

## Take advantage of dynamic innovation – while building on continuity. Leverage Windows® technology for Saia PCD® controls with the Saia PCD® web panel.

### Windows technology adapted to the needs of automation

- Take advantage of innovation and adapt it to the longevity of automation systems

### Connect Windows applications efficiently to the automation level

- Develop .NET and Java-based applications
- Create programs in Visual Basic, C# and Java with Visual Studio and Eclipse
- Simple, web-compatible access facilities at control level via S-Connect driver or CGI interface
- Reusable software engineering based on software platforms

### Scalable IT capability for every situation

- Connect the control level to IT infrastructures
- Optimum flexibility to meet the needs of small businesses and large companies

### Universal exchange of data with web, FTP and file server

#### Live deployment of multimedia in automation systems

- Voice output and control – all possible with Windows
- Video technology for machines, systems and buildings
- VoIP and video telephony for applications, service and support

### Saia PCD® web panel for CE and eXP

- Windows-based platforms as an add-on and link to the control level
- Available with Windows CE and Windows embedded XP
- Perfectly adapted to SBC S-Web technology and Saia PCD® controls

## Lasting innovation

### Windows technology adapted to the needs of automation

The Saia PCD® product range makes it possible to integrate dynamic Windows innovation into automation projects without losing the reliability and continuity of a robust control product

#### Leverage the benefits of Windows – even in automation

Windows has found its way into automation: starting with the whole gamut of communication options, taking in database applications and data handling, all the way to a comprehensive selection of HMI solutions and visualisation and control systems. And there is more – functions that previously belonged to the realms of science fiction are now reality. New functions such as voice output and control or intelligent video surveillance are emerging from their infancy and becoming more and more widespread in the live environment. Multimedia is no longer restricted to home PCs – applications from the professional wellness sector now demand acoustic background sound and TV insets in control panels. Here, Windows can offer a number of highly innovative functions and facilities, which can be adapted to specific requirements. By choosing the right options and connecting them to your application, you can gain real competitive advantage.

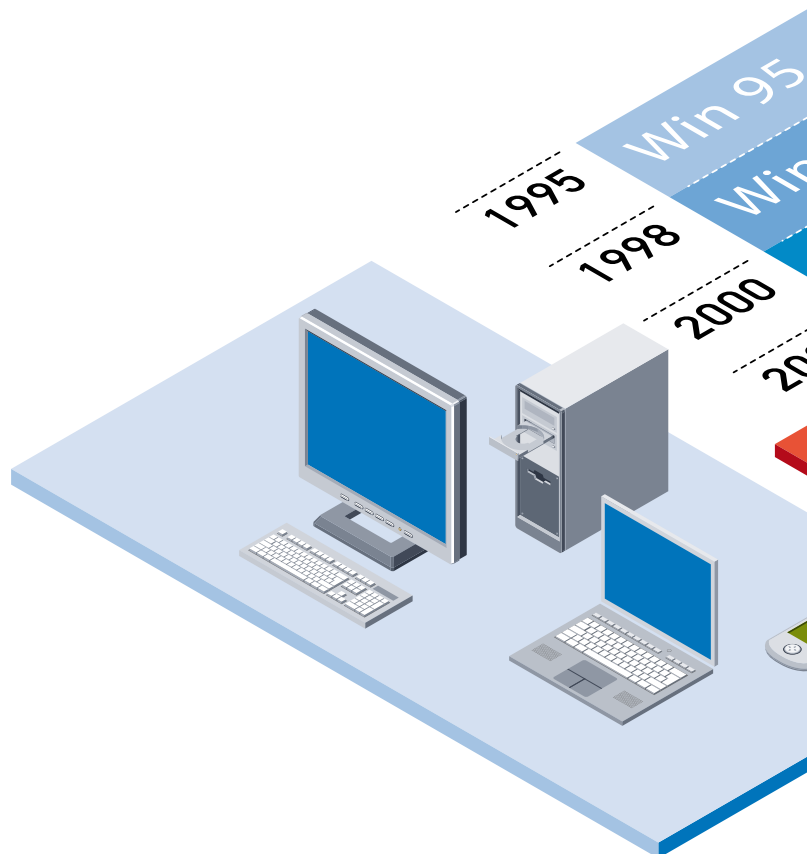
#### Achieve high rates of innovation

Innovation and change always go hand in hand. Particularly in PC technology, change is always on the agenda. Every two to three years there are totally new and more powerful processors with more and more integrated chipsets. On average, a new Windows operating system appears every 3 years, which of course means more functionality and complexity. On the other hand, product lifecycles in the automation sector run to 10 or 15 years.

Saia Burgess Controls has set out to reconcile this breakneck pace of innovation (Windows) with continuity (automation systems). This will enable users to incorporate highly innovative technologies into their projects without the risk of increased integration costs in development, maintenance and support. Windows-based control panels and (PC) standard interfaces play a key role in this. PCD controls are therefore fitted with the appropriate interfaces and can be perfectly integrated into the Windows environment in conjunction with CE and eXP web panels. Access to Windows innovation is then effectively built in to every PCD component.

#### Coupling innovation with permanence

Innovation is good; sustainable progress is better. The crucial thing is to marry the high rate of change from innovations initiated through Windows with the longer-term perspective of the automation environment. Specifically, this means that the closer you get to the process and the machine, the more mature and reliable the components deployed need to be, and the longer the product lifecycles. This inevitably results in a division of labour between the Windows platform and the SPS technology. Normal processes are best regulated/controlled with SPS-based control technology; overall automation with higher-level coordination, data maintenance, visualisation, control and network technology is better suited to Windows-based automation. Windows-based automation from Saia Burgess Controls guarantees problem-free integration of tried and tested PCD automation components with constantly evolving PC platforms and operating systems, using standard interfaces.

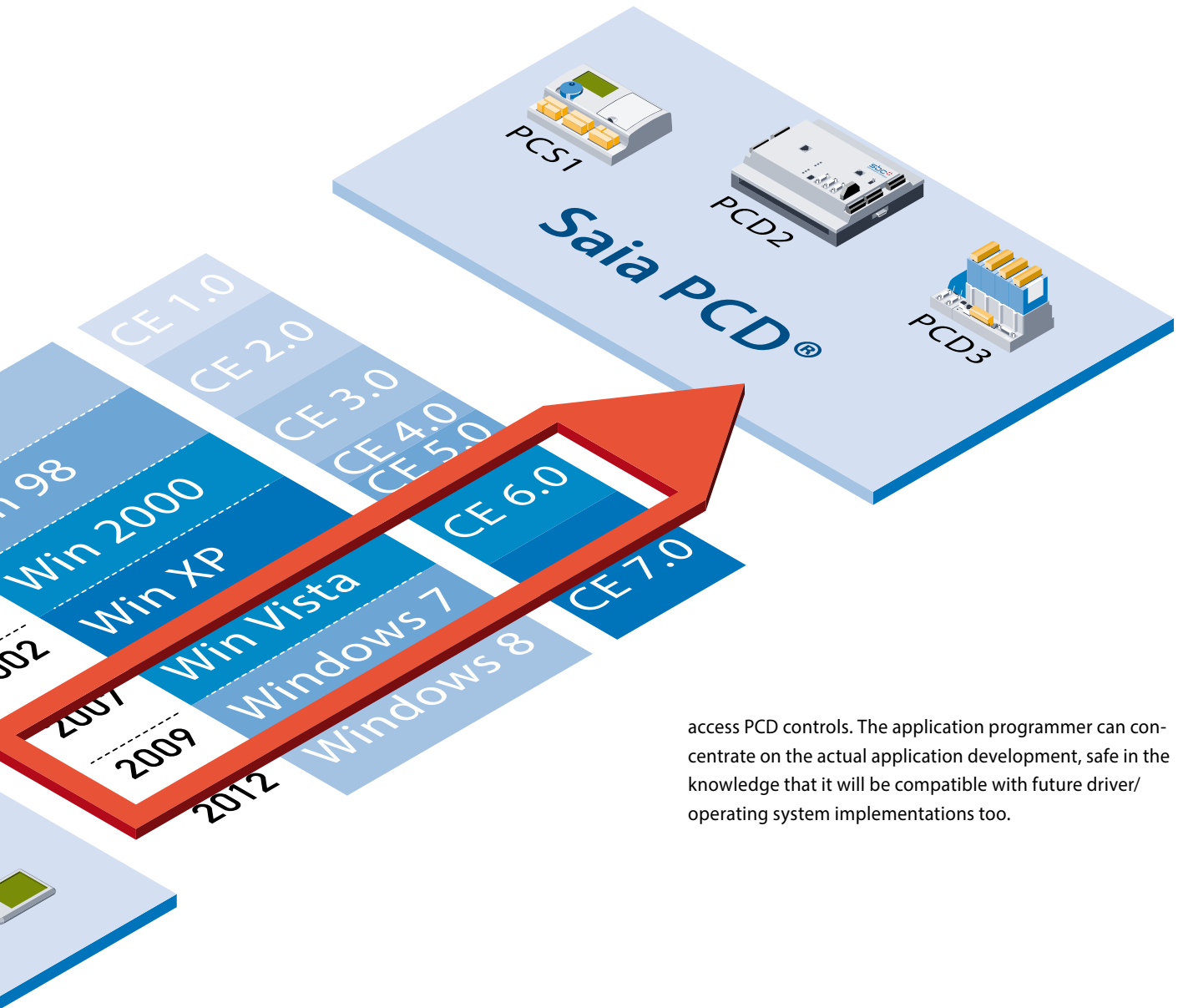


## PC standards and continuity

Standard means «future-proof», and so contributes towards the continuity of any solution. It is no different with PC technology: particularly in the area of communications interfaces, a remarkably constant base has emerged. To take just one example, think of RS-232 or PS/2 interfaces. Even with more recent interface technologies like USB and Ethernet, lifetimes of over 15 years are entirely feasible. This is why PCD controls have typical PC interfaces like USB, RS-232/RS-485 and Ethernet. This allows straightforward connection to Windows

platforms even over longer periods. Needless to say, the drivers required for communication between Windows and PCD CPUs are being constantly enhanced by Saia Burgess Controls and adapted to the latest Windows operating systems. The user then has a choice between a number of communications technologies.

