Innovative PC Technology

The most innovative industrial PC generation

B&R has been developing and producing PCs for industrial use for more than ten years now. Unlike the fast-paced consumer market, what counts in this segment is continuity and compatibility over many years and the ability to seamlessly trace all product versions. The hundreds of thousands of B&R PC systems installed worldwide over the years prove that B&R meets these requirements.

The perfect industrial PC

Scalability doesn't stop with the different device types, either. Smaller variants of the APC810 with one or two slots, larger types with three slots, and the PC with five slots ensure there is a device type that fits perfectly to the application, regardless of how many cards are needed. Space is saved in the control cabinet thanks to the minimal installation depth of these devices. Panel PC 800 systems with brilliant displays up to 23.6" and one or two optional slots also present an ideal solution for any application. Harnessing the power and performance of highly efficient Intel® Atom™ N270 processors all the way up to the Core™2 processors opens up several different possibilities for combination. For machine manufacturers and system planners, this means a fully uniform PC architecture for both small machines as well as complex systems that is based on the same device types, preventing discontinuity and the extra engineering work that comes with it. In addition, because components such as hard drives are basically the same, the logistical stress that occurs when trying to find replacement parts is also reduced to an absolute minimum.

Reliability over many years

B&R development engineers considered the importance of maximum long-term availability when choosing which components to use. After all, the product lifespan of a B&R industrial PC series is ten years or more. Furthermore, the use of B&R industrial PCs in tough production environments places special demands on reliability and longevity.

Eliminating internal cable connections for PC components, using firm fitting circuit boards and offering optional mass memory without rotating parts (CompactFlash) – together with a very robust mechanical construction – provide extra protection against failures.

APC810 highlights:
- Highest level of performance
- Best price/performance ratio
- No internal cable connections
- Long-term availability

Selecting the right performance level

Scalable performance
An extensive range of processors is available for all applications, ranging from simple visualization tasks to complex image processing. Computing power can therefore be perfectly adapted to the respective application and a price-optimized system platform can be configured using extremely energy-efficient Atom processors or Core™2 Duo processors for high-performance tasks. All of the processors offered have been developed by Intel® specifically for mobile computing. Their high level of computing power and low power consumption offer many advantages for industrial use.

User-friendly system access
It is possible to read and edit all specific device parameters from the Automation PC and Panel PC:

- Key matrix
- Display brightness
- LEDs
- Temperature values from the PC and panel
- Service data (serial number, etc.)

C programming languages (with import libraries for Microsoft Visual C++ 6.0 and Microsoft embedded Visual C++ 4.0) and Visual Basic are supported. To provide fast access, the Control Center features a clearly designed window that includes all important information.

Intel® Core™2 Duo
Intel® Core™2 Duo processors are optimized for the highest level of performance with minimal power consumption. The 45 and 65 nm dual core processors are equipped with up to 6 MB L2 cache, which is dynamically assigned to the two cores as needed. This enables a single process to utilize the entire cache. Power-saving functions were also expanded. Processor features that are not needed at a given time are individually enabled and disabled, which keeps the power dissipation at a very low level while still maintaining the highest level of performance.

Available processors

Processor	Clock frequency	L2 cache	External bus	Chipset
Atom™ N 270	1600 MHz	512 kB	533 MHz	Intel® 945GME
Celeron® M 423	1060 MHz	1 MB	533 MHz	Intel® 945GME
Core™ Duo L2400	1660 MHz	2 MB	667 MHz	Intel® 945GME
Core™2 Duo U7500	1060 MHz	2 MB	533 MHz	Intel® 945GME
Core™2 Duo L7400	1500 MHz	4 MB	667 MHz	Intel® 945GME
Core™2 Duo T7400	2160 MHz	4 MB	667 MHz	Intel® 945GME
Core™2 Duo P8400	2260 MHz	3 MB	1066 MHz	Intel® GM45
Core™2 Duo T9400	2530 MHz	6 MB	1066 MHz	Intel® GM45

