



Has your system already been shunted into the sidings?



Takes you beyond the limits

Get back on the right track and migrate to the latest technology.

# SIMATIC PCS 7

Answers for industry.

**SIEMENS**

# Migration – an investment in your future

Regardless of whether you want to increase productivity or shorten the time to market: Commercial success depends decisively on the automation of a plant. In order to meet the more stringent demands of the market both today and in the future, it is therefore essential that these systems comply with the latest state-of-the-art – or can be migrated to it.

## Checking the need for modernization

When assessing existing plants and installed systems, a number of aspects must be taken into account:

- How great is the risk of unplanned plant downtimes and production stoppages?
- Does the system offer the performance, openness and flexibility for an expansion of production or the introduction of new products?
- Is an MES / ERP integration possible? And if so, at what expense?
- How expensive is the maintenance of the installed system?
- Will the old system still be supported or has it already been discontinued?
- Does the efficiency of the operating personnel suffer from the fact that a number of different systems are deployed in the plant?

## The right strategy for success

In each case of migration, the return on investment (ROI) plays a crucial role. This is because a huge investment in hardware and application software is associated with the installed process control system – as well as the accumulated know-how of the operating, engineering and maintenance personnel. For this reason, the prime objective of any migration strategy should be to modernize the installed base gradually without any system discontinuity – and if possible without any plant downtimes or loss of production. Also of great importance: The long-term security of existing investments, in order to maximize the return on assets (ROA). For this reason, every migration should include a robust lifecycle support strategy for the new system which considers not only the availability of the components, but also the product warranties, on-site service and technical support.