If you want to implement your own PC applications, you can use the .NET and Java software platforms. Saia Burgess Controls supports both programming environments in the form of class libraries and communication mechanisms to



access PCD controls. The application programmer can concentrate on the actual application development, safe in the knowledge that it will be compatible with future driver/operating system implementations too.

# Software platforms

## Connect Windows applications efficiently to the automation level

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**Java and .NET form the ideal basis to implement your own ideas with the maximum of flexibility. Suitable communication mechanisms and library functions provide easy access to process data and control resources.**

### Open, reusable and platform-independent

Software engineering has become a key cost factor. All the more annoying, then, if these expenses have to be paid out several times over. Software platforms decouple software development from the underlying hardware. Applications can then run on different operating systems and hardware platforms without any porting or other modifications. In real terms, this means that an application produced for a low-cost Windows CE panel directly on that machine can also be deployed on a host computer with Windows XP in the production planning area or an office PC at management level. By breaking projects down into sub-functions and structuring them around universal software components, you can base new projects on a pool of familiar, tried and tested functions – software platforms support this approach and are precisely tailored to it.

Windows-based CE and eXP web panels enable platform-independent, reusable software engineering with today's most widely used software platforms.

### Microsoft .NET

Any Windows PC with .NET installed is capable of running .NET applications. The range extends from desktop operating systems like Windows 98, 2000 or XP, through Windows CE to pocket PC (PDA) applications.

### Java

The Java platform has the attraction of a diverse selection of target systems: whether you have Windows, Macintosh or UNIX systems, provided you have a Java machine installed, Java applications will run under Windows, OS X, Linux, etc. Java applications can be dynamically loaded from servers and executed on the target system (as applets), which exactly reflects the concept of a distributed web-based visualisation system. Whether you decide on the .NET framework with its close association with Windows, or prefer the general approach taken by Java, engineering based on software platforms reduces development costs and opens up new opportunities across platform boundaries. The dream of «reusable» code is now a reality.

### Sophisticated development tools – bridging the gap to automation

It has never been easier to create GUI interfaces. Powerful software tools make creating graphical interfaces a matter of «dragging and dropping» and parameterising. One person's Visual Studio is another's Eclipse – both top-class professional development environments. If you want to leverage all the possibilities of a CE or eXP web panel, .NET or Java will get you to your goal easily and efficiently. You will be able to handle tasks that go well beyond pure visualisation. Application development with .NET or Java is the perfect complement to creating a user interface with SBC S-Web: if you need to produce a user interface simply and quickly with typical automation objects, the easiest way to do it is with the SBC S-Web Editor. For specific requirements for communication/networking, data handling, multimedia etc., Java and .NET are the right choice.

A particular strength of Java and .NET is their simple access to web resources. Accessing servers, loading applets, HTML pages or other data – all taken care of in an instant with easy-to-use functions. And it is just as easy to address PCD automation components directly from a .NET or Java application. With their integrated web servers and associated communication mechanisms, PCD controls provide uncomplicated access to all SPS data, and allow docking with Java and .NET without significant cost.

### The direct route: web-compatible control access with HTML and CGI

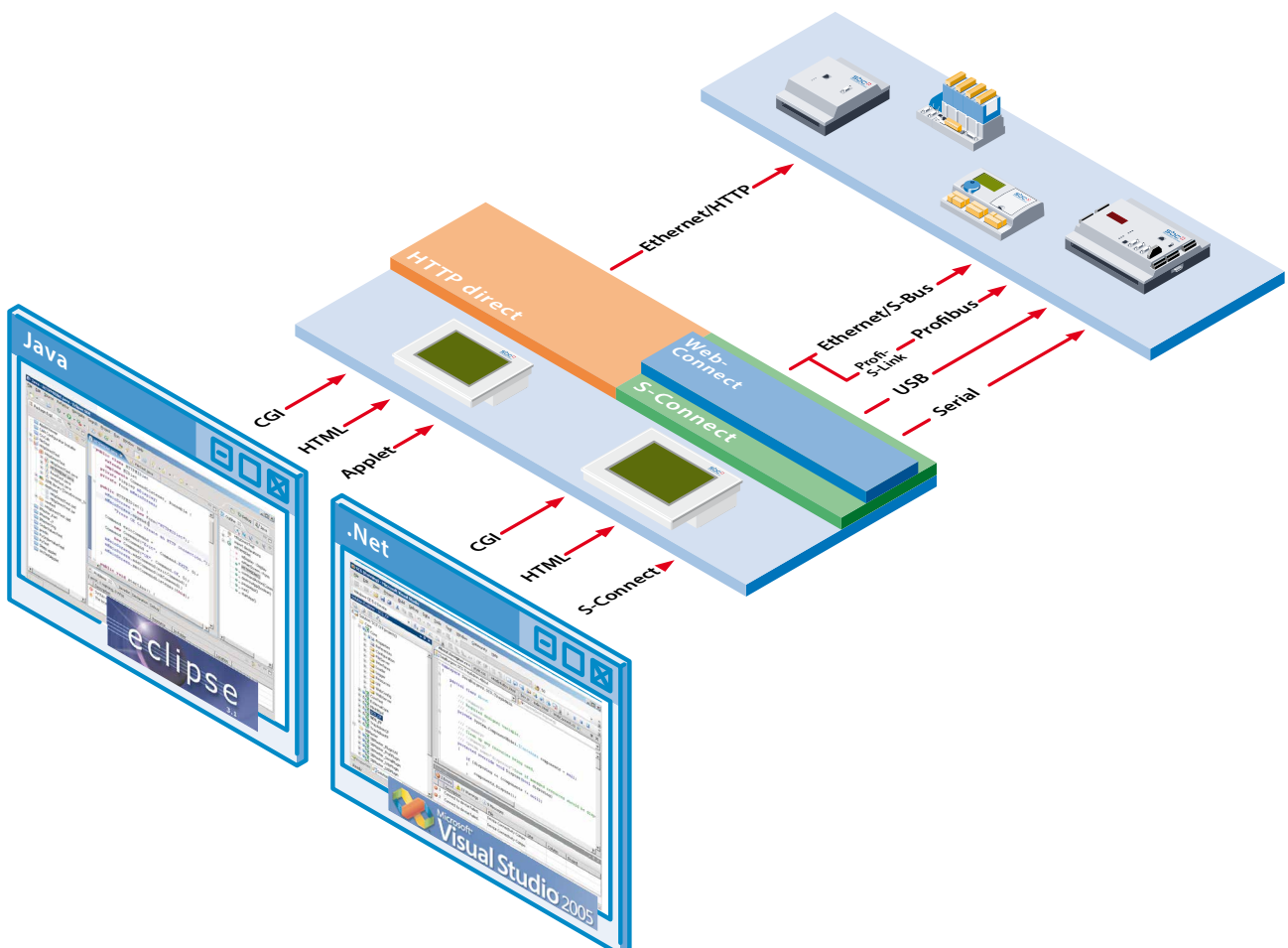
Most PCD controls speak HTTP, and so can exchange data directly with a Java or .NET application without any special drivers. This means that freely definable HTML pages – with embedded SPS data – can be requested and processed by the application. Access to SPS data via the CGI interface is especially elegant. All SPS data can be queried using CGI scripts running within the control. The Java or .NET application receives a simple string in return, containing the requested data.

## Up close to the control: S-Connect communications driver

If you want to communicate with native CPU protocols with .NET but without HTTP, you can use a function library developed specially for PCD controls. S-Connect is a collection of classes and examples for PC-PCD communication. Based on .NET technology, these can be easily incorporated into Visual Basic or C#. S-Connect integrates seamlessly into the Visual Studio development environment – including documentation. The application programmer can then concentrate on core application development, safe in the knowledge that it will be compatible with future driver/operating system implementations too.