Design

Customized industrial PCs - compact, fan-free and cost-effective

Compact design

The Automation PC810 saves space in the control cabinet. Drive inserts (HDD, DVD, etc.) and two Compact-Flash slots are hidden behind a cover on the front of the device. B&R has been using this extremely reliable storage media for many years.
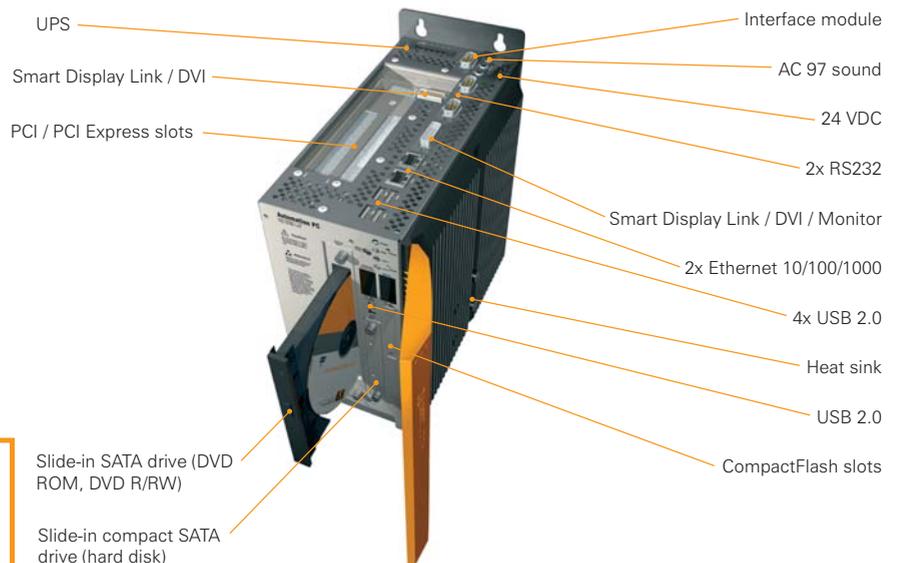
All connections and interfaces are located on the top side of the housing, and the installation depth is not increased by protruding connectors.

Fan-free

The APC810 can be operated in many variations without fans. All components that require cooling are placed on the board so that heat is distributed directly to the large outer heat sink. The advantages of a fan-free system are obvious: When using Compact-Flash cards, for example, there are no rotating parts. This eliminates maintenance work such as having to regularly exchange fan filters.

Integrated UPS

The optionally integrated UPS ensures that the PC system completes all of its write operations even if a power failure occurs. This allows all running programs to be terminated properly by the UPS software, which prevents inconsistent data. The UPS charging circuit takes up very little space in the APC810, and the batteries can be easily exchanged by the user.

UPS

Smart Display Link / DVI

PCI / PCI Express slots

Interface module

AC 97 sound

24 VDC

2x RS232

Smart Display Link / DVI / Monitor

2x Ethernet 10/100/1000

4x USB 2.0

Heat sink

USB 2.0

CompactFlash slots

Slide-in SATA drive (DVD ROM, DVD R/RW)

Slide-in compact SATA drive (hard disk)

APC810 highlights:
- Compact design
- Modular construction
- Fan-free
- Cost-effective

Processors	Celeron® M Atom™ N 270 Core™ Duo Core™ 2 Duo	Celeron® M Atom™ N 270 Core™ Duo Core™ 2 Duo	Celeron® M Atom™ N 270 Core™ Duo Core™ 2 Duo	Celeron® M Atom™ N 270 Core™ Duo Core™ 2 Duo
Memory	512 MB - 8 GB	512 MB - 8 GB	512 MB - 8 GB	512 MB - 8 GB
PCI / PCI Express slots	1 half-size	2 half-size	3 half-size	5 half-size
COM1 / COM2	RS232	RS232	RS232	RS232
Slot for an interface module	✓	✓	✓	✓
USB	Up to 5x USB 2.0	Up to 5x USB 2.0	Up to 5x USB 2.0	Up to 5x USB 2.0
Panel/Monitor	✓/✓	✓/✓	✓/✓	✓/✓
Panel (optional)	-	✓	✓	✓
AC 97 sound[1]	✓	✓	✓	✓
CompactFlash slots	2	2	2	2
Hard disk	Optional	Optional	Optional	Optional
Ethernet interfaces	2	2	2	2
UPS	Optional	Optional	Optional	Optional
Drive slots	-	1 slide-in drive	1 slide-in drive	2 slide-in drives
Housing fan inserts	✓	✓	✓	✓
Power supply	24 VDC	24 VDC	24 VDC	24 VDC
Power supply buffering (power fail logic with NMI)	10 ms	10 ms	10 ms	10 ms

[1] In combination with the 945GME chipset

Software

The APC810 represents a powerful and open system platform. From visualization systems to complex automation tasks Automation PCs are always the first choice. All of the advantages of an open system are still available when fully integrated into an automation system.