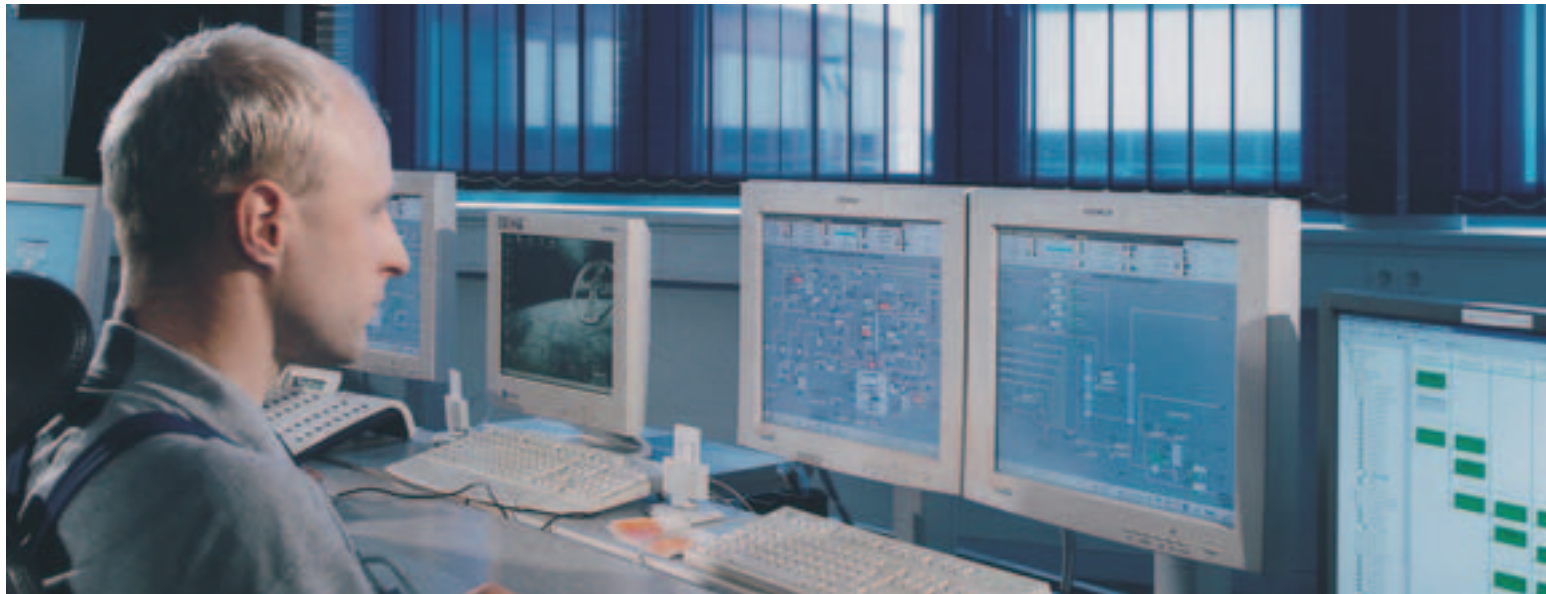
## SIMATIC PCS 7

SIMATIC PCS 7, the Siemens process control system, creates the conditions that enable you to improve your competitive capability with lasting effect: to respond quickly and flexibly to new market demands and to minimize any interruptions to the operation in progress. Our innovative process control system meets all the demands on process technology – for all industries and applications. SIMATIC PCS 7, an integral part of Totally Integrated Automation, boosts your profitability over the entire life cycle of your plant.

## Totally Integrated Automation (TIA)

With Totally Integrated Automation, Siemens is the only manufacturer to offer a fully integrated range of products, systems and solutions in all sectors – from the field level, through the production control level to the connection with the ERP level. In this way, TIA offers an opportunity for optimizing the production processes in all areas of a plant, leading to reduced complexity and increased productivity, while maintaining great security of investment.

This results in a lower total cost of ownership (TCO) – and consequently an improvement in competitiveness: greater production throughput, significantly increased availability, higher product quality, improved efficiency of operation, extended maintenance options and, at the same time, a shorter time to market.



Being flexible and reacting quickly to new market demands while minimizing production downtime is a basic requirement for any company that wishes to enhance its position in the market. This characterizes the SIMATIC PCS 7 process control system. As a cornerstone of Totally Integrated Automation, SIMATIC PCS 7 forms a seamless all-in-one system with capabilities that exceed those of legacy systems and the ability to handle all of your process control requirements – a control system for all industries and all applications.

With SIMATIC PCS 7, we are addressing the business issues that are critical to maintaining and building up your competitive advantage. You can profit throughout the entire life cycle of your industrial plant. SIMATIC PCS 7 opens up new perspectives through

- Integration
- Performance
- Scalability
- Modernization
- Safety & Security
- Innovation
- Global Network of Experts

#### **SIMATIC PCS 7 at a glance**

- ▶ Powerful, centralized, plant-wide engineering system
- ▶ Integrated efficient engineering
- ▶ Multiuser-capable HMI components in client / server architecture
- ▶ Central parameterization of field devices with SIMATIC PDM
- ▶ Intelligent alarm management
- ▶ Software simulation and testing
- ▶ Change management (version tracking, change log etc.)
- ▶ Asset management with standardized visualization, diagnosis and maintenance of all process control system components
- ▶ Overview of the entire maintenance process
- ▶ Complete traceability of status and maintenance jobs
- ▶ Monitoring of plant performance
- ▶ Scalable from small to very large plants
- ▶ Redundancy at all levels (distributed I/O, controllers, bus systems, servers)
- ▶ Expansions / changes can be performed online during operation
- ▶ I/O modules for hazardous areas
- ▶ OPC support
- ▶ Distributed access via Internet / Intranet
- ▶ Wireless operator control and monitoring with MOBIC
- ▶ Innovative controllers with scan rates down to 10 ms
- ▶ Time stamping at I/O module level down to 1 ms
- ▶ Standardized hardware platform also for process security
- ▶ Fast Ethernet and PROFIBUS DP / PA
- ▶ Interfaces to MODBUS, AS-i and FF