## The local pathfinder: Web Connect communication server

Standard browsers, .NET and Java applications communicate with web servers using the HTTP protocol, and implicitly assume an Ethernet connection. At the automation level, on the other hand, it may make more sense to access PCD-internal web servers via RS-232/RS-485 or even Profibus. This is where Web Connect comes in: implemented as a server application, this routes HTTP requests to PCD controls via the various communication interfaces. Fitted with an intuitive web interface, it allows various connections to be configured easily. Web Connect is pre-installed on all Windows-based Saia PCD® web panels. Web Connect routes requests from the local browser or the local application to the defined PCD connections, while the PCD connections from an external station (panel or PC) can also be used, allowing it to access the control via an Ethernet connection through the local web panel. This routing function offers a high level of flexibility, allowing PCD controls to be integrated into LANs even without an Ethernet connection, and underlining the web capability of the PCD series.



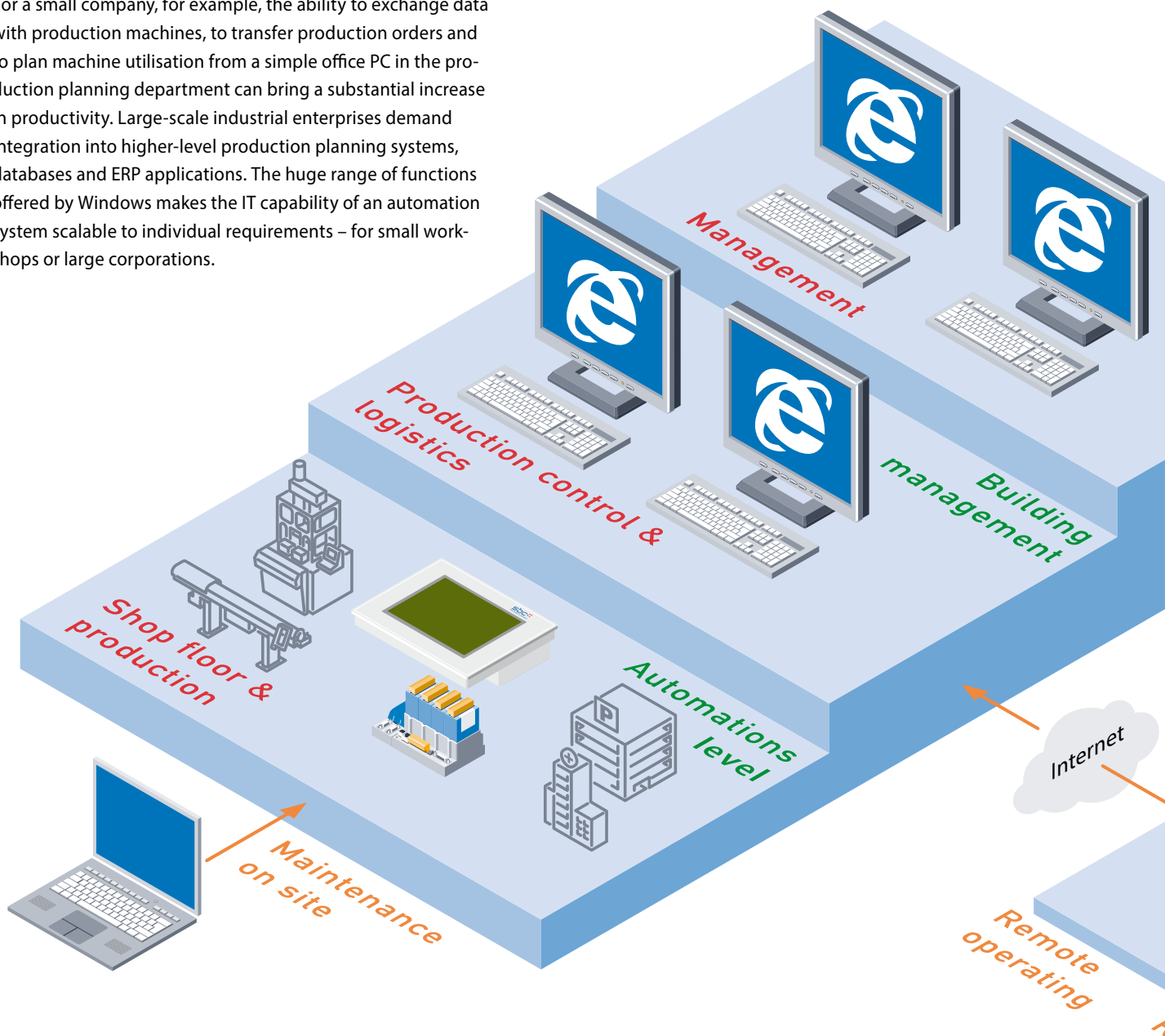
## IT-ready

### Scalable IT capability for every situation

The majority of today's IT infrastructures are based on Windows and Internet protocols. Windows-based components allow simple, seamless integration into any IT environment. End-to-end coverage across all levels of the company enables the IT environment to be individually tailored, from the simple and pragmatic to the complex and all-embracing.

### IT access made to measure

A well thought-out IT solution has become a competitive factor. IT-supported production planning or warehouse management are no longer the preserve of complex software systems. With Windows, the automation level can be made compatible with IT at minimal cost and without recourse to IT specialists. For a small company, for example, the ability to exchange data with production machines, to transfer production orders and to plan machine utilisation from a simple office PC in the production planning department can bring a substantial increase in productivity. Large-scale industrial enterprises demand integration into higher-level production planning systems, databases and ERP applications. The huge range of functions offered by Windows makes the IT capability of an automation system scalable to individual requirements – for small workshops or large corporations.



## Communication: information flow through standard interfaces

The basis of any IT approach is communication. And this now has to cover all levels in the company, plus remote access via the Internet. The aim is to make process and operational data available and usable throughout the company. Windows-based web panels combined with SBC S-Web technology enable access to the automation level from the manager's office PC or from the support department over the Internet. This is based on networking with Ethernet and TCP/IP – no problem with Windows.

## File handling: exchange of information with client/server technology

Communication and protocols are one thing – exchange of data in the form of files is another. The most efficient way of handling this is a client/server architecture. This is why Windows-based Saia PCD® web panels provide a whole range of integrated clients and servers:

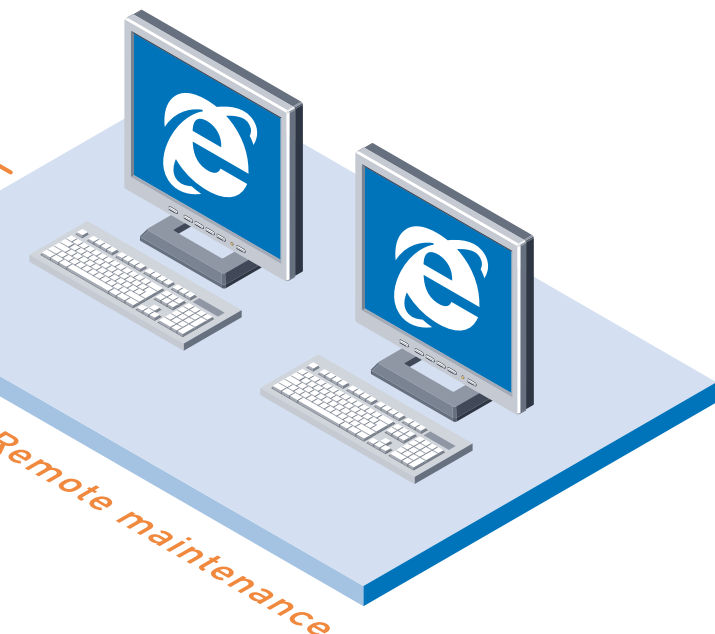
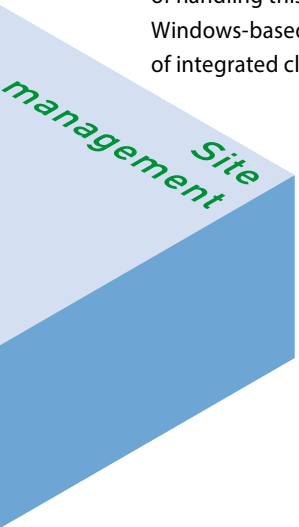
- ▶ Microsoft Internet Explorer
  - Browsing web pages
  - FTP connections
- ▶ Micro-Browsers
  - Performance-optimised browsers for S-Web visualisation functions
- ▶ IIS (eXP) or HTTPD (CE) web server
  - Active Server Pages support (ASP)
  - JScript
  - VBScript
  - Authentication with user-name/password
  - SSL encryption
- ▶ Web Connect communication server
  - Connections to PCD controls
- ▶ FTP server
- ▶ File server
  - File access to authorised folders/files via network paths

## Data maintenance: structuring and compiling information

Storing information in files is good storing structured data is better. Databases allow information to be collated and filed in an orderly way. Windows CE itself provides a database, in the form of SQL Server. If you want, you can equip your web panel with the database system that best suits the application. Windows allows access to a number of different software solutions.

## Peripheral devices: capturing and outputting information

IT only makes sense when data can be captured and output again. With the Windows operating system, there is an almost limitless number of peripheral devices available: printers, scanners, keyboards, barcode readers, cameras, USB sticks etc. – Windows-based web panels can integrate this multitude of devices into automation projects, allowing them to be used even from the automation level.



## Remote access

### Virtually on-site

Windows provides a whole range of remote access facilities. Depending on the situation, files can be exchanged, settings entered or the whole application operated over the LAN or the Internet.