Windows® 7 Professional and Ultimate
The new Windows® 7 operating system offers a wealth of innovative features and performance improvements. The 64-bit variants can also exploit the full power of current PC architectures. Faster switching to power saving mode, quicker restores, less memory usage and high-speed detection of USB devices are just a few of the advantages provided by Windows® 7. Both German and English are available in Windows® 7 Professional, while Windows® 7 Ultimate supports up to 35 different languages. Product activation is not necessary on B&R PCs, which is a huge advantage for simple logistical procedures relating to machine automation.

Upgrading from Windows® XP to Windows® 7
All of the Windows® operating systems offered by B&R are from the Microsoft Embedded division. This guarantees much longer availability, especially when compared to products offered on the consumer market. For this reason, the planning process for upgrading from Windows® XP can take place over a longer period of time since it will still be offered for many years.

SCADA software
The APC810 and Panel PC are fully compatible with the PC standard. They are the ideal platform for SCADA systems such as zenOn®. The B&R OPC server provides a standardized data interface for Windows® based systems.

APROL process control system
APROL from B&R is a Linux-based, complete and scalable process control system covering everthing from the field level to the control station. The APROL engineering tool CAE Manager combines all of the functions for process data acquisition and processing as well as process visualization in a single system platform. Integrated project management, including a revision system, provides support for qualification/validation (FDA, GAMP) of the system.

Soft PLC
The APC is also well-suited for complex automation applications. All of the advantages of an open system are still available when fully integrated into an automation system. The hard real-time capabilities of VxWorks or Windows® CE together with the open structure of Windows® XP are provided by B&R Automation Runtime Windows® as well as VxWin® and CeWin®.

Complete programming tool
With Automation Studio, B&R offers an integrated Windows® development environment for control, visualization, motion and communication, which also provides customers with production and service support during programming and commissioning.

Software highlights:
- Open system
- Standardized interfaces
- High-performance system platform
- Maximum flexibility

Display options

DVI - The open standard
The DVI (Digital Visual Interface) link is based on the DVI standard defined by the Digital Display Working Group, which is also being used more frequently in office environments. The integrated panel interface is designed so that display units and office monitors with a DVI interface can also be connected. Monitors can also be connected with analog RGB interfaces. Touch screens and remote USB ports can also be connected using separate cables.

RS232

DVI

USB 2.0

DVI
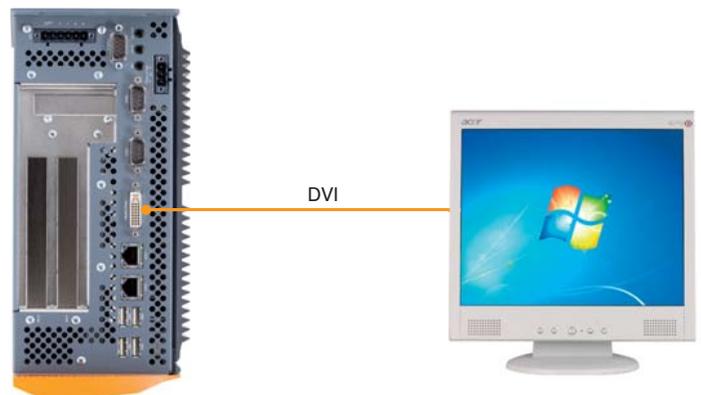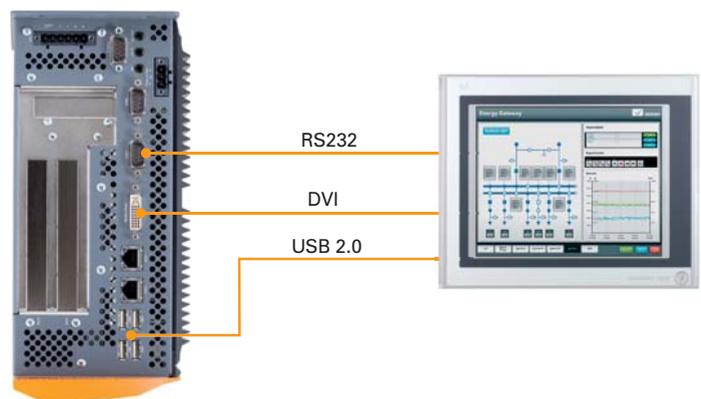
DVI highlights:
- Integrated on all APC810s
- Standard in offices
- Operation of monitors with analog RGB interfaces

Smart Display Link

There are many obstacles involved with installing display units in machines and systems. To meet these requirements, care was taken during development of the Automation PCs to ensure that connections to the Automation Panel can be handled in a very flexible manner.