# Comprehensive migration strategy – unique to the industry

Migration strategy from Siemens		
System:	Plant / Asset:	Production:
<p><b>HMI / Batch</b></p> <ul style="list-style-type: none"> <li>– Replace legacy HMI</li> <li>– Replace batch manager</li> </ul> <p><b>Controller / Network</b></p> <ul style="list-style-type: none"> <li>– Replace controller</li> <li>– Gateway to PCS 7</li> </ul> <p><b>I/O / FTA</b></p> <ul style="list-style-type: none"> <li>– Reuse of I/O</li> <li>– FTA for PCS 7</li> </ul>	<p><b>Innovation Pressure</b></p> <ul style="list-style-type: none"> <li>– Improve operations</li> <li>– IT integration</li> <li>– APC &amp; asset management</li> </ul> <p><b>Life cycle / ROA</b></p> <ul style="list-style-type: none"> <li>– Maintain &amp; modernize</li> <li>– Expand &amp; improve</li> <li>– Renew / replace</li> </ul>	<p><b>Product Strategy</b></p> <ul style="list-style-type: none"> <li>– Capacity increase</li> <li>– Product innovation</li> </ul> <p><b>Cost Reduction</b></p> <ul style="list-style-type: none"> <li>– Operation</li> <li>– Maintenance</li> </ul> <p><b>Time to market</b></p> <ul style="list-style-type: none"> <li>– Production time</li> <li>– Available downtime</li> </ul>
<b>Stepwise</b>	<b>Adaptable</b>	<b>Flexible</b>
<b>Innovative Technologies</b>		

The Siemens migration strategy is stepwise, adaptable and flexible allowing customers to perform a successful migration in a way that best meets their requirements.

Migration has never been a more important topic in the industrial marketplace as users confront the life cycle management of their installed systems. Users from all sectors, from process control engineers to executive leaders, are expressing their concerns and expectations about migration, from the availability of spare parts to process optimization.

There are many compelling reasons for why migration is becoming so important. In many regions of the world, plant expansions and modernizations are much more common than new or “Greenfield” projects. Furthermore, the process automation industry itself has undergone massive industry consolidations of both suppliers and end users, and significant changes have been made in the lifespan for DCS components spurred on by rapidly changing technology. While the expected lifespan for I/O and wiring is 25 years or more, the lifespan of HMIs and workstations is now typically 5 years.

To respond to these business and technology drivers, Siemens has created the industry’s most comprehensive approach to migration. This means that Siemens is in a unique position to not only meet, but exceed our customer expectations due to our ability to provide a migration strategy which is stepwise, adaptable, and flexible. And this as well for their own legacy systems as for those of 3<sup>rd</sup> party suppliers.

- **Stepwise** – allows incorporation of new technology incrementally and at various levels of your existing system in a way that is ideal for your plant.
- **Adaptable** – creates a strategy which is tailored to the plant’s lifecycle strategy (maintain and modernize, expand and improve, or renew and replace) and to maximizing return on assets (ROA).
- **Flexible** – is designed to take into account the business issues facing production and operations, including the need to increase capacity, add new products, reduce costs or reduce the time to market.

Adaptation of the migration solution on an individual basis to the requirements of the customer and the plant structure

Product	Purpose
Conversion tools & services	Preserve & convert existing investment & accumulated know-how
Batch manager	Connect new batch manager to existing system
HMI connectivity	Connect new HMI to existing controller & I/O
Engineering libraries	Provide faceplates, function blocks with same look and feel as older system
Gateways	Allows peer-to-peer controller communication
I/O interface	Control existing I/O with new controller
Field termination assemblies	Preserve field devices and wiring



The benefits of this comprehensive migration strategy are delivered through a series of products and services which Siemens has developed to transition users to newer technology. These products, tools and services can be combined to meet the specific migration requirements of your plant.

Designed to minimize the cost of change associated with migration, these products and tools allow users to reuse their intellectual property and to preserve existing hardware which still retains value.

#### Siemens unique approach to development of migration products

Siemens' unique approach to development of migration products starts with the philosophy that the structure of every process control system is more or less similar. Each process control system contains a configuration database that consists of building blocks that are common to all systems, independent of supplier or vintage, such as:

- Function block types and instances
- Hardware address information
- Control logic
- User interface made up of process graphics, dynamic elements, faceplates, etc.

For an effective migration, the target (new) system must "understand" the information contained in the old system so that it can automatically reproduce the configuration within the new platform at a fraction of its original development cost.

