pressure under the membrane
- Control of platform height on the water
- Control of water level in channel
- Connection of encoder and diverse sensors via Ethernet-RIO Saia®PCD3
- Storage of data on flash module
- Display of data via Saia® S-Web



«MobileControl» with Saia®PCD3.WAC

The scene of the crime is a large supermarket in the south of Essen, where something happened that is repeated every week somewhere in Germany. The shop manager, Herr Schönfelder, breathes a deep sigh. It is just after 8 o'clock on a Saturday evening. One last glance round the deserted store: all daytime lighting off, alarm system on, and it's time to lock up. At the end of a busy Saturday in the run-up to Christmas, he climbs contentedly into his car and drives home. According to Murphy's Law, the inevitable happens at the very moment Herr Schönfelder locks up the store: one of the fully loaded chest freezers decides to stop its cooling function.

Slowly but surely, the pizzas and frozen vegetables awake from their deep sleep and begin to thaw.

The deputy manager, Herr Schröder, opens the supermarket at 6 o'clock on Monday morning, switches off the alarm, turns on the daytime lighting and ... sees the wonderful spread which, despite the Christmas season, really isn't Christmassy at all. A stinking soup has spread itself evenly around the faulty freezer and beyond.

Without going into more details, it is immediately obvious that considerable financial damage has been caused here – from the disposal of spoiled products to the cost of cleaning and not forgetting lost sales.

Must this be accepted as fate?

No, with «MobileControl» it could have been avoided! And it would not have cost much money or work either.

The reader may now be wondering why he should continue reading this: «I don't have a supermarket».

The supermarket is just an example cited here to represent the various technical systems in buildings. We might just as well be talking about ventilation, air-conditioning or heating systems. Wherever error messages indicate a fault or the

complete failure of a system or installation, «MobileControl» makes it possible to prevent serious consequential losses. This applies particularly when no on-site staff is present, either at night or over the weekend.

«MobileControl» offers the following possibilities:

- Generation of error messages
- Forwarding of error messages to the server
- Generation of escalation messages by email and/or SMS
- Initiation of action through the appropriate responses
- Capture of access and service times and their forwarding to the server
- Sending of targeted emails with installation, system and service documentation

Sending error messages without establishing a connection saves costs

In the current market for building management and control systems, a variety of systems are in use for error messaging and remote operation. These systems communicate using analogue or digital fixed line modems or GSM modems with a SIM card. With conventional systems data is transmitted by establishing a charged connection.

The fees for these types of connections always comprise a relatively high, fixed monthly charge plus the additional costs arising from an individual connection. This is precisely where the patented «MobileControl» procedure comes in, achieving large economies with improved, secured and logged message functions.

Technical details

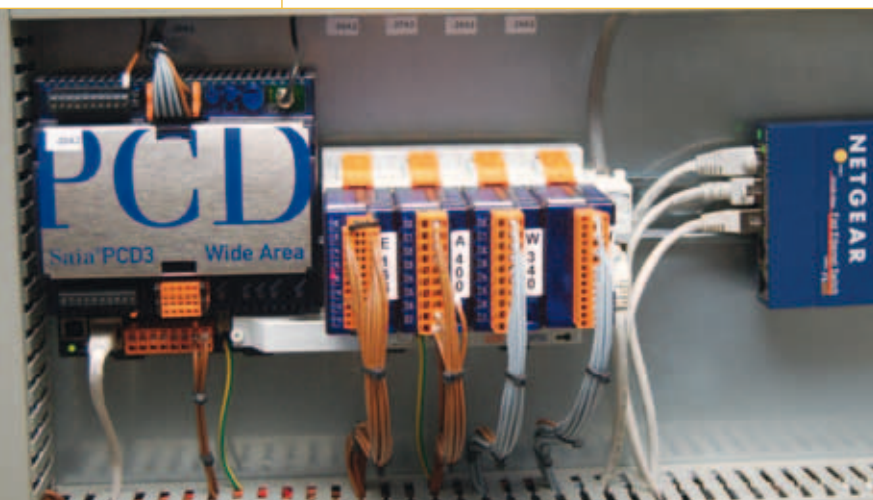
Any data or messages arising are transferred to the server according to the CLIP process. In addition, a four-digit code like an extension number is appended to the server's dial-up number. The server recognizes the call and evaluates the attached code, without accepting the call. This means that no connection costs are incurred.

Actions are defined in the server for all incoming CLIP codes. For example, «Burner 3 fault» can be sent by email or SMS to the relevant recipient. All incoming messages are logged in a database on the server and provided with a date and time stamp.



Local operation via a 10" Saia®PCD Micro-Browser Web-Panel on the switch cabinet

Control of heating system by Saia®PCD3.WAC with integral modem



Through the use of CLIP functionality, almost no load is placed on the system resources of provider networks. Transmission of a telephone is possible in almost all locations, because the network quality required is significantly lower than for establishing a speech connection.

Application example: heating system in a nursery in Geilenkirchen (Germany) with error message system based on «MobileControl»

When renovating a heating system, the following parts of the project were carried out:

- Renovation of heating supply and distribution
- Provision for three energy-optimized control circuits with temperature-controlled pumps
- Insertion of electronically controlled energy saving pumps
- Incorporation of an oil-fired condensing boiler with a demand-adapted output of 50KW (reduction of 25KW compared with old system)
- Implementation of remote operation system based on MobileControl

Prognosis for saving energy

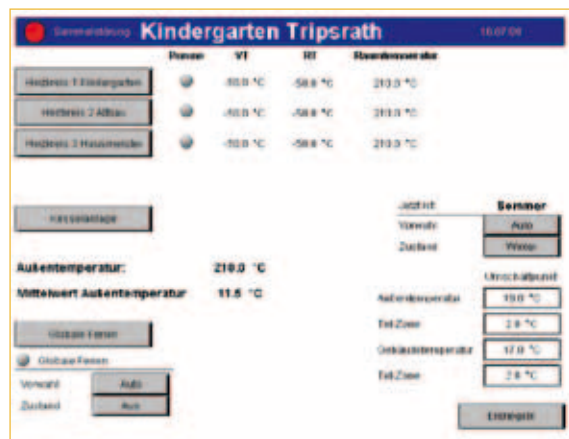
- Oil required approx. 35%
- Energy required approx. 65%



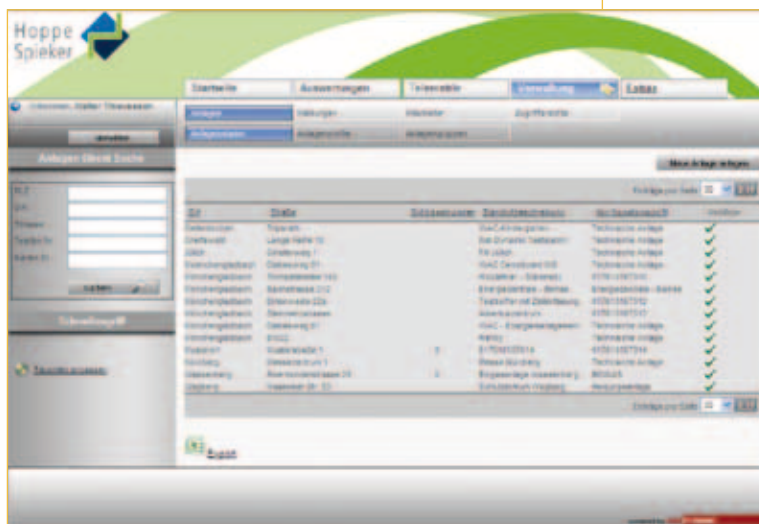
The integral error message system in MobileControl transmits and, if necessary, forwards the following messages:

- General error message
- Boiler malfunction
- Error message, pumps
- Ready for use message
- Temperature threshold values

