Welcome

Operation & Monitoring

With HMI & Industrial PCs

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HMI & Industrial PCs - Overview

HMI

Visu+ Touch Panel

HTML5 Web Panel

Specialty &
Industry Ready

Industrial PC

Box PCs

Panel PCs

Stand-alone Panel PCs

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HMI and Industrial PCs – Overview

HMI

- Runtime based HMI
- HTML5 Web HMI

Box PC

Ultra-compact PCs

Basic Box PCs

Standard Box PCs

Panel PC

Basic Panel PCs

Standard Panel PCs

Standalone Panel PCs

Specialty & Industry ready IPC

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Quiz

What makes an industrial PC *industrial*?

- ✓ Passive cooling
- ✓ 24V DC powered
- ✓ Metal construction
- ✓ Single board computer
- ✓ Embedded system
- ✓ High shock & vibration
- ✓ Wide temperature range
- ✓ Industry relevant approvals / certifications
- ✓ Maintenance friendliness
- ✓ Long product life cycle
- ✓ Mounting options

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Best Practice Industrial PC Design

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Best Practice Industrial PC Design

Flush display front (easy to keep clean)

10 finger multi touch interface for gesture operation

LED backlight for long product life

Glass front surface to reduce scratches

Rugged metal design increases EMC immunity

PCAP touch technology

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All interfaces one side
Easy installation

24 VDC Power
No internal power supply

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Single Form Factor
One size across performance classes

Rugged Aluminium housing for mechanical protection

Aluminium housing for excellent EMC protection

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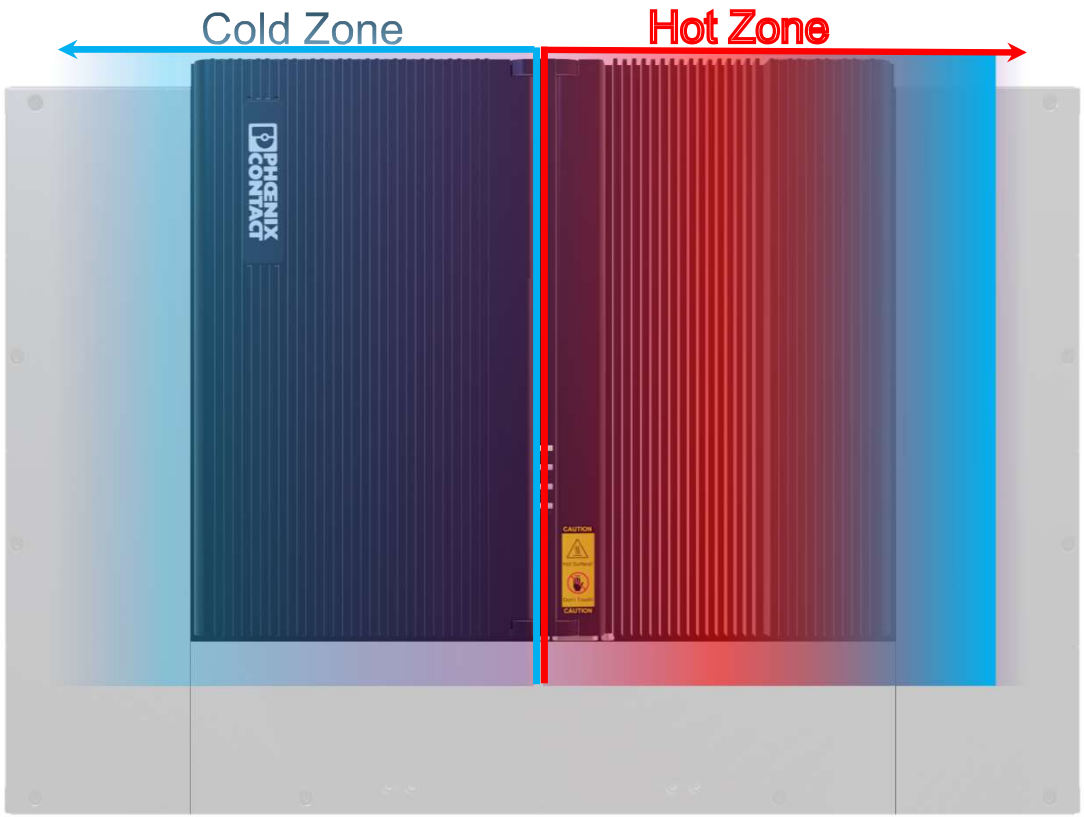

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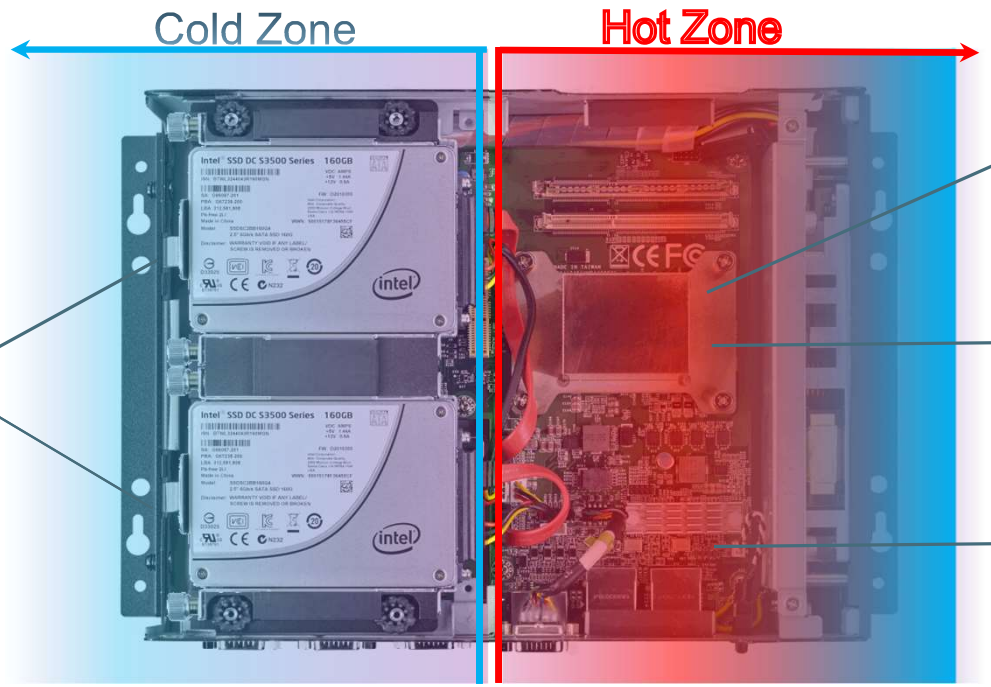
Best Practices in industrial PC design



Industrial storage devices and RAID support
Wide operating temperature, long life and high data availability

Passive Cooling
Intelligent Thermal Design instead of fans

Long term availability
Same form factor, same performance

Industrial components
Intel Ethernet chipset for real-time tasks

Thermal Separation
To keep temperature sensitive components cool

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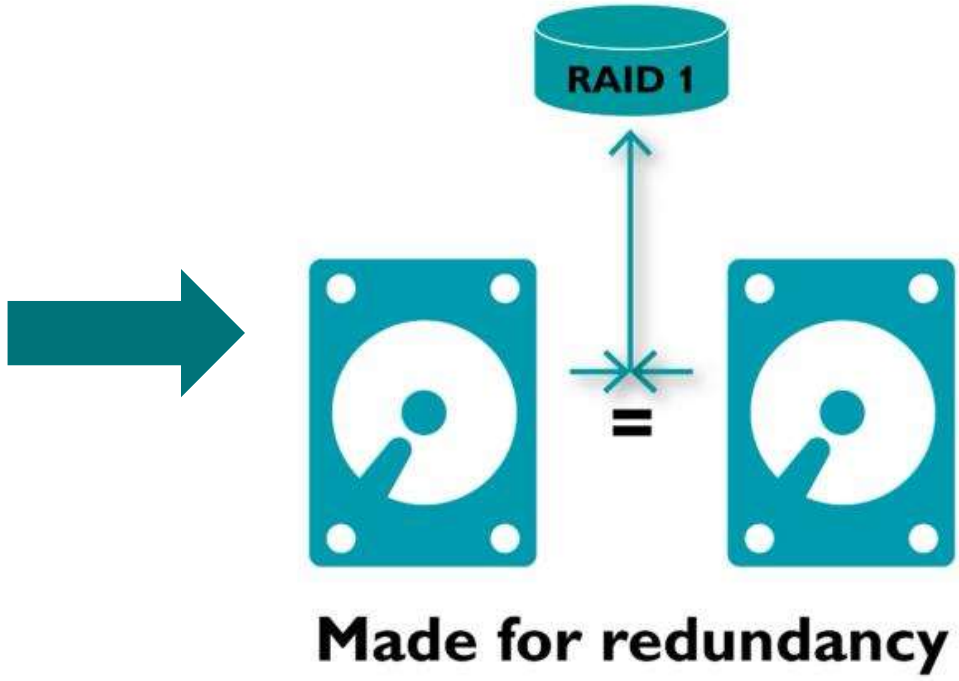
RAID Explained

RAID 0 - Striping
- Made for speed/performance improvement
- Not recommended in industrial environment
  - Reliability is more important than speed

RAID 1 - Mirroring
- **Made for reliability with 2 or more drives**
- **BIOS selectable**
- **Configuration option**

RAID 5 – Parity
- Made for speed and reliability
- Minimum 3 drives needed



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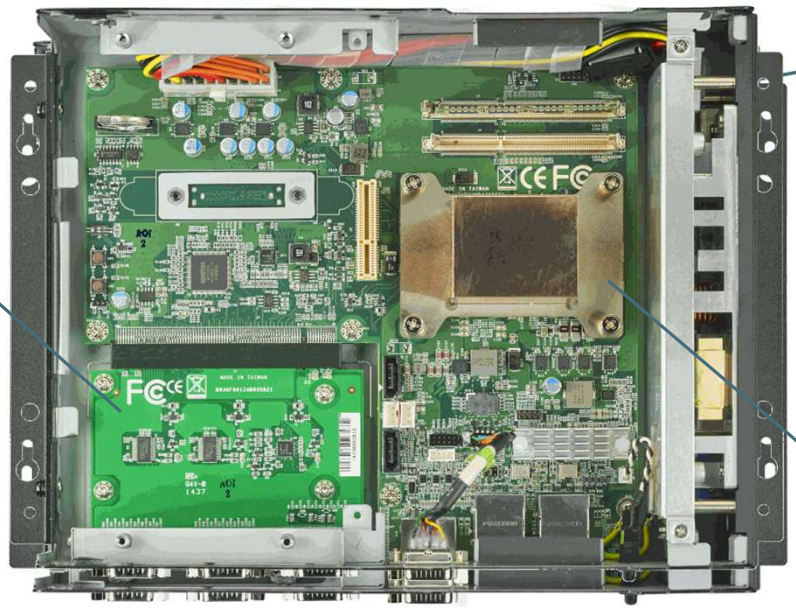
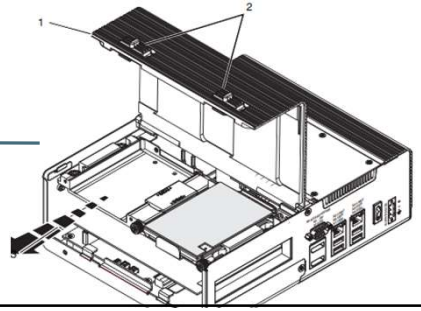
Best Practice Industrial PC Design

Wiring
- Minimized wiring
- Intelligent routed



Accessory Cards
Easy installation of PCI / PCIe card to meet application needs

Industrial Technology
- Powerful
- Energy efficient CPUs



Service Door
Fast & Easy access to change drives and battery

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Product testing

Design verification & Field simulation

- Drop & shock
- Vibration

- Protection Class

- Altitude Simulation
- Rapid Aging
- Temperature

- Electromagnetic Noise

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Manufacturing Excellence

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IPC Production network

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Industrial PC Products

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Box PC, Panel PC and Monitor

Box PC

- Intelligent component in Automation without a display to run any application like control system, MES, data acquisition tasks, etc.