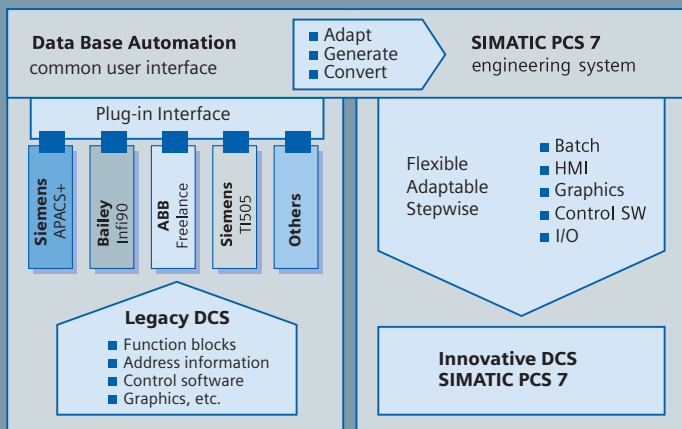
At Siemens, we have created a universal technology that is embedded in all of our migration products which enables this preservation of intellectual property: Data Base Automation or simply DBA.

"In ARC's view, Siemens offers one of the most comprehensive sets of migration products, tools, and services on the market for competitor systems and its own legacy systems to SIMATIC PCS 7."\*

\* ARC White Paper "Siemens Process Automation System – Migration and Modernization Strategies" from February 2007, page 3

Data Base Automation: a universal, enabling technology that is used to migrate existing legacy DCS applications to SIMATIC PCS 7 while preserving engineering and process control know-how.

Replacing the aging operator consoles by state-of-the-art SIMATIC PCS 7 consoles is supported by the DBA tool.



With the aid of a modular “plug-in” interface, existing configuration data can be interpreted and read into the Data Base Automation tool from any process control system and can be displayed and configured using a common user interface. This architecture creates a universally applicable migration infrastructure that permits simple connection to different legacy process control systems thanks to its modular architecture. DBA allows migration of HMI, batch, and controller data, while creating a consistent look and feel for every control system migration. This migration tool is tightly integrated within the SIMATIC PCS 7 engineering system, allowing for common configuration techniques to be used for both old and new systems alike.

Siemens migration tools are designed to focus on the automated conversion and reuse of existing intellectual property, allowing users to save time, reduce costs, minimize errors and maximize traceability and reliability.

Another unique approach in the industry is that Siemens treats its migration products just like its standard SIMATIC products, not like “one-off” products. This means that we follow a rigorous product development process including thorough testing at the product and system level. We also follow the same product maintenance and life cycle support guidelines as with our standard products. This applies to technical support and product warranties as well. At Siemens, our development teams treat system compatibility as a priority, not as an afterthought. This ensures that modernization projects have minimal risk, allowing you to take advantage of new technology while continuing to offer a high degree of investment security. Because it is a world leader in automation and a financially stable company, Siemens is in a unique position to back its products for the long term, ensuring scope of supply well into the future. Thus the plant manager may be sure that by partnering with Siemens, he will enjoy reliable worldwide support, and that the investment made in migration will help to secure the long-term viability and operation of the plant.

# Advantages of migration – tailored to your needs

Replacing legacy controllers is supported by powerful conversion tools and can be executed without shutting down the plant.

The state-of-the-art SIMATIC PCS 7 controller is more powerful than the controller of legacy systems allowing users to reap the benefits of tighter control and improved quality.



The extensive portfolio of migration products and services from Siemens allows customers to create a migration strategy and timeline that is tailored to their individual needs, allowing them to balance factors such as capital expenditures, process downtime and personnel resources. “We don’t force you into a single strategy, but provide you with multiple options that can be implemented in a phased approach!”

In this respect, Siemens relies on the state-of-the-art SIMATIC PCS 7 process control system which is a key component of the advanced Totally Integrated Automation system platform.

A successful migration always requires three essential components:

- Migration products
- Migration tools
- Migration experts.

Migration products are used for integrating modern PCS 7 components with existing parts of the old system that are to be retained. They are an inherent part of the SIMATIC PCS 7 product range, i.e. you will also receive full support for them over the entire life of a product – which means maximum safety for you and your investment.

Our migration products and services are designed to allow you to preserve your existing assets while also realizing the full benefits of SIMATIC PCS 7.