#### Setup and control from near and far

Powerful remote control functions save long journeys, time and expense. Such benefits are especially telling in connection with control stations. Support, diagnostics, troubleshooting, update – in normal day-to-day maintenance, it is extremely convenient to have access to the control units wherever they are installed. You can then respond quickly and efficiently, which also contributes to customer satisfaction.

But it doesn't have to be about clearing problems: with remote access facilities, whole new operating concepts can be implemented. Wherever there is not always an operator on site, configuration and operation can also be handled from a central location. For distributed installations spread over long distances, it is an advantage to control everything from one point, even just to save the caretaker a trip to the basement to fix the heating.

#### Reloading without an air ticket: software update via FTP

We have all experienced the situation where the machine is already on the truck, commissioning is complete, but the moment you get home there is a new software version or a revised manual in PDF format available – or you have simply found an error that needs to be fixed as quickly as possible at the customer site. With a Windows-based web panel with access to the Internet, all this is no problem. The whole file system for a Windows platform can be made freely accessible via an integrated FTP server – subject of course to checking of access rights and authentication. An on-site operator is not required: once set up, FTP transfers run discreetly in the background. This means that files can be easily loaded, deleted or overwritten anywhere, via the Internet from the office PC.

#### By far the best way to configure the system: administration via web interface

Flexibility is achieved by configuring the system. Windows CE panels can be conveniently configured via a built-in web interface. Even here, you do not need to get at the panel itself – all settings can be entered perfectly well via the network or the Internet. You can also control the panel program execution, i.e. you can start or terminate Windows applications or query the system status. All you need for such operations is a PC with a browser and a network connection. Administration via the web interface provides the following specific functions:

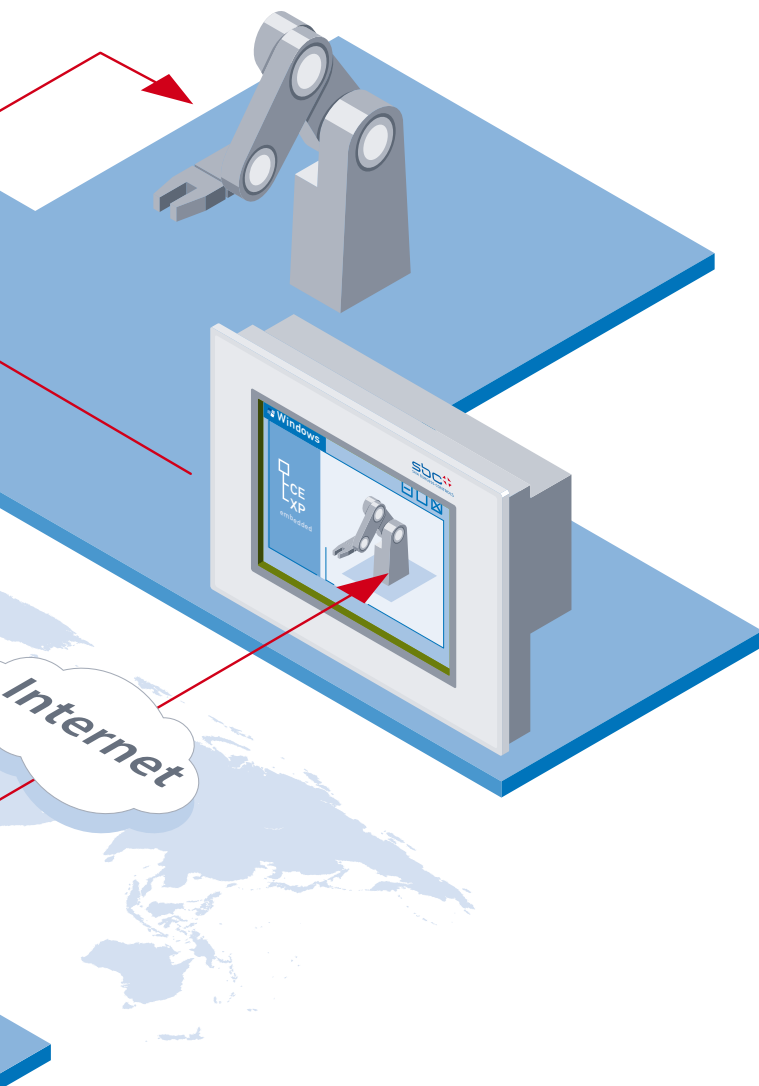
- ▶ Access to the file system
- ▶ Starting and stopping programs and querying the program list
- ▶ System status
- ▶ Enter registry settings





## Remote control of the web panel: remote desktop

On-site operation from a distance – not a contradiction in terms but the most convenient way of controlling a Windows panel via the LAN or the Internet. A connection to a web panel is established from a PC. The panel desktop appears in a window on the PC. The PC mouse and keyboard can now be used to operate the panel exactly as if you were on site. Remote desktop technology is therefore suited both for ease of use by the operator in a production environment and for troubleshooting and on-site support of customers.



CE Remote Display is the name of the Windows CE remote desktop function. A client application is required on the PC to establish the connection between the PC and the Windows CR panel. This is stored in every SBC Windows CE panel and is simply copied to the relevant PC. Once installed and launched, a remote desktop connection can be established.

Windows XP (Professional) supports two types of remote desktop: remote desktop enabling and remote desktop invitation. With remote desktop enabling, a user signs on to the XP panel via an Ethernet connection. Sign-on then proceeds quite normally, as if you were logging in to the panel on site. With remote desktop invitation, a user can use the panel to «invite» a specialist to provide support. A file is sent to the specialist by e-mail or some other transfer method, with a key to enable the specialist to log in in parallel with the user. In this way, users can work locally on the same desktop as the specialist accessing the panel remotely.

If you prefer remote desktop connections to be decoupled from Windows-specific user access, you can use VNC. Although this freeware is not part of the Windows operating system, it can be downloaded from the Internet free of charge. VNC uses a security mechanism with user name and password independent of Windows, and needs a client installed on the PC and a server on the Windows XP panel. Whether you use CE Remote Display, XP Remote Desktop or VNC, the advanced operating facilities reduce the cost of on-site support and open up new ways of running distributed applications.

# Multimedia

## Deploying audio and video in the production environment

Windows offers a wide range of multimedia support. With eXP and CE web panels, this host of functions can be implemented professionally and used in the production environment.

### Multimedia in automation: open up new business areas – get ahead through innovation

Multimedia is no longer just something for home PC fans. PC-based audio and video technology has emerged from its infancy and is now suited to professional automation tasks. Windows provides a number of multimedia functions, which can be integrated into automation projects using open HMI platforms. Multimedia opens up whole new areas of activity, and hence markets, to automation. When fitted with audio and video functions, existing applications can be upgraded to keep ahead of the competition.

### Photos, graphics, animation –setting the tone with pictures

Visual impressions are absorbed more quickly and retained for longer. If people have a clear idea of processes and flows, they will work more confidently and productively. Illustrations in user interfaces are not just an aesthetic feature; they can make a real contribution to increasing productivity.

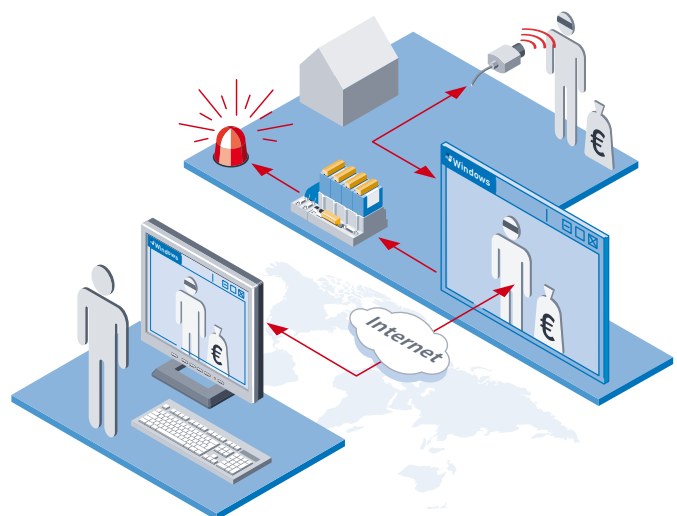
But an HMI platform first has to be able to display photos, graphics and animations. Windows XP can display all the most common image files and animation standards, while Windows CE also covers the usual web formats; the traditional control panel does not generally look beyond an animated GIF file. With Windows-based control panels, you are on the safe side, in the knowledge that you can use the best display type for your purpose.

A positive side-effect is that a simple pictorial presentation is often quicker to produce than detailed notes and explanations. A picture really is worth more than a thousand words.