Flat Panel Monitor

- Display unit to connect to
  - Box PC
  - Panel PC as additional (secondary) display

Panel PC

- Intelligent component in Automation with a display to run any application like control system, MES, data acquisition tasks, etc.
- Allows connection to additional displays (FPM)

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BOX IPCs

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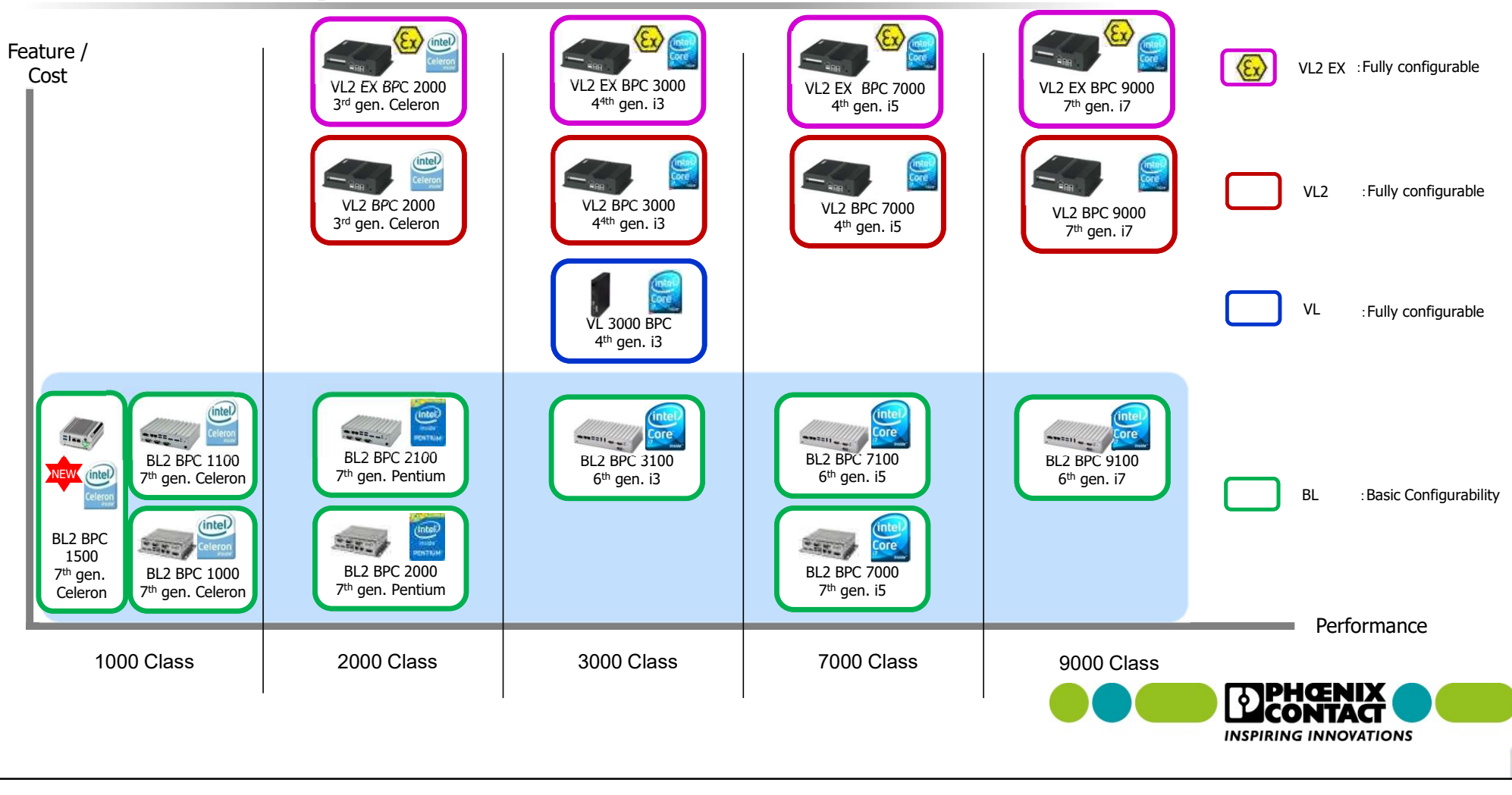
Box PC Lineup



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Small Frame Box PCs

- ✓ Fit into small junction boxes
- ✓ Passive cooled
- ✓ Robust metal construction
- ✓ No moving parts
- ✓ Connectivity to serial interfaces

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BL2 BPC x100

- Small form factor, Box PC family
  - ✓ Passive cooled
  - ✓ Compact
  - ✓ Windows 7 & Windows 10 IoT
  - ✓ Robust
  - ✓ DIN rail and wall mount
  - ✓ M.2 and 2.5” SATA mass storage

- Intel CPU technology
  - ✓ BL2 BPC 1100 – Celeron N3350 1.1/2.4 GHz (2 core)
  - ✓ BL2 BPC 2100 – Pentium N4200 1.1/2.5 GHz (4 core)
  - ✓ BL2 BPC 3100 – 6th gen. (Apollo Lake) Core i3-6100U 2.3 GHz (2 core)
  - ✓ BL2 BPC 7100 – 6th gen. (Apollo Lake) Core i5-6300U 2.4 GHz (2 core)
  - ✓ BL2 BPC 9100 – 6th gen. (Apollo Lake) Core i7-6600U 2.6 GHz (2 core)

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BL2 BPC x000

- Small form factor, Box PC family
  - ✓ Passive cooled
  - ✓ Expansion option (WIFI)
  - ✓ Windows 10 IoT
  - ✓ Robust
  - ✓ DIN rail and wall mount
  - ✓ M.2 SATA mass storage

- Intel CPU technology
  - ✓ BL2 BPC 1000 – Celeron N3350 1.1/2.4 GHz (2 core)
  - ✓ BL2 BPC 2000 – Pentium N4200 1.1/2.5 GHz (4 core)
  - ✓ BL2 BPC 7000 – 7th gen. (Apollo Lake) Core i5-7442EQ 2.1/2.9 GHz (4 core)

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BL2 BPC 1500 – Compact Box IPC

Overview

- Compact design to fit into small cabinet boxes
- Efficient performance with Intel Celeron N3350 or Atom E3940 CPU
- High reliability with passive cooling and solid-state mass storage media
- Available as Secure Hardware, equipped with TPM 2.0 module
- Flexible mounting options to compliment your application

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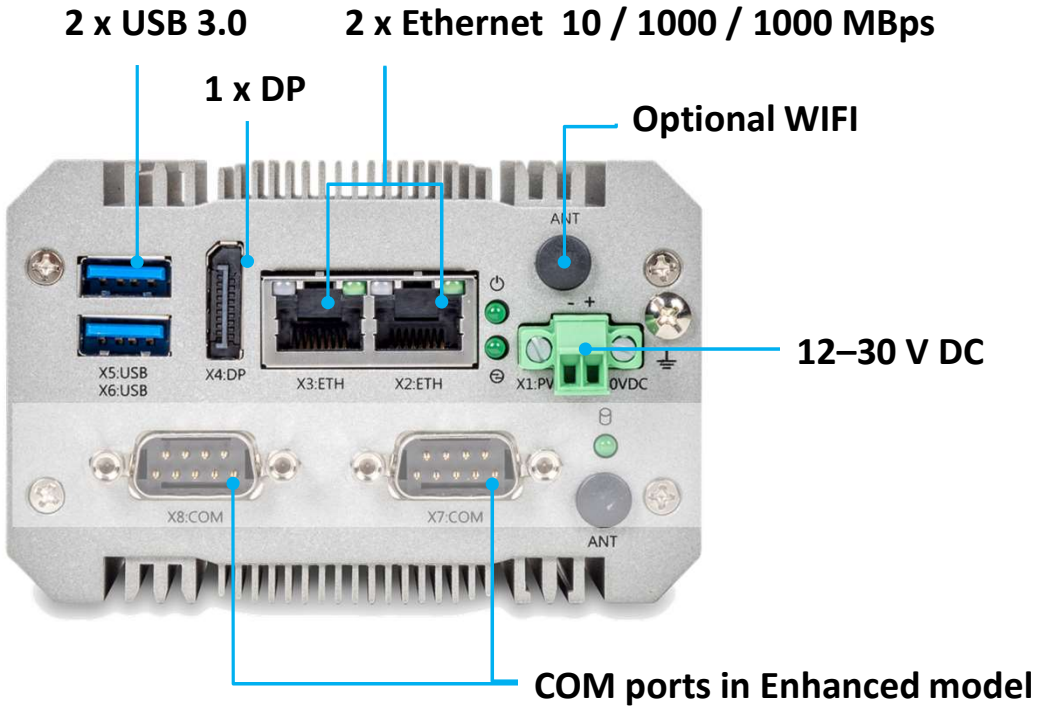
BL2 BPC 1500 – Compact Box IPC

General technical data

- Intel Celeron N3350 CPU or Atom E3940
- 32 GB on-board eMMC storage
- m.2 SSD mass storage options
- Windows 10 IoT and Linux support
- Serial port options
- WLAN 802.11 options
- Din-rail and wall mounting options