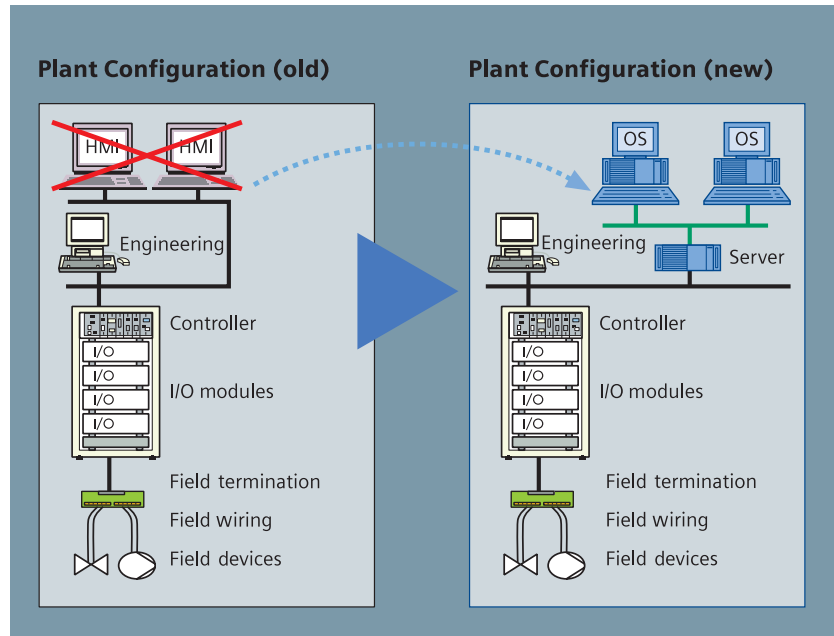
- SIMATIC PCS 7 operator stations (HMI) – with interface to the controllers of the old system in order to operate the plant with new HMI technology
- Controller migration – in the context of a migration it is advisable also to modernize the controller level along with the operating system
- Engineering libraries for SIMATIC PCS 7 controllers and operator stations – function blocks, faceplates and dynamic HMI elements in SIMATIC PCS 7 that guarantee a functionality comparable with the existing systems
- Network gateways – for peer-to-peer communication between the existing and the new SIMATIC PCS 7 controllers
- I/O interfaces to SIMATIC PCS 7 – reuse of existing I/O sub-systems (field devices, field terminations and I/O modules) on new SIMATIC PCS 7 controllers
- Field Termination Assemblies (FTAs) – Retention of existing field cabling through 1:1 replacement of existing field terminations with new, compatible FTAs (same size and function) and standardized cabling to SIMATIC PCS 7 I/O modules
- Migration Support Center (MSC) – the MSC specialists provide information on the migration options, analyze the plants, offer individual advice and, if requested, also produce a detailed migration concept

# Common migration scenarios

With a comprehensive set of products and services available for migration to newer technology, Siemens provides numerous options for migration that can be tailored to the unique requirements of a specific plant.

Below are several common solutions that have been used by customers to address their migration requirements:

- HMI replacement
- Plant expansion
- Modernization



Example 1

## Example 1: HMI replacement

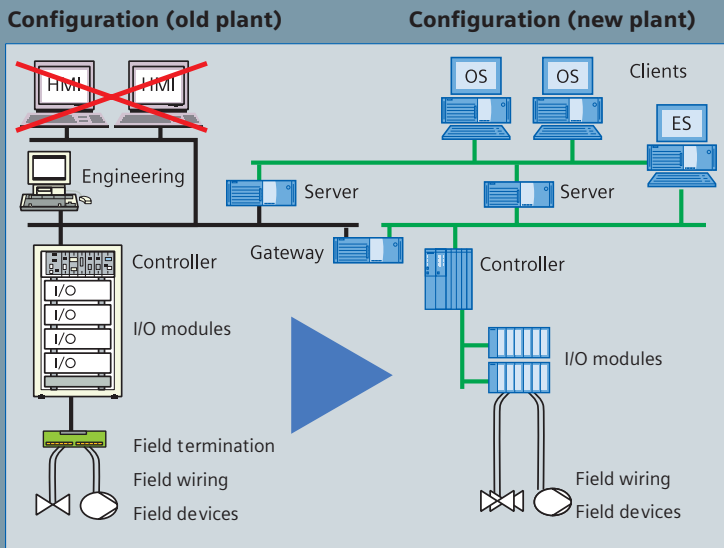
In today's environment, there are many reasons why it might make sense to replace aging HMI terminals as part of a migration strategy. Due to the rapid changes in PC technology it is possible that the HMI of the existing system is technically outdated, or its spare parts may be prohibitively expensive, or even obsolete. Changing business requirements, such as integration of the control network with the corporate network, improved network security, or other functional expansions may also require an HMI upgrade. In these cases, the old HMI can simply be replaced by a new state-of-the-art Operator Station (OS) based on SIMATIC PCS 7 – thus protecting the investments made in controllers, I/O, process graphics, and application software. Conversion tools enable existing process graphics to be redrawn within SIMATIC PCS 7 OS at a fraction of their engineering value.