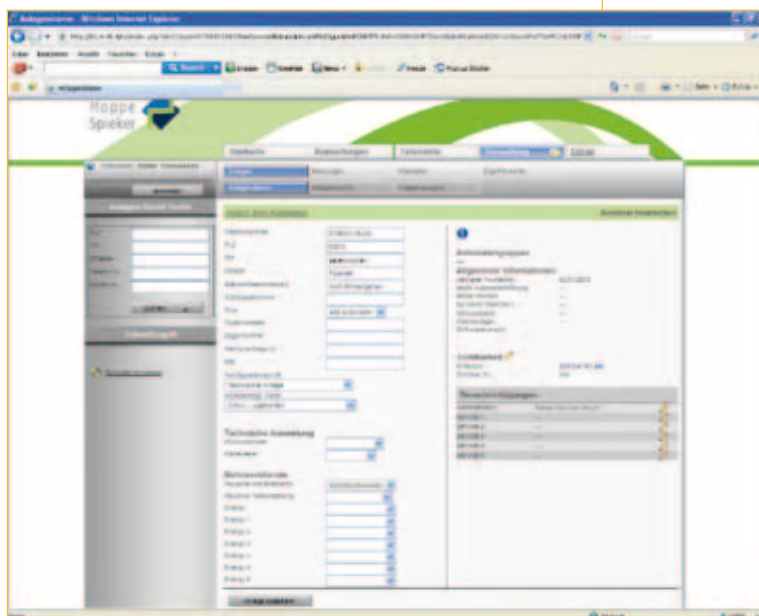
The ICA technology has been implemented using a Saia®PCD3.WAC with GSM modem. The on-site user interface is provided by a Saia®PCD Web-Panel. ■



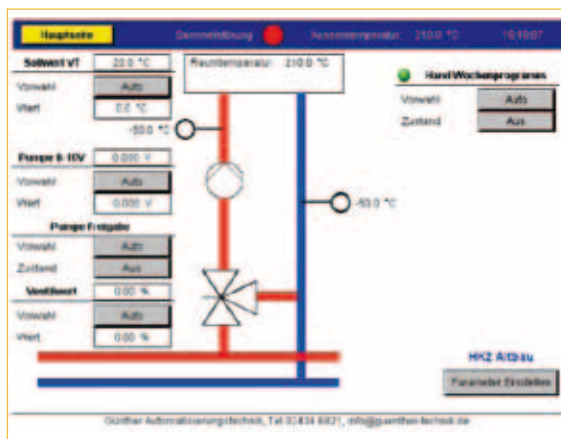
Start page of heating system



Direct access to the system via internet. Start page of the web interface



Web control mask for configuring system and error messages



Visualization of heating circuit 2 in the old building

Companies involved in implementation

Planning and construction management:
Planungsbüro IB Hoppe & Spieker, 41065 Mönchengladbach

Implementation of control engineering:
GETECH Gesellschaft f. innovative Elektrotechnik mbH, 41366 Schwalmtal

User software, web-based visualization and installation of MobileControl:
Günther Automatisierungstechnik, 41844 Wegberg

Saia®PCD web technology for HEAVAC application in modern buildings

Instead of an expensive SCADA system, Saia®PCD web technology provides for an excellent indoor climate in the newest building of the «Regional Chamber of Crafts» in Ljubljana (Slovenia).



This public building extends over three floors. On the ground floor there are offices, while the other floors accommodate training and conference rooms. For the investor it was extremely important that the indoor climate in all rooms should be fully individually adjustable. Great flexibility had to be allowed for in presetting room temperatures for different times to take account of holidays and other absences. Another requirement was the ease of making changes to individual parameters via a web browser. The main objective was a very good indoor climate with regard to air quality and temperature while at the same time minimizing energy consumption and costs for heating, ventilation and cooling.

The building is supplied with fresh air through three comfort ventilation units. These appliances have heat exchangers to recover heat from spent air. Fan-coil systems (4-pipe) have been installed for heating and cooling, allowing for very individual room temperature settings.

Task

Development of a lean building management system without the complicated administration of a classical SCADA system. All installed HEAVAC systems must be capable of operation easily and intuitively via Saia®PCD5 using an efficient web application.

Summary

The Saia®PCD5 controls the following systems:

- 3 comfort ventilation units
- 2 gas boilers (in cascade)
- 1 cooling unit
- 23 fan-coil units (PCD7.L690 room controllers)

The Saia®PCD5 communicates

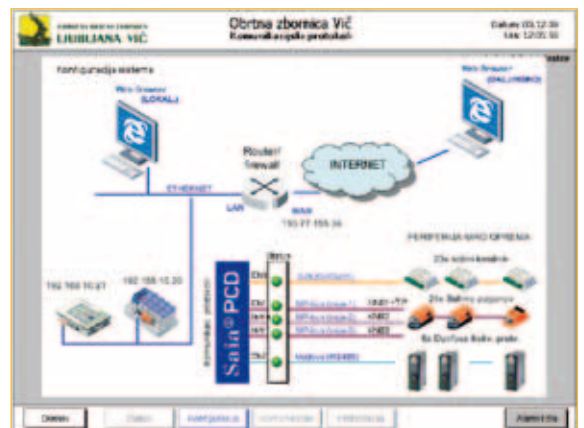
with installed equipment via:

- 1 Modbus (6 frequency converters)
- 1 S-Bus (23 room controllers)
- 3 MP-Bus (one MP-Bus branch per comfort ventilation unit, 24 valves and dampers)

The 98-page web application covers all requirements and offers the user a good overview of all systems installed in the building.

Through the use of different bus systems, the time required for electrical installation work has been significantly reduced. In addition, material has been saved on cable and installation boxes.

Remote access (via communications protocols like S-Bus, HTTP and FTP) has proved to be highly efficient and comfortable. Even during trial operation, further possible improvements arose from the web application. ■

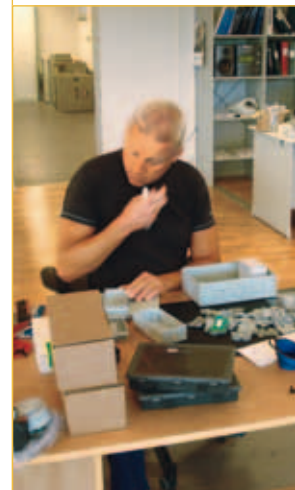
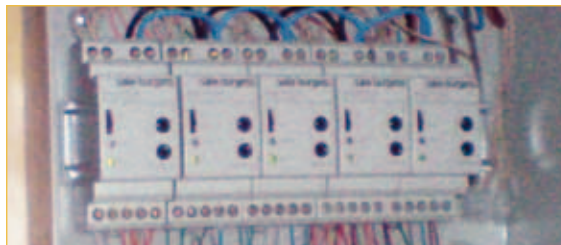


Indication of individual consumption and billing via web pages for student apartments, thanks to Saia®PCD with web and IT technology

Uppsala is an old university town in Sweden with many students. One of the student fraternities set itself the aim of reducing energy consumption in its buildings and student accommodation, while also simplifying the billing procedure and allowing residents to access their personal consumption data via internet.



This objective was achieved with the help of Saia®PCD using web and IT technology. «Malthe Winje Automation AB», the partner of Saia-Burgess Controls in Sweden, worked with system integrator «EI & Reglerteknik AB» to develop and deliver a solution that exactly met the requirements of the student fraternity.



The solution includes reading cold and hot water meters in the separate apartments, individual web pages for tenants, and monitoring, data registration and alarms via email.

The installation comprises

- 4 Saia®PCD5 systems each with one 6.4" Windows®CE-Panel and
- 170 Saia®S-Bus S0 modules PCD7.H104S with integral meters for 4 pulse inputs



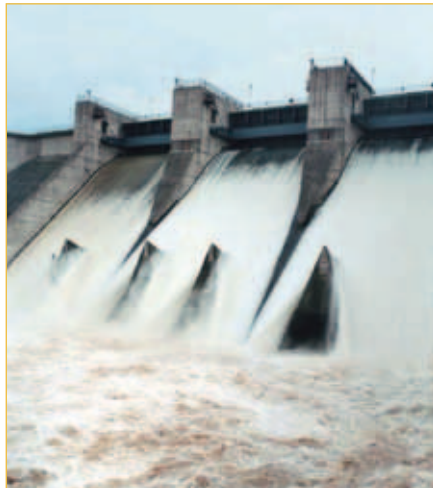
As usual for Saia®PCD projects, all web pages have been integrated into the PCD5 controllers and communication between them takes place via Ethernet.