### Video – seeing what is going on

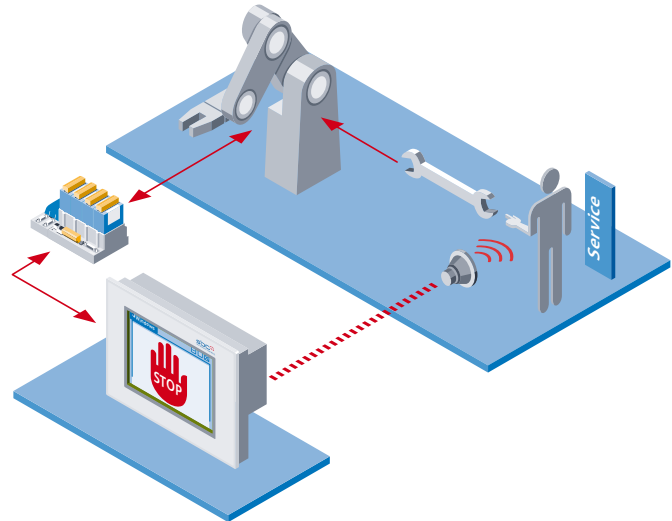
Video is not just good for films. the range of uses for video technology in automation is diverse. Cameras can be used to make inaccessible parts of machines and installations or processes visible, even in a secure area. Specialised video technology can make processes visible that cannot be followed with the naked eye. In building technology, simple webcams can be used for round-the-clock surveillance of the rooms and surroundings. The range of functions stretches from simple snapshot capture through recording video sequences triggered by movement detectors, to the most sophisticated software solutions capable of detecting suspicious behaviour.

Whether it be a high-speed vision system, a surveillance camera or a simple webcam: with Windows-based control panels, video functionality can be incorporated into user interfaces and linked to the control. And last but not least – in the wellness area, for example – you can always display the latest «blockbuster» in the user interface for a whirlpool.



## Audio –listening to the technology

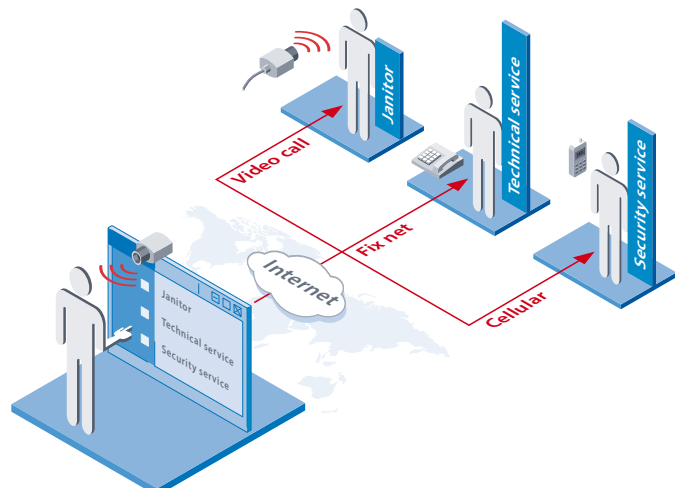
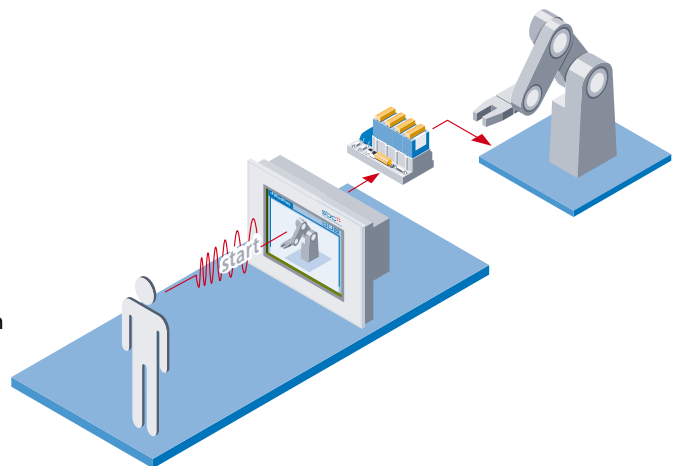
When listening and speaking, you keep your eyes free for what is essential. Navigation systems in cars have made us familiar with computerised voices that tell us the way – with the advantage that we can concentrate on what the traffic is doing. Machines and systems can be made more ergonomic and efficient with the aid of audio. The machine operator can concentrate on the workpiece without having to keep an eye on a display. Information on faults and settings can be passed to operators acoustically in the form of voice output, even when they are out of sight of the control panel. Even a simple playback of WAV or MP3 files triggered by the control fulfils this aim – and Windows-based web panels can do that.



Mobile phones, cars and even jets can now be operated and controlled by voice commands. With a Windows XP web panel and voice recognition software, buildings and machines now respond to voice commands too. You can choose lighting scenarios by voice, open and close the blinds or simply turn out the light – there are no limits to the convenience of it all.

## VoIP and video-conferencing – telephoning with eye contact

Worldwide phone calls free of charge – Voice over IP makes this possible. But you don't have to talk to the whole world. VoIP also allows communication paths to be established within companies or building complexes. Integrated into a user interface, the right contact can be selected at the touch of a button – whether it be the caretaker, the security service, technical support, the hotline or the manufacturer's support group. Equipped with a webcam, the two parties can see each other and transmit pictures of «problem areas» to specialists. When commissioning new systems, where home-based colleagues can be included online, a Windows web panel pays for itself.



# Saia PCD® CE and eXP web panels

## Windows-based HMI platforms

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Saia PCD® web panels are specially designed for the requirements of the automation sector. Equipped with Windows CE or embedded XP, the control panels support operation and visualisation based on a variety of display techniques.

### Distributed operation and visualisation with web technology

Visualisation using web technology involves storing the user interfaces in the control itself (see System Information for Saia PCD® S-Web P+P26/428). Saia PCD® web panels support the following visualisation formats using web technology:

► **Micro-browser (Windows CE only)**

The micro-browser can be used to display user interfaces created with the SBC S-Web Editor. The page description files (TEQ files) for an S-Web Editor project are interpreted directly by the micro-browser, providing improved performance. Possible display types:

- S-Web visualisation

► **Applet viewer**

The applet viewer can display applets directly without the use of a standard browser. This enables it to handle S-Web Editor projects also. Possible display types:

- S-Web visualisation (with IMaster applet)
- Java applet-based visualisation

► **Internet Explorer**

Internet Explorer offers the widest functionality and flexibility for the display of web user interfaces. With a Java plug-in, it can handle all web-based display types and even combine them. Possible display types:

- S-Web visualisation (with IMaster applet)
- Java applet-based visualisation
- HTML operation

### Panel-centric visualisation and software applications

In contrast to web visualisation, traditional visualisation solutions only load process data from the control. The user interface itself and the associated project files are held on the panel. Saia PCD® web panels with the Windows operating system also support this type of solution.

► **Java application**

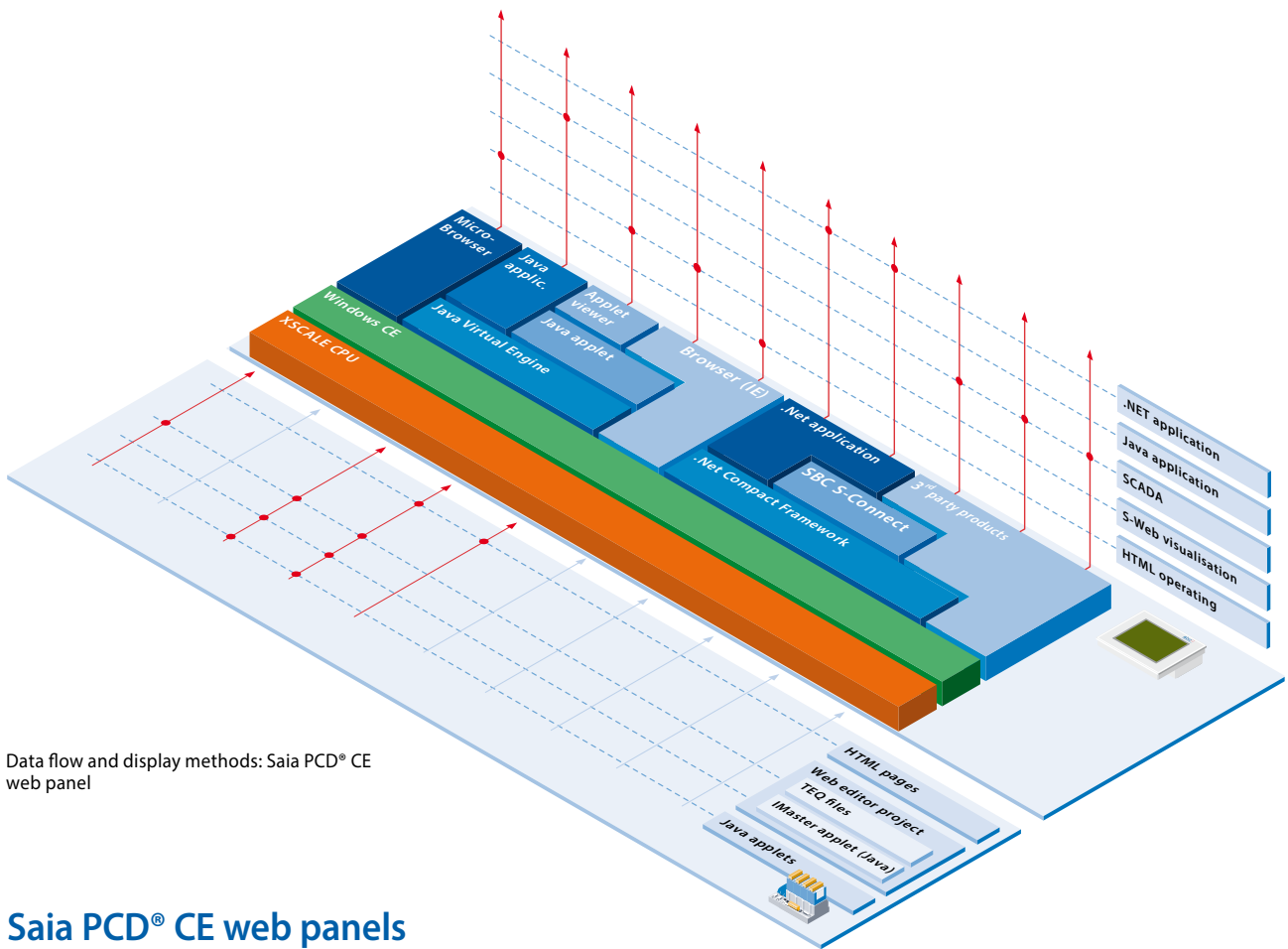
The integrated Java Virtual Machine allows Java applications to be run. These can access process data from PCD controls via a CGI interface.