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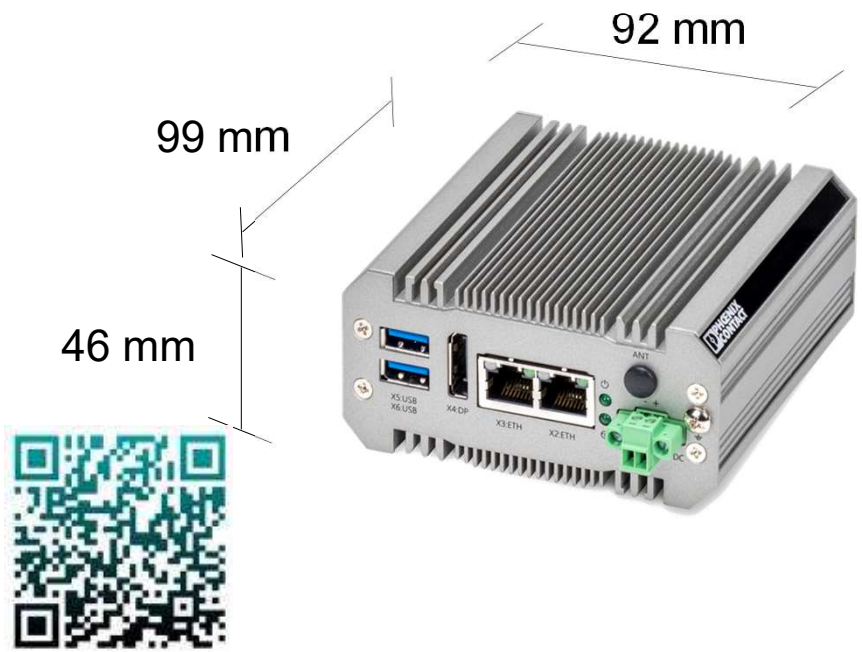
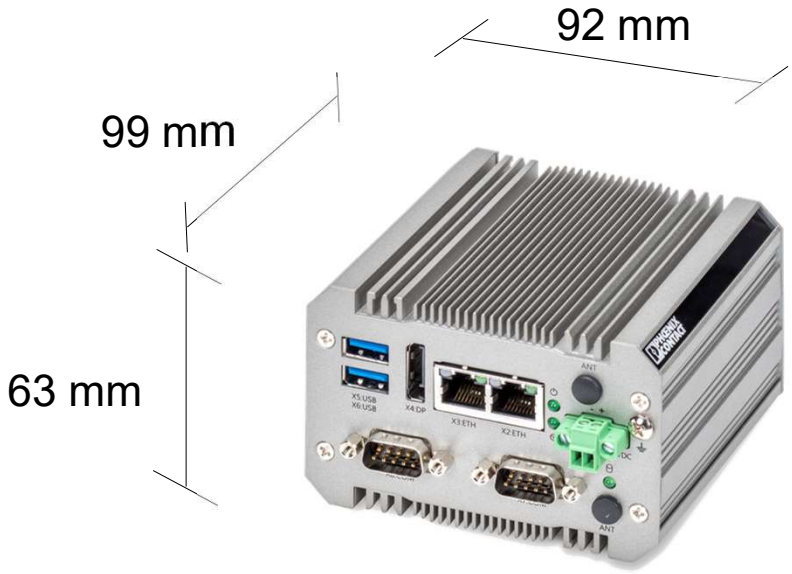
BL2 BPC 1500 – Compact Box IPC

Standard model – BL2 BPC 1501S



Extended model BL2 BPC 1501E



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BL2 BPC 1500 and EPC 1500 series for Edge computing

Comparison BL2 BPC 1500 EPC 1500		
Hardware	Two CPU versions: Intel Celeron N3350 or Atom E3940	Intel N3350
Hardware security	Optional TPM 2.0	TPM 1.2
Software	Optional Windows 10 IoT	Linux, Edge computing engine
Software functionalities	N/A	• PLCnext inside • NodeRed • Web based management system • Proficloud, AWS, Azure and Google cloud access

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Standard Box PCs

- ✓ Passive cooled
- ✓ Robust metal construction
- ✓ Easy Service concept
- ✓ Wide environmental ratings

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VL2 BPC x000

- Complete range of fully configurable Box PCs
  - ✓ Passive cooled
  - ✓ Windows 7 & Windows 10 IoT
  - ✓ Expansion option (PCI & option cards)
  - ✓ Thermal isolation barrier
  - ✓ Bookshelf and wall mount
  - ✓ SSD and HDD SATA mass storage options

- Intel CPU technology
  - ✓ VL2 BPC 2000 – Celeron N2930 1.6 GHz (4 core)
  - ✓ VL2 BPC 3000 – 4th gen. (Haswell) Core i3-4010U 1.7 GHz (2 core)
  - ✓ VL2 BPC 7000 – 4th gen. (Haswell) Core i5-4300U 1.9 GHz (2 core)
  - ✓ VL2 BPC 9000 – 6th gen. (Sky Lake) Core i7-6822 EQ 2 GHz (4 core)

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Quiz

What determines the performance of a PC system?

- ✓ CPU
  - ✓ Age / generation of CPU
  - ✓ Amount of CPU cores
  - ✓ Clock speed
  - ✓ CPU Performance is good overall system performance indicator
- ✓ Memory
- ✓ Mass storage
- ✓ System architecture

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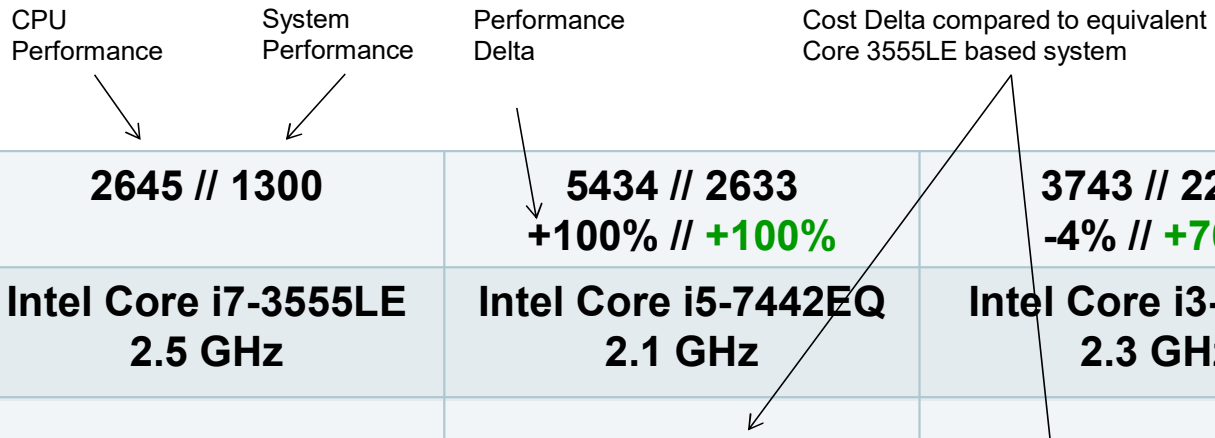
Cost – Per – Performance



Performance CPU / PC	**2645 // 1300**	**5434 // 2633** **+100% // +100%**	**3743 // 2246** **-4% // +70%**
	Intel Core i7-3555LE 2.5 GHz	**Intel Core i5-7442EQ 2.1 GHz**	**Intel Core i3-6100U 2.3 GHz**
Cost compared to Intel BL BPC 7000 (Core i7-3555LE)	**--**	**-12%**	**-37%**
Cooling	Convection Booster	Convection booster	Passive
Temp. Range	0…45°C	-20…50°C	-0…50°C
	7000 Class	7000 Class	3100 Class

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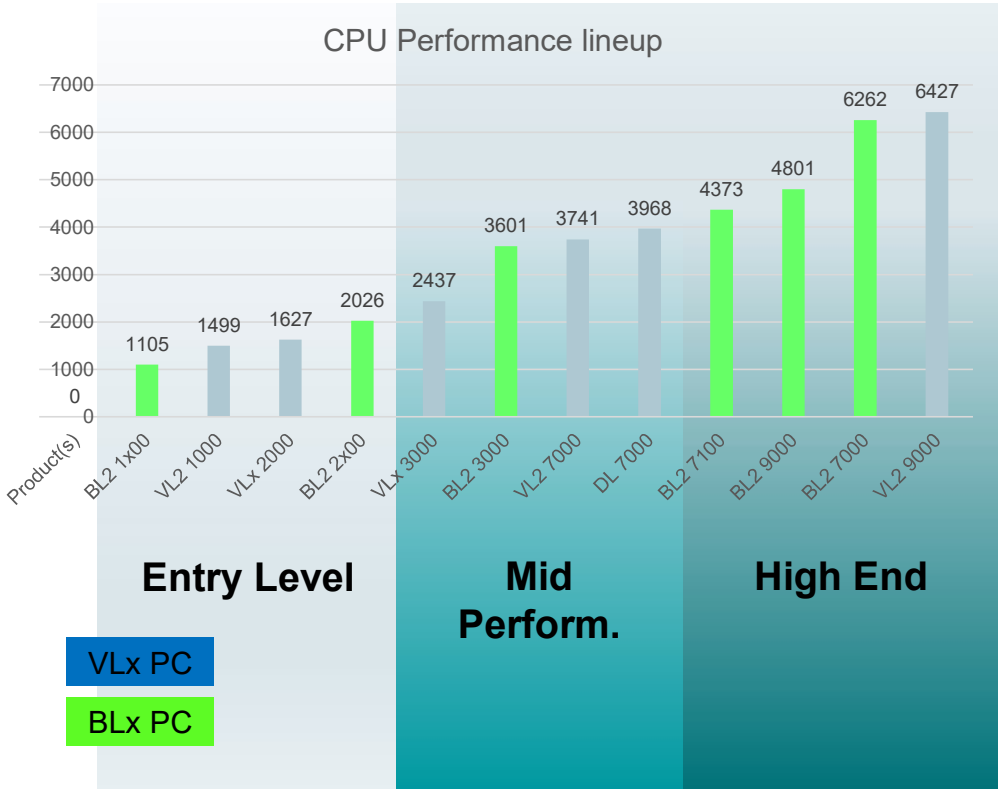
CPU Performance classification



Product(s)	Name	#of Cores	CPU mark
BL2 1x00	N3350	2	1105
VL2 2000	N2930	4	1627
BL2 2x00	N4200	4	2026
VLx 3000	i3-4010U	2	2437
BL2 3000	i3-6100U	2	3601
VL2 7000	i5-4300U	2	3741
DL 7000	i7-4650U	2	3968
BL2 7100	i5-6300U	2	4373
BL2 9100	i7-6600U	2	4801
BL2 7000	i5-7442EQ	4	6262
VL2 9000	i7-6822EQ	4	6427

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Quiz

What are the differences between HDD and SSD?