With real-time access to individual consumption data, each resident can influence his own energy bills by reducing his consumption and thereby actively protecting the environment. ■



Dam safety with Saia®PCD3.WAC

In 1986 a dam was built across the river Raba at Dobczyce, about 30 km from Krakow in southern Poland. A reservoir 10 km in length was created that supplies more than half of the drinking water requirements of the city of Krakow. The lake contains over 127 000 000 m³ of water and covers an area of 1060 ha. Apart from supplying Krakow with drinking water, the dam regulates the downstream flow of the river according to the needs of water consumers. Its other tasks include flood protection and power generation with a 2.5 MW hydropower plant.



- Convenient access to the web and FTP servers of PCD3.WAC stations
- Remote programming and maintenance of the three telemetry stations
- Possibility of direct exchange of data between the PCD3.WAC and the SCADA system
- The ability of PCD3.WAC controllers to send emails directly using the SMTP protocol

Solution

In each telemetry station a Saia®PCD3.WAC works to capture and process data. The relevant values are either sent to the SCADA system or the system automatically polls on a cyclic basis. Manual queries by the operating staff are also possible. Communication between the dam's SCADA system and the telemetry stations occurs via the GPRS service of the GSM network. The SCADA system computers work in the hot backup process. They are connected as communications routers via Ethernet with external GPRS modems which, like the modems of PCD3.WAC controllers, have SIM cards with a fixed, public IP address.

The PCD3.WACs in telemetry stations ST1 and ST2 use radar sensors to capture water inflow and the water level of the reservoir. The PCD3.WAC in ST3 monitors water outflow through the two underwater pipelines to Krakow. At the same time, the status of water meters and the current outflow values in m³/s are captured. All three Saia®PCD3.WAC controllers process the data and send it to the SCADA system. In addition, they monitor access to the control boxes and the charge status of batteries.

Telemetry stations ST1 and ST2 are supplied by photovoltaic modules (175 W) and a battery. The PCD3.WAC and batteries of ST1 are located in a control box on a bridge arch. ST2 is mounted on a waterside mast. ST3 lies in a water impoundment in Dobczyce and has a mains power connection.

All data for the entire installation is stored centrally in the SCADA system. Operators can analyse changes to the waterline and water inflow, represent them graphically, and make the right decision for regulation of the water level. Time-dependent reports about water levels, inflows and outflows can also be compiled and are of great importance for longer term operation and future development. ■

General conditions for project

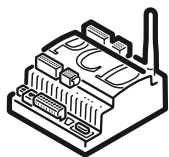
The company «SABUR Simtech Partner» specializes in the automation of hydro-technical projects. In summer 2009 this company was awarded a contract to develop three telemetry stations (ST1, ST2 and ST3) for the monitoring of water level and of the flow of water into and out of the Dobczyce reservoir. The three stations are connected through GPRS technology to the existing dam monitoring system. The latter is based on the SCADA system «Wizcon Supervisor», which was installed as a hot backup system in the dam's site office, together with an additional preview. For the purposes of monitoring and controlling the dam, the SCADA system captures:

- All hydro-technical device states
- Temperatures (including the dam's internal temperatures)
- Hydrostatic pressures from water level sensors equipped with piezometers
- Probe calibration
- Pendulum deviations
- State of screw and fan drives

All three telemetry stations must be controlled by the PCD3 Wide Area Controller (PCD3.M2350) from Saia-Burgess.

Saia®PCD3.WAC controllers were chosen for the following reasons

- Easing polling of data from the PCD3.WAC by the SCADA system



Saia®PCD3.WAC



First BACnet® application at Masaryk-University in the Czech Republic

With over 35 000 students and more than 4500 staff, Masaryk University in Brunn is the second largest University in the Czech Republic. The associated complex of property includes over 200 buildings and 17 000 rooms in an area of 35 000 m². The university's existing IT infrastructure also includes PLCs from various manufacturers that communicate with each other by means of the LONWorks® and BACnet® protocols.

In two new buildings on the «Brno-Bohunice» campus, automation is achieved with Saia®PCD2.M5540 controllers via BACnet®. Alongside support for the BACnet® protocol, connection was required to the existing IT infrastructure of the university and to the campus visualization system. Support was also specified for the Modbus protocol, which is used to connect the cooling system, and the M-Bus protocol, which is used for accessing the kWh meters and the comprehensive HEAVAC system that regulates climate in the lecture theatres.

Saia®PCD solution



Saia®PCD2.M5 Saia®PCD7.L100 Saia®PCD7.L601 Saia®PCD7.L643

Hardware

- 13 CPU PCD2.M5540 with 1300 I/O and 13 BACnet® option modules PCD7.R561
- 17 RIO S-Bus input modules PCD7.L100
- 7 room controllers PCD7.L601
- 7 room control units PCD7.L643

Bus protocols

- BACnet®/IP, S-Bus, M-Bus, Saia®Modbus

Visualization

- ORCAview from «DELTA controls»



The automation solution shown demonstrates the excellent communications capabilities of Saia®PCD2.M5540 controllers, which fully satisfy the customers sophisticated requirements for this building automation system. ■



Amsterdam's AMC Hospital profits from policy decisions: open building automation system with industrial quality

In 2000 the building automation system of the Academic Medical Centre (AMC) in Amsterdam was modernized. On the basis of a policy decision in favour of an open management system with industrial quality, a choice was made for automation technology from Saia-Burgess. This brings AMC every benefit in its current growth phase.



The AMC University complex of buildings in Amsterdam will be extended over the coming years

«In 2000 we chose a building automation system with industrial quality because we liked the openness of the system. This openness just isn't there in many other building systems», says Tom Emke. «Systems like that give you very few possibilities for programming and in practice you come up against all kinds of limitations. Until 2000 we had various automation systems, including ones from Johnson Controls, Honeywell and Siemens. Since only a few adjustments are possible with these systems, we couldn't optimize our energy management. Also, it was impossible to monitor remotely the status of the pneumatic system. At that time, Saia-Burgess was already equipped for Ethernet. The best thing about it was – and is – the fact that with Saia® I can program everything I need.»

Finding own solutions

Where does this passion for open systems come from? «Before I started here, I worked in ships. At sea you learn that you have to find solutions to problems yourself. Closed systems that can only be operated by the manufacturer are unusable at sea.

There systems just have to be open. Why wouldn't this openness be an advantage in a building automation system too? I know both the advantages and disadvantages of open systems and I'm convinced that in building automation the advantages predominate. When the AMC was opened, many things were arranged specially for our building system. Countless technical solutions from suppliers have been put in. Today that's not possible any more. Today products and systems have to be freely available on the market. Unless you work with open systems, you will in time face steeply rising costs for spare parts. For this reason, we decided in favour of Saia®PCD. »

Factors in the choice of building automation system

- Open Saia-Burgess management system
- Products from third-party suppliers are easy to integrate
- Ethernet-based network communications
- High reliability of Saia®PCDs in industrial quality
- Data capture and alarm management integrated in Saia®PCD
- User is independent



Tom Emke, Building Manager working for AMC Facilities Management:

«We are now independent and that gives us a crucial advantage»

AMC building automation system

The AMC building automation system includes, for example, the air conditioning system with 450 climate control cabinets and room controllers. In addition, heating and cooling systems, pressure and compressed air, oxygen and water (plus demineralized water) are also included. To this can be added all areas concerned with energy consumption. At all important points, energy meters have been fitted and connected to the network. At times of peak demand, the building automation system controls



An old system at AMC with Saia®PCD4 systems

the efficient use of electricity and gas. Door locking and smoke-check valves are also controlled by the system, together with the necessary emergency operation control circuits.

New components constantly

The AMC building automation system is being expanded constantly. Mr Emke tells us: «In 2005, 10.000 physical data points were connected to the Saia system, now that number has already grown to 17 000». The AMC area keeps on developing. At the same time, the number of tasks the management system must fulfill is growing. This is down to a stricter legal framework.

