Controls**News**

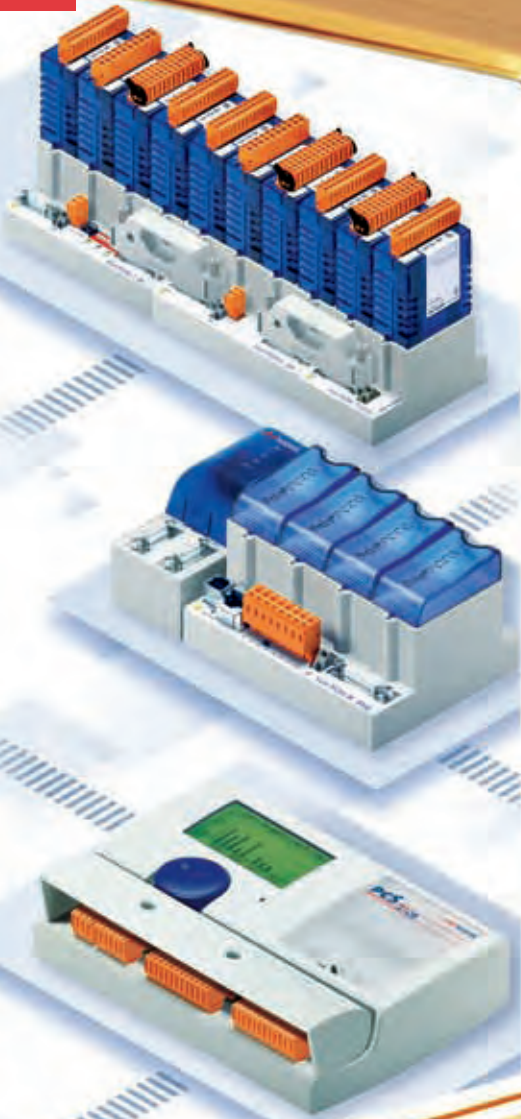### The customer magazine of Controls Division

saia-burgess

Smart solutions for comfort and safety

3,5" to 15" Saia®PCD touch screen Web-Panels with Micro-Browser, CE or eXP

Saia®HMIs for the Infrastructure Automation

Windows® technology in automation with Saia®PCD

Windows perspective from the Saia®PCD world

Jürgen Lauber
Divisional Manager, Saia-Burgess Controls

New perspectives with Windows

Dear Reader

The classical PLC approach has always played a strong part in the culture of our company. For decades, full independent control – from development and production to programming tools – has enabled us to guarantee continuity, compatibility and availability.

With this background, we struggled in the world of fast-moving, flimsy Windows PCs. First we were just disconcerted by it; then the advent of soft PLCs made us openly hostile. This was because soft PLCs reduced the PLC concept to a mere programming methodology. Premature obituaries appeared in the technical press announcing the death of the classical PLC.

But in fact, the soft PLC has stagnated for many years at a very low level in general automation. It has also, unintentionally, demonstrated to many users the value of a proper PLC from a classical PLC manufacturer.

Meanwhile, Microsoft® has done some very good work towards stability, Windows.Net has achieved portability and platform independence for applications, and new, powerful interfaces (such as USB and Ethernet) have enabled connection to the field level, without the problems of plugging proprietary cards into the PC.

The time is now right for a fresh viewpoint; one which offers customers new perspectives with Windows. These new perspectives are shown on the title page and explained in many articles within the current issue of ControlsNews. We have fully integrated Windows as an important automation component within the range of products and services we offer. We have opened up PLC-based control technology to Windows applications, and built a bridge between these two worlds.

Some people might say, with justification, that we were pretty late coming up with all this. We wanted to make sure that the technology and the environment were really mature enough to guarantee profit for our customers and ourselves. Some might call this attitude old-fashioned.

We can live with that. ■

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BASIC PRODUCTS

Saia®PCD2
Flat-style, compact construction combined with modular, plug-in interface technology

Saia®PCD3
Device series with CPU in backplate and interface modules plugged in front

Saia®S-Net
Fully continuous multiprotocol operation via Profibus and Ethernet, from the management and automation levels to the field level

Saia®S-HMI
Saia®devices and technology spectrum for man↔machine interfaces

Saia®S-Web
Web server continuous in all new control devices and accessible via all interfaces

Established business with flat-style controllers

Flat-style Saia® controllers have been available for 25 years, contributing significantly to our growth throughout the period. Their combination of compact exterior with a highly modular internal structure has always been very attractive. In 2003 we launched the Saia®PCD2.M480, with the new Saia®NT OS operating system and a new processor generation. This high-end PCD2 product excels as a system controller and fast machine controller.

1980 | Saia®PCA1   1994 | Saia®PCD2.M120   1996 | Saia®PCD1.M130   2003 | Saia®PCD2.M480   2007

In 2005, when we launched a new cassette-style generation of controllers with the Saia®PCD3 CPU, we worried about harming the growth of the flat Saia®PCD2 series. However, despite phenomenal growth with the Saia®PCD3 series in 2005, hardly any of it was due to cannibalization between the Saia®PCD2 and Saia®PCD3 series. Saia®PCD2 sales rose by more than 10% and this should continue in future. No-one who is happy with the Saia®PCD2 design format should have to switch to the Saia®PCD3 because of a lack of functions. In addition, we want to make the flat controllers even more attractive and win more customers with them. That is why we have initiated the Saia®PCD2 New project. ∎

# Saia®PCD2 II development project: more value for money

We set ourselves the aim of making something good even better. We also want to build the best flat-style controller in the world, and continue the Saia®PCD2 success story with a new CPU series in a new housing. To achieve this, we set up the Saia®PCD2 New development project and, for the next 12 months, devoted extensive funds and personnel resources to it.

CPU versions are planned that will correspond functionally to a PCD3.M, but will make better functional use of the large front area offered by the Saia®PCD2 format.

With all these improvements, we have remained true to our PLC culture, ensuring that existing PCD2 I/O modules will continue to function. The new Saia®PCD2 New is ready for new I/O technology, but retains its existing strengths into the future. This innovation is not an end in itself; it creates added value.

The design studies opposite are intended to show you the direction we are taking and give you an idea of what the Saia®PCD2 New might look like. There is still a good year's work ahead of us before we deliver the first Saia®PCD2 New controllers. Already, anticipation is growing and the wait will not be easy. It will be worth it! ∎
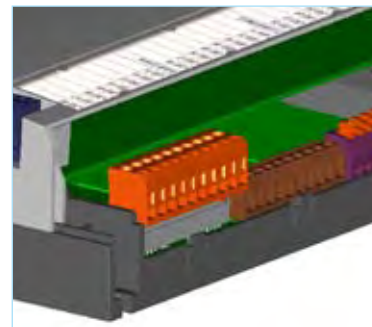
The possibility of additional variations will allow better adaptation of connection technology to your needs. As in the past, I/O modules will be connected with a few simple manipulations. This leaves the CPU protected.

The optional operator unit will be more economical and better integrated than before. Ethernet connection technology will include a direct switch function, making external add-on devices superfluous in many cases.
Connection technology and labelling will be much improved. In addition, the Saia®PCD 2 New will allow I/O modules to be serviced or changed without removing the housing cover.

New CPUs in PCD3 series

2005 was the launch year for the Saia®PCD3 CPU. It brought us so much success, especially in new applications, that for the whole year we had trouble maintaining fast enough production to keep up with sales.
Of course, this is the kind of trouble we are happy to take on. We have done a few things in development to ensure that 2006 demand will continue to rise as in 2005.

A new low-cost CPU PCD3.M3120 with Ethernet «on board» has been launched. For higher value CPU versions we have doubled hardware memory, enabling up in 2006 to supply more user memory for the same price. The CAN version of Saia®PCD3.M (M6340 and M6240) is now available alongside the Saia®PCD3.

M version with 12 MBit/s PROFIBUS DP master connection (M6540 and M6440). A PCD3.M5 variant, which instead of 1.5 MBit/s Profi-S-Net has an RS 485/422 interface, is currently in development. For a better overview, and more detailed information on the many advanced developments within the Saia®PCD3

range, we have produced the 2006 Innovations Flyer. You can download this flyer under www.controls-division. com/cn8.html. ∎

		Basic				Extended		CAN		DP Master	
PCD Classic	PCD3.M	3020	3120	3230	3330	5440	5540	6240	6340	6440	6540
PCD Serie xx7						5447	5547		6347		6547
Ethernet 10/100 On Board		No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Number of inputs/outputs		Up to 64 I/Os		Up to 1023 I/Os							
Main memory (RAM) for user program, text/DB		128 KByte		512 KByte		1 MByte					
Backup on-board memory (flash)		128 KByte		512 KByte		1 MByte					
RS485 on-board for free protocols		Bis 115.2 kBit/s									
Multi-master Profi-S-Bus on-board		(or) up to 187.5 kBit/s				Up to 1.5 MBit/s		(or) up to 187.5 kBit/s			
Additional RS232 interface		No				Yes		Yes		Yes	
Integral web server		Yes				Yes		Yes		Yes	
Optional communications modules in slot 0		RS232, RS422/RS485, TTY/20mA, Belimo MP-Bus									

Saia®PCD memory systems

PLC + IT = Saia®PCD3. In 2005 this formula was often crucial to success. Living up to the claim of PLC+IT called in particular for memory, alongside computing power. There had to be more memory contained on a different kind of media than in classical PLC engineering. The new system information document: "Saia®PCD memory systems" provides an overview of new memory modules for the Saia®PCD3 and their potential uses. You can find this document under www. controls-division.com/cn8.html ∎

PCD7.R550M04
PCD7.R551M04
PCD7.R560
PCD7.R561

PCD3.R600

PCD3.R550M04
PCD3.R551M04
PCD3.R560
PCD3.R561

PCD7.R500

PCD3.R600
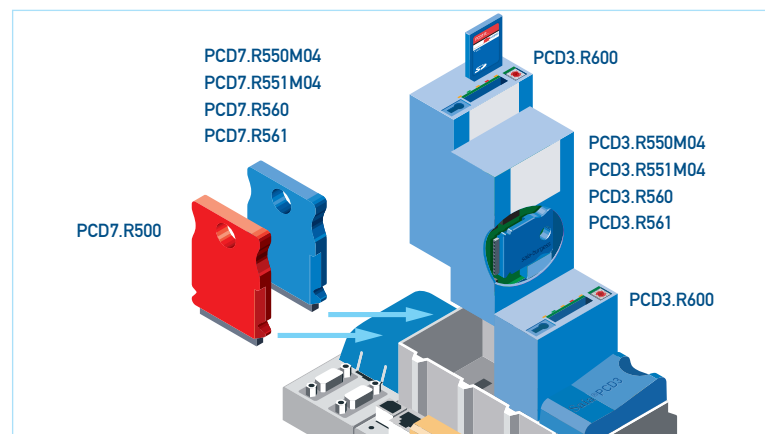
Windows technology in automation with Saia®PCD