- ✓ HDD
  - ✓ Rotating disk storage media
  - ✓ Very large storage volumes possible
  - ✓ „Unlimited“ write cycles
  - ✓ Inexpensive media

- ✓ SSD
  - ✓ Solid state media
  - ✓ High shock / vibration tolerance
  - ✓ Fast storage media
  - ✓ Limited write cycles
  - ✓ More expensive media

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Hard Disk Drive vs. Solid State Drive

- **If...**
  - ✓ You need lots of storage capacity, up to 2 TB
  - ✓ Don't want to spend much money
  - ✓ Don't care too much about how fast a computer boots up or opens programs
  - ✓ You do a lot of writing to disk (i.e. Data Logging)

- **If…**
  - ✓ You need to install it in a vibration or shock environment
  - ✓ You are willing to pay for faster performance
  - ✓ Don't mind limited storage capacity or can work around that

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M.2 Storage

Another solid-state mass storage media

- ✓ Solid state solution with no moving parts
- ✓ Shock\vibration 2000G\20G (per MIL-STD810)
- ✓ SATA III 6 Gbit/s compliant
- ✓ High performance, high durability
- ✓ MTBF > 2M hours
- ✓ Cost per GB on par with 2.5” SSD

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Software options

- **Full range of Microsoft operating systems**

Windows 10

Windows Embedded Standard 7

Windows 7

- **Phoenix Contact Software**

Control

Visualization

Networking

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Panel IPCs & Monitor Solutions

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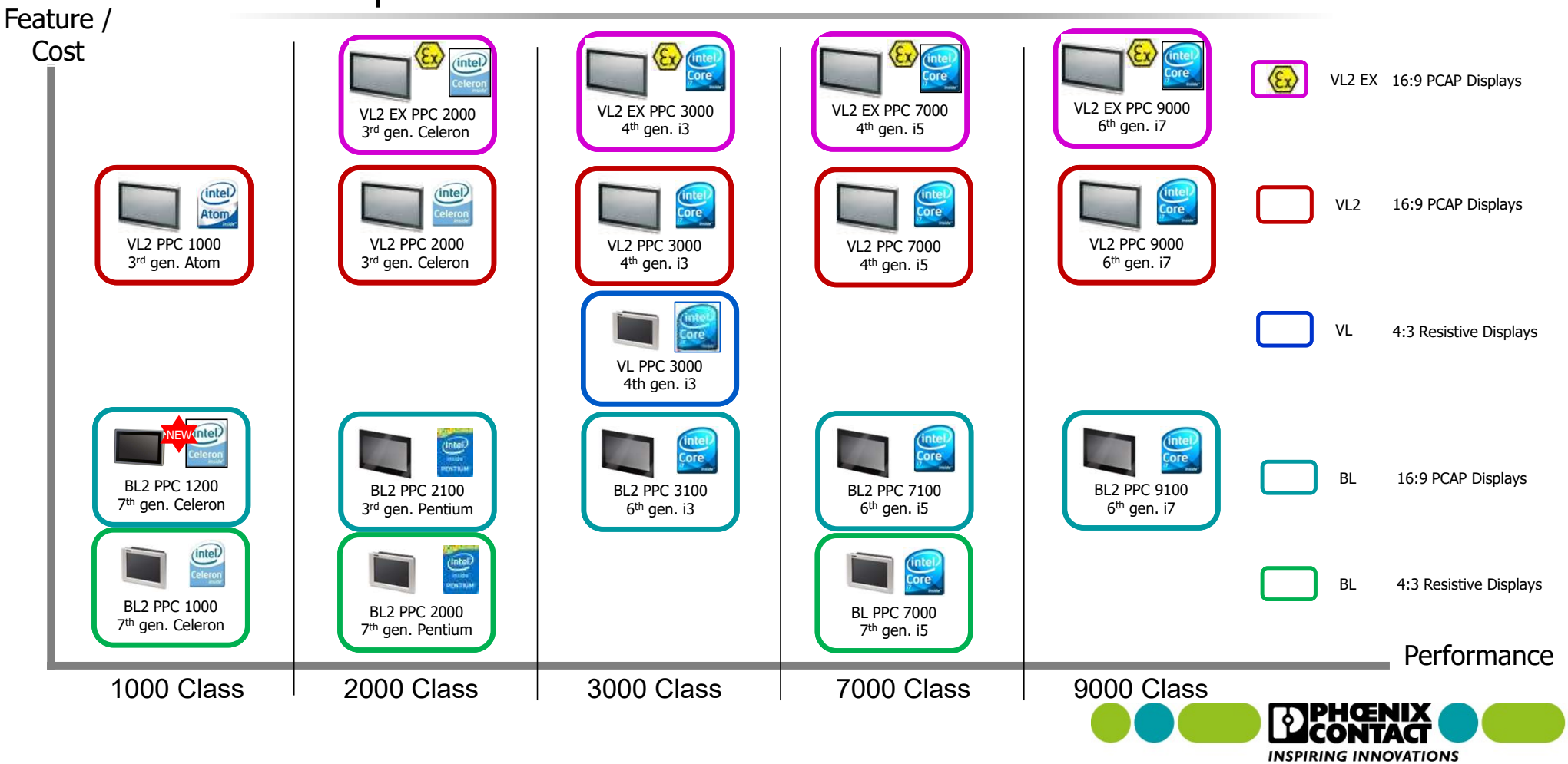
Panel PC Lineup



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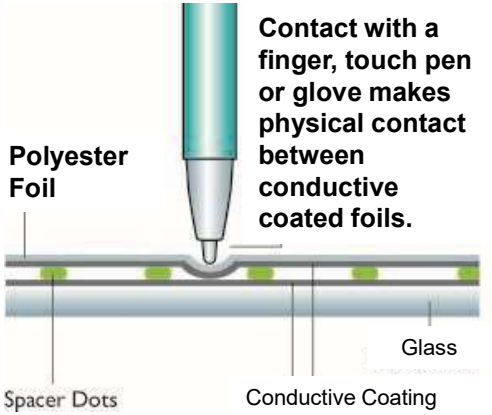
Touch Technologies – (analog) Resistive Touch

Advantages

- ✓ Inexpensive
- ✓ Pressure point sensor (operation with finger, touch pen, glove, etc.)
- ✓ High resolution
- ✓ Energy efficient

Limitations

- ✓ Reduced image transparency (Polyester type)
- ✓ Polyester touch foil is prone to physical damage



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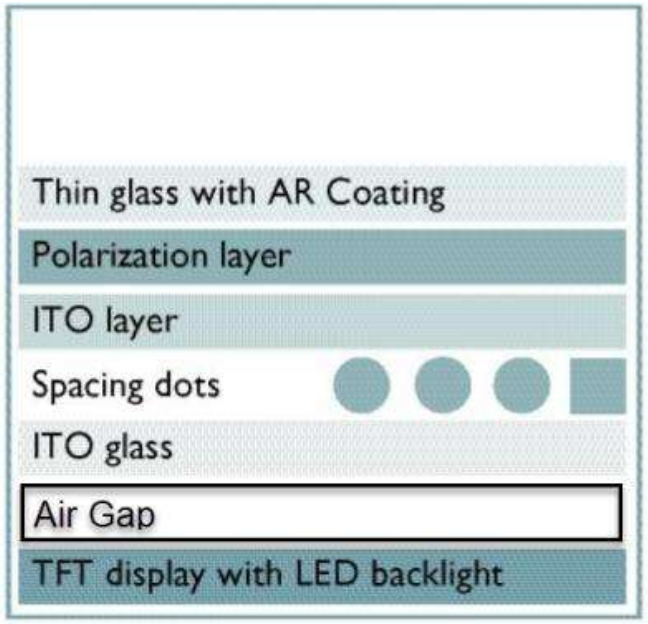
GFG (Glass Film Glass) Touch

Advantages

- ✓ Proven resistive touch technology
- ✓ Pressure point sensor (operation with finger, stencil, glove, etc.)
- ✓ High resolution
- ✓ High chemical resistance
- ✓ Scratch resistant Glass Front Surface
- ✓ Daylight readability

Limitations

- ✓ Higher cost
- ✓ Single-Touch interface
- ✓ Calibration necessary



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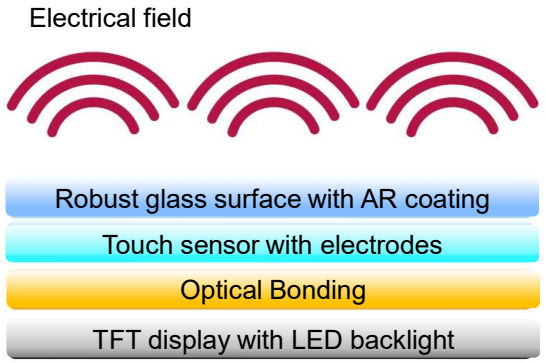
Touch Technologies – (Projected) Capacitive Touch

Advantages

- ✓ High chemical resistance
- ✓ Scratch resistance (sharp objects)
- ✓ Multiple Touch points at the same time possible
- ✓ Modern All Glass Front designs
- ✓ Cleaner design with less pollution surfaces
- ✓ No calibration necessary

Limitations

- ✓ Works only when touched with conductive materials
- ✓ Possible false operation in wet applications
- ✓ Application software needs to be developed for this technology
- ✓ Higher cost



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Touch Technologies

Table

Technology	Analog-resistive touch technology		Capacitive touch technology		Optical touch technology	Acoustic touch technology
Design	Polyester touch structure	Glass-film-glass	Surface-capacitive	Projective-capacitive	Infrared	Surface acoustic wave
Abbreviation	AR touch	GFG	S-CAP	P-CAP	IR touch	SAW
Method of operation	Upon touching the surface, two conductive ITO layers meet, causing a voltage drop (voltage divider).	Polyester film laminated in between two sheets of glass. Same functional principle, but with robust and scratch-proof surface	Touching causes changes in an electric field.	P-CAP uses a sensor pattern. Changes in the electric field are detected individually in each part of the pattern.	Touching interrupts the light beams.	Touching causes partial absorption of the wave energy.
Control mode **• Finger** **• Glove** **• Touch pen**	 Yes Yes Yes	 Yes Yes Yes	 Yes No No	 Yes Yes (with restrictions) No	 Yes Yes Yes	 Yes Yes No

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Touch Technologies

Table

Technology	Analog-resistive touch technology		Capacitive touch technology		Optical touch technology	Acoustic touch technology
Surface material	Polyester	Glass	Glass	Glass	Glass	Glass
Touch operation mode	Single-touch control	Single-touch control	Single-touch control	Multi-touch control	Multi-touch control	Two-touch control
Typing frequency	+	+	+	+++	+	+
Positioning accuracy	++	++	0	+++	0	0
Light permeability	0	0	+	+++	+++	+++

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Touch Technologies

Table

Technology	Analog-resistive touch technology		Capacitive touch technology		Optical touch technology	Acoustic touch technology
Surface hardness (mech. sensitivity)	-	+	---	+++	+	0
Vibration resistance (mech. sensitivity)	+++	+++	+	+++	0	---
Chemical resistance	-	+++	--	+++	+++	+++
EMC sensitivity	+++	+++	---	---	-	+++

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Touch Technologies

Table

Technology	Analog-resistive touch technology		Capacitive touch technology		Optical touch technology	Acoustic touch technology
Sunlight resistance (UV sensitivity)	---	+++	-	+++	+	+++
Outdoor suitability (temperature sensitivity)	0	+++	0	+++	0	0
Dust/water tightness	+++	+++	0	+++	+	-
Gas tightness	+++	+++	-	+++	-	++
Cost efficiency	+++	0	0	++	--	--