According to Mr Emke: «We have to log ever more history data. We log water temperature and water pressure for all the floors. The same applies to GMP areas like the laboratories and pharmacies. All laboratories are certified and we make that possible. In the laboratories there are over 350 freezer cabinets storing all kinds of medical materials at a temperature of -80°C. Apart from that, we have 100 cryogenic containers with irreplaceable DNA material.»

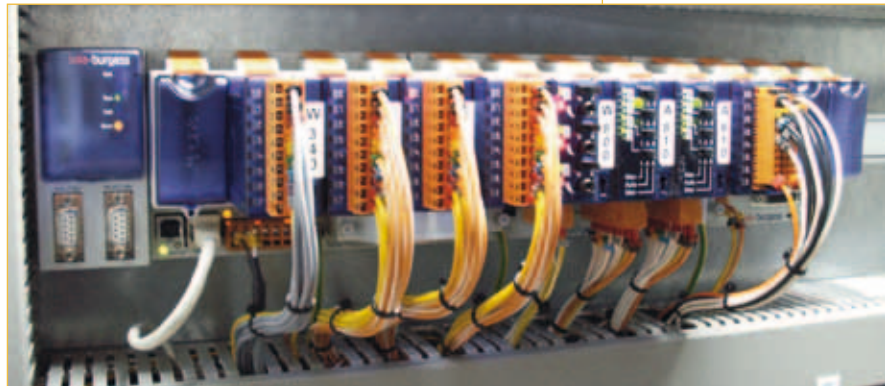
Top ten

AMC is one of the top ten academic hospitals in the world. It has over 8000 employees and 1000 beds. Most rooms are used as research laboratories for scientific purposes in the service of medicine. From time to time, scientific congresses also take place here. During one such congress, more than 15 000 people may be located within the buildings of the AMC.



Independent

At AMC all rules and technical agreements have been set down in writing. Every company involved in the work on the automation of AMC undertakes to adhere to these technical guidelines in their programming. Previously, this work was carried out by «Regel Partners», a system integrator. All PCD controllers are still serviced and looked after by Regel Partners. Mr Emke says: «With the technical guidelines at hand, basically anyone can program for AMC. A programmer who has never worked before for AMC will be given a laptop with all the information about the programming



New Saia®PCD3 automation stations at AMC

procedure. When he is finished, he gives back the laptop and his work can be checked. That works very well. We are independent not and that gives us a huge advantage. Even in the choice of spare parts, we have complete freedom. For example, I can connect an old PCD4 controller to any other new PCD3 intervention module of my choice. The IFIX visualization system is totally independent of the building automation system, but can be operated with our system. That's vital too, because many other installations are running as well. This is genuine openness.» ■

The AMC building automation system offers many functions, including peak shaving for electricity and gas consumption

Parts of the building automation system

- Saia®PCD: 310 pcs.
- Phys. data points : 17 539
- Server: 22 pcs.
- Applications: IFIX 4.0, terminal server IFIX, history data I-Hist, portal web applications, automated workflow, change management, alarm system
- Communication: At field level with S-Bus, at network level with Ethernet

Need-adjusted street lighting: How using Saia®PCD3.WAC controllers can save lots of energy

Public street lighting has enormous potential for savings that can be exploited with efficient lighting management. This includes optimizing switch-on/off times, daylight-dependent lamp dimming, need-adjusted lighting at weekends and on public holidays, and switching on full lighting by remote control for emergencies. Saia®PCD3.WAC is an all-round solution that provides the backbone of this approach.



Saia®PCD3.WAC with personalized edp cover

«EDP Serviços & Consultoria, SA», an affiliate of the Portuguese EVU EDP Group, uses Saia®PCD3.WAC as an RTU (remote transmitter unit) to control dimmers from a wide variety of manufacturers with different protocols. At the same time, the energy saved is calculated in real time using an algorithm specially developed for the purpose.

Saia®PCD3.WAC devices were chosen because they can use all open and proprietary protocols to communicate with all dimmers and so prevent any breakdown of information in an emergency situation.

Local and remote operational reliability
PCD3.WAC devices form a reliable platform for configuring operating modes and the calendar, measuring energy with meters, defining expect-

ed energy consumption, or saving and triggering alarms.

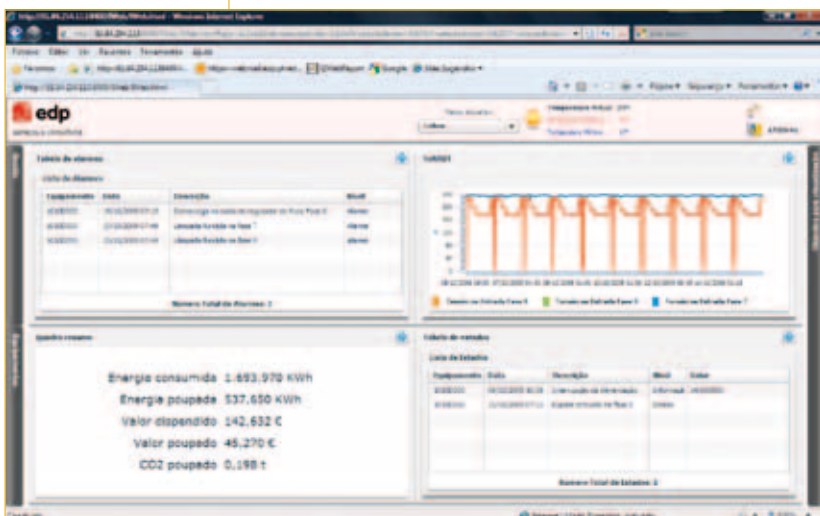
All PCD3.WAC devices have a GPRS modem for sending trend measurement data at predefined intervals and for the immediate transmission of alarms and current operating states via Engiby's NG-Server with a central database. Local CSV files are stored on the SD flash card as backup. The Saia®PCD3's web browser functions are used for local configuration via a laptop, tablet PC, or micro-browser panel.

Any local modification of the configuration of a Saia®PCD3 is automatically transferred to the central database in the NG-Server, providing it at all times with an up-to-date image of all installed PCD3s.

If it becomes necessary to replace a faulty controller, the new PCD3 will automatically be reconfigured with all the parameters of the faulty device, including energy meter states and running times. All these parameters and values are transferred from the central database in the NG-Server. This allows the system to continue running seamlessly, without additional effort.