The APC810 has an integrated interface for connecting an Automation Panel or a monitor. Many types also allow additional Automation Panels to be connected by inserting an optional link module. This modularity is also available on the panel.

Smart Display Link
SDL (Smart Display Link) is already integrated on the APC810. It combines the digital display interface and touch transfer for the display unit into a single interface. Matrix keys, service data (temperature, operating hours, etc.) and USB signals are transferred using the same cable. SDL also allows the display unit to be equipped with PC resources such as USB drives and a keyboard.
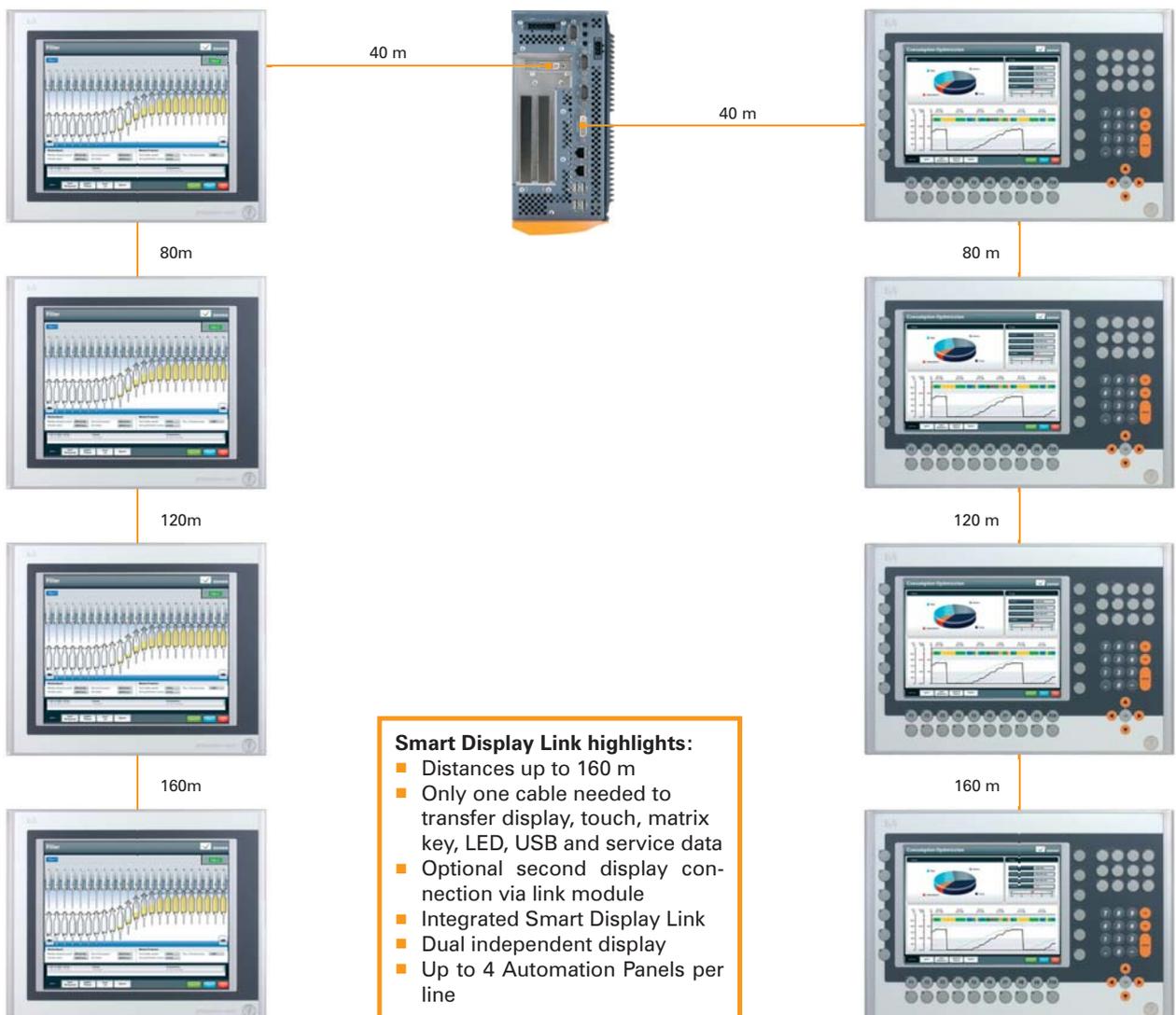
Dual independent display
Up to four Automation Panels can be connected via SDL to the integrated or optional SDL interfaces. The segment length is 40 m, which allows 4 panels to be separated by up to 160 m. The two lines show different content (dual independent display). Alternatively, the same display content can also be shown on all displays (display clone). Touch and key entries on the Automation Panel can be locked with software to prevent operating errors.