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Touch Monitors & Display Solutions

- ✓ Industrial design
- ✓ True flat glass front
- ✓ Robust metal base construction
- ✓ Multiple display connectivity options
- ✓ 10 pt. PCAP Multi-Touch

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BL FPM - Flat Panel Monitors

BL FPM 15.6

- 16:9 aspect ratio with 1366 x 768 resolution
- 1x VGA, 1x DVI-I, 1x DP++, 1x USB 1.1\2.0 Type A

BL FPM 18.5

- 16:9 aspect ratio with 1366 x 768 resolution
- 1x VGA, 1x DVI-I, 1x DP++, 1x USB 1.1\2.0 Type A

BL FPM 21.5

- 16:9 aspect ratio with 1920 x 1080 resolution
- 1x VGA, 1x DVI-I, 1x DP++, 1x USB 1.1\2.0 Type A

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Box & Panel PC

LIMITATIONS (max. cable length standards):

- USB cable: 5m
- VGA cable: 5m - 10m, resolution dependent
- DVI cable: 5m - 15m, resolution dependent
- Display Port cable: 5m

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Keyboard Video Mouse Extender

- ✓ Flexible use of displays, up to 90 m away from PC
- ✓ Cost efficient wiring with single cable between TX and RX
- ✓ Increased application reliability with PC in safe location
- ✓ Industrial wide temperature design
- ✓ Fast setup with plug and play technology

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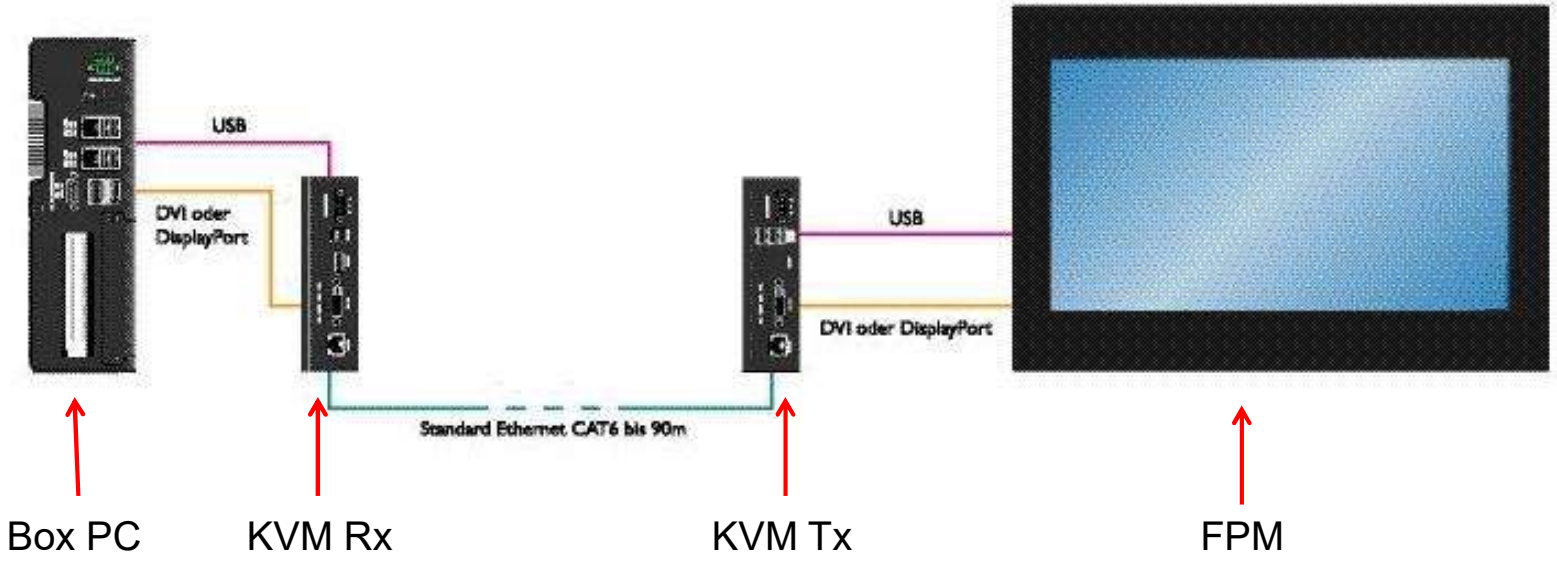
BL KVM Extender 90 m solution



Remote Monitoring using Portico

BPC

Standard CAT 5 Ethernet

- ✓ Software based solution using standard ethernet cable
- ✓ Unlimited distance, bandwidth dependent
- ✓ Up to 16 simultaneously connected clients
- ✓ Client control arbitration, USB redirection features
- ✓ Portico can be used with all PxC IPC products

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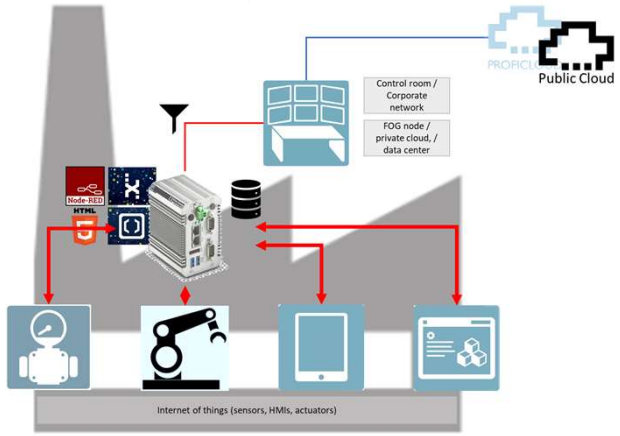
Programmable Edge Computing

- ✓ Pre-installed software tools such as Node-RED provide a local time-series database and simple cloud connection
- ✓ PLCnext-programmable
- ✓ Multiple configuration and programming tools
- ✓ Rugged, industrial PC hardware
- ✓ Perfect for maximizing application uptime and data retention
- ✓ Reduced network data traffic and latency



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Basic Panel PCs

BL2 PPC

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BL2 PPC xx00 Series

- ✓ Suitable for every system with display sizes from 12" to 17" (4:3) and 15.6” to 21.5” (16:9)
- ✓ Analog Resistive Single-Touch and Projective-Capacitive Multi-Touch available – the right touch for every application
- ✓ The right processor performance for each application
- ✓ Long-term available and energy-efficient Intel® Atom™, Celeron®, Pentium® or Core™ i processors
- ✓ Passive cooling for long product life

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Compact Basic Panel PC – BL2 PPC 1200

- 10 pt. PCAP (Multi-Touch) Panel PCs in 16:9 display aspect ratio
  - ✓ Display sizes 7” and 10”
  - ✓ Expansion option (USB / COM)
  - ✓ Windows 10 IoT
  - ✓ Passive cooled
  - ✓ mSATA mass storage
  - ✓ Panel- and VESA mount
- Intel CPU technology
  - ✓ BL2 PPC 1000 – Celeron N3350 1.1/2.4 GHz (2 core)

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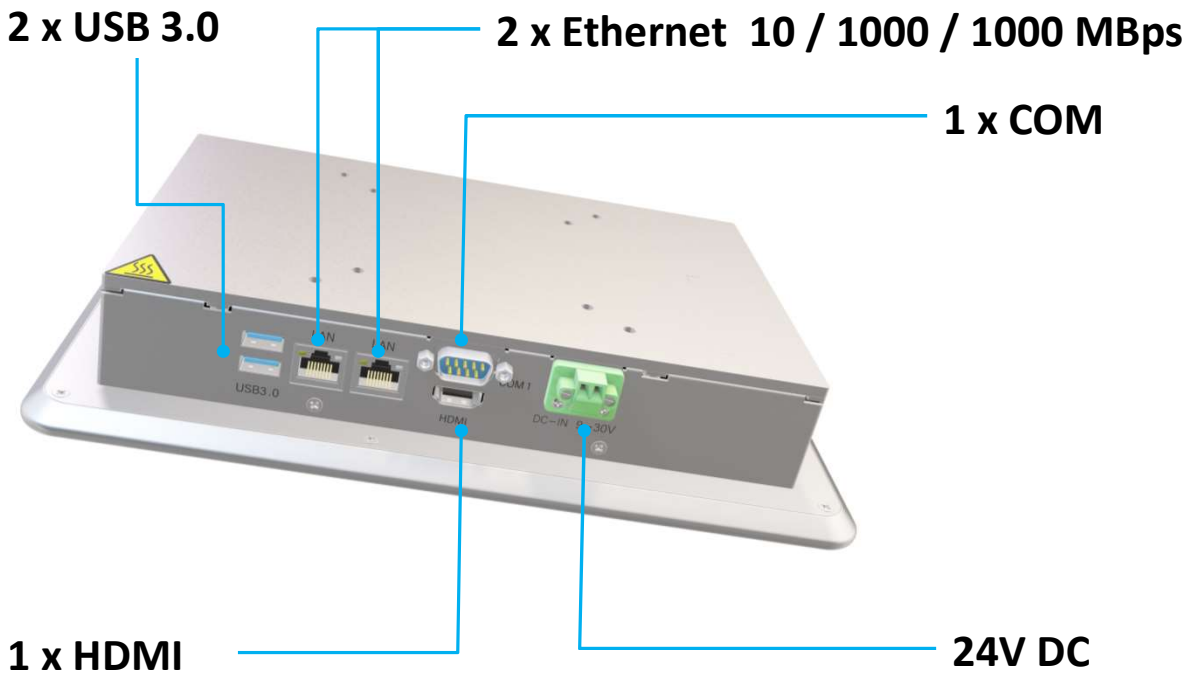
BL2 PPC 1200 – Compact basic panel PC

General technical data

- 7“ and 10“ PCAP multi touch (10 finger)
- Intel Celeron N3350 CPU
- mSATA storage options
- Windows 10 IoT & Linux support
- I/O expansion options
- VESA 75 and panel mount



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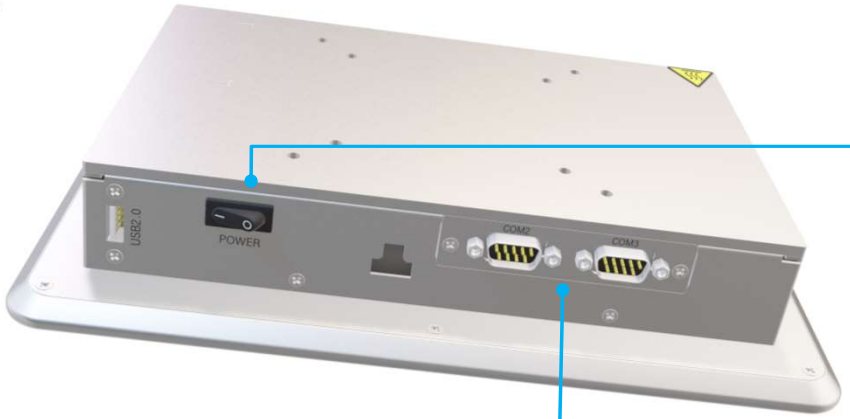
BL2 PPC 1200 – Compact basic panel PC