► **.NET application**

Saia PCD® CE and eXP web panels are fitted with the .NET framework and so are able to run .NET applications. These can access process data via CGI or the S-Connect library.

► **Visualisation / SCADA**

Ready-to-use visualisation systems from third-party providers can either be set up on the .NET framework or address the Windows API directly.

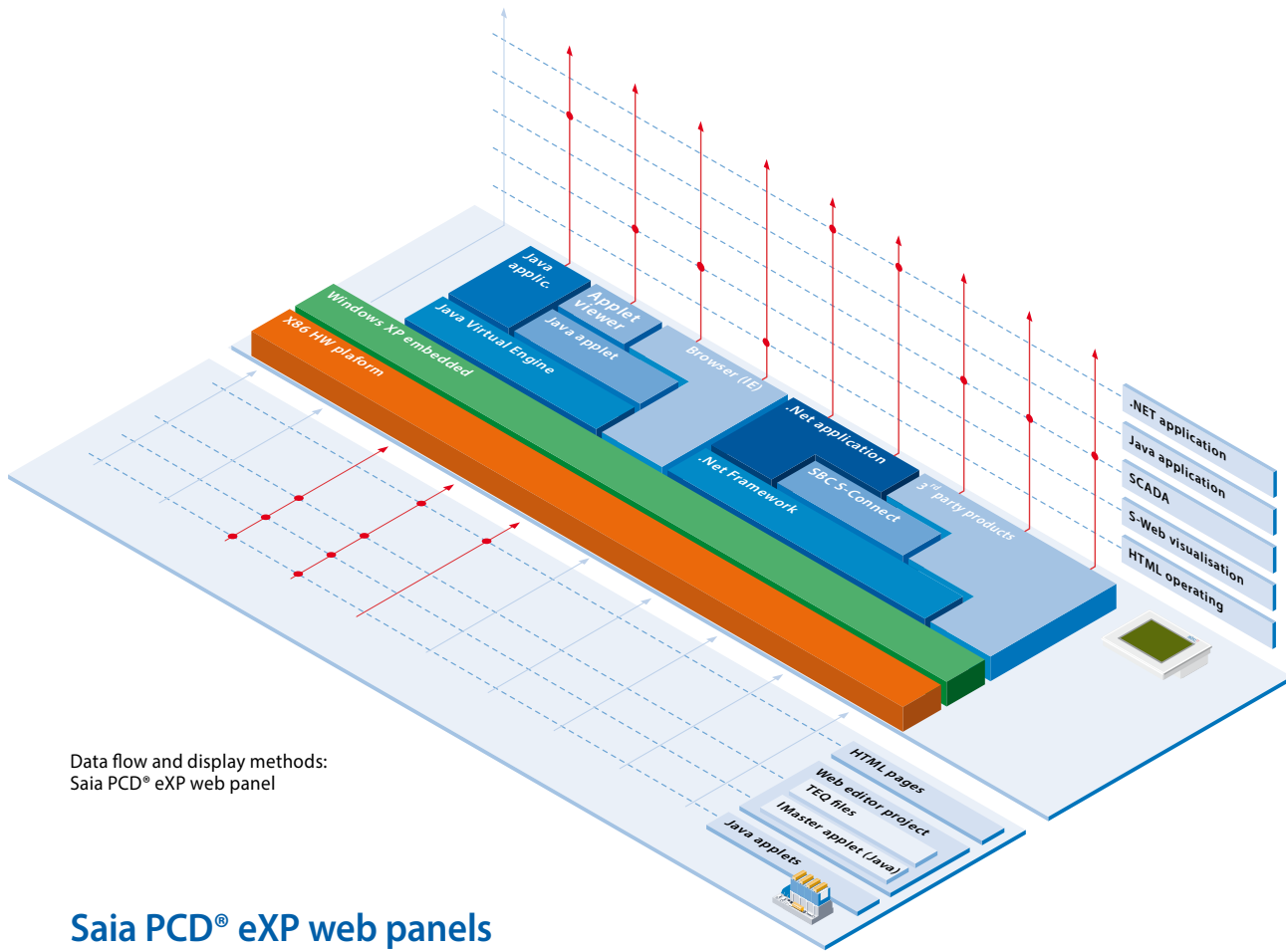


Data flow and display methods: Saia PCD® CE web panel

## Saia PCD® CE web panels



	<b>PCD7.D5100TL010</b>	<b>PCD7.D5120TL010</b>
<b>Display</b>	10,4" / 800 × 600 / colour TFT	12,1" / 800 × 600 / colour TFT
<b>Processor / RAM</b>	AMD Geode / 256 MB	AMD Geode / 256 MB
<b>Operating system</b>	Windows CE 6.0	Windows CE 6.0
<b>Browser</b>	Internet Explorer Micro-browser	Internet Explorer Micro-browser
<b>Software platforms</b>	Microsoft .NET Compact Framework  NSISCom CrEme Java Virtual Machine	Microsoft .NET Compact Framework  NSISCom CrEme Java Virtual Machine
<b>Servers</b>	Web server (HTTPD / Microsoft)  Web server (Web Connect /Saia Burgess Controls)  FTP server  File server	Web server (HTTPD / Microsoft)  Web server (Web Connect /Saia Burgess Controls)  FTP server  File server
<b>Remote maintenance</b>	SysAdmin - web interface – System status – Access to file system – Start and terminate processes – Enter registry settings  Remote desktop	SysAdmin - web interface – System status – Access to file system – Start and terminate processes – Enter registry settings  Remote desktop



Data flow and display methods:  
Saia PCD® eXP web panel

## Saia PCD® eXP web panels



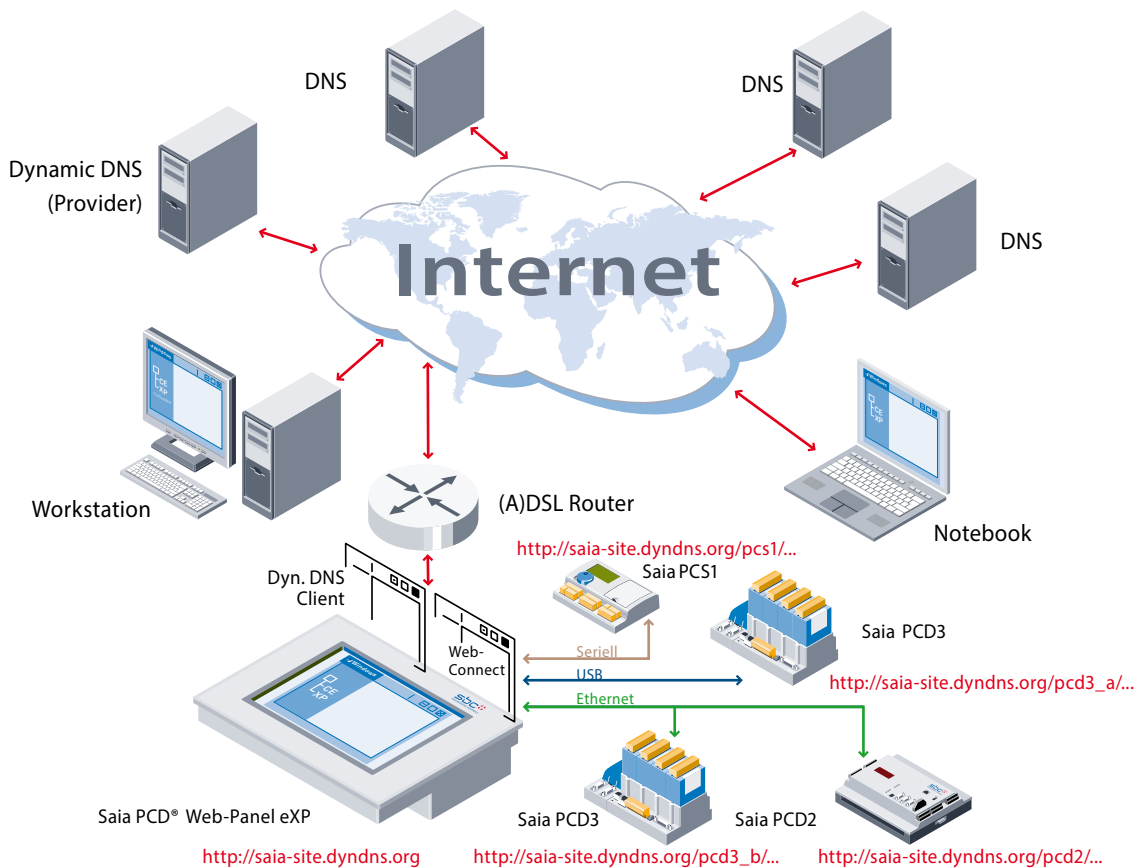
	<b>PCD7.D5120TA010</b>
<b>Display</b>	15" / 1024 × 768 / colour TFT
<b>Processor / RAM</b>	Intel ATOM Z530 1.6 GHz / 1 GByte
<b>Operating system</b>	Windows XP embedded
<b>Browser</b>	Internet Explorer
<b>Software platforms</b>	Microsoft .NET Framework
	Sun Java 2 Platform Standard Edition
<b>Servers</b>	Web server (IIS / Microsoft)
	Web server (Web Connect / Saia Burgess Controls)
	FTP server
	File server
<b>Remote maintenance</b>	Remote desktop