Reporting and maintenance without losing time or data

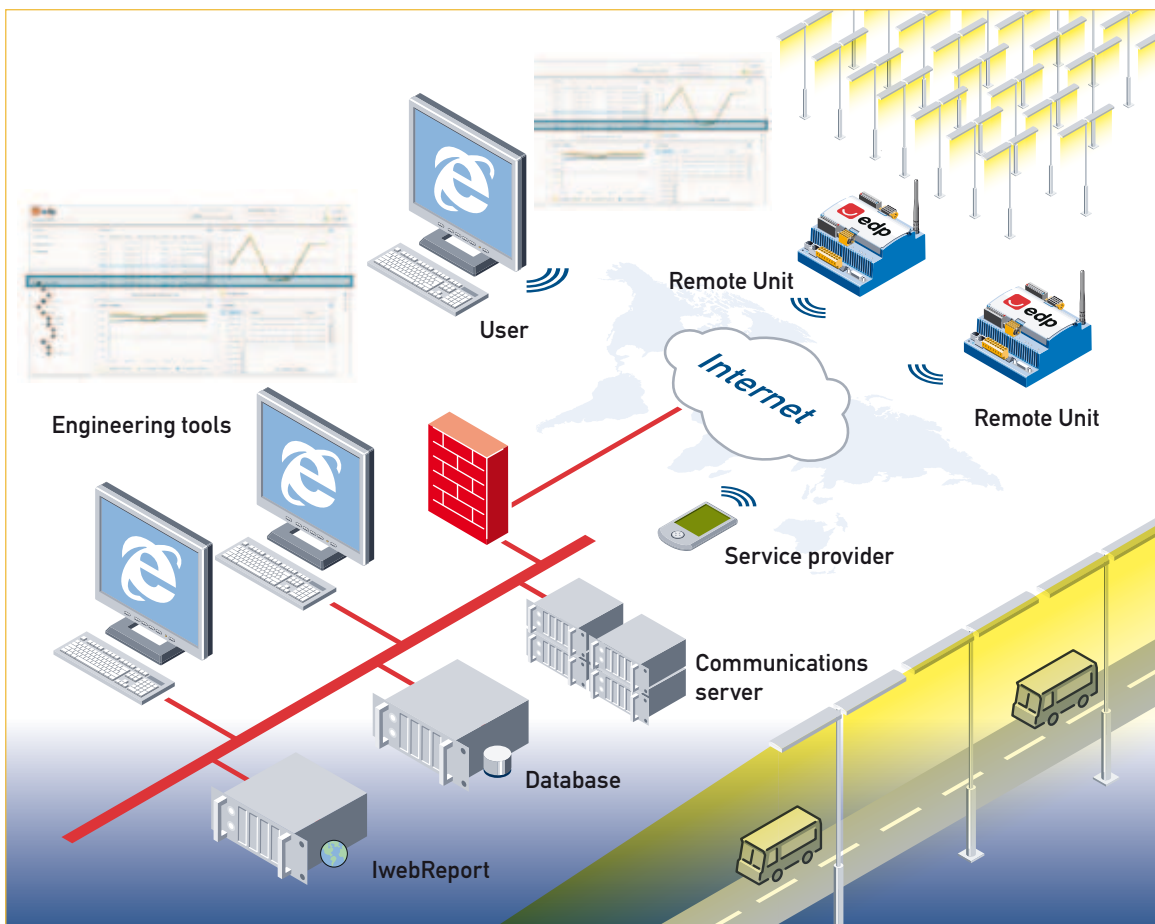
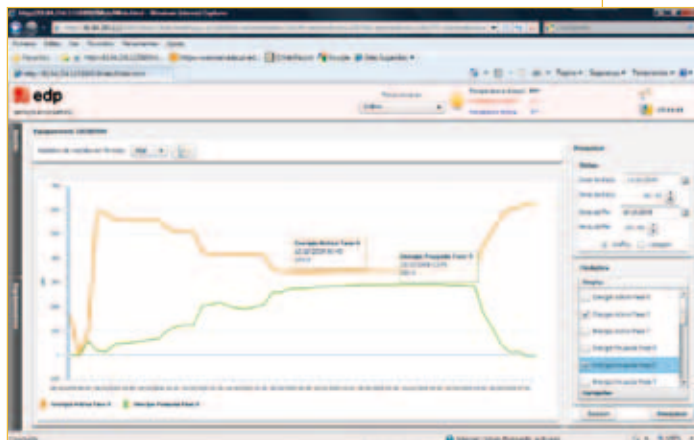
The web application «IWebReport» provides a Web 2.0 user interface for the remote control of changes to configurations, maintenance work, access to measurement data and management of different components in street lighting.





Saia®PCD3.WAC controllers edit statistics for forecast consumption in multiple linear regression as well as performing ANCOVA calculations for auto-adaptive electric load modelling in real time.

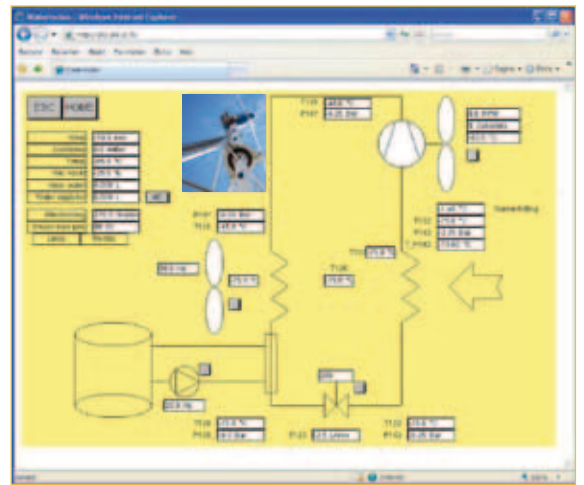
To guarantee immediate transfer at all times, the alarm function uses separate channels with high priority. Suitable safety provisions ensure constant connection to all Saia®PCD3 controllers and in addition guarantee that, even with an evolving structure, there is no risk of mixing up PCD3 data. ■



Switch cabinet with Saia®PCD3.WAC controller in edp version

Air becomes a source of energy and water

Holland is the undisputed world leader when it comes to water technology. The Netherlands-based company Dutch Rainmaker uses the condensation effect in ambient air to generate a few tons of water per day. To make this process possible even in the most remote areas without a power supply network, the mechanical compressor required is coupled directly to a wind turbine. Control and automation of the entire system take place via a Saia®PCD3.M5.



Web-based process images of waterworks – local and remote operation and monitoring based on the web server in the Saia®PCD3.M5.: created using Saia® Web-Editor

«Dutch Rainmaker»,
plant engineers:
www.dutchrainmaker.nl

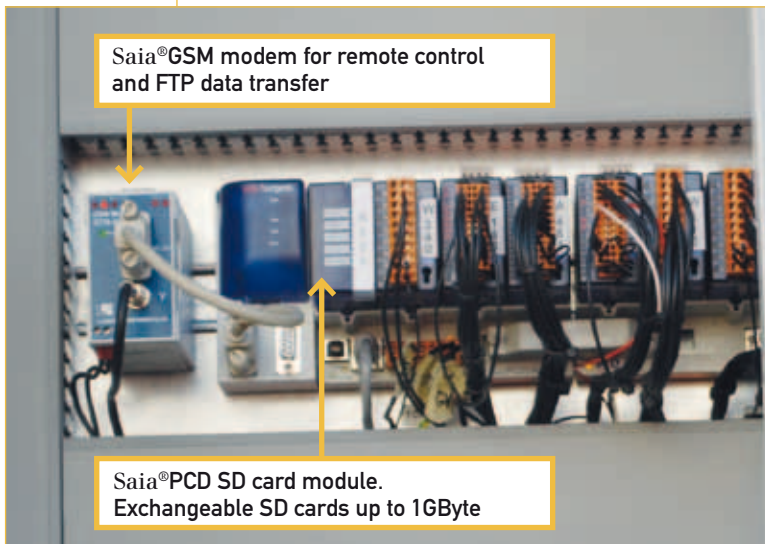
«Dutch Rainmaker»
is an affiliate of
WindWaterTechnologie (WWT)
Schoondijke
www.wwtcleantech.com

One of the functions of this project is also the purification of water gained to produce drinking water, as well as the overall management of these independently functioning systems, which are mostly located in remote parts of the world.

The Saia®PCD3.M5 controller regulates and controls the entire system. A GSM modem, installed as standard, allows full remote access to all functions. Due to the challenging climate conditions at the locations of use, only robust and reliable modules are employed.

On-site operation and the management system are already integrated into the Saia®PCD3.M5. The basis for this is a combination of Saia®SD flash and Saia®Web technology. Any choice of device with a browser can access controller data and display history or alarms, either locally or remotely. This makes service and operation simpler and more economical. This is a mandatory precondition of operating windmills efficiently in remote regions.

Even in areas with a better infrastructure, the Saia®PCD3.M5-based solution is an attractive alternative compared with expensive and complicated PC-supported control and visualization systems. ■



Saia®GSM modem for remote control and FTP data transfer

Saia®PCD SD card module.
Exchangeable SD cards up to 1GByte

Saia®PCD3.M5 controller in switch cabinet at foot of water extraction plant. For local networks, Ethernet is used; for on-site service the USB interface is used.



Compressor and switch cabinet directly at the foot of the windmill

Vnukovo Airport, Russia

Vnukovo Airport is a very large building complex made up of:

- **Vnukovo-1 Passenger Terminal**
for international flights with an area of 250 000 m² and passenger handling capacity of 7800 persons per hour.
- **Vnukovo Post and Freight Terminal**
with an area of 57 000 m² and capacity of 150 000 tons of freight per year.
- **Vnukovo-3 general air-traffic terminal** with an area of 7000 m².
- **Vnukovo Airport Hotel**
with an area of 30'200 m², a 4-star hotel comprising 443 rooms.