In the innovation field, hardly any industry upgrades its products as dynamically as PC engineering. However, in automation engineering people are interested in durable, reliable solutions and, when it comes to development, cannot afford to follow every new PC fashion. On the other hand, no company that wants to keep ahead of the competition can afford to exclude itself from technical innovations. It is therefore a question of balancing rapid innovation cycles against continuity. Saia-Burgess Controls shows how it's done.
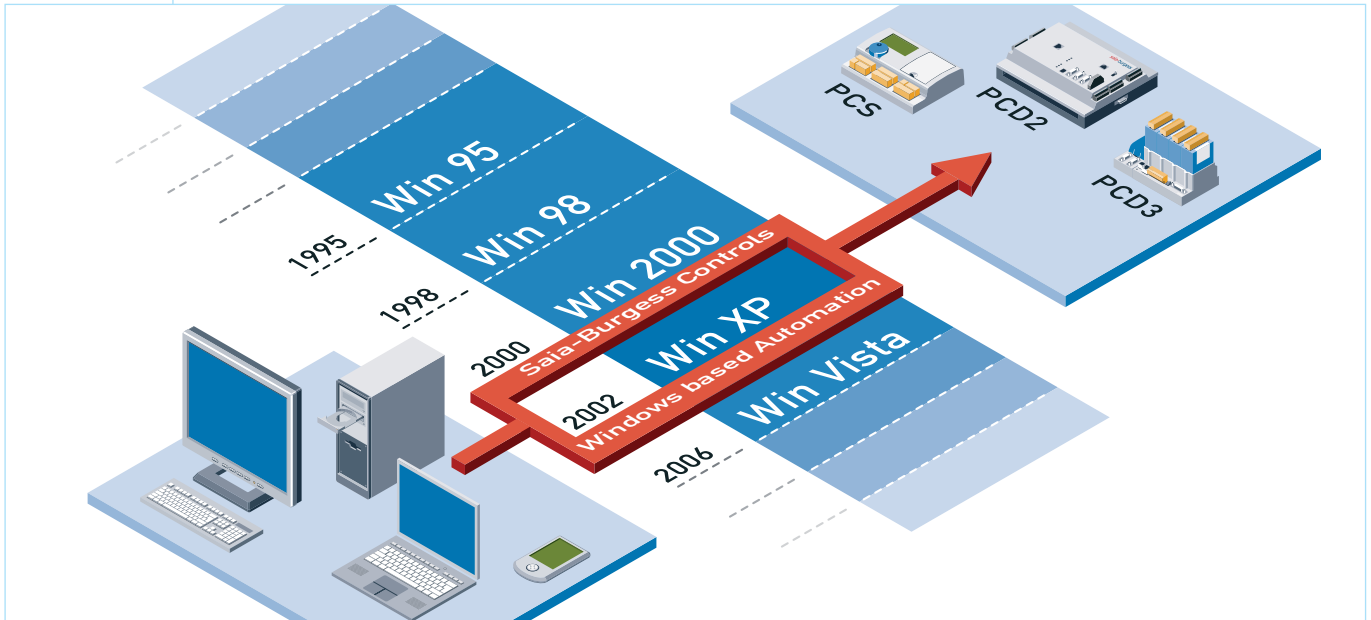
If one looks at innovation rates for individual, PC-based technologies, CPU engineering and operating systems stand out first. Every two or three years, we see completely new, more powerful processors with ever more integrated chip sets. On average, a new Windows operating system comes out every three years, and of course its functional diversity and complexity keep increasing. On the other hand, there are also calmer waters in PC engineering: the field of communications interfaces in particular has developed remarkable constancy. Notable examples of this are the good old RS 232 or PS/2 interfaces. As a result, one has to reckon on lead times of more than 15 years for the newer interface techniques, such as USB and Ethernet.

Associating durability with innovation

It is important to coordinate the different innovation periods of the PC and automation worlds. In concrete terms, this means that the closer one gets to the process and the machine, the more mature and reliable components must be before they are deployed. For the controller function, it is not advisable to bet on PC-based software solutions and proprietary expansion cards. They usually come to market at an early (prototype) stage

and are no longer maintained after a maximum of 18 months. This is why, for Saia-Burgess, PC-based automation means a logical combination of PLC control components and highly innovative PC platforms for functional extension. Normal process control is ideally managed with PLC-based control technology, while overall automation with higher ranking coordination, data maintenance, visualization, management and network technology is better suited to Windows-based automation. With Windows-based automation from Saia-Burgess Controls, a smooth link via standard interfaces is guaranteed between proven PCD automation components and constantly developing PC platforms and operating systems.

PC standards with continuity

PCD controllers have the typical PC interfaces, such as USB, RS 232/ RS 485 and Ethernet. These allow a straightforward link to PC systems for long periods of time. Of course, for communication between PC platform and PCD CPU, the necessary drivers are subject to constant refinement and adaptation to the prevailing Windows operating systems. Users therefore have a large number of communications technologies to choose from.

In concrete terms, this means:
People who want to keep things traditional in established field bus technology will install a Profibus master connection in the PC. People who want to access a broad base of different visualization software – conventionally and without added hardware – will invest in an OPC server and use the existing RS 232 / RS 485, USB and Ethernet interfaces. People who prefer the «cost-free» approach with web compatibility will go for the CGI interface on the Saia® PCD web server.

Especially for users with knowledge of Windows programming, the S-Connect library provides a collection of classes for PC-PCD communications. Built on .NET technology, they can comfortably be integrated within Visual-Basic or C#. At the same time, S-Connect will slip seamlessly into the Visual-Studio development environment – including documentation. Applications programmers can concentrate on actually developing the application, while compatibility is guaranteed with future driver or operating system implementations. ∎

Windows-based $Saia$®PCD web panels
Added openness and functionality

There are more possibilities with Windows. Alongside a straight visualization function, the Saia®PCD CE and eXP web panels offer true added value in software compatibility, web communication, data handling, service and diagnosis.

Saia®PCD CE and eXP web panels are perfectly in tune with the Saia® S-Web concept. Equipped with browser, Java support and the communications server S/Web-Connect, these web panels can be connected to PCD controllers immediately, without any installation cost to the user.

Perfect openness:
Windows, .NET and Java

Windows itself offers extensive scope for using individually developed software solutions or commercial ones. Beyond that, standardized software platforms like .NET and Java make it easy to realize individual ideas efficiently in Visual-Basic, C# or Java. The capabilities of individual software platforms can, of course, be combined with the Saia®S-Web concept to produce an ideal division of labour: standard visualization tasks are handled faster with tools like the Saia®S-Web editor, while special requirements can be implemented perfectly with .NET or Java. For the user, this opens up a literally unlimited diversity of software solutions, offering answers to even the most specialized requirements.

IT-compatible communications and data holding as far as the control level

Saia®PCD CE and eXP web panels are equipped with a range of servers. These provide seamless integration into existing, professional IT structures. Data holding and exchange are achieved with a couple of mouse-clicks, which can, of course, be automated. Two web servers are available: HTTPD or IIS from Microsoft and Web-Connect from Saia-Burgess Controls. The Microsoft servers give web panels a powerful web server which, on the server side, supports ASP, JScript and VBScript among others. They allow overview pages for automation projects to be produced dynamically at a high functional level. The Web-Connect server takes over communication with PCD controllers, allowing not only Ethernet connections, but also serial port, USB and Profibus links. Integral FTP servers allow access to the web panel's file system and make data handling child's play. Accessing process data, log files, recipes, etc. has never been so easy. Even updates are simple to arrange. Thanks to the file server, specific files and directories in the network can be released. The web panel can then be accessed by network name – just as one might expect to do from a desktop PC or notebook.

No restrictions on telemaintenance – remote desktop makes it possible

Service and maintenance cost money, especially when large distances are concerned. With modern remote technology, many service interventions can be avoided. All Saia®PCD CE & eXP web panels support remote desktop connections; i.e. panels can conveniently be remote controlled from an office PC via a local network or internet. When the connection has been established, a window will open showing the panel's own desktop, which can then be operated from a distance as if one were actually on-site. Alongside this remote desktop connection, Windows CE panels offer the possibility of administering the panel via service pages on the integral web server. In this way, system information can be called from the panel, applications started up and ended, or changes can even be made in the Windows registry. Commissioning time is therefore saved, and costly service trips are avoided. ∎

	PCD7.D5064TX010	PCD7.D5100TX010	PCD7.D6120TV010	PCD7.D6150TV010
Display	6,4" / 640x480 / Farb-TFT	10,4" / 640x480 / Farb-TFT	12" / 800x600 / Farb-TFT	15" / 1024x768 / Farb-TFT
Processor / RAM	XScale 400 MHz / 64 MByte	XScale 400 MHz / 64 MByte	VIA C3 1GHz / 256 MByte	VIA C3 1GHz / 256 MByte
Operating system	Windows CE 5.0	Windows CE 5.0	Windows XP embedded	Windows XP embedded
Browser	Internet Explorer	Internet Explorer	Internet Explorer	Internet Explorer
	Micro-Browser	Micro-Browser		
Software platforms	Microsoft .NET Compact Framework	Microsoft .NET Compact Framework	Microsoft .NET Framework	Microsoft .NET Framework
	NSICom CrEme Java Virtual Machine	NSICom CrEme Java Virtual Machine	Sun Java 2 Platform Standard Edition	Sun Java 2 Platform Standard Edition
Server	Web-Server (HTTPD / Microsoft)	Web-Server (HTTPD / Microsoft)	Web-Server (IIS / Microsoft)	Web-Server (IIS / Microsoft)
	Web server (Web-Connect /Saia-Burgess)	Web server (Web-Connect /Saia-Burgess)	Web server (Web-Connect /Saia-Burgess)	Web server (Web-Connect /Saia-Burgess)
	FTP server	FTP server	FTP server	FTP server
	File server	File server	File server	File server
Telemaintenance	SysAdmin - web interface – System status – Access to file system – Start and end processes – Define registry settings	SysAdmin - web interface – System status – Access to file system – Start and end processes – Define registry settings	Remote desktop	Remote desktop
	Remote desktop	Remote desktop		

$Saia^®$S-Web editor creates java-based web pages with ease and efficiency

In 2000, Saia-Burgess Controls brought the first controller with integral web server to market. Since then, a web server has been part of the standard equipment of each new controller. Even older models, such as PCD1.M1x5 or PCD2.M150, have been upgraded in the past year with the addition of a web server.

Creating web pages represents a major part of the engineering cost of producing web-based visualization and control interfaces. Appealing, functionally designed web pages are the public face of any machine or installation, and support its safe, efficient operation. A powerful tool for editing web pages is therefore crucial.

When our web concept was first introduced, simple, static HTML pages were created using standard HTML editors (e.g. Frontpage). Users quickly recognized the potential and benefits of Saia®S-Web technology, and wanted to extend its application to more complex, graphical and animated user interfaces (web pages). However, designing dynamic, animated web pages with a normal HTML editor is laborious and requires specialist know-how (detailed knowledge of HTML and Java programming).

Rather than leave this innovative technology as the preserve of a small group of specialists, we decided to develop an easy-to-use software tool. In early 2005 we launched it on the market in the form of the Saia®S-Web editor. Since that date, the tool has been used and appreciated by over 150 customers. The web editor enables java-based web pages to be created easily and efficiently by putting in place ready-made objects that are specially matched to the PCD web server, and then setting their parameters or animating them. Operation of the editor is intuitive and requires no HTML or Java programming knowledge. Its perfect integration within PG5 (direct access to symbols in the PG5 resource manager), powerful macro management (users create their own macros for reuse in other projects) and many other useful features for structuring web pages efficiently, all significantly reduce engineering costs in comparison with other editors. Investment in the one-off licence fee is worthwhile, and even pays for itself with the first project realized.

One tool for all web-based HMI devices

The web editor is used to create continuous web pages for all web-based HMI devices: from simple, low-cost Saia® micro-browser touch panels, to Win CE and Win eXP based Saia® touch-panels, to standard PCs with Internet Explorer, and even Windows-based PDAs or smart phones with micro-browsers for mobile access. Web-based HMI devices are now used successfully in association with the Saia®PCD web

server not only as simple Scada systems (e.g. in building automation) but also as devices for operating and servicing machine controllers.