Easy key configuration
On display units, it is often necessary to adjust the function keys for the respective application software. On Windows®-based systems, pressing the F1 key opens the help page, which is often not what is desired for visualization systems during runtime. B&R Automation Panel devices have an easy-to-operate key editor program that allows the functionality of each key to be configured separately. Each key can have up to four functions, and multiple characters can be sent with a single key stroke.

40 m

40 m

80m

80 m

120m

120 m

160m

160 m

Smart Display Link highlights:
- Distances up to 160 m
- Only one cable needed to transfer display, touch, matrix key, LED, USB and service data
- Optional second display connection via link module
- Integrated Smart Display Link
- Dual independent display
- Up to 4 Automation Panels per line

Modular display units

Individually designed panels for perfect integration in your machine and system

Many variations
As operating and monitoring stations, display units are in the middle of the action on a machine or system. The Automation Panel 900s developed by B&R are available in various designs, ranging from 10.4" VGA to 19" SXGA, with keys and a touch screen.

One special feature is the modular display interface, which allows the Automation Panel to be flexibly adapted to various transfer technologies.

Ready for tough operating conditions
The front is made of milled aluminum, which provides the robustness expected of operating panels in tough industrial environments.

Simple handling of complex procedures
Whether it's an intuitive user interface via touch screen, fixed function keys or both, the Automation Panel offers all input variations.

Function keys are labeled with individual key legends and are supplemented with soft keys on some versions. All keypad devices are also available with a touch screen. This leaves all options open for the developer to create an optimal operator interface.

Typically, control functions that are required frequently are assigned to fixed function keys, and all other input takes place using the intuitively operated touch screen.

Corporate design
Years ago, design was seldom emphasized in machine and system manufacturing; today it is an important part of product development and product placement. This is a decisive advantage that provides a high level of recognition. The functional properties of an operating unit are often taken for granted, but a customized unit provides the freedom needed to adjust the form and color according to customer wishes.

From customized printing to completely new designs, B&R is a knowledgeable partner when it comes to clearly defined development of a customized operating unit that meets customer needs.

Automation Panel 900 highlights:
- Perfect integration
- Flexible transfer technology
- Easy handling
- Custom design
- IP65 (from front)

Automation Panel 900 types

Diagonal	Display type	Resolution	Colors	Touch screen	Keys
10.4"	Color TFT	VGA (640 x 480)	262,144	✓	✓
12.1"	Color TFT	SVGA (800 x 600)	262,144	✓	–
15"	Color TFT	XGA (1024 x 768)	16 million	✓	✓
19"	Color TFT	SXGA (1280 x 1024)	16.7 million	✓	–

Panel PC 725 - Flexible on-site operation

Robust and well-protected
The Panel PC 725 is designed for on-site operation. Built with IP65 protection on all sides, it can easily handle splashed water, impacts and vibrations. Support arm mounting allows flexible positioning and provides an ergonomic user interface even in cramped spaces.

Intel Atom efficiency
The Intel® Atom™ N270 processor, which offers top performance and low power consumption, is used on the Panel PC725. The system is cooled via the back of the housing without the need for a fan.

Cabling made easy
Panel PCs with IP65 protection usually implement all connections using expensive IP65 plugs, but the cabling for the Panel PC 725 is done via the flange. This makes it possible to use inexpensive standard cables.