Tasks and objectives

To operate this multifunctional, technically highly developed airport installation with real efficiency, only the very best was good enough for the building and it was necessary to use state-of-the-art information technologies. Vnukovo-1, the largest passenger terminal in Russia, includes 3 separate heating plants, 1 cooling system, 3 transformer substations, 2 decentralised transformer substations, 4 comfort ventilation control centres and dozens of control devices for heating, ventilation and air conditioning (HEAVAC).

Solution

The project engineering integrates the infrastructure of all buildings and includes all internal systems. These are the mechanical and electrical plant, safety systems, information and telecommunications systems, and building management systems.

All systems in the airport complex have a common information environment and communicate via open protocols, such as Modbus, Profibus-DP, EIB, BACnet® and S-Bus. Heating and ventilation plant is controlled by Saia®PCD3. The power supply and other systems are monitored by remote I/O modules (serial S-Net RAIL).



Saia®PCD3 with SD flash card module Saia®PCD3.R600 in the post and freight terminal



Patented technology as a philosophy

The patented PROFIVE® technology from the Russian company EcoProg Ltd. allows for the optimum planning and implementation of highly developed infrastructure solutions for large projects:

- Efficient project management thanks to integration
- Cost reduction in project planning and implementation
- Greater reliability and security of technical infrastructure
- Reduction of operating costs
- Lower insurance costs
- Solutions according to the highest Russian standards
- Support throughout entire lifetime
- Combination of both proven and innovative technologies

Saia®PCD controllers fit this concept outstandingly well, enabling them to be equipped with a large number of protocols and interfaces, alongside the integral IT and web functions. ■



Extensive Saia®PCD3 technology at passenger terminal-1



Saia®PCD3 installation in the post and freight terminal

Installed Saia®PCD products from Saia-Burgess Controls

Type	Control devices		I/O modules				Remote I/O modules		
	PCD2.M150	PCD3.M5340	PCD3.E160	PCD3.A460	PCD3.W340	PCD3.W410	PCD7.L130	PCD7.L200	PCD7.L300
Vnukovo-1		148	344	132	243	179	3975	359	350
Vnukovo Post and Freight		32	79	32	60	30	312		
Hotel		53	126	64	86	51	641	157	
Vnukovo-3	28		76	25	30	30	10	10	30
Total		261			1587			5844	

Modernization of production for McDonald's in Russia

«McComplex» is the food processing and distribution centre of McDonald's in Russia. Based in the Pere-delkino district of Moscow, it supplies products to more than 240 McDonald's restaurants in Russia. Alongside the sales department, the company includes a modern factory with production lines for semi-finished meat products, a bakery and the company's quality control laboratory.



The cooling system of a factory of this size is a particular challenge. A technically complicated system is required to maintain the necessary temperatures for production technology in each individual room.

The first planned step was to modernize the control system of the cooling plant. The system previously used, initially based on one of the first PCA2 series and later on the PCD6, had been working impeccably since 1988. That is why there was never any doubt for McComplex that they would continue to rely on Saia®PCD in the future.

The Russian Saia® partner «MCsquared» distinguished itself with a very good price/performance ratio, smooth and rapid progress and outstanding technical competence in changing the cooling plant system to Saia®PCD3. For this reason «MC-squared» also received the contract to modernize the production plant for semi-finished meat products. On this production line, fresh, ground meat is used to form hamburger patties which are then frozen. The system consisted of two parts – the controller for the ammoniac freezing plant and the controller for the assembly line and washing plant. Both parts of this old system were controlled by Siemens® S5 controllers.

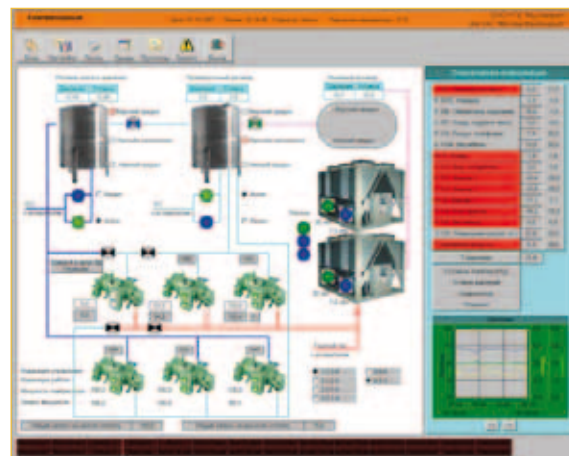
The controllers in the old plant were replaced with Saia®PCD3.M5340 devices. Operation of the system is via a web interface on the Micro-Browser Web-Panel. The challenge here was the narrow time frame specified by the customer. The assembly line controller was converted in two days and the cooling plant controller in less than two weeks. Any more lengthy stoppage of the plant would have been unacceptable to the customer.

The next modernization project was the system for manufacturing the bread dough. This was also based on a Siemens® S5 and a text panel. The new system is now controlled by a Saia®PCD3.M5340. Operation is via the web interface using a Micro-Browser Web-Panel.

Here the Saia®PCD controller's advantages of flexibility and system openness are demonstrated once again: the reduced engineering expenses become a winning factor. ■

Part of system	Controller	Number of I/Os	Operation	IBS* year
Cooling	1x PCD3.M5340	133DI, 103DO, 42AI	Scada system Visi.Plus	2010
Meat products	1x PCD3.M5340 connected via S-Bus	112DI, 112DO, 8AI, 4AO	PCD7.D410 and web via TCP/IP	2009
Meat chilling	1x PCD3.M5340 connected via S-Bus	64DI, 52DO, 48AI, 8AO	Web via TCP/IP	2009
Bread dough	1x PCD3.M5340	32DI, 16DO, 1AI	PCD7.D435	2010

*IBS = InBetriebSetzung (commissioning)



Visualization with Saia®Visi.Plus

Saia®PCD3 and Visi.Plus control and monitor refrigeration machines in a supermarket in Sweden

ICA Kvantum is the leading local supermarket food retailer in Liljeholmen, a district of Stockholm. ICA Kvantum is located with other businesses in a new shopping arcade and operates four sophisticated refrigerator machines in its supermarket.

For these refrigerator machines ICA wanted an extremely reliable and comfortable control and monitoring system that could be operated both locally and via remote access. The appropriate solution to these critical requirements is provided by Saia®PCD3 controllers with web server and the Saia®Visi.Plus management system.

All four refrigerator machines are each equipped with a Saia®PCD3 and a text panel (PCD7.D232). As a backup-medium, every Saia®PCD3 has a flash memory card. As soon as any controller fails, the backup memory card is simply inserted in the new CPU and the cooling system continues running. This reduces potential downtime to a minimum. If there should be a fault in communication with the Visi.Plus management system, the machine can also be operated via the local text panel. Like a spider in the network, there is also a fifth PCD3 system in the control room that stands alongside a local PC with Saia®Visi.Plus.

The dynamic display of all processes and trend curves for all temperatures measured and alarm handling takes place through visualization and management system software: Visi.Plus with web server. The add-on tool «PChart» gives operators and system integrators the ability to assess trend data by remote access, without being directly on-site.

The ICA success story started in 1917, in the town of Västerås, when Hakon Swenson founded the shopping centre «Hakonbolaget». His



idea was to offer numerous independent retailers sales space «under the same roof», purchasing merchandise together and sharing the marketing costs. Today, if the independent retailers are included in the calculation, approximately 2230 shops are members.

ICA Kvantum Liljeholmen belongs to the ICA Group with many business of the same name in Norway, Sweden and the Baltic states. The ICA Group comprises «ICA Sverige», «ICA Norge», «Rimi Ostsee» and the «ICA Bank». The Group employs 22 000 staff (excluding sales personnel in Sweden and without the employees of franchise stores in Norway).