### Major benefits:

- Extends the life of an existing control system incrementally and provides new operational capability
- Minimum cost impact
- Enables connectivity to ERP systems and tighter IT integration
- Provides for a smooth transition for operating personnel to new HMI technology
- System upgrades can be performed online without requiring unplanned downtime
- Minimizes total cost of ownership by reducing design, installation and startup costs

Additional details on system-specific migration solutions can be found in individual brochures.

**Contact your Siemens partner  
for more information!**



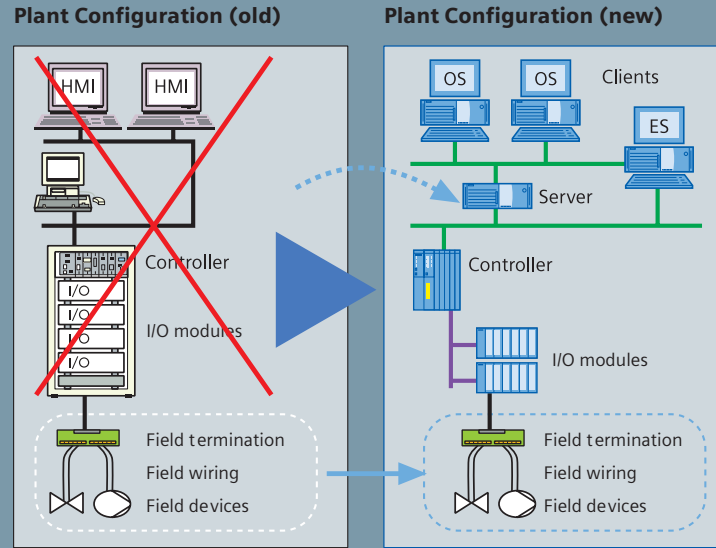
Example 2

**Example 2:  
Plant expansion**

Here, the existing plant is expanded by means of a new SIMATIC PCS 7 process automation system. The old system is retained for the time being, allowing coordinated operation between new and old, as well as a smooth transition to new technology. If the old and new systems are united under a common new HMI, then the system is architected to ensure that operating personnel work with a common look and feel for both systems. Engineering libraries developed within SIMATIC PCS 7 to mimic the functionality and behavior of older systems help to minimize the learning curve for the technicians and the scope of maintenance functions. This step-by-step modernization – addressing a new section of the plant first – thus offers the possibility of functional extensions such as fieldbus technology, IT integration, Totally Integrated Automation, and more, without the need for a complete system replacement.

Major benefits:

- Adds production capacity and manufacturing flexibility
- Allows for smooth introduction of new technologies (such as fieldbus) into the plant
- Enables connectivity to ERP systems and tighter IT integration
- Allows different automation systems to be brought under control of a common HMI
- Provides for a smooth transition for operating personnel to new HMI technology



Example 3

**Example 3:  
Modernization**

In some cases, difficulties with the supply of replacement parts of the old system, a lack of technical support or needed functional extensions, perhaps involving fieldbus technology or IT integration, make comprehensive modernization unavoidable. In this case, the old system is replaced by the modern SIMATIC PCS 7 control system, even while – if necessary even while the system remains online to ensure that production goals are met. In this scenario, the investment in wiring, hardware components, existing I/O and field devices or intellectual property (the valuable application engineering) can be reused, based on the customer's evaluation of what components hold maximum future value. This helping to minimize total cost of ownership.