New version 5.03.00

The web editor currently stands at the beginning of its life cycle and, of course, is subject to constant refinement. Version 5.03.00 is now available in Basic or Advanced variants. Alongside many useful, smaller additions, the web editor now also supports the handling of multilingual user interfaces, concealed password requests, TableControl objects, ComboBox objects and – in the Advanced variant – trending. A powerful alarm module will follow with the next version in April 2006.

Web HMI for machine controller operation

The Saia®Web-Panel is not only used by the machine operator, but also by service personnel for commissioning and machine maintenance. ∎
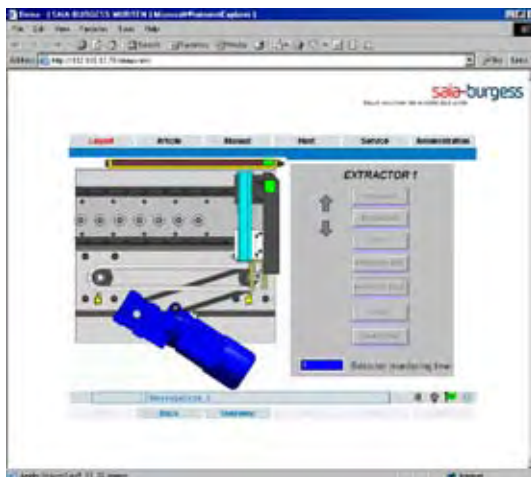
Machine control via browser

Saia®PG5 Controls Suite CD with PG5 Version 1.4

Following versions 1.1 (2001), 1.2 (2003) and 1.3 (2004), the latest major version was made official this February: version 1.4. We have improved Saia®PG5 engineering and programming software in many ways with this version. Work flow efficiency has been enhanced, while safety and comfort have been increased.

Results obtained from customer surveys, which we commission periodically from a professional market research company, confirm that the Saia®PG5 software tool we offer is good, and that its position is above the general market level.

But the customer survey also indicated that functions were desired, which could only be achieved with relatively large adjustments to the current Saia®PG5. Requests were made that we can only meet if we give up programming compatibility for CPU types that are 12-15 years old. This is a very hard step for us as a classical PLC company to take.

However, we do not just want the Saia®PG5 software we provide you with to be good, we want it to be essentially better. Software should be a good reason for switching to Saia®PCD. We have therefore decided not to develop any more Saia®PG 5 1.X versions, but to concentrate on taking a bigger step and making structural changes to our system. The next major software release will be V 2.0. In approximately one year, we intend to enter the beta phase with it.

We are confident that all customers implementing new projects with Saia®PCD will benefit from taking this bigger step.

We are not in any hurry, because we have already built very many innovations into version 1.4, which must first find their way into the daily work of our customers. This is innovation in digestible, manageable doses. For details of all improvements and a free demo version of the new Saia®PG5 V 1.4, go to www.sbc-support.ch.

Some aspects of new functions

The new version PG5 v1.4.100 includes many improvements for working efficiency:
– Supports models PCD3.M3120/ PCD3.M6340/ PCD3.M6540
– Undo and redo functions for all editors and read-only files, CPUs and projects (they can be opened, but not edited)

Project Manager (SPM)
– New CPU handling. The "Active CPU" is now activated automatically, according to its position in the project tree. The "Set Active" instruction is no longer needed to create a "Build" or go online.
– Online operation with more than one CPU at a time

– "Build All CPUs" and "Download All CPUs". These processes can now proceed much faster with one menu command.
– "Self downloading files". You can use this menu item to generate a .sd5 file. This file contains the "online settings", "hardware settings" and "program files" for the active CPU, and they can be sent to an end-user simply by e-mail.

Online Configurator (S-Conf)
– New menu item "Create Diagnostic File". With this instruction, an S-Bug file is executed that collects and logs all necessary information from the Saia®PCD for the support team.

Fupla Editor (S-Fup)
– "Side connectors" and "Free connectors" for Fupla pages. "Free connectors" can be positioned freely on the Fupla page with the "Place Connector" button, or automatically by dragging and dropping a symbol from the symbol editor.
– "Autorouting". The Fupla wiring method allows routing through definition of start and end positions. Autorouting allows the horizontal or vertical movement of an FBox, without breaking a connection.
– Multiple languages for the FBox selector.
– "Download in RUN" for all FBoxes with a green icon in the FBox selector.
– New "Watch-Window Editor". Revised for even better support during error detection
– New "Data Transfer Utility", more compatibility and more powerful. ∎

Energy meters from Saia-Burgess Controls

Saia-Burgess Controls produces a range of energy meters which, due to their precision and economic efficiency, can be used in numerous areas.

Liberalization of electricity markets in some countries, and the growing number of different types of electrical device, mean that ever more consumers are asked to pay for their electricity at the place of consumption. This is the very market niche where our small, compact, precise counters provide a great service.

A brief stay somewhere (e.g. camping site, marina, office or builders' prefab) places high demands on the measurement of electricity actually used. At the same time, modern mobile homes are often equipped just like a normal home, with electrical appliances and entertainment electronics. Quite clearly, no-one wants to leave the electricity bill to the vagaries of an all-inclusive tariff.

Class 1

Devices on standby consume only a small amount of electricity, sometimes too little for previously fitted meters to detect. However, since they are connected to the power supply round the clock, the kilowatt-hours still add up. That is one of the reasons why meters from Saia-Burgess Controls belong to sensitivity class 1. Nothing escapes them.

As far as other applications are concerned (e.g. dividing up and calculating the power consumption of exhibition or market stands, or kiosks in shopping centres) meters from Saia-Burgess Controls satisfy their demands for reliable measurement and tamper proofing, just as customers would expect from a quality product.

Wide range of high quality products

Energy meters from Saia-Burgess Controls are available in two single-phase versions (32A and 65A) and two three-phase versions (65A with single or dual tariff). All our devices are PTB-approved and can therefore be used as a basis for invoicing. Tamper proofing, magnetic field protection and impact resistance make these meters particularly suitable for all applications where they will be exposed to environmental influences. In addition, each model has impulse outputs that can be used for connection via remote access to the network. For example, connection to the standard digital input of a Saia®PCD controller enables all measured data to be collected and forwarded to a computer. Data capture, analysis of consumption for optimization purposes and, if required, invoice printing are only a step away.

Number one in the field of compactness. With the 32A requiring only 17.5 mm of space and the three-phase versions requiring only 70 mm, Saia-Burgess meters need very little room. Switch cabinets can therefore take further modules, or quite simply need less space. In both cases, considerable savings can be achieved.

Energy meters from Saia-Burgess Controls
– **32A or 65A single phase, 3x 65A three phase**
– **Accuracy class 1, for measurement of very low consumption**
– **Made in Switzerland**
– **Best interference protection for its class**
– **Best tamper-proofing**
– **Compact design**
– **LED-signalling to indicate fault-free operation and transposed line connections**
– **Recognized PTB-approval. Calibrated versions available**
– **Custom versions available on request**

These meters are accurate, compact, reliable, economical, can be polled by remote access, and make child's play of invoicing or analyzing consumption – sufficient arguments to convince anyone.

Typical areas using energy meters
– Cost monitoring
– Consumption control
– Secondary tariff structuring
– Invoicing
– Provisional construction or temporary accommodation
– Monitoring of excessively low or high consumption

Shopping centre in Indonesia

In the huge shopping centres currently being developed in Indonesia, sales outlets are found that offer every possible product or service. Each of these rented outlets requires electricity for lighting, food-chilling or air-conditioning equipment.

High-tech solutions with prepaid cards are not very widespread, or too costly, and the risk of tampering is ever-present.

Saia-Burgess Controls won the contract through a tendering process, in which the competing products were more highly priced or inferior in value. Crucial features were the high quality of the products offered, tamper proofing, operating status indication for individual meters via LED signalling, and the possibility of remote access for reading the meters, with metering coupled to a network of control elements and a PC solution. Monthly invoices for individual premises can also be processed automatically in this way.

«Lindeteves Mall» shopping centre in Indonesia

Application: production of invoices for electricity consumption in the enormous shopping centre

This ideal, global solution at a competitive price has already managed to convince many other customers.

The next project is to transmit invoice data directly to the bank that is entrusted with processing invoices for the infrastructural services provided. ■

Typical system application similar to "Lindeteves Mall" comprises
– 2 500 electricity meters, 32A version
– 200 electricity meters, 65A version
– 100 three-phase meters, 3 x 65A version
– 130 controllers, types Saia®PCD1 and Saia®PCD2
– Metered data is administered with "NG Dump"

HMIs from Saia-Burgess Controls for infrastructure automation
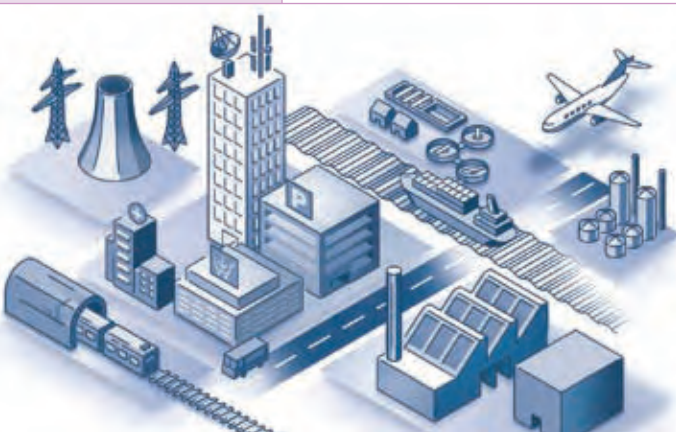
Infrastructure Automation

Flexible, intelligent displays for all areas

The automation of infrastructure – buildings, tunnels, water and power supply – not only calls for powerful systems, but also for displays that are always clear and give speedy access to control elements, meeting the needs of user friendliness, safety and optimization of consumption.

Human machine interfaces (HMIs) perform these additional tasks. They ease the work of operators and allow service personnel to keep control of systems in all situations. In addition, they supply management with an overview of system operating status, further improving system availability and makes optimum use of allocated investment.

Saia-Burgess Controls offers a comprehensive range of HMIs to meet the needs of infrastructure automation. The following examples show typical application areas, where products from Saia-Burgess Controls present interesting solutions, depending on the complexity of installations, processes, communications systems or monitoring software, and financial aspects.

HMIs for setting parameters and control in the building automation field

Products from the K.DDC.L7 series can be used to set economically the main parameters of a room, such as temperature, ventilation and speed of air exchange. They can be deployed quite quickly via dedicated controllers or by adding them to an S-BUS network. Since they are extremely economic, robust and easy to use, no special programming is required.

K.DDC.L774 Infrared control for room automation

Semi-graphical HMIs for setting parameters and control in distributed systems or small technical installations

HMIs from the PCD7.D23x series can, for example, be used on small heat pumps or in large, distributed systems, or even in a tunnel. Often they are used as simple visualization aids within a very large air-conditioning system.

Their semi-graphical displays enable data or parameter settings to be output not only in the form of interactive menus, but also simplify the evaluation of certain control elements via symbols or graphs.

Since these HMIs do not have their own intelligence (their display management programs are integrated in those of the controller), they form a unit in combination with the system. When the controller program is updated, all modifications are immediately also carried over to the display. In distributed systems, this is a valuable advantage.

PG5 Controls Suite includes an editor for these HMIs that can be used to create symbols and menus, and simulate displays during program development. PCD7.D23x series HMIs are robust, reliable and indispensable additions to numerous technical installations.