The system integrator for the «Liljeholmen» project is «Partor AB», a specialist in refrigeration and heating. «Partor AB» has a scalable and easy to expand PLC concept for HEAVAC applications and is therefore able to implement turn-key projects from the initial idea to final commissioning. Some examples for reference are: projects in the food sector, 25 MW air conditioning systems on cruise liners, and high voltage generators in Dubai. ■



Saia®PCD3 with flash memory module



Switch cabinet with Saia®PCD3 controller and PCD7.D232 panel



Visualization with Saia®Visi.Plus

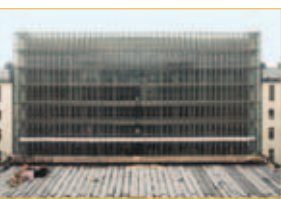


Local operation with the text panel Saia®PCD7.D232

Chill cabinets in the supermarket controlled by Saia®PCD3

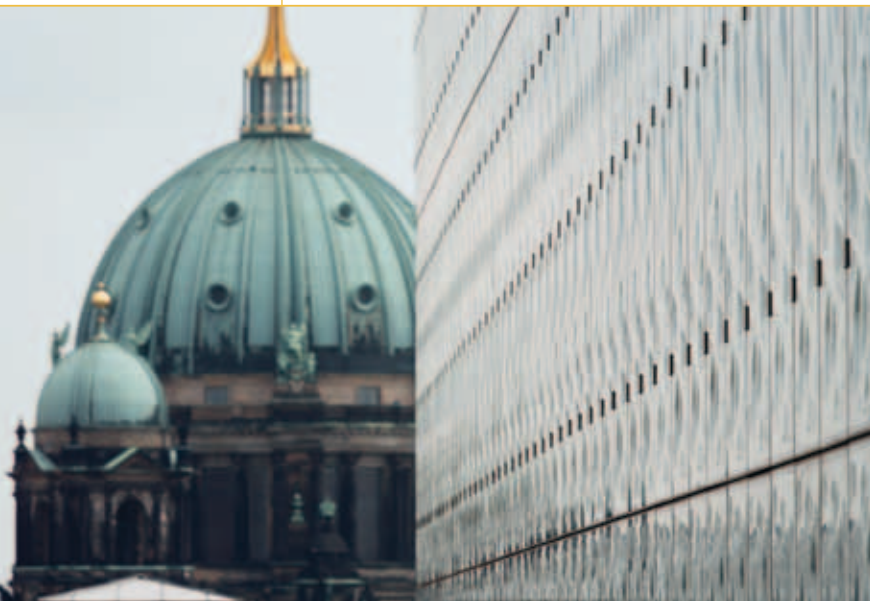


Tailor-made lighting with daylight and artificial light in the National Library Berlin, controlled with Saia®PCD3



Window frontage of the new central reading room of the National Library Berlin

The new central reading room of the National Library Berlin, located on the iconic boulevard «Unter den Linden», is enclosed beneath a glass cube. This allows optimum use to be made of daylight. However, for a constant light intensity of 500 lux, it must be precisely adjusted with sun blinds and, when required, artificial light must be added. The Swiss system integrator and specialist in shading solutions «Bühler and Scherler» solved this sophisticated task with Saia®PCD controller technology.



The glass façade of the National Library, near Berlin Cathedral

The National Library Berlin with its headquarters on the «Unter den Linden» boulevard is the largest general library of the German language. The building, which measures 107 m in width, 170 m in length and has 13 floors, was badly damaged in the Second World War, its central domed hall being hit by bombs. War damage had only been partially removed and the central reading rooms were torn down in 1975. This deprived the library of its centre, both functionally and in terms of content. As part of current general renovation works, a new, central reading room is being built that will serve both as an axis for development and a new centre for the library. According to the designs of the architects HG Merz a cube – whose side walls and roof are made of thermally worked glass – has been constructed over a «wooden lectern» structure. The new cube accommodates, in addition to numerous books, the central reading room with 90 reading stations, 140 research reading stations directly next to the glass façade, 19 so-called carrels (closed, research stations that can be rented for periods) and a work station for the blind.



The large window frontage allows optimum use to be made of daylight

Great demands placed on lighting control

Illumination of the reading room should – as far as possible – be achieved with daylight and have a specified constant lighting level of 500 lux \pm 100 lux. Fluctuations in daylight should remain clearly detectable, because direct contact with the outside world promotes the wellbeing of the reader and at the same time increases the capacity to absorb. This is agreeable for users, but places significantly greater demands on the lighting controller than operation exclusively with artificial light.

The basis for adaptive lighting control is a matrix created by the Institute for Daylight Technology, Stuttgart. Data for the matrix was calculated using a simulation of the incidence of light from all directions taking account of building geometry and orientation. The matrix takes the form of an Excel table and covers all 52 weeks in a year, with six values for each day and for each façade. Two external measuring stations that each have five measuring heads on the roof and four sensors in the reading room (average value) are used to capture the actual, prevailing intensity of light – subdivided into artificial and daylight. With the help of this data and the corresponding control of light incidence, the lighting level in the reading room is kept almost constant. Any necessary adjustment – mainly by measures that affect shade, but if necessary also by artificial light – always occurs after a slight delay. This, however, will become shorter as deviation from the lighting level setpoint increases.

Controllers fit for the Microsoft® world

Two Saia®PCD3.M5340 programmable logic controllers play the main role in this adaptive lighting. Both components share the extensive work and ensure reliable operation. They regulate the intensity of light with sun blinds or by adding artificial light and, in this way, ensure the required constant lighting level.

For this purpose, controllers rely on the matrix containing insolation data for each façade and for the whole year. This data has been transferred to flash memory in the form of one Excel table per FTP and can be plugged directly into the PLC. Rep-

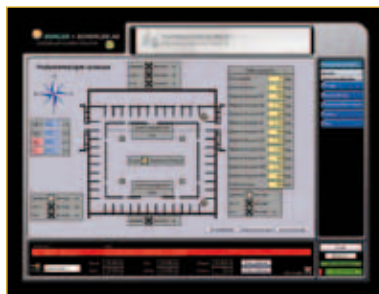
representing the system integrator Bühler and Scherler, IT Manager Urs Rüegg explains: «To enable the PLC to interpret and process the data, it was necessary to have extensive application programs and a corresponding commitment from the controller specialist's programmers. With the application support of Saia-Burgess in the form of complex program routines and appropriate file system functions, Excel data can be accessed accurately and smoothly».

8000 data points are managed

The glass cube is embedded in the historic stonework of the National Library. It consists of 800 glass elements, each of which has its own, motor-controlled sun blind. These motors have been connected to the Saia controllers via KNX actuators, with KNX telegram transfer taking place in the backbone via TCP/IP. In addition, there are around 150 push-buttons allowing the level of shading to be controlled manually in groups. Whereas glare shields for the research reading stations are always controlled manually, external sun protection for the façade is integrated within the central controller. Manual control will have priority for no more than one day, returning to automatic mode after the reading room's closing time. For the control, positioning and monitoring of sun roller blinds, it is necessary to manage in total around 8000 data points.



Sun blinds provide shade



Photometer



North façade



Trending



Anti-glare shield, north



Alarms



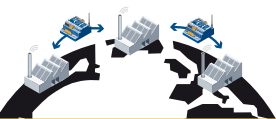
Photometer parameters

Most light comes in through the roof. Shading here is therefore continuously adjustable to achieve the exact positioning of sun blinds. For aesthetic reasons, sun blinds on the façade have single-stage control, although intermediate positions can be achieved in the area of ventilation gaps.

Due to their integral web server, controllers can be operated with password protection from any normal PC via SCADA software. In this way, parameters can be adjusted or values changed with no great effort. Thanks to the use of standard web browsers, no added costs are incurred either for installation or training. Existing infrastructure (internet/intranet) can also be used with standard protocols like Ethernet TCP/IP and HTTP for remote maintenance and remote action – an invaluable advantage for service. ■

Business all over the world !

O.S. Panto is an Italian company active for over 20 years in the construction of wood drying plant. It also automates combined heat and power plants up to 20 MW capacity.