World-wide operation of PCD controllers via dynamic DNS

In a production business, four Saia PCD® and Saia PCS type controllers require Internet access. The production sites are connected to Internet via a normal (A)DSL router through a commercial Internet provider. The simplest (and lowest cost) version uses dynamic IP addressing for communication with Internet; i.e. the provider assigns the router an IP, which can change every time a connection is established. However, to access the controllers, it is indispensable to know the IP currently used for Internet connection. This is remedied by the dynamic DNS concept. In the world-wide web, DNS servers look after the translation of «talking Internet addresses in text form» – fully qualified domain names – into real IP addresses. If you enter a URL (FQDN) in the address line of a browser, it will automatically request the appropriate IP from a DNS server before establishing a connection to the desired web site. This assignment can be changed dynamically within the DNS system. For this purpose, providers exist that allow you to open a suitable account (depending on requirements, this may be free of charge), where the fully qualified domain name and the

appropriate, current IP are stored. The DNS provider will then store this information in the global DNS system, which guarantees world-wide access through the chosen fully qualified domain name. Since in this particular case the IP is not fixed, when it changes the new IP must be entered with the DNS provider. Client software exists for this, which independently recognizes the change of IP and transfers the new IP to the DNS provider. This means that the controllers can always be accessed under the same FQDN.

In concrete terms, a Windows® XP-based web panel is superposed onto the controllers. The DNS client, which detects any change of IP and reports it to the DNS provider, is installed on this web panel. Also active on the panel is the Web-Connect communications server, which looks after local routing to individual controllers. Using the FQDN, the (A) DSL router can be accessed via Internet. The router forwards requests to the web panel, where Web-Connect then uses the FQDN – with the extension of the controller path – to switch to whichever controller is addressed.

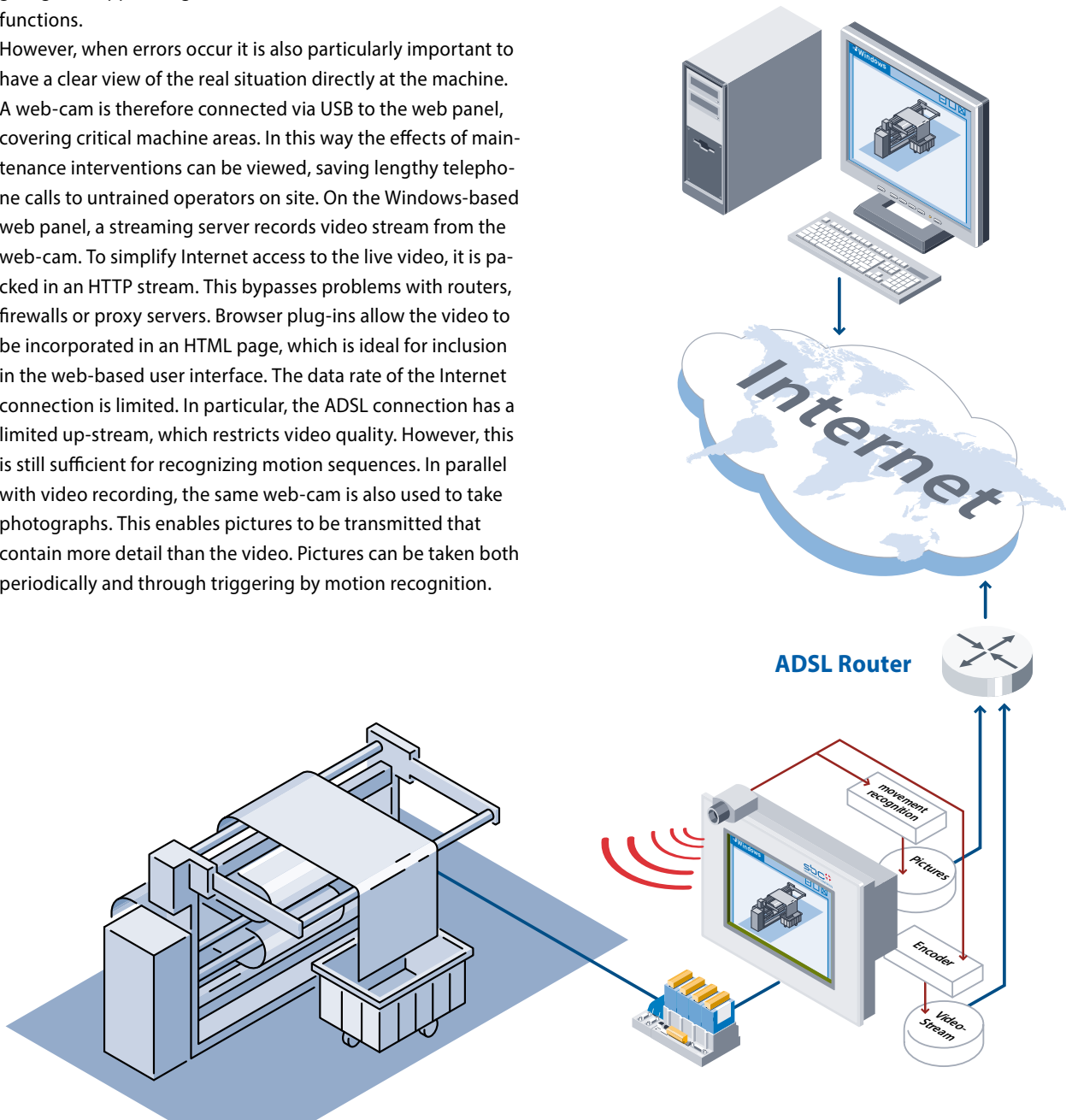


## Machine monitoring and maintenance by remote access and web-cam

In a medium-sized business, production has been partially relocated from the main factory to physically separate branch facilities in the interests of rationalization. The necessary production machines continue to be looked after by the main factory's maintenance department. For this purpose, the machines are provided with an Internet connection and control panel suitable for remote maintenance. The Saia PCD® web panel eXP is used, which supports powerful remote desktop functions. It allows convenient operation of the machines from the office in the main factory via Internet. Moreover, a remote desktop connection also enables the user interface to monitor and control all the web panel's operating system functions, giving the support engineer unrestricted access to all machine functions.

However, when errors occur it is also particularly important to have a clear view of the real situation directly at the machine. A web-cam is therefore connected via USB to the web panel, covering critical machine areas. In this way the effects of maintenance interventions can be viewed, saving lengthy telephone calls to untrained operators on site. On the Windows-based web panel, a streaming server records video stream from the web-cam. To simplify Internet access to the live video, it is packed in an HTTP stream. This bypasses problems with routers, firewalls or proxy servers. Browser plug-ins allow the video to be incorporated in an HTML page, which is ideal for inclusion in the web-based user interface. The data rate of the Internet connection is limited. In particular, the ADSL connection has a limited up-stream, which restricts video quality. However, this is still sufficient for recognizing motion sequences. In parallel with video recording, the same web-cam is also used to take photographs. This enables pictures to be transmitted that contain more detail than the video. Pictures can be taken both periodically and through triggering by motion recognition.

Motion recognition in particular is excellent for recording any faults that occur. A refined masking technique makes it possible to check just certain sections of the picture for motion – for example, if a workpiece has not been correctly inserted.