Web-based graphical HMIs for control, data display and remote access to installations

The ventilation and air conditioning systems of the Lucerne Casino have been completely renovated using intelligent Saia®PCD web panels with touch-screens and the Windows® eXP system. They now represent considerable added value to the system.

Their ease-of-use and impressive graphics quality have given the building manager and operating staff control over the entire system. In addition, immediate support from the manufacturer is available whenever necessary via remote access, which means the system is equipped for all possible eventualities.

Connection of the data display system to internet possibilities is very appealing. On-site display, or remote access via an internet browser, simultaneously allows access to parameters and values in the Saia®PCD controller, with the possibility of intervening in the process. The software tools used

meet the Microsoft product standard. Instructions can be executed and displays generated perfectly both with PCD7. D5-series WinCE touch-screens and PCD7.D6-series eXP touch-screens.

Touch-screens as additions to existing systems

Since Microsoft products are open to the standardized communications capabilities of the IT world, further displays can be added to existing processes. Switzerland's Federal Office for the Environment has also exploited this opportunity by deciding in favour of the Saia®PCD7.D6-type web panels, which it now uses for displaying parameters during data acquisition from remote measuring stations.

They use these touch screen panels in public places to display graphics and replace efficiently the old fashioned drum-chart recorders.

Touch-screens as additions to PC-based monitoring and display systems

Another potential application for Saia® HMIs is the direct use of graphical web panels in previously implemented monitoring or visualization systems (e.g. Saia® Visi.Plus). Here too eXP type web panels from the PCD7.D6 series are extremely interesting. For example, in the editorial offices of Edipresse, Lausanne, staff can individually regulate workplace lighting and temperature from terminals. These terminals are connected to the management system network and serve as a point of direct access for users of the system or building concerned, without differentiating from the building's graphical concept. ∎
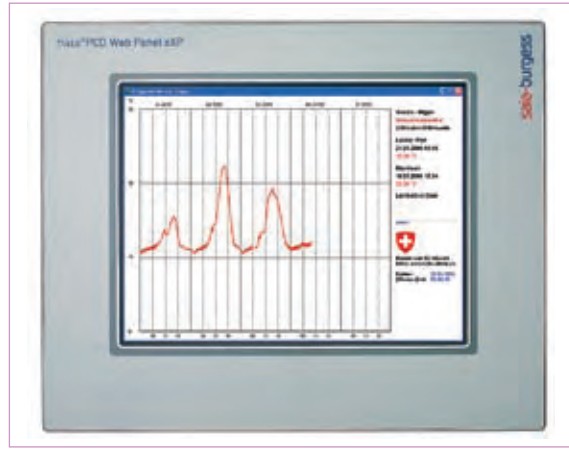
This list of such examples is far from complete, but it shows some of the

Individual room user prompting

Any individual room control concept must have components that can be quickly adapted to the requirements of individual user groups. In recent months, the DDC-Plus portfolio has been steadily expanded to satisfy this demand. The latest product for the field of user-prompting in individual rooms is the PCD7.D290.

The outstanding feature of this room control device is its graphical display with 128x64 pixels (8x20 characters) and LED back-lighting. Six integral keys allow individual adaptation to all necessary room parameters. In addition, temperature and humidity sensors are built-in, so that the controller connected can directly influence room climate. Connection to the controller level is via a point-to-point or multi-point bus link. In order to satisfy all user prompting needs, the PCD7.D290 has been fully integrated into the HMI editor. This tool allows for the comfortable configuration of key assignment and representation of text or symbol information on the display. The spectrum of uses for this new product is almost unlimited, due to its great flexibility and marked functional scope. ∎

# Open, interoperable building automation with BACnet®

Open system engineering is a prerequisite for integrated building technology. Saia-Burgess Controls already supports a large number of the open communications standards in building automation. With the implementation of the BACnet® standard in the new PCD3 automation system, further progress has been made along this path.

Saia®PCD3 as BACnet building controller (B-BC)

Overall project planning for all BACnet® -related client and server functions takes place via a convenient programming environment: Saia®PG5 Controls Suite.

Due to its high level of integration at the Saia®PCD system level and its extensive functional scope, open communications solutions can be implemented quickly and efficiently based on the BACnet® standard. ∎
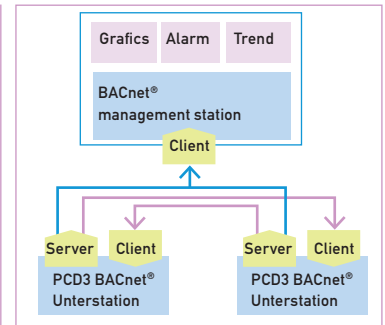
BACnet® client / server functionality in the Saia®PCD3 automation station

The PCD3 supports 22 data objects according to the ANSI ASHRAE 135-2004 standard	
Data exchange	Analogue input, output and value
	Binary input, output and value
	Multistate input, output and value
BACnet® program	Accumulator, averaging, calendar, command, device, group, loop, program, pulse Converter, schedule, event enrolment, notification class, and trendlog object
BACnet® services	Time synchronisation, UTC time synchronisation (as master and slave)
	Bidirectional connection via modem
	Backup / restore according to B-BC requirement
	Flexible definition for write and read access according to priority mechanism
	User programmable client configuration for data exchange with other automation stations

Extension of PCD2/3.W220-series

PCD2.W220Z02	8 inputs for NTC temperature sensor (NTC 10A/10B)
PCD3.W220Z03	8 inputs for NTC temperature sensor (NTC 10A/10B)
PCD2/3.W220Z12	4 inputs 0-10V and 4 inputs Pt/Ni1000
PCD2/3.W220Z18	8 inputs Pt100, 0…150°C

Saia® communications driver for DALI lighting control network


The digital addressable lighting interface (DALI) is a protocol for triggering lighting units which, from its origins in the field of pure lighting technology (e.g. theatre, cinema, etc.), has now become established in building technology for both simple and complex lighting tasks. Lighting units are triggered via an externally installed coupler from RS 232 to DALI.

With the DALI communications library in Saia®PG5 Controls Suite, DALI instructions can be transmitted in the network and status messages received. ∎
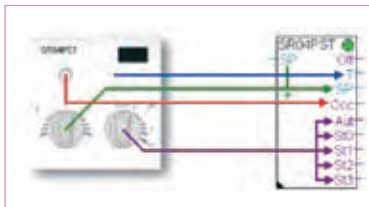
Features
– Communication through RS 232 via DALI SCI interface from TRIDONIC.ATCO
– Easy configuration with convenient function blocks
– Programming with Saia®PG5 Controls Suite
– Triggering of individual lamps or lamp groups
– Triggering with on/off command or via dimming factor
– Triggering of scenes
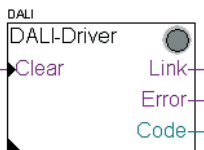
Saia® communications driver for EnOcean radio network

When buildings are converted, the rewiring of sensors and switches is not only a tiresome undertaking, but also an expensive one. The EnOcean radio-based network offers a flexible, economic alternative.

This technology can be integrated into the Saia® automation world easily and efficiently. With a coupler to RS 485 installed remotely in the building, EnOcean sensor technology can be simply switched to the automation level. ∎

Features

– Communication via RS 485 and connection of up to 64 couplers
– Many standard, commercial EnOcean components are supported
– Programming via Saia®PG5 Controls Suite
– FBoxes to match the relevant EnOcean components
– Intuitive engineering and simple commissioning
– Event-controlled communication, no network load from polling

List of components currently supported

Model	Description	Manufacturer
SRC RS 485 EVC	Universal radio receiver	Thermokon
PIR	Motion detector	Servodan
EasySens	Complete EasySens range	Thermokon
Easyclick	Radio switch	PEHA
Ratio	Radio switch	Omnio
Senso Flex	Radio sensor product range	Sensortec

Additions to the room controller range

Single-room controllers from the DDC-PLUS ROOM range ensure individual comfort in individual rooms. The wide spectrum of uses includes not just radiators, but also combined radiators and cooling ceilings, fan-coil devices, and even variable air volume (VAV).

With the most recent additions to the room controller family, users can now choose from 9 different device variants. The newcomers are devices for direct manual control of ventilator stages by the room user. When enabled by the master station, room users can adjust fan stages to their personal preference with a simple button function. Reversion to automatic stage switching is achieved via the room controller or master station. Ventilation speed is indicated by an integral LED display. ∎

Application spectrum for DDC-Plus Room

Fan-Coil: PCD7.L723   PCD7.L724   PCD7.L726   PCD7.L727

Radiators / cool ceilings: PCD7.L730   PCD7.L720   PCD7.L721   PCD7.L722   PCD7.L725

Variable air volume (VAV): PCD7.L730   PCD7.L720   PCD7.L721   PCD7.L722
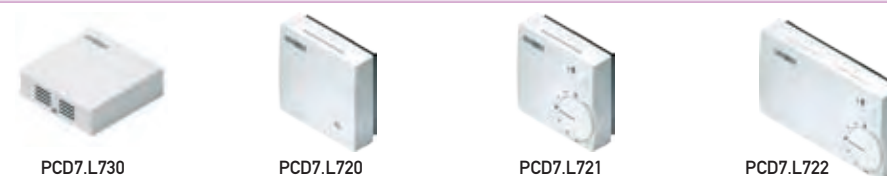
Control technology for production machines 2005

In 2005 our sales in this application segment rose by 29.5 % compared with the previous year. The prospects for the coming years also look very good. We are winning new customers and gaining more projects with existing customers.

In cooperation with some OEM customers, we develop very innovative technologies to production-readiness for machine controllers. This not only provides our OEM customers with a competitive edge: all Saia®PCD customers can benefit from it in the longer term. Many products and systems that came to light in the course of machine development projects also come to market, after a certain delay, as Saia®PCD standard product. The following two case studies are intended to

explain what possibilities Saiaa®PCD technology gives you for production machine engineering, and what services and competencies we can provide for your production machine development. ■