General technical data

- 7“ and 10“ PCAP multi touch (10 finger)
- Intel Celeron N3350 CPU
- mSATA storage options
- Windows 10 IoT & Linux support
- I/O expansion options
- VESA 75 and panel mount



Power button

Expansion slot

PHOENIX CONTACT
INSPIRING INNOVATIONS

Basic Panel PC – BL2 PPC x100

- Projected Capacitive (PCAP Multi-Touch) Panel PCs in 16:9 display aspect ratio
  - ✓ Display sizes 15.6”, 18.5” and 21.5”
  - ✓ Expansion option
  - ✓ Windows 7 & Windows 10 IoT
  - ✓ Passive cooled
  - ✓ VESA or panel mount
  - ✓ M.2 and 2.5” SATA mass storage

- Intel CPU technology
  - ✓ BL2 PPC 2100 – Pentium N4200 1.1/2.5 GHz (4 core)
  - ✓ BL2 PPC 3100 – 6th gen. (Apollo Lake) Core i3-6100U 2.3 GHz (2 core)
  - ✓ BL2 PPC 7100 – 6th gen. (Apollo Lake) Core i5-6300U 2.4 GHz (2 core)
  - ✓ BL2 PPC 9100 – 6th gen. (Apollo Lake) Core i7-6600U 2.6 GHz (2 core)

PHOENIX CONTACT
INSPIRING INNOVATIONS

Basic Panel PC – BL2 PPC x000

- Analog resistive (Single-Touch) Panel PCs in 4:3 display aspect ratio
  - ✓ Display sizes 12”, 15” and 17”
  - ✓ Expansion option (WIFI)
  - ✓ Windows 10 IoT
  - ✓ Passive cooled
  - ✓ VESA or panel mount
  - ✓ M.2 SATA mass storage

- Intel CPU technology
  - ✓ BL2 PPC 1000 – Celeron N3350 1.1/2.4 GHz (2 core)
  - ✓ BL2 PPC 2000 – Pentium N4200 1.1/2.5 GHz (4 core)
  - ✓ BL2 PPC 7000 – 7th gen. (Apollo Lake) Core i5-7442EQ 2.1/2.9 GHz (4 core)

PHOENIX CONTACT
INSPIRING INNOVATIONS

Standard Panel PCs

VL2 PPC

PHOENIX CONTACT
INSPIRING INNOVATIONS

Standard resistive panel PCs – VL PPC Series

- ✓ Suitable for every application with display sizes from 12” to 18.5” in 4:3 (non-widescreen) and 16:9 (widescreen) format
- ✓ Analog Resistive Single-Touch
- ✓ Scalable processor performance for each application
- ✓ Passive cooling for long product life
- ✓ Easy serviceability with easily accessible components

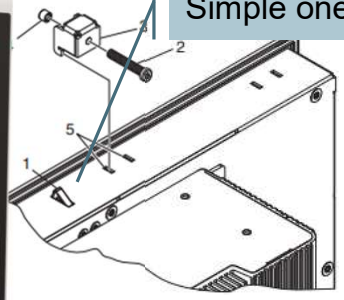
PHOENIX CONTACT
INSPIRING INNOVATIONS

Standard Capacitive Touch Panel PCs – VL2 PPC Series

Display variety
7” to 21.5” screen sizes

Modern Design
- Small bezel frame
- No logo
- Anti-glare

User-Interface
- PCAP Multi-Touch interface
- Glass front



Installation
Simple one-man installation

Higher Protection Class
IP66

Wide Operating Temperature
-10°C ... up to 55°C (SSD media)

reddot award
product design

PHOENIX CONTACT
INSPIRING INNOVATIONS

Standard Capacitive Touch Panel PCs – VL2 PPC Series

- Projected Capacitive (PCAP Multi-Touch) Panel PCs in 16:9 display aspect ratio
  - ✓ Display sizes 7” to 21.5”
  - ✓ Expansion options (PCI & Option card)
  - ✓ Windows 7 & Windows 10 IoT
  - ✓ Passive cooled & Thermal barrier
  - ✓ 2.5” HDD & SSD SATA mass storage
  - ✓ VESA or panel mount

- Intel CPU technology
  - ✓ VL2 PPC 1000 – Atom E3845 (4 core) / Atom E3827 (2-core)
  - ✓ VL2 PPC 2000 – Celeron N2930 1.6 GHz (4 core)
  - ✓ VL2 PPC 3000 – 4th gen. (Haswell) Core i3-4010U 1.7 GHz (2 core)
  - ✓ VL2 PPC 7000 – 4th gen. (Haswell) Core i5-4300U 2.4 GHz (2 core)
  - ✓ VL2 PPC 9000 – 6th gen. (Sky Lake) Core i7-6822 EQ 2 GHz (4 core)

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INSPIRING INNOVATIONS

Panel PCs for harsh environments – VL2 PPC 1000

Corrosion resistant design
- Housing, surfaces and components.

Outdoor installation possible
- Wide operating temperature (-20°C to +70°C)
- UV and IR protection

Sunlight readable displays
- GFG (Glass-Film-Glass), low reflective
- PCAP low reflective

Glass front surface
- Scratch resistant
- Higher impact resistance

Two CPU options
- Intel E3845 (4-core) for 0…50C operations
- Intel E3827 (2-core) for -20…60C operations

Standard Capacitive Touch Panel PCs – VL2 PPC Series

7” Wide Screen 10 pt. PCAP Touch, 800 x 480 resolution

9” Wide Screen 10 pt. PCAP Touch, 800 x 480 resolution

12.1” Wide Screen 10 pt. PCAP Touch, 1366 x 768 resolution

15.6” Wide Screen 10 pt. PCAP Touch, 1366 x 768 or Full HD resolution

18.5” Wide Screen 10 pt. PCAP Touch, 1366 x 768 or Full HD resolution

21.5” Wide Screen 10 pt. PCAP Touch, 1920 x 1080 (Full HD) resolution

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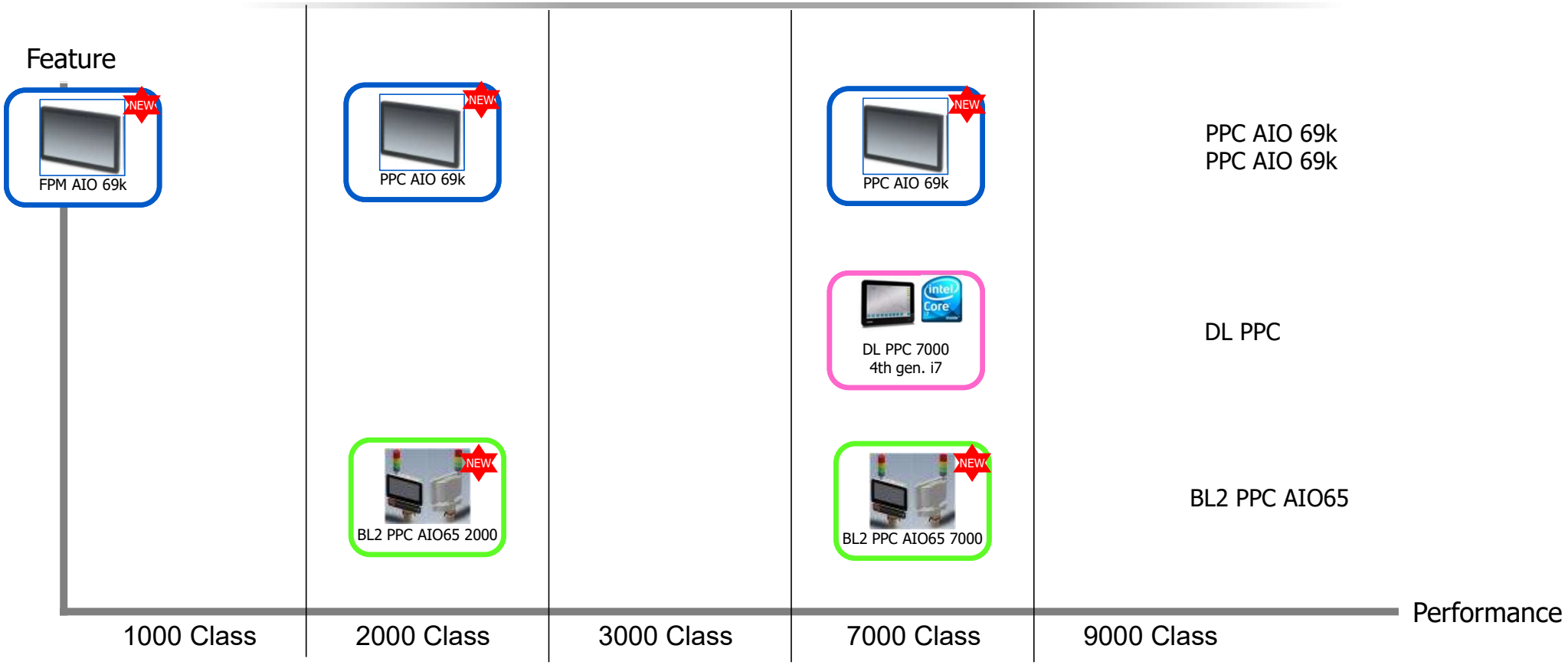
INSPIRING INNOVATIONS

All-in-one and all-round IP65 protected panel PCs

All-in-one and all-round protected Panels



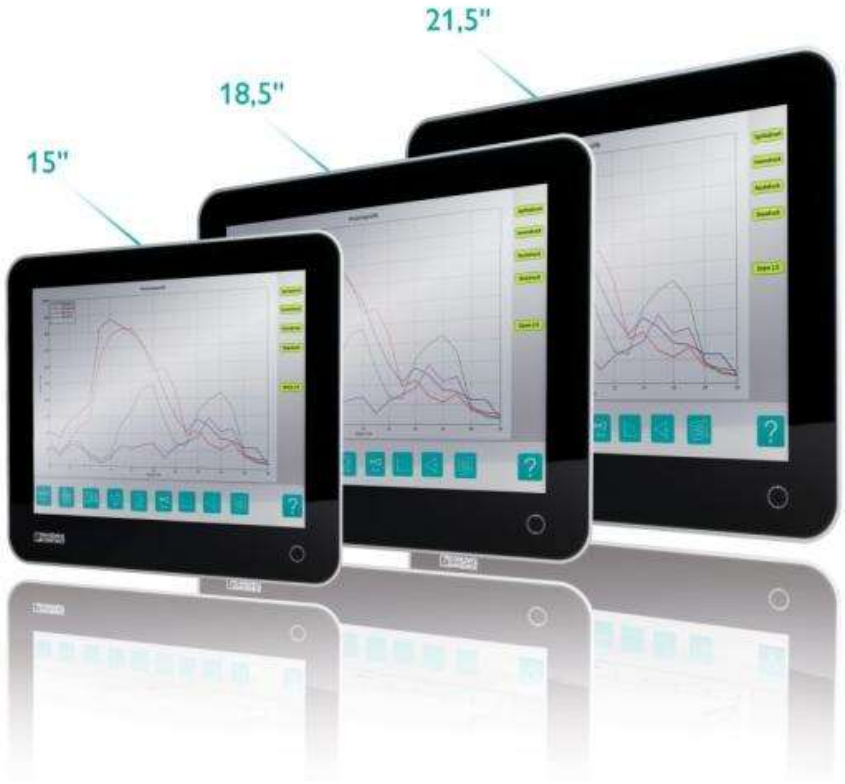
PHOENIX CONTACT
INSPIRING INNOVATIONS

Evolution in Cabinet Design

INSPIRING INNOVATIONS

All-in-one panel PC - DL PPC Series

- ✓ Attractive, modern industrial design
- ✓ PCAP Multi-Touch allows intuitive gesture control
- ✓ Wide operating temperature range
- ✓ High Performance, passive cooled Intel® Core™ i7 processor
- ✓ Space saving on factory floor without need for cabinet and just 60 mm system depth
- ✓ Easy maintenance with easily accessible parts