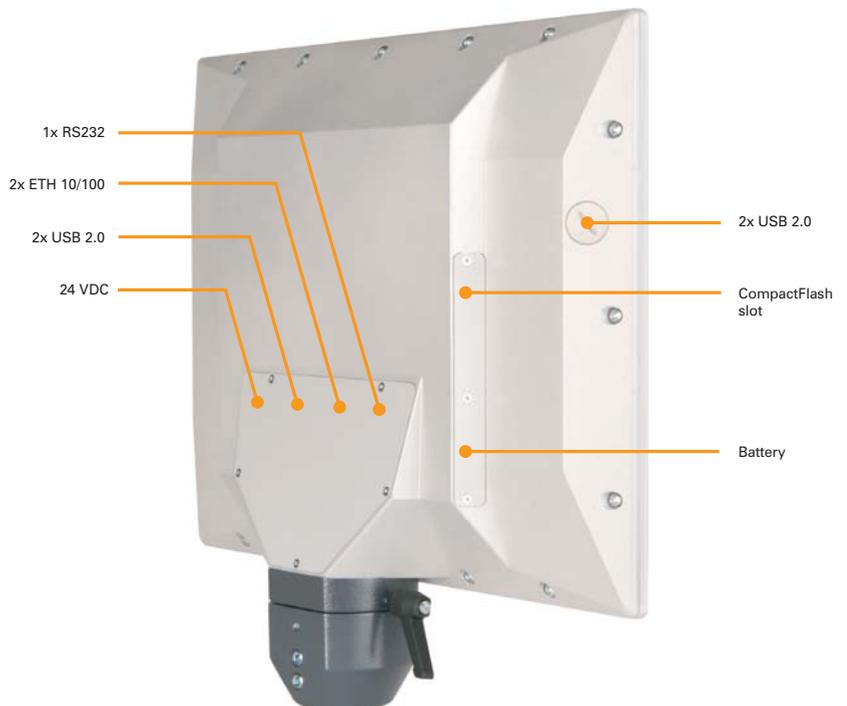## A fully-equipped PC that is also extremely thin
The Panel PC 725 offers extensive PC resources in a highly compact design. With two Ethernet interfaces, three USB 2.0 ports and a serial interface, communication is ensured both at the machine level and across the company network.

Optimal access from the outside
The interfaces are easy to access behind the flange cover. The battery and CompactFlash card are behind a separate cover, which makes service a snap.

Custom designs
The PPC725 is also available in custom designs. For example, customized color schemes and key layouts can be created for the front of the panel.

1x RS232

2x ETH 10/100

2x USB 2.0

24 VDC

2x USB 2.0

CompactFlash slot

Battery

	5PC725.1505-00	5PC725.1505-01
Display	Color TFT	Color TFT
Resolution	XGA	XGA
Diagonal	15"	15"
Touch screen	Analog resistive	Analog resistive
COM1	RS232	RS232
Slot for an interface module	✓	✓
USB	2x USB 2.0 on the back behind the flange cover 1x USB 2.0 on the back behind the cover	2x USB 2.0 on the back behind the flange cover 1x USB 2.0 on the back behind the cover
CompactFlash slot 1	✓	✓
CompactFlash slot 2	Optional	Optional
Hard disk	Optional	Optional
Ethernet interfaces	2x 10/100 Mbit/s	2x 10/100 Mbit/s
Power supply	24 VDC	24 VDC
Protection	IP65 (on all sides)	IP65 (on all sides)
Flange output	Top	Bottom

CPU board

	5PC600.X945-00
Processor	Intel Atom N270
Clock frequency	1600 MHz
L2 cache	512 kB
External bus	533 MHz
Memory socket	1x SO-DIMM
Memory type	DDR2
Maximum memory capacity	2 GB
Chipset	945GME
Graphics	Chipset graphics
Graphics memory	Max. 224 MB RAM[1]

[1] Allocated in main memory

Panel PC 800

Scalable PC performance
The Panel PC 800 covers a wide performance range from efficient Intel® Atom™ N270 processors to Core2 Duo processors for applications with the highest performance requirements. Brilliant 15" XGA and 19" SXGA touch screen displays provide a simple and intuitive user interface.

Intel Atom processor for cost optimization
Based on the Intel® 945 GME chipset, the PPC800 with an Intel® Atom™ N270 1.6 GHz processor is unbeatable in regard to optimizing the price/performance ratio. Up to 3 GB SDRAM ensures fast processing of memory-intensive programs.