New customer with new application

The company concerned is a group which, in the field of dynamic warehouse systems, produces by far the highest volume of units world-wide. As the absolute number 1, this group has production facilities in America, Europe and Asia. In Germany and the USA, there are in total four development centres. To satisfy different customer and market needs, a multi-market strategy is practised.
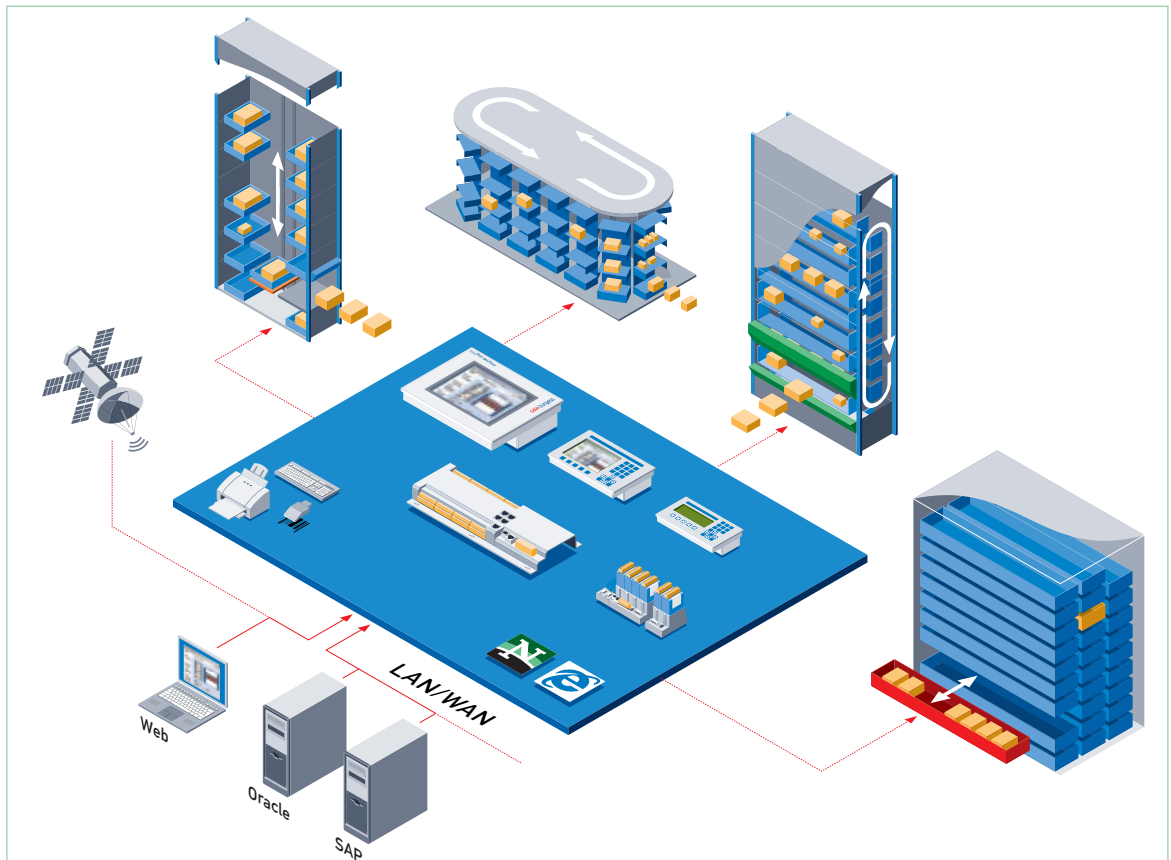
New Saia®PCD controller platform for all types of dynamic warehouse systems

The project

From its history of different factories and brands, the controller environment within our client group has developed with much diversity and many different suppliers. This meant that the potential benefits of large volumes for the biggest produces were not best exploited. Over

a period of almost two years, a working group of controls specialists drew up a comprehensive market study and technology evaluation. The aim was to define and implement a single, modern, group-wide control platform for all production machines. In January 2005,

a contract of cooperation was agreed with Saia-Burgess Controls. In March, specifications were defined in common. At the Hanover Fair in April 2006, our customer will launch production machines on the market that are equipped with the new control platform.

PLC technology of new control platform

A dedicated compact PLC was defined as the common kernel for all types of production machine. The standard CPU of the Saia®PCD3 series provided the basis. The machine interface technology for CAN-Bus and electrical signals was defined for full compatibility with existing machine sensors and actuators. An I/O combination was chosen that covered practically all types of production machine. Machine-specific variants were therefore reduced, as well as the diversity of spare parts and the cost of staff training. The interface board and the Saia®PCD3 CPU board were fitted in
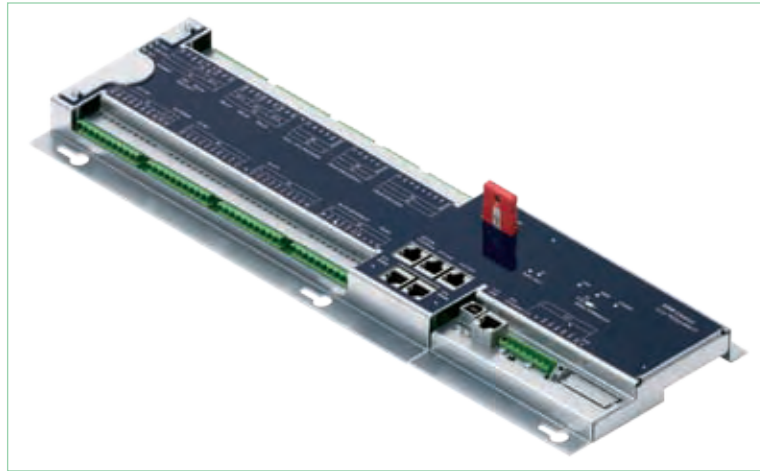
Dedicated compact PLC for warehouse

Innovative web HMI system in new control platform

The technical basis of the machine HMI system is the Saia®Web HMI concept. HMI objects are located in the web servers of Saia®PCD controllers, ready for display using any choice of browser. The web user interface is produced uniformly with the Saia®Web editing tool. Actual operation and display with a remote network PC is then identical to a wireless Win CE pocket PC, or the graphical machine panel on site.
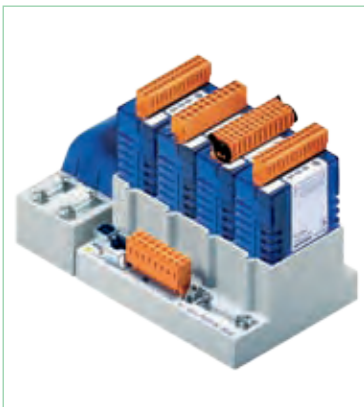
one housing, whose size and shape gave it mounting compatibility with the main controller previously used. Customer benefit: the latest functions, higher performance and advanced technology are achieved at minimum upgrade cost. If several machines are linked in one automated warehouse system, or if added options are built onto a machine, the Saia®PCD3.M is used for the automation station as a standard product. The necessary interface modules can then be chosen from a portfolio of over 40 different I/O modules. This means that the production machine controller does not have to be equipped with costly options, and that practically any customer request can be met.

The economic HMI–System

A four-line text panel, costing much less that previously used control devices, was defined as the HMI device. External add-on devices (e.g. keyboards) can also be connected via PS2. The text panel is driven directly from the PLC program. All interfaces are fully transparent for the PLC. ∎

Text panel of the new control platform

Existing customer with extended application

For many years, the company LNS has used Saia®PCD controllers for CNC bar-loaders in its factories in Cinncinati (USA) and Orvin (CH). As the world number 1 in this market, LNS saw itself confronted with very different demands. Part of their clientele is extremely price sensitive and demands lower cost solutions. However, many other customers simply want greater performance and more comfort for the same money. The semi-graphical panel, which had previously been standard for all machine types, was no longer adequate to meet these demands. It was too costly for one group, and not good enough for the other.

In cooperation with LNS we have developed two new HMI handheld panels, available in a simple version and a comfort version. The simple machine HMI is based on the semi-graphical display and the standard electronics of the Saia®PCD7.D231. The comfort machine panel uses Saia®Web HMI technology. It is a 5.7 inch Saia®Micro browser touch panel, in monochrome and colour versions. For small machine HMIs, it is not possible to use a Windows® CE platform because of cost pressures. Windows® CE CPUs in industrial design and with corresponding long-term availability are simply too expensive, because of the resource-hungry nature of Windows®, Internet Explorer and Java. This is one of the reasons we designed in a Saia® Coldfire CPU with Saia®NT. OS operating system and Saia®Micro browser instead. ∎

Comfort machine HMI based on Basis Saia®Web-Panel MB

Simple machine HMI based on Saia®PCD7.D231

Programming machine controller with PG5 Graftec editor (S-Graf)

Graftec is one of three programming editors in Saia®PG5 Controls Suite. The Graftec editor is designed for creating flow charts and is particularly suited to sequential processes. Sequential blocks are a fixed part of the PCD firmware and are therefore processed in optimum time.
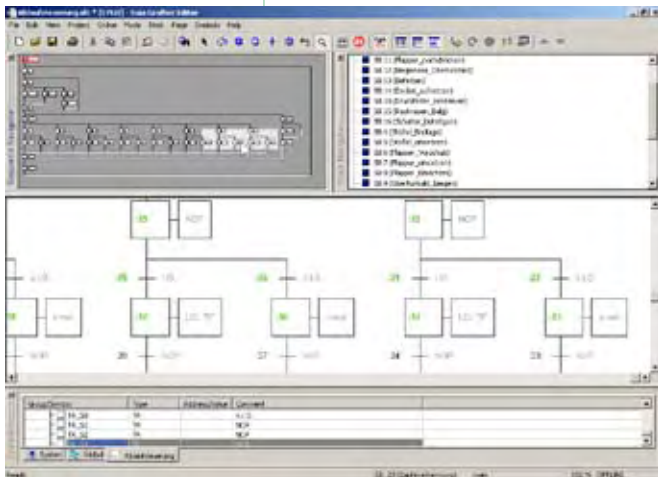
Benefits with Saia® S-Graf Graftec editor
– Steps and transitions can be programmed either in an instruction list or graphically in FUPLA.
– To guarantee clarity for extensive sequential processes, division into sub-pages is possible.
The new release of PG5 Controls Suite 1.4 brings many innovations to Graftec. These include:
– "Block navigator" The block navigator is a docking window that allows "tree control" of the Graftec sequences page. Users can navigate through sub-pages and SBs within the Graftec file.
– "Sequence Navigator" The sequence navigator is a docking window that constantly displays the entire structure (adapting its size to the window). It helps users when navigating complex structures. The light-grey rectangle reflects the view in the main window. When you click on the window, this part of the structure is displayed in the main window (see picture).
– Symbol Editor
– Automatic assignment of SB/ST/TRs. No collisions of SB/ST/TR addresses between Graftec files.
– Online functions – Step-mode with Graftec. More convenient use of Graftec step-by-step mode. ∎

TECHNICAL SUPPORT

Importing resources from PG5 projects to PCD8.D81W programming software

From version 5.09, a new function is available in the programming software of PCD7.D7xx terminals. It allows resources to be imported from PG5. This means that any resources used in the terminal no longer have to be edited twice.

This new function is available in the topology window under S-Bus station attributes.

When users press the "Import Var." button, they are prompted by a dialog box allowing global resources to be imported from a PG5 project.

The following rules apply:
– The CPU name is integrated into the variable name as standard, so that resources from different stations can be distinguished.
– With grouped resources, group names are taken into account in variable names to a maximum depth of 10 levels.
– The maximum length of variable names is 60 characters, including CPU and group names. Names that are too long will be cut off.
– With the expection of DBs, all global PCD resources can be imported.
– Arrays are divided in individual variables. For example, a 10-register array called "MyRegArray" leads to 10 variables with names from MyRegArray_0 to MyRegArray_10.
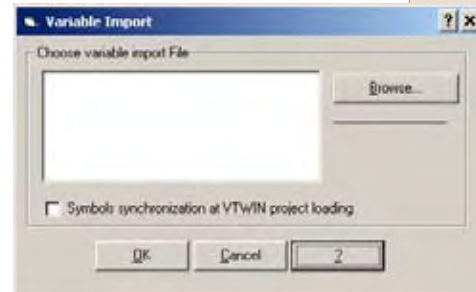
– Automatic updating is possible every time the PCD8.D81W project is opened. The appropriate function is shown in the adjacent screenshot.

Version 5.09 is available free-of-charge as an update. If required, please contact the Saia® support organization in your country. ∎

FAQ manager

The FAQ manager under www.sbc-support.ch/faq has developed strongly in recent months, and today over 500 FAQs can be consulted. Examples of some useful FAQs are shown below:

In the HMI editor, how can numbers with more than 5 digits be displayed?
By switching to 2-line mode. Then numbers can be displayed up to 9999999.99, i.e. up to 9 digits. FAQ 100368

Why is the USB driver re-installed with each new controller?
Each USB device has a unique identification number. With PG5 1.3 this means that, for each controller, the first time the USB driver is plugged in, re-installation takes place on the PC. FAQ 100345 provides instructions for bypassing this. Another alternative is to use PG5 1.4, because this behaviour is avoided with the new version and the driver is installed once only.