Major benefits:

- Provides the maximum lifespan extension of the process automation system
- Removes dependence on existing vendors
- Minimizes total cost of ownership by allowing reuse of the most significant existing assets

# Pooling competence for first-class solutions

## Siemens Systems

- ▶ APACS+ / Quadlog
- ▶ TELEPERM M
- ▶ SIMATIC PCS / TISTAR
- ▶ OpenPMC

## Third-party systems

- ▶ Bailey (ABB) – Infi90
- ▶ Fisher (Emerson) – Provox
- ▶ Foxboro (Invensys) – Series I/A
- ▶ Hartmann & Braun (ABB) – Contronic P
- ▶ Hartmann & Braun (ABB) – Freelance
- ▶ Honeywell – TDC2000 / TDC3000
- ▶ Rosemount (Emerson) – RS / 3
- ▶ and others

A successful and efficient migration is best achieved by working with a team of competent partners. Consequently, Siemens is accustomed to working hand in hand with the customer and with their system integrator(s), particularly when it involves the migration of third-party systems. In such cases, the system integrator may have specialized knowledge of the customer's existing application, or an expertise with the third-party control system, or an insight into the needs of the client and the requirements of the plant. In this way, plant management can be assured that the effective partnership between the system integrator and Siemens will result in the optimum migration solution for his business.

There are many reasons why Siemens is in a unique position to be your process automation partner for the future. Combining the innovative SIMATIC PCS 7 process control system with flexible migration solutions and services, plus industry expertise and migration experiences accumulated over years, in addition to global support, creates a combination that provides maximum value for our customers.

Providing a viable and flexible migration path from earlier Siemens control systems to SIMATIC PCS 7 has been one of the major drivers during the development of our migration products, tools and services. This work has been leveraged to create migration solutions that can also be used for third-party control systems from ABB, Bailey, Emerson, Honeywell, Invensys and others. Thus, users of third-party control systems can rely on the global leader SIMATIC technology to secure their investments in new automation technology for the future. In this way, they benefit from the features of the modern SIMATIC PCS 7 process control system and the synergy effects resulting from the use of Totally Integrated Automation.

# Selection criteria for migration partners



Teamwork: plant management, system integrator and Siemens.

Based on decades of experience in process automation, Siemens has for years been offering comprehensive migration solutions to help users effectively manage the life cycle of their installed process automation systems.

The migration strategy is based on leveraging the innovative technologies of Totally Integrated Automation and by transitioning to the SIMATIC PCS 7 platform in a stepwise, adaptable and flexible fashion. Now, users of earlier Siemens control systems, or of third-party control systems are both able to benefit from the advantages of Totally Integrated Automation for their processes.

Below you can see for yourself how the Siemens migration strategy to SIMATIC PCS 7 addresses the key user migration requirements as defined by ARC.

User requirements*	SIMATIC PCS 7 migration strategy
System openness and adherence to international standards	SIMATIC PCS 7 is an open platform that is built on the basis of international standards such as OPC, Industrial Ethernet, PROFIBUS, S88 and IEC 61131, and is a cornerstone of Totally Integrated Automation.
Ability to preserve existing assets that still offer value and avoid replacing hardware assets that add no value	The SIMATIC PCS 7 migration strategy allows users to preserve whatever existing investments provide future value: field wiring, terminations I/O subsystems, controllers and application software.
Tools for effective graphics conversion	Conversion tools and services are provided to convert process graphic displays automatically at a fraction their original engineering cost.
Improved engineering efficiency	HMI displays, including dynamic elements, can be generated automatically from the existing controller configuration.
Accommodation of higher-level applications	Integration support for SIMATIC BATCH and SIMATIC IT enables easy connectivity to ERP systems.
Support by training solutions	Standard training courses and migration-specific training/workshops are available.
Solid partner, also for the future	Siemens is a large, financially stable company and a long-term player in the process automation industry.
Ability to provide references	APACS+, TELEPERM M, SIMATIC PCS/TISTAR, DCS from Bailey and Honeywell, additional third-party systems in preparation.

\* based on ARC study „Process Control System Migration Strategies“ from February 2003, Page 8

## Up-to-date information on SIMATIC PCS 7:

[www.siemens.com/simatic-pcs7](http://www.siemens.com/simatic-pcs7)

More information about the migration to SIMATIC PCS 7:

[www.siemens.com/simatic-pcs7/migration](http://www.siemens.com/simatic-pcs7/migration)

Interactive catalog on the Web:

[www.siemens.com/automation/ca01](http://www.siemens.com/automation/ca01)

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