Core™ 2 Duo processors for the highest demands
Powerful dual core processors are used for applications that place high demands on computing power. The Core2 Duo CPUs up to the T7400 with 2.16 GHz (which are also used on the APC810) and the Intel® 945 GME chipset are available to meet these requirements. For even more advanced applications (e.g. when using vision systems), Panel PC 800 devices with the new GM45 chipset and Core2 Duo T9400 2.53 GHz processors achieve an entirely new level of performance. This new processor/chipset combination achieves top benchmark results not only because of the higher clock frequency and the large L2 cache, but also because of the new infrastructure that is optimized for the highest possible data throughput. This includes the 1066 MHz system bus, dual channel DDR3 memory and a powerful graphics chipset.
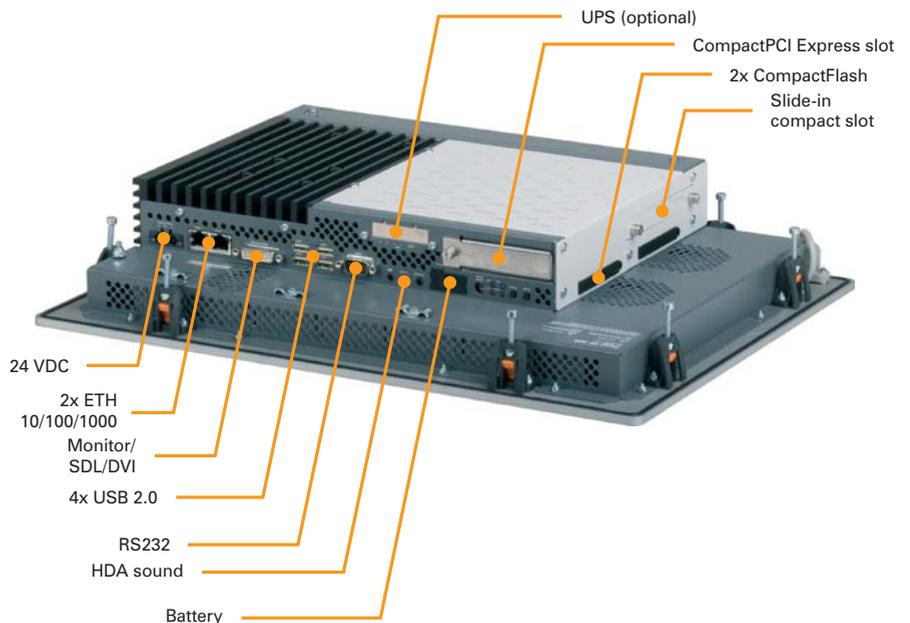
Fan-free
Implementing a cooling design with as few fans as possible was an ambitious goal while designing the Panel PC 800. The chipset, processor and other components are connected directly to the heat sink using heat conductive materials. This makes it possible to operate Atom processors and also certain dual core processors without a fan.

Perfect modularity
Many options can be selected for the cost-optimized standard device. This includes up to two PCI and PCI Express slots, modular drives, additional interfaces and an integrated UPS.

UPS (optional)
CompactPCI Express slot
2x CompactFlash
Slide-in compact slot

24 VDC
2x ETH 10/100/1000
Monitor/ SDL/DVI
4x USB 2.0
RS232
HDA sound
Battery

PPC800 - Technical data

Interfaces	5PC820.1505-00	5PC820.1906-00	5PC820.236C-00
COM	1x RS232, modem-capable, not electrically isolated		
CompactFlash slot			
Type	2x Type I[1] / 1x Type I[2]		
USB			
Type	5x USB 2.0		
Ethernet			
Amount	2		
Design	10/100/1000 Mbit/s		
Audio	HDA sound		
Display			
Type	Color TFT		
Diagonal	15" (381 mm)	19" (480 mm)	23.6" (600 mm)
Resolution	XGA, 1024 x 768 pixels	SXGA, 1280 x 1024 pixels	Full HD, 1920 x 1080 pixels
Touch screen			
Technology	Analog, resistive		
Inserts			
PCI slots			
Amount	1 or 2 (optional)		
PCIe slots			
Amount	1 or 2 (optional)		
CompactPCIe slots			
Amount	1 (optional)		
Slide-in drives	1 (optional)		
Compact slide-in drives	1 (optional)		
Add-on UPS slot	Yes		
Electrical characteristics			
Rated voltage	24 VDC ±25%		

[1] In combination with the 945GME chipset
[2] In combination with the GM45 chipset

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