How can I change the IP configuration of a controller from the user program?
This has been made possible with the introduction of a new CSF function. FAQ 100522 explains how. The new function can be used when PCs or terminals communicate with the PCD. For Ether-S-Bus communication with other controllers, this function cannot be used if the PCD concerned is being used as a server for other controllers. When the user program is downloaded, a table is loaded into client controllers that includes the IP addresses of other stations. It is not updated automatically when one of the stations changes address. To get round this limitation, a function is being prepared so that the client's user program no longer works with node IDs, but directly with IP addresses. With this function, the client still has to learn the new address of the server

(e.g. via a terminal), but it is no longer necessary to execute a program download to complete the change.

How can I use the PGU port of a PCS1 as an S-Bus or PGU port?
Originally, the PGU port of PCS1 compact controllers could only be used for programming in PGU mode. This is because port 0 is used both as the PGU port and for the optional modem, and when the S-Bus protocol is used it automatically switches to the modem. From firmware version 0A1, it is possible to switch to the PGU port by calling a SYSWR instruction from the user program. For more details, see FAQ 100128.

Are T814 and T851 modems compatible with the present PCS1?
New analogue and digital modems can only be mounted in PCS1 devices that have modification 4 (new units from approx. Jan. 2006). If a T814 or T851 modem is fitted as a replacement or upgrade in a PCS1 that does not have modification 4, the PCS1 must be sent to the factory. If the modem is still fitted, despite the absence of modification 4, there is a risk of short-circuits that might destroy both the PCS1 and the modem. FAQ 100523 ∎

News

Experience with RS 232 / EIB converters
PCDs can be connected to EIB networks via RS 232 / EIB converters. Unfortunately, the converters currently available have a very small receive buffer, so that in some cases telegrams may be missed. Applications in which EIB gateways are used with Ethernet and DALI have proved critical, because they send many telegrams in a short time, which causes the converter buffer to overflow. A short cycle time in the PCD application is beneficial, because it empties the converter's receive buffer more quickly. For applications like those mentioned above, which have EIB gateways to Ethernet and DALI, it is advisable to use a Saia®PCD2.M480 to minimize the cycle time and with it the probability of missed telegrams.

Overwritten register contents with PCS1.C6xx and firmware version 0B0
In summer 2005, a series of approx. 120 Saia®PCS1. C6xx devices was delivered with a serious firmware error. With firmware version 0B0, registers from address 3770 are overwritten with random values if no XOB 0 has been programmed (i.e. in most cases). This can lead to a wide variety of effects and it is therefore imperative to execute a firmware update on all CPUs concerned. No Saia®PCS1.C8xx devices have be supplied with this firmware version. Unless version 0B0 has been loaded by the user, this problem will not arise with Saia®PCS1.C8xx devices. The current version 0B1 is ready for downloading under www.sbc-support.ch.

Exchange area for large files
Many mail accounts have a limit on the size of transferable files. To get round this limit, we have set up a web-based exchange area for you on our support site: go to www.sbc-support.ch under menu item "Exchange Area". Here you can exchange files that are too big for e-mailing. Instructions for using the exchange area are also included under this menu item.

Programming PCD2.M487 and PCD3.M5xx7 via USB
The xx7 CPUs Saia®PCD2.M487 and Saia®PCD3.M5xx7 can be programmed via USB. In order to make this connection possibility available in STEP®7 (registered trademark of Siemens Ltd) a virtual port driver is at your disposal free of charge, which represents the USB interface as a serial port. The driver is ready for downloading, including documentation, on the support site: www.sbc-support.ch (pages of CPUs mentioned).

PG3 and PG4 will no longer be supported
Saia®PG5 has been on the market for 5 years now and has not only been continuously refined, but has also very much proved itself. In our view, there are no longer any good reasons to work with PG3 or PG4. You can, of course, still do this, if you have a suitable computer. However, our support department will no longer support you in doing so. If you should experience any problems converting applications to Saia®PG5, we will naturally be pleased to advise you.

RoHS
EU directive 2002/95/EG dated 27th January 2003, which restricts the use of hazardous substances (RoHS), limits the use of certain hazardous substances in electrical and electronic equipment and comes into force on 1st July 2006. Any electrical or electronic devices now brought into circulation must not contain lead, mercury, cadmium, hexavalent chrome, polybrominated biphenyl (PBB) or polybrominated diphenylether (PBDE).

To our knowledge, our products are not affected, since they come among the exceptions in category 9 (monitoring and control instruments) of this RoHS directive. Moreover, they are used in fixed installations and are therefore also excluded from the WEEE directive (waste electrical and electronic equipment).

Despite these exceptions, Saia-Burgess Controls has committed itself to RoHS technology, both out of respect for the environment and in anticipation of a clear lead-free trend in the electronic module market. Since spring 2005, we have only bought components that are RoHS-compliant. Since 3rd January 2006, the production department has been using the new processes for lead-free welding, reflow furnace and weld wave. The changeover to RoHS-compliant products will start in March for control components and continue for Saia®PCD products. ∎

Notice of product discontinuation for PCD6

Lack of availability for components used in the PCD6 series has forced us to give notice that this produce family will be discontinued. By the end of September 2006, orders will only be accepted with final delivery dates up to the end of 2006. The repairs service will be maintained for at least 5 years (i.e. up to 31.12.2011).

PC software news

Package	Version	What is new?
Controls Suite (including PG5)	1. 4. 100	Many new functions with emphasis on Fupla, Graftec and Watch-Window. A fully functional, 90-day demo version is available under www.sbc-support. ch. Regarding any update, please contact your local Saia office.

Firmware news

Product	Version	What is new?
PCD1.M1x0	084	Correction regarding use of modem (use of modem library in combination with a modem configuration in the hardware settings)
PCD2.M1x0	097/0C5/01A	
PCD4.M170	01A	
PCD2.M1x7		Support for lead-free versions of the firmware chips, change of IP configuration in runtime, various error corrections
PCD2.M480	025	Several small corrections, mode C and Etherne
PCD3.T760	1.019	Support for new modules: HLK modules, PCD3.W3x5 and W6x5. Correction regarding support for PCD3.W600 modules
PCD3.Mxxx0	023	Support of HTTP direct, File System, Profi-S-Net port can be used as "free" RS 485 port

New documents since Controls News 7

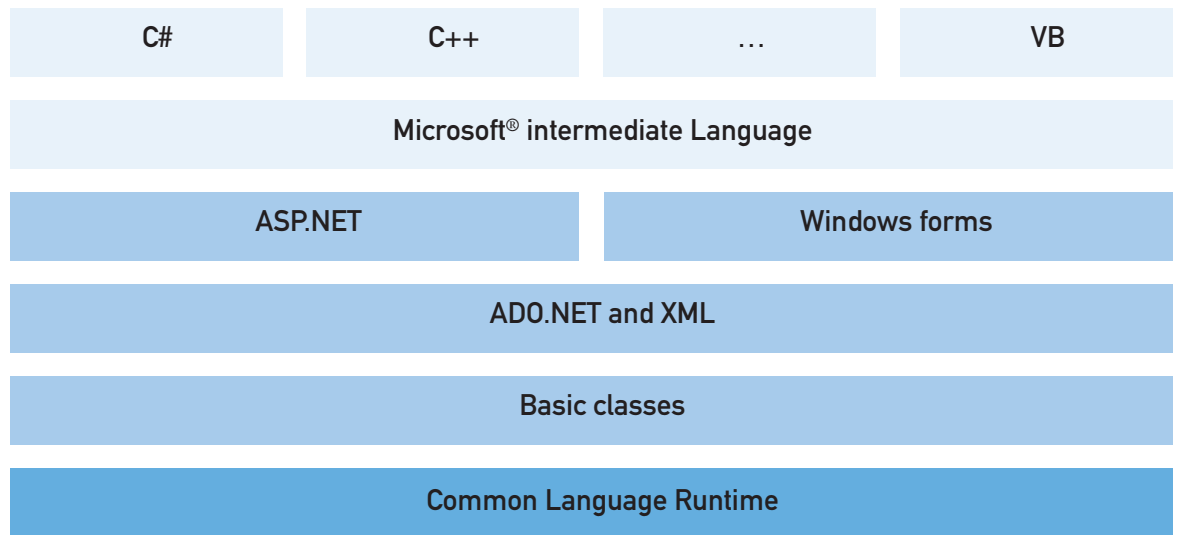| Name	Document type	Document ref.	Status
Saia®DDC.Plus System	Brochure	P+P26/949	new
Saia®PCD xx7 series	System information	P+P26/438	new
Saia®FBox.Builder	System information	P+P26/422	new
Manual, emergency control modules	Technical information	P+P26/396	revised
HEAVAC library	Technical information	P+P26/398	new
Single phase electricity meters	Technical information	P+P26/433	new
S-Bus Safe/Rail	Technical information	P+P26/339	revised
Saia®PG5	Technical information	P+P26/362	revised --> V1.4
PCD23.W745	Data sheet	P+P26/386	revised as data sheet
Building automation: light and shade	Application flyer	P+P26/440	new
Micro-Browser	Flyer	P+P26/435	provisional
PCS1	Flyer	P+P26/437	new
Building / DDC plus	Flyer	P+P26/441	new
BACnet	Flyer	P+P26/442	new
EnOcean	Flyer	P+P26/443	new
DALI	Flyer	P+P26/444	new
Smart	Flyer	P+P26/445	new
Price list Compact-Easy	Price list	P+P26/211	new
PCD1	PCD2	Manual	P+P26/737	revised
PCD3	Manual	P+P26/789	revised
PCDx.W745	Manual	P+P26/796	new
FBOX-Builder - LV (limited version)	Manual	P+P26/831	revised
PCDx.W7x0	Manual	P+P26/833	new
PCD3.M6340 CAN-on-classic	Manual	P+P26/839	new
PCD3.M6340 CAN-on-xx7	Manual	P+P26/840	new
Hydropower plant «Magere Au»	Reference	P+P26/943	new
Grand Casino Lucerne	Reference	P+P26/944	new
Lötschberg tunnel	Reference	P+P26/945	new

New «Saia®DDC.Plus System» image brochure P+P26/949

New system information Saia®PCD xx7 series P+P26/438

Windows® technologies: a closer look at Microsoft®.NET

Over ten years have passed since Windows®95, the first Microsoft® operating system came on the market. It ushered in a new era. Since then, it would be hard to imagine a PC without a start-button, long file names and the TCP/IP stack as fixed parts of the system, among many other things. This progression from the old DOS to Windows® was a great challenge for us, and for the entire automation industry. On one hand was the existing software with thousands of installations and on the other the task of switching a 16-bit application to a 32-bit application, or changing from a DOS interface to a state-of-the-art Windows® interface. We made the leap into this world first with Saia®PG4 and then in 2001 with Saia®PG5. Of course, the world and Microsoft® have not stood still. After Windows®95 came Windows®98, ME, NT, 2000, XP and Vista has also now been available for 9 months as a beta version.