PHOENIX CONTACT
INSPIRING INNOVATIONS

All-in-one panel PC - DL PPC Series

- All-round IP65 protected Projected Capacitive (PCAP Multi-Touch) Panel PCs in
  - ✓ Display sizes 15”, 18.5” and 21.5”
  - ✓ Expansion options (mPCIe)
  - ✓ Windows 7 & Windows 10 IoT
  - ✓ Passive cooled
  - ✓ VESA mount or arm adapter
  - ✓ 2.5” HDD & SSD SATA mass storage

- Intel CPU technology
  - ✓ DL PPC 7000 – 4th gen. Core i7-4650 1.71 GHz (4 core)

PHOENIX CONTACT
INSPIRING INNOVATIONS

All-in-one panel PC - DL PPC Series

Easy maintenance
Service door (HDD/CMOS)

Easily accessible
IP65 protected interfaces

Intuitive gesture control
Projected Capacitive Touch

Attractive design
60 mm panel depth

Easy setup and service
External IP65-rated USB port

Convenient operation
integrated function key

PHOENIX CONTACT
INSPIRING INNOVATIONS

Designline PPC 7000

Basic all-in-one and all-round IP65 protected panel PC BL2 PPC

PHOENIX CONTACT
INSPIRING INNOVATIONS

Basic all-in-one and all-round IP65 protected panel PC BL2 PPC

Benefits

- ✓ All-around IP65 protection without the need for a cabinet
- ✓ Attractive, modern industrial design
- ✓ Scalable processor performance
- ✓ Easy installation and various mounting options
- ✓ Push button box and stack light accessories

PHOENIX CONTACT
INSPIRING INNOVATIONS

Market Launches - AIO65 Standalone Panel PCs IIoT & Compact Box IPCs

Description

BL2 AIO65 is a new customer configurable All-In-One panel PC family that comes in two performance classes and in screen sizes ranging from 15.6” to 21.5” (FULL HD). The BL2 AIO65 is available with different mounting options and can be expanded with push-button box and stack light.

PHOENIX CONTACT
INSPIRING INNOVATIONS

Base configuration options

- Performance level options
  - 2000 class (Pentium N4200)
  - 7000 class (Core i5-7442EQ)
- Display size options
  - 15.6” or 18.5”, 21,5” (Q4/2020)
  - 10-point PCAP touch
  - FULL HD resolution (1920 x 1080 Pixel)
  - operable with gloves
- Windows 10 IoT support

Base configuration options

	BL2 PPC AIO65 2000	BL2 PPC AIO65 7000
Display size	15.6“ / 18.5“ PCAP multi touch (operable with gloves)	
Display resolution	1920 x 1080	1920 x 1080
CPU	Intel Pentium N4200 (fanless)	Intel Core i5-7442EQ (fanless)
Memory	4 or 8 GB	8 or 16 GB
Mass storage	mSATA SSD, configurable	
Interfaces	2 x ETH (10/100/1000), 2 x USB 2.0, 2 x USB 3.0, 1 x COM (RS-232/422/485)	
Typ	BL2 PPC AIO65 2000	BL2 PPC AIO65 7000
Art.-Nr.	1138366	1138367
List price	**2.090 €**	**2.905 €**

PHOENIX CONTACT
INSPIRING INNOVATIONS

Basic all-in-one panel PC – BL2 PPC AIO65 Series

- Two performance level options
  - 2000 class (Pentium N4200)
  - 7000 class (Core i5-7442EQ)
- Three display size options
  - 15.6”, 18.5” or 21.5” (Full HD)
  - 10-point PCAP touch
  - Glove operation
- Windows 10 IoT support

Configuration options

- AIO65 – VESA
- AIO65 – Pole mount

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INSPIRING INNOVATIONS

Flexible installation

VESA configuration	Pole mount configuration	Support arm configuration
		
▪ VESA 100 mounting pattern ▪ 3 dual cable entry ▪ Rubber grommets ▪ **External cable routing**	▪ For 48mm standard, Bernstein- Pole or Rittal-Pole ▪ Cable entry through pole ▪ **Internal cable routing**	▪ For 48mm standard, Bernstein-Pole or Rittal-Pole ▪ Cable entry through pole ▪ **Internal cable routing**

Comparison DL PPC & BL2 PPC AIO65

DL PPC	BL2 PPC AIO65
1. 3 screen sizes 15”, 18.5”, 21.5” PCAP	1. 3 screen sizes 15.6”, 18.5”, 21.5” PCAP
2. Intel Core i7 4650U (CPU mark 3963)	2. 2 performance classes
3. 2.5” SSD / HDD mass storage	a) Intel Pentium N4200 (CPU mark 2026)
4. Configuration up to 12 GB DDR3 RAM	b) Intel Core i5 7442EQ (CPU mark 6262)
5. mPCIe slot	3. M.2 SSD mass storage
6. Windows 7 & Windows 10	4. AIO65 2000 class: 8 GB DDR3 RAM AIO65 7000 class: 8 to 16 GB DDR4 RAM
7. Monolithic design	5. Windows 10
8. Configurable front button	6. Modular design
9. External USB	7. Push button box accessory (pole mount version)
10. VESA and Arm mount	8. Stack light accessory (pole mount version)
11. Temp range 0…45°C	9. VESA and pole /swing arm mount
12. Approvals CE, UL	10. Temp range 0…45°C
	11. Approvals CE, UL

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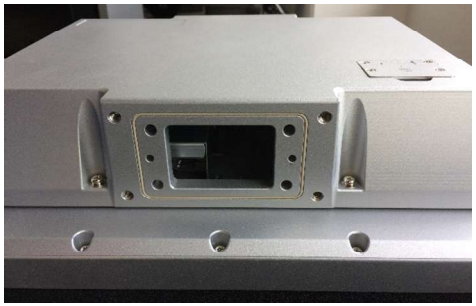
INSPIRING INNOVATIONS

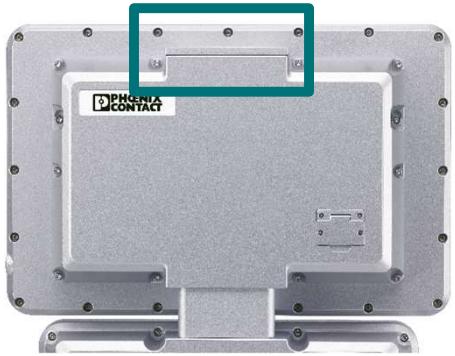
Base mounting options

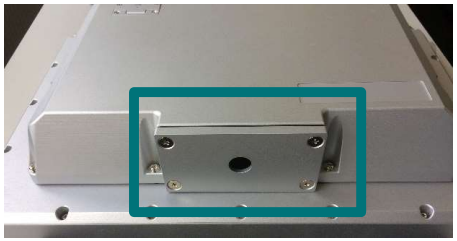
- **VESA 100**
  - Only
- **Pole Mount**
  - Only
  - With Extension Box
  - With Extension Box and/or Stacklight
- **Support Arm**
  - Only
  - With Extension Box
  - With Extension Box and/or Stacklight



Pole mount or Support arm with Stack light

- Pole / Support arm mount
- Cable entry through pole / swing arm
- Internal cable routing, also for stack light





Pole mount or Support arm with push button box

- Pole / swing arm mount
- Cable entry through pole / swing arm
- Internal cable routing, also for push button box

Mounting Adapter

VESA mounting	Pole or Support arm mounting for Bernstein CS-3000 systems	Pole or Support arm mounting for Rittal CP60 systems	Pole or Support arm mounting for all other systems (48mm standard)
		Image in process	
DL WALL MOUNT 2400013	BL2 AIO65 CS-3000 ADAPTER 1201506	BL2 AIO65 CP60 ADAPTER 1213952	BL2 AIO65 48MM ADAPTER 1201505
	https://www.bernstein.eu/en/products/enclosure-systems/suspension-systems/cs-3000/	https://www.rittal.com/uk-en/product/list.action?categoryPath=/PG0001/PG0002SCHRANK1/PG7661SCHRANK1/PG0058SCHRANK1	

Extension Box Options

			
Prepared for 9 holes with 22.5mm for mounting hardware keys; without wiring and keys. Width of the 15.6" display	Prepared for 11 holes with 22.5mm for mounting hardware keys; without wiring and keys Width of the 18,5" display	Connector between expansion box and 15.6" control unit	Connector between expansion box and 18.5" control unit
BL2 AIO65 9 PB BOX - 1160210	BL2 AIO65 11 PB BOX - 1160209	BL2 AIO65 15.6 PB BOX BRACKET - 1160212	BL2 AIO65 18.5 PB BOX BRACKET - 1160205

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Applications & target groups

Factory Automation

Quality assurance

Machine Building

Laboratory

PHOENIX CONTACT
INSPIRING INNOVATIONS

All in one Panel PC AIO65 Series

Modular Operator Station – Introduction of a new system

Modular Operator Station – Introduction of a new system

Overview

Name: Modular **O**perator **S**tation (Abbr. MOS)

Article number: 1168430

What kind of article is this and and what can you do with it?