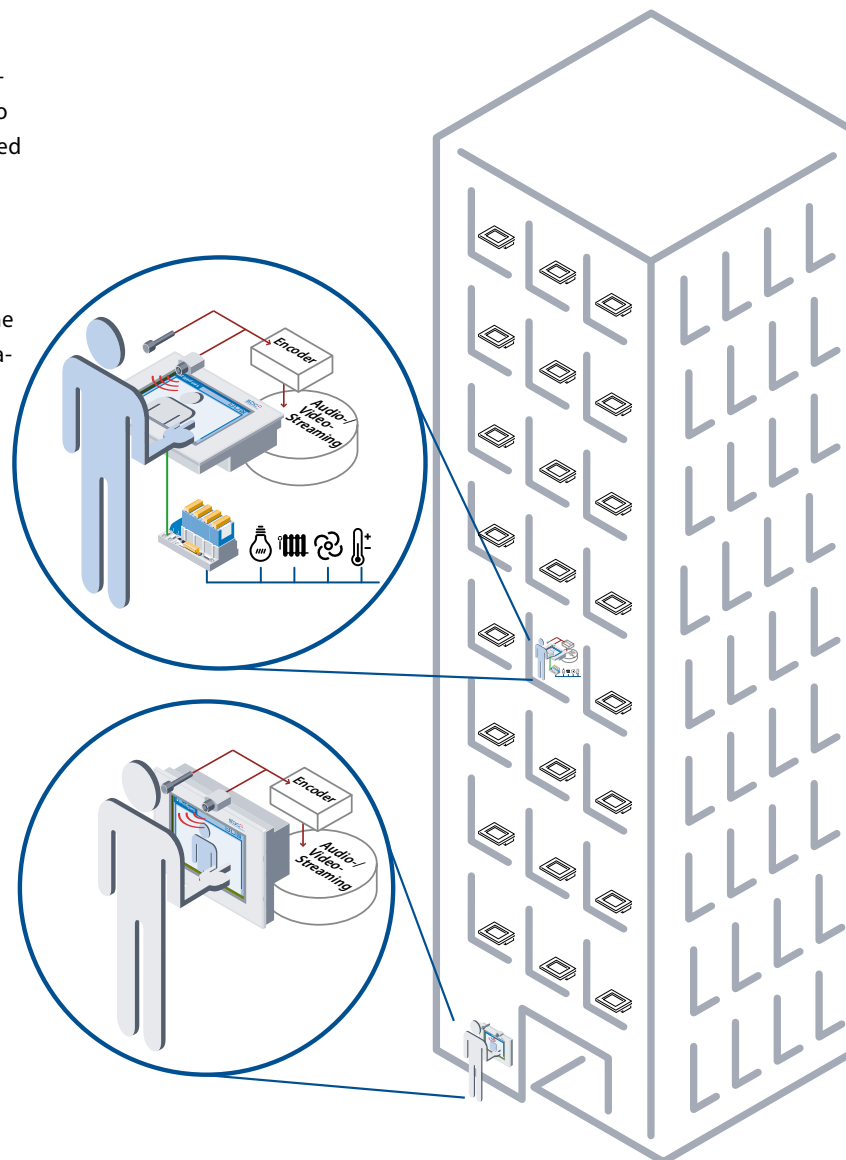
## Doorbell and intercom system with video transmission

In a residential complex, all 200 apartments are equipped with their own Saia PCD3 controllers and web panels. These panels and controllers switch ventilation, air-conditioning/heating, blinds and lighting scenarios on and off. In addition, a doorbell and intercom system is installed through networking across Ethernet. For this purpose, a further Saia PCD® web panel is installed at the main entrance. Visitors can use a keyboard on the touch-screen to enter the apartment number, which rings the doorbell. Alternatively, they can select the resident's name from an alphabetical scroll field. The panel in the main entrance area and those in the apartments are equipped with web-cams, microphones and loud speakers. As soon as the bell rings, a video window opens on the web panel of the apartment concerned and the resident can see the visitor at the door. If desired, an audio/video connection can be established, which also opens a video window at the main entrance door, so that both resident and visitor can converse together. A streaming server is installed on each panel, which records the web-cam's video stream and the audio input in real time, encoding it in resource-thrifty MPEG4-based video format. The streaming server on the Saia PCD® web panel at the main entrance makes the resulting MPEG4 video stream, including audio information in the form of a UDP broadcast, available to all network stations. This means that each apartment panel can tap the stream. In contrast, the servers in the apartments only make the video streams available to the entrance panel (UDP unicast). Connections are coordinated via the Saia PCD® controllers – i.e. which video is transmitted where, and who is allowed to see and hear what. This ensures maximum protection of privacy. The use of a standard operating system (embedded XP) means that an open source solution and licence-free standard

Codecs can be relied on for the streaming application.

Therefore, no additional costs are incurred aside from normal engineering expenses. The chosen concept still has scope for added functionalities. For example, video streams can be recorded individually from the entrance area, so that residents can see who wanted to visit them, even after an absence.

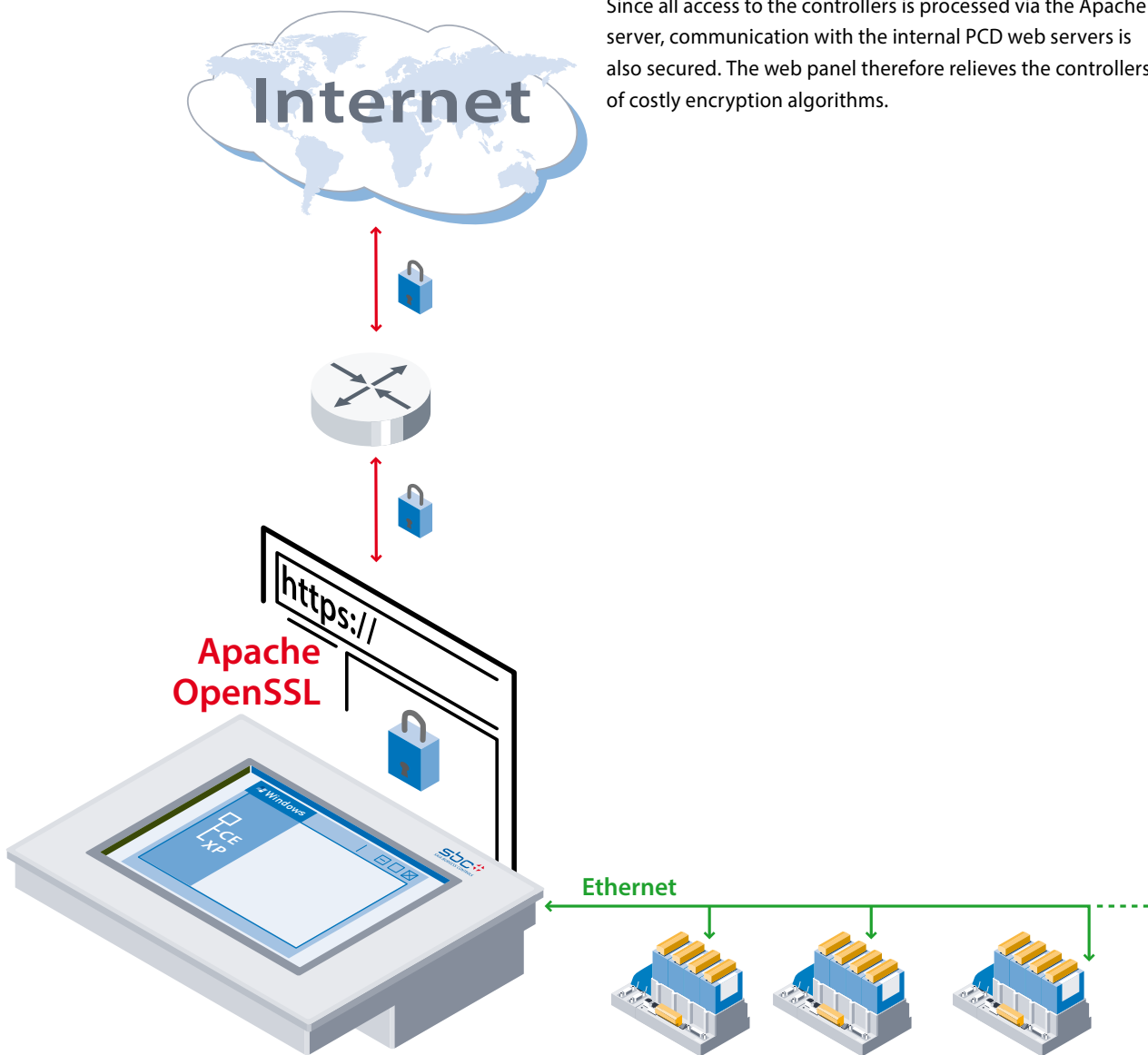
A message box function like telephone answering is therefore conceivable. Internet networking makes it possible to access this information externally.



## Secure access to Saia® PCD controller with authentication and SSL encryption

Three Saia PCD® controllers must be accessible via Internet across a secure connection. The intranet containing these PCD controllers is connected to Internet by a router. An embedded Windows® XPbased web panel, on which the open-source web server Apache is installed, is superposed on the controllers. Even in its basic installation, Apache offers authentication that complies with standards, i.e. users have to login to the server with their name and password. In addition, every access/login is logged – a frequent security directive in public facilities or the pharmaceutical/health sector. With Apache, so-called

virtual hosts can be set up. For each controller, an individual web site (virtual host) is established. This means that individual controllers are then selected via a fully qualified domain name. Any accessing of the virtual host is forwarded by the Apache server to the relevant controller, so that it functions as a kind of proxy server/router. The open SSL version of Apache supports the internationally established SSL security standard. With SSL, all data transmissions are encrypted, e.g. using a 512-bit wide code. This meets the highest security requirements and is used, for example, in online shopping/banking. Since all access to the controllers is processed via the Apache server, communication with the internal PCD web servers is also secured. The web panel therefore relieves the controllers of costly encryption algorithms.



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