C#	C++	…	VB

Microsoft® intermediate Language

ASP.NET	Windows forms

ADO.NET and XML

Basic classes

Common Language Runtime

Microsoft®.NET structure
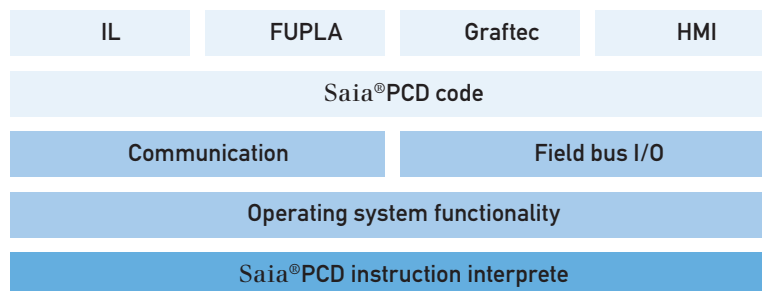
What is Microsoft®.NET ?

Software technologies were also developed in parallel with the versions of Windows®. At first, the only available software developers were Win32 API and MFC. Later COM/COM+ came along and a few years ago .NET (DOT-NET) was added. What is .NET and what does it do for us? Microsoft® defines .NET as follows: ".NET is the Microsoft Web services strategy to connect information, people, systems, and devices through software". In concrete terms, and from a technical viewpoint, .NET comprises a virtual runtime environment (common language runtime) combined with a framework of class libraries and services. These are then used as a basis for individual development.

The .NET framework works just like the Java programming language, with an intermediate language. A compiler for a .NET language therefore does not generate processor-specific machine code, but a platform-independent interim code. Microsoft® calls this interim code its intermediate language (MSIL) and forms a so-called assembly. This MSIL code is only converted into processor-specific, native machine code (native code) at runtime. However, MSIL code is not interpreted, but converted in short bursts by a just-in-time compiler and then executed. During this process, the just-in-time compiler takes account of processor-specific optimization possibilities. The fact that it is not interpreted, but compiled before execution means that the loss of performance is low. In case of doubt, there is also the possibility of saving the result of compilation from MSIL to machine code and executing it later. This is called a native image. However, native images are no longer platform-independent. To stretch a point, one could compare a Windows® device using .NET with a Saia®PCD.

The "IL" (intermediate language) from Microsoft® corresponds to our Saia®PCD "IL" (instruction list). The PLC with interpreter represents the runtime environment, like the CLR (common language runtime) in .Net.

IL	FUPLA	Graftec	HMI

Saia®PCD code

Communication	Field bus I/O

| Operating system functionality |
|---|

Saia®PCD instruction interprete

Structure of a Saia®PCD

Instead of C# or Visual Basic.NET, the Saia®PG5 gives us IL or Fupla together with Graftec and the Saia®HMI editor. Control programs developed for one platform, e.g. PCD2, are also capable of running on another one, e.g. PCD3, unless they use platform-specific features. This is also the great advantage of a genuine PLC over a soft PLC, which generates and processes code that is compiled normally, i.e. not processor-independent code.

With the .NET framework, Microsoft® has created a consistent successor to the earlier confusion of software development platforms for Windows® and given Java a competitor. The big advantage of .NET over Java is that there is a whole range of programming languages for .NET, whereas in the Java world one is fully tied to the Java language. The .NET framework unites the development paradigms of object orientation, component orientation and service orientation and is programming language-neutral. With the exception of driver programming, .NET covers all application types, from desktop to web applications, from system services to web service and from database routines to office programming.

Paradigm shift

Increasingly, Windows® also pervades the non-PC market. Embedded XP and in particular Windows® CE are now encountered everywhere, whether on PDAs, mobile telephones, or HMI devices. For some time there has also been the .NET compact framework, which offers a subset of .NET functionality for Windows® CE. This is precisely where portability plays such a large role. Programs based on .NET, assuming that they have also been developed and programmed accordingly, are capable of running not only on PCs but also on Windows® CE devices. The time-consuming and often ultimately impossible job of porting a program from one platform to another is abolished and, more importantly, users always work with the same program, the same interface and the same graphics. Portability combines with the web services of .NET to allow devices and systems to grow together, leading to more transparency.
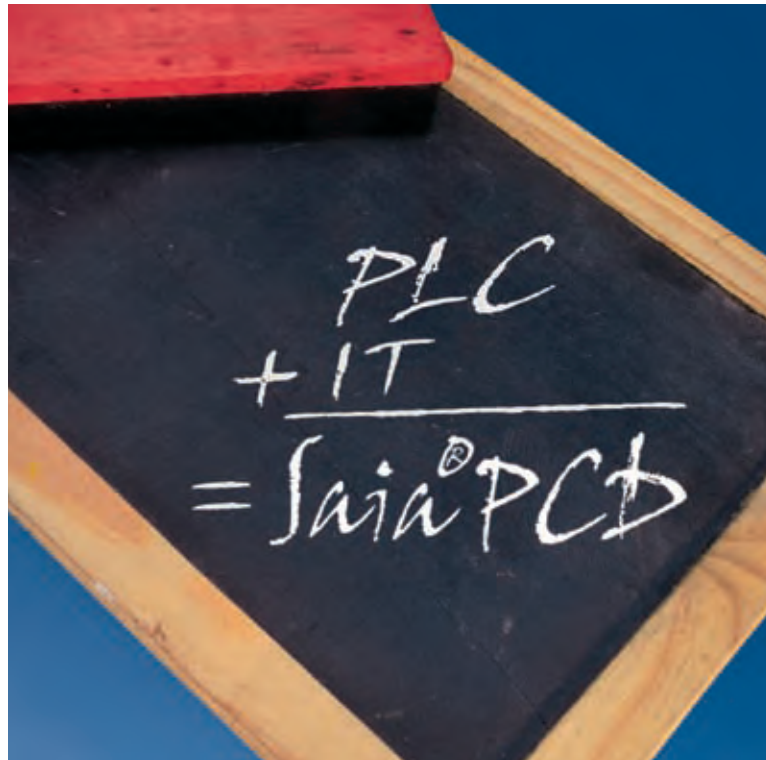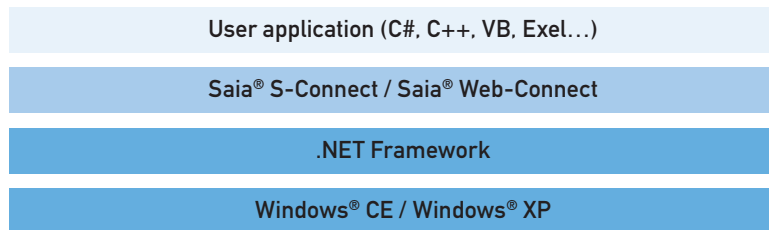

We connect the controller world with the IT world

Saia® S-Connect, a new software product for the .NET world

A practical example of .NET development is provided by our new communications software: S-Connect/ Web Connect. This product is a bridge between Saia®PCD and .NET. Now that the first priority (i.e. connection of our Windows® CE web panels to the Saia®PCD world) has been successfully achieved, we are working on extending this package and offering it on desktop PCs too. The advantage for us is that we only have to develop it once, and have only one software product to maintain. Your advantage is that your application programmed in .NET (for diagnosis, commissioning, or data capture) will be capable of running both on PCs and Windows® CE devices, like web panels or PDAs.

Saia®PG5 and .NET

Saia® S-Connect is not the only product in which we use .NET technology. New software modules for the next Saia®PG5 version (e.g. the new configuration tool) are being developed as .NET components. Our experience to date shows that we have made the right choice. Here platform-independence is less important than the other advantages of .NET, which we cannot adequately describe in the context of this article: multilingual capability, simple installation (remember XCOPY) and faster development cycles are just a few examples. With the incorporation of many IT standards and web technology into our PCD and PCS products, .NET lets us realize the vision of easy integration for our controls into the wider Windows world. Our aim is not "PC based control", but "Windows based automation". The task is not to amalgamate everything in one device, but to leave controller functionality in the PLC and to connect the PLC with Windows through software, just as Microsoft® says. ■

| User application (C#, C++, VB, Exel…) |
| Saia® S-Connect / Saia® Web-Connect |
| .NET Framework |
| Windows® CE / Windows® XP |

Saia® S-Connect / Saia® Web-Connect

The enlarged division: Saia-Burgess Controls

In 2005, responsibility for all electronics business of the Saia-Burgess Group passed to Controls Division.

Key data 2005/2006 Controls Division

- 2300 m² production area
- 300 employees
- > 75 million CHF turnover
- > 10% profitability
- > 10% growth in controller technology
- 8 million CHF spent on R&D
- 30 000 CPUs per year
- 1.5 million I/O points
- 500 000 small devices per year (Controls Components)

J. Lauber
Divisional Manager

P. Marti
Sales & Logistics

T. Mathys
Finance and Control

A. Hänggi
Production

K. Kafandaris
R & D

As a result, our turnover rose from 53 million CHF in the field of PLC based control technology by 22 million CHF to 75 million. The growth of 22 million is divided among the business areas of controls components, micro-controller systems and job fabrication. The number of controls staff has almost doubled as a result. Most of this comprises electronic production staff.

On 1.1.2006 the additional business areas were fully integrated into Saia-Burgess Controls Ltd in Murten (CH) and all business processes represented in a common ERP system. In this way, the Saia-Burgess Group has put together all electronic competencies and all existing resources, with the aim of becoming even stronger and more successful as a result.

The article about the technology model (page 23) of the enlarged Controls Division describes the effect this concentration of forces has had on the strategic approach. The article on page 14 describes a practical example of the effect of this new technology model: here all forces and parts of the new division pulled together to develop a completely new control platform in a short time for a major OEM.

Looking back, we can not only see positive organizational changes in 2005, but also a year of economic success. It has been a good start for the new, enlarged Controls Division, whether with regard to sales, growth or customer satisfaction (see following article). Our sales companies have shown strong growth and our new products (such as the Saia®PCD3 CPUs and Saia®PCD Windows-based web panels) have had a very good first year.

Sincere thanks go to all our customers, whose orders gave us the trust and financial means to continue further along our present path. ∎

Are our customers satisfied? Where do you see progress, and where is there need for action?

In December 2005 we again carried out a large customer survey. As in 2004, we asked a professional market research institute to survey Swiss customers who used Saia®PCD controllers in the course of the year. Among the 80 subjects were, of course, all our top customers. By the end of the survey period, 80 interviews had been completed.

Interviewees were asked questions on a total of five topic areas. Each topic area comprised four question parts. Questions asked did not just address general satisfaction, but also issues of quality and development. Customers were also invited to judge us against the average market level and express how they assess our continued development in the relevant topic area for 2006. The last point in particular showed us how far our customers have confidence in

The Quality of our Hardware Products
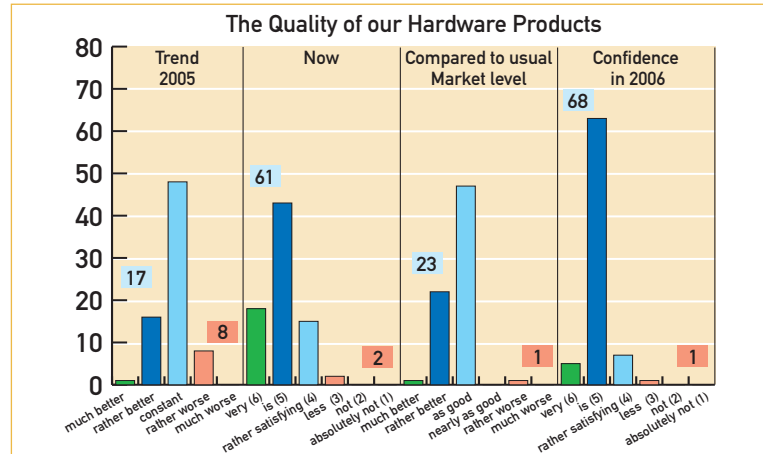
Numbers on a red background show the number of responses that expressed dissatisfaction. Numbers on a blue background represent positive assessments or above the market level.