OSPANTO
www.ospanto.it



Wood drying installation made by O.S. Panto in Ukraine



Central heating plant in the Ukraine

These systems are exported worldwide. As a medium-sized business, it is not possible to maintain a local service presence on-site everywhere. For this reason, O.S. Panto soon came to rely on the following three pillars for its system automation:

- Easy, intuitive on-site operation
- Remote monitoring of all systems 24 h/7 days per week
- Teleassistance for solving technical problems

Since 2007, O.S. Panto has relied consistently on Saia®PCD technology for the controller platform. The concept PLC+Web+IT suited it very well.

When Saia-Burgess added the Saia®PCD3 Wide Area Controller and expanded this formula to «Saia®PCD = PLC + Web + IT +Telecom», this new product was immediately used with success in an initial project in the Ukraine.

The Saia®PCD3.WAC takes over not only the control and automation of central heating plant, but also important system management tasks.

In normal operation, the Saia®PCD3 writes all operating data and events for the whole system as an Excel-compatible CSV file. Once a week, the Saia®PCD3 automatically sends the data file by email to the control centre at O.S. Panto in Italy. All operating data also remains permanently on-site on the Saia®PCD3.WAC's SD flash module, where it is stored and retrievable for a maximum of 999 weeks. Stored data can be retrieved by remote access using an FTP client or standard browser.

With the Saia®PG5 service and programming tool, technicians from the O.S. Panto service centre in Italy can access any system's Saia®PCD3.WAC at any time via internet. In this way, application programs can be debugged remotely and program updates or even functional extensions are also possible.

Summary

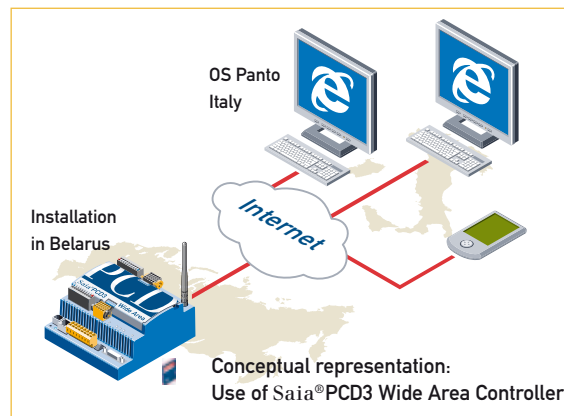
With the formula «Saia®PCD=PLC+Web+IT+Telecom» a company can extend the area in which it does business far beyond any regional borders. When a «simple» central heating plant or wood-drying system is equipped with such a universal controller, it becomes a «Peace of Mind» product for the end customer. It increases the value of any installation or machine for the operator and offers the manufacturer important opportunities to differentiate itself from the competition. ■



Remote polling of boiler status via browser interface. HMI application lies in web server of Saia®PCD3.WAC



Built-in Saia®PCD3.WAC with GSM antenna cable. M-Bus and Modbus are used for coupling with peripherals. The SD flash memory card is located under the silver PCD cover.



Building management technology for Hamburg's Volksbank Arena

On 1st November 2008, after 17 months in construction, Hamburg's Volkspark was opened to the public. It has provided a suitable training location for the professionals of the Hamburg Freezers ice hockey team and the Handball Association. Of course, this kind of arena does not just have to look prestigious; it must also be equipped with the latest technology. Its building automation has therefore been implemented using Saia®PCD technology.



The Hamburg company eNeG (eNeG Gesellschaft für wirtschaftlichen Energieeinsatz mbH) was responsible for implementing building services management technology in the Volksbank Arena, which covers an area of around 7000 m². eNeG was charged with producing the building management technology associated with heating, ventilation, air conditioning, fume extraction and lighting throughout the arena. Ice chilling plant was also bought in and integrated into the management system. A further special feature was the request for remote monitoring of the Volksbank Arena through the neighbouring «O₂ World Hamburg» control centre. The «Arena Control» centre is permanently manned and intended to complement on-site monitoring with remote supervision.



Four controllers from the PCD3 series control the entire heating, ventilation and lighting

Everything perfectly under control

For the control and automation of all building functions, the company opted for PCD3 controllers from Saia-Burgess. As a system integrator, eNeG has many years of experience working with Saia® and also knows the products extremely well. In the actual project, a crucial advantage was the comprehensive support for the BACnet® protocol by Saia®PCD controllers. BACnet® was requested by the operator to provide the link with the «Arena Control» centre because it was already present there. In addition, BACnet® allowed the easy integration of very different plant systems, such as HEAVAC (heating, ventilation, air conditioning), lighting control, security and fire alarm technology with approx. 1.000 data points into the central controller. In concrete terms, three PCD3.M5340s take over the control of heating and ventilation while one PCD3.M3250 regulates lighting.

Clarity of operation

One PCD7 series touch-panel in the technical room allows clarity of operation for the system via a resistive 15" touch-screen. Thanks to the integral web server, FTP server and file server, the web-panel can be used for easy remote access via intranet or internet. This allows plant data to be collected and passed on with ease. ■

For further information, see:
www.volksbank-arena.net
 and
www.eneg.de

The Volksbank Arena serves as a training location for the Hamburg Freezers ice hockey team and Hamburg's handball association. It is also intended to promote field sports in Hamburg.



When working in the technical room, a PCD7 series touch-panel allows useful ways of accessing the system directly on-site.



Control station in the permanently manned control centre of the Volksbank Arena



Westside Tour 2010 –

Backstage access to one of the largest and prestigious building complex compliant with Minergie standard.

Last January, we welcomed partners and customers from Finland, Russian Federation and Sweden to discover our R&D and production facilities in Murten and to experience an example of a full size project entirely controlled and monitored by Saia®PCDs and Saia®HMI at the Westside Center in Bern, 20 minutes away from our factory.

The Westside Center is a multifunctional building incorporating a shopping mall, a multiplex movie theatre, a hotel, an adventure pool & spa, a retirement home and a parking facility build on top of a highway tunnel. The Westside Center is not only a large and impressive architectural creation, it is also, thank to the intensive usage of the cross-facility automation capabilities of Saia®PCD a low energy building complex compliant with the Minergie standard.

Visitors had a complete presentation of all automation aspects, could talk directly with the system integrator and could also look at the central heating, cooling and ventilation facilities. Saia®PCD are also controlling the technical installations for the preparation of the water for the all the pools, the projectors into the Pathé movie theatre and all the road and safety infrastructure of the highway tunnel.

This project, made by Saia system integrators is very impressive and inspiring for everyone and is a good demonstration about the huge variety of business opportunities which can be achieved by Saia®PCD partners. ■



First presence of Saia®PCD to Energetika Fair in Slovenia. Simple and successful.

Our local partner Controls SI presented for the first time our Saia®PCD automation products at Energetika Fair last May in Celje, Slovenia. Energy and Automation Technology were the main themes of this fair dedicated to building and infrastructure automation professionals interested in the practical use of renewable energy sources and energy efficiency.

Controls SI presented and demonstrated all core products of our Web+IT+Energy portfolio. He included already a special highlight on our brand new Saia®S-Energy Manager as well as our range of room automation solutions.

The focus of Saia® proved to be totally adequate for this fair. Controls SI sold an Energy Manager right on the fair and established a first contact which already lead to a first project based on 4 new PCD1.M2120 for the sport stadium in Maribor. ■



Saia®PCD Info Day in Moscow : Sharing news and moments to create new business opportunities

Last June, together with our local partner MC Squared Trading, we met with 25 companies, customers and system integrators, active in Russian Federation to present, explain and discuss the newest evolution of our portfolio.

Passionate discussions started automatically when people projected themselves into the world of opportunities opened by the technical concepts of Saia®PCD. In Russia too, Web and IT are hot and intriguing topics. The way Saia-Burgess proposes the integration of all functions into one Automation Server concept is exceptionally clever and totally new for people used to the limited traditional approach proposed by competitors.

The presentation of the new Saia®PCD1.M2120 proved that even small automation solutions can benefit from all the technological advantages of Saia concepts at reasonable costs. And the Saia®S-Energy Manager was a good demonstration for the real practical complementarity of our products. With PG5 v.2.0 SP1, the possibilities to create projects in Cyrillic make our offer even more attractive for creative and ambitious customers and integrators. ■

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