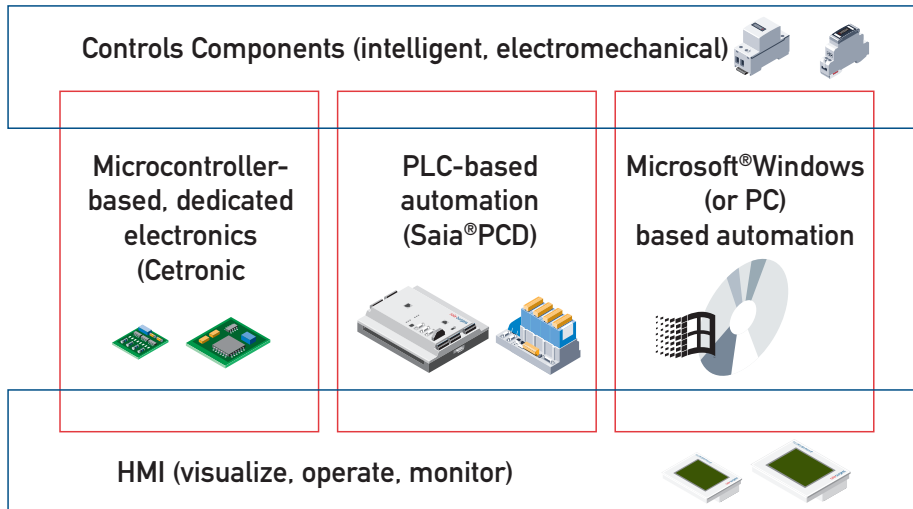| Survey of 80 Swiss customers	Trend 2005	Satisfaction	Comparison with market level	Confidence in 2006
Hardware quality	4.14	4.99	4.3	4.95
Quality of software tools/libraries	4.39	4.64	4.27	4.7
Quality of technical advice and support	4.37	5.08	4.92	4.83
Reliability of supply and product availability	4.29	4.69	4.29	4.74
Attractiveness and competitiveness of Controls Ltd	4.36	4.7	4.44	4.79
6 = very good / very high 1 = poor / low				

Survey of Saia®PCD customers in Switzerland, December 2005

further improvements to our products and services.

All customers who expressed dissatisfaction on any item were asked for specific reasons. All the detailed feedback was fed into our ISO 9001 QM system and will therefore be the basis for real action and corrective measures.

The statistical results of the customer survey are very positive for us. Practically everywhere the assessments were better than for the same survey at the beginning of 2004. Whereas such topics as reliability of supply and product availability or technical advice and support have a predominantly local relevance for Switzerland, assessments under the topics of hardware quality, quality of software tools/libraries or attractiveness/competitiveness are probably representative for the whole of Controls Division.

You can be sure that we will not be complacent with the good evaluation of our customers. We want to become even better, and we know that we have the potential to do it. We want to be so good that not only will our existing customers become even more satisfied, but our competitors' customers will also find us "irresistible". ∎

Technology model of Saia-Burgess Controls

Our specialist competency ist control engineering for automation. In this role, we concentrate our resources on being a highly attractive partner for our customers. We do this by covering all the technologies, product types and architectures that are needed for the control engineering of electrical automation. We therefore offer the ideal combination of devices and technology for all relevant applications.

Controls Components (intelligent, electromechanical)

| Microcontroller-based, dedicated electronics (Cetronic | PLC-based automation (Saia®PCD) | Microsoft®Windows (or PC) based automation |

HMI (visualize, operate, monitor)

According to this claim, our technology model comprises five partially overlapping areas. In the middle are three pillars, each of which stands for a fundamentally different technology environment. HMI technology is located beneath them as the connecting, underlying, foundation element. Controls components are located above the three technology pillars as the connecting roof. Controls components comprise electronic switch cabinet equipment and installation material for general purpose use and requiring no functional integration within controllers.

This five-part technology model still retains PLC technology as the central element of our business. Saia®PLC controllers have been around for more than 25 years. The Saia®PCD as a brand for PLC-based technology is the essential medium for sales and growth of the Division. As a company, we are fully committed to the values of PLC technology, such as quality, stability, profitability, reliability and durability. With Saia®PCD we build bridges between worlds (IT, telecom, Windows) without giving up the industrial platform of controller technology. ∎

Microcontroller products

Microcontroller (µC) products are electronic modules or electromechanical subsystems whose functions are programmed directly on a microcontroller in C. The type of µC is selected for the application concerned on the basis of cost and functionality. The µC producer's software tools are used as tools for development. In the case of microcontrollers, typical PLC programming and guaranteed decades of availability for a computer kernel are neither called for nor affordable.

Microcontroller solutions are ideal for implementing relatively well defined and delimited functionalities at the lowest possible hardware cost.

The microcontroller pillar of our technology is essentially represented by the former Cetronic company, a Swiss enterprise that was bought by Saia-Burgess three years ago and was incorporated within Controls Division in 2005. ∎

µC board.
Custom product, developed by Saia-Burgess (Cetronic)

Web-based automation for generating refrigeration in Lucerne's Grand Casino

Today's Grand Casino in Lucerne is housed in a building that dates from 1882, situated in a prime, lakeside location. In 1910 the building was restyled along neoclassical lines and subsequently given the protection of listed building status. From that date, modernization work could only be carried out on the interior. Since the casino is located directly on Lucerne's lake promenade, external building alterations were totally excluded. The new refrigerating plant with twice the chilling power had to be built within the available roof space. To make matters worse, the operators, owners and system engineers all needed full control of installations.

Since the refrigerating machine belongs to EWL (Lucerne's water and power generating company: Energie-Wasser-Luzern), they wanted to control the system from their control centre in Lucerne. In addition, the casino's technical department had to have viewing access to refrigerating plant operation, and K-TEC in Berne also had to have access to the functions, so that they could take immediate action when servicing the system. For security reasons it was not possible to establish a connection from all these locations via the casino's existing HEAVAC network. Saia®PCD's new web technology offered the most elegant solution.

The refrigerating machine is controlled by a Saia®PCD2. M170 with integral web server. On-site operation is achieved via a Saia®PCD web panel eXP. The user interface takes the form of Java-based web pages created with the Saia®S-Web editor. The software tool offers an easily operated, graphical interface and visualization objects that can be animated. Web

pages displayed on the web panel of the refrigerating machine are stored in the PLC and can, subject to password protection, be called up and operated from various locations via Internet (ADSL), not only by EWL's control rooms, but also by K TEC as the system integrator. In this way, the Saia®S-Web concept reduces costly service interventions and increases system availability. ∎

Grand Casino Lucerne, www.grandcasinoluzern.ch
K-TEC Klima-Kälte AG, www.ktec.ch

Colour-coordinated recooling unit on roof

Location-independent control and visualisation with Saia®S-HMI and Saia®S-Web

Saia®PCD2.M170
with web server

Saia®PCD web panel eXP.
Touch panel for local operation

Refrigerating plant
Screw-type compressors with 2 x 350 kW chilling power, two drive motors each with 92 kW capacity, 2 x 250 kW adiabatic recoolers, Recooling tower with 475 kW chilling power

Controller
Saia®PCD2.M170 with integral web server, touch screen eXP panel Saia®PCD7.D5100TX010, ADSL router Netopia 3346, Saia®PG5 Controls Suite with Saia®Web editor

Refrigerating machine from K-TEC controlled with Saia®PCD

Saving energy and installation costs, Twello, Netherlands

Football club SV Voorwaarts from Twello plays in second class KNVB and was faced to the fact last year to maintain its facilities herself because the council wanted to sell the building.

Therefore they had to search for a controller that could cope with the enormous variety of user patterns that are typical for sports accommodations. There are days that hardly anyone uses the building and days, especially at weekends and sport events, that the use increases rapidly.

Because of the lack of a good controller the last years much money fled through the drain. Second factor is that during the building of the facility there was not much attention and money spend on a good controller.

At most sports accommodations, the HVAC controller is the week point.

Ground condition for the take over of the building was that a good HVAC controller would be installed and so save a lot of energy costs. It so happens that one of the volunteers of SV Voorwaarts is a specialist in HVAC and building automation. His company, Building Technology, installed a Compact-Easy controller of Saia-Burgess in the new HVAC installation of the football club.

The facility of SV Voorwaarts holds twelve dressing rooms with showers and a club house with cantina. Heating and warm water are supplied by two gas heated boilers and two ventilation systems.

For an accommodation such as this one, a controller is needed with which several user periods can be programmed. With the Compact-Easy three switch points can be installed separately very easily for sixteen periods each.

After programming the correct user period and day and night temperatures an enormous amount of money can be saved, because the installation is not constantly in use but only on those times required.

Differences in the pattern, such as tournaments, days off and holidays can be programmed.

Because of this possibility to program so detailed with the Compact-Easy SV Voorwaarts succeeded in saving costs for energy by 14% and for gas by 50% in the first winter period! ■

Compact-Easy

The new PCS1 Compact-Easy from Saia-Burgess Controls is an "all in one" controller for the building automation market. With only one type of controller the Compact-Easy is capable to configure heating, air conditioning and sanitary facilities. The Compact-Easy can be configured on location through a graphic menu with an operating display. The controller has standard all possibilities for a wide range of solutions.

Its memory has more than enough capacity to store important events (holidays) for months. These then can be read out with Easy-Suite. The network of controllers can be increased till 32 pieces. On location the controller can be configured with an ISDN or GSM modem. ∎
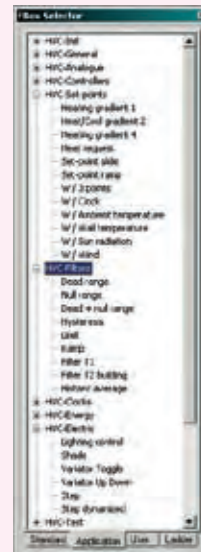
XEROX Manufacturing Europe
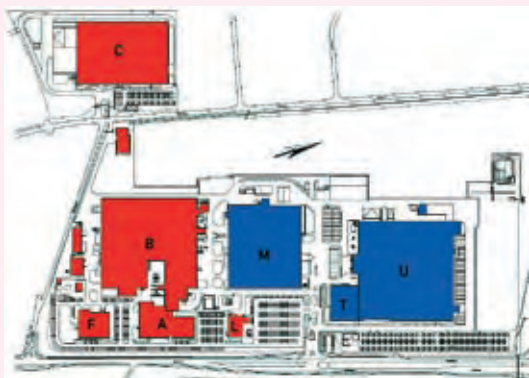
XEROX had to renew the heating, air-conditioning and ventilation automation of half its facility in the Netherlands. XEROX' own maintenance and engineering team decided to realize the project themselves. In 2004 they ordered Saia®PCD controllers for almost 100 kEuro. The Saia®PG5 FUPLA tool and the Saia®FBox-Library were used to realize the project.

The project was finished succesfully for XEROX as the engineering and commissioning time was only 50% compared to the other half of the facility (realised with another control system). There were no technical hitches and the project was completed on schedule.

This project is typical for HeaVAC applications, no single line of PLC code had to be written to realize the project. All the necessary logic is in graphical FBoxes.

If the project has a special requirement, the "speciality" is packed in an FBox, ready to be used by project engineers. In this way, Saia®PCD system-integrators create their own libraries of know-how, which makes them highly flexible and efficient in fulfilling any customer requirement.

Almost 100 % of all HeaVAC projects are realized without writing PLC code. Usually the project engineer or system integrator is using the standard Saia®PG5 HeaVAC library. ∎