- Configurable Operator Station
- Can be used for monitoring, operating and programming plants and machines
- **Consists of: Signal Tower, IPC, Push-Button Box, Keyboard / Mouse, Mounting device and Software**

Configurated Modular Operator Station

Your advantages

- Modern, space-saving & robust IP65 design
- Very easy & fastest configuration
- Reliable & robust technology
- Easy & fast maintenance
- Best ergonomics
- Newest & most innovative technologies
- Use of PROFINET & PROFISAFE
- Fastest data communication thanks to Gigabit
- Easiest operating

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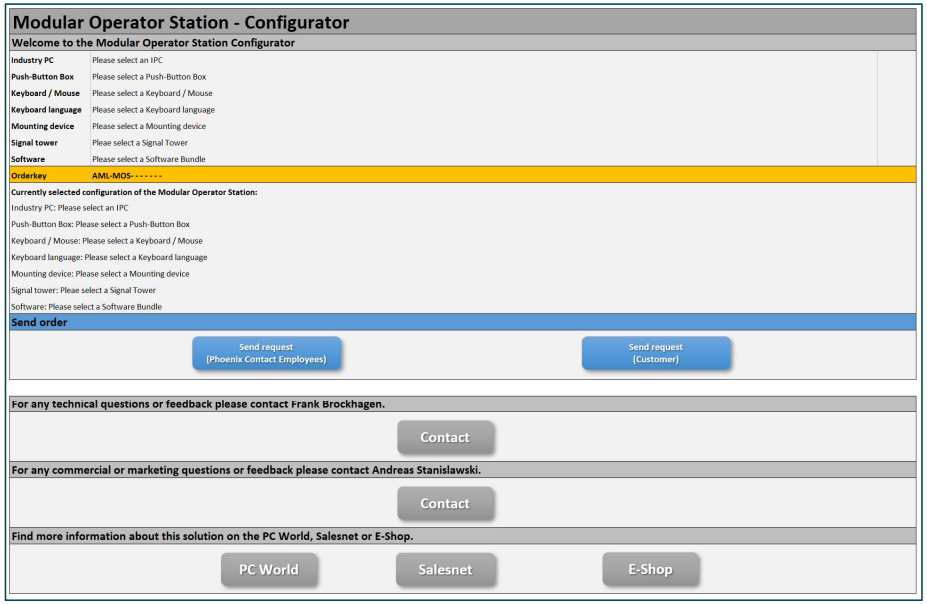
How to configure & order your Modular Operator Station

Modular Operator Station – Simplest operation & maximum performance for Smart Factories

How to configure & order your Modular Operator Station

- Our brand-new configurator assists you in configuring your favorite solution quickly and easily

- Only 6 steps are necessary
  - Download & open the configurator
  - Select your favorite components
  - Check your configuration
  - Copy the order key & press "Send request"
  - Wait for your personal offer
  - Order your desired article



Welcome page at the Modular Operator Station – Configurator

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INSPIRING INNOVATIONS

All-in-one panels for food, beverage and pharmaceutical applications

PHOENIX CONTACT
INSPIRING INNOVATIONS

Hygienic designed Panel-PCs and Monitors

Product design – hygienic, flexible, robust

Panel-PC and Monitors 17.3“ and 23.8“

Monitors 15,6“

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Hygienic designed Panel-PCs and Monitors

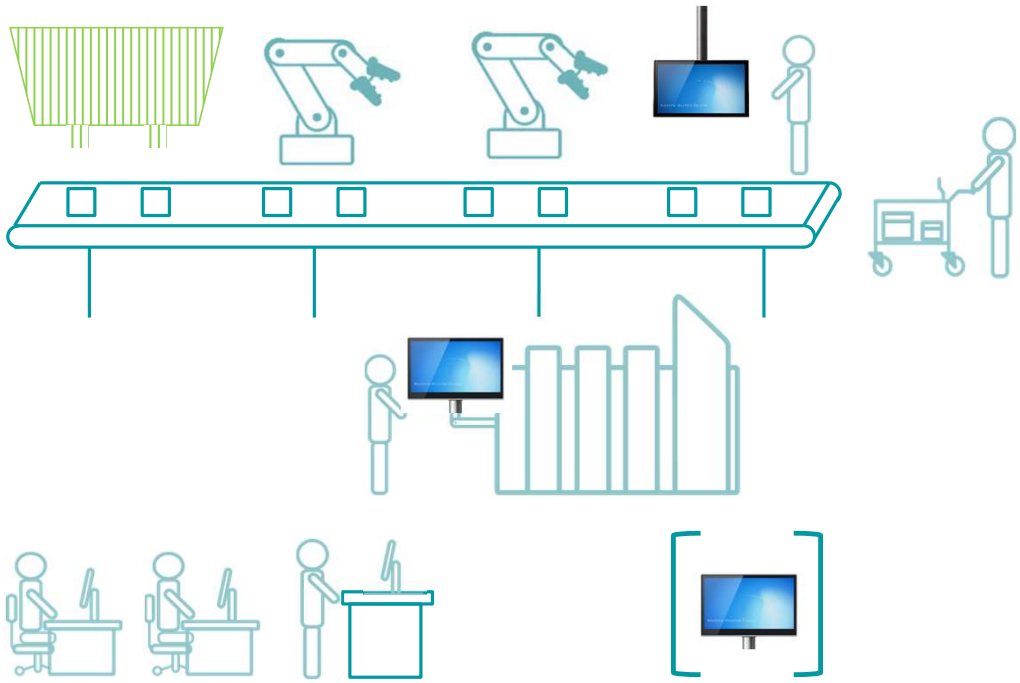
Industries

Food Industry		Increasing consumer awareness and alternative packaging concepts:	**Respond flexibly to current trends in the food & beverage sector**
Pharma Industry		Differentiated product range and different patient needs	**Ensure more flexibility in the manufacture of pharmaceutical products**
Chemical Industry		Individual portfolio realignments and scalable product solutions	**Increase the innovation power and reaction speed in your production**

PHOENIX CONTACT
INSPIRING INNOVATIONS

Hygienic designed Panel-PCs and Monitors

Fields of application



White area (direct product contact)

Grey area (encapsulated production process)

Black area

Increased hygiene requirements

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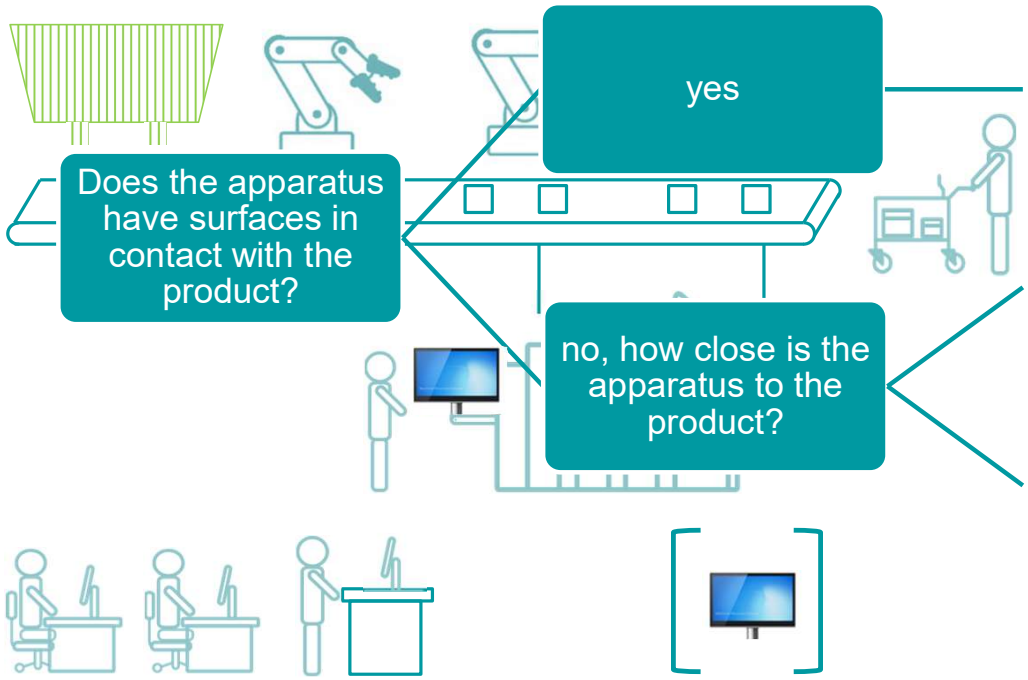
Fields of application



White area (direct product contact)

Grey area (encapsulated production process)

Black area

Increased hygiene requirements

PHOENIX CONTACT
INSPIRING INNOVATIONS

Hygienic designed Panel-PCs and Monitors

For smooth use in the hygiene area

Do you need a device without a cooler so that there is **no air exchange** between the PC and the environment?	Passive cooling through **heat pipe technology**
Do you want to clean your terminals/screens under **high pressure** and with acidic and alkaline **detergents**?	Protection class **IP69K** (dust-tight, protection against ingress of water), alkali- and acid-resistant, when using commercially available detergents
Do you use **gloves** to operate?	Capacitive multi-touch display for comfortable **multi-finger operation with gloves**.
Do you want your terminal/screen to be **insensitive to mechanical stress**?	Anti-reflective **tempered glass** front screen with shatter protection film
Do you want to pair your terminal with other **WLAN / Bluetooth enabled devices**?	**WLAN/ Bluetooth** combo card in terminal

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INSPIRING INNOVATIONS

Hygienic designed Panel-PCs and Monitors

Use case

Use Case

- Inspection of glass and PET bottles using camera technology to release recycled bottles for the filling process

Environmental conditions

- Hygienically sensitive area, no contamination by components of the inspection system
- Regular cleaning of the entire facility, including the terminal
- High reliability to ensure complete capture of all test items

⇒ AIO69ks as a reliable, robust and hygienic solution for displaying complex data in sensitive environments.

„ Thanks to the AIO69K solution, we can convey the perfect appearance as a measure of quality to our customers right from the intuitive initial handling.”

(Head of Development of a Camera and Inspection Systems Manufacturer)

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INSPIRING INNOVATIONS

Your individual configuration options

FPM:

PPC:

Monitor: 15,6“, 17,3“ oder 23,8“

PPC: 17,3“ oder 23,8“

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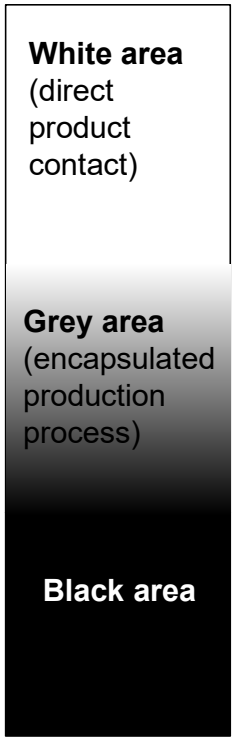
INSPIRING INNOVATIONS

Adaptation possibilities

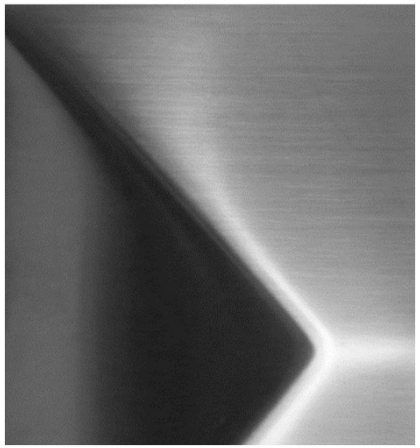
Steam Jet cleaning (IP69K)			
Hidden cable guide			
Open cable guide			



Increased hygiene requirements

Increased hygiene requirements – Overview

1 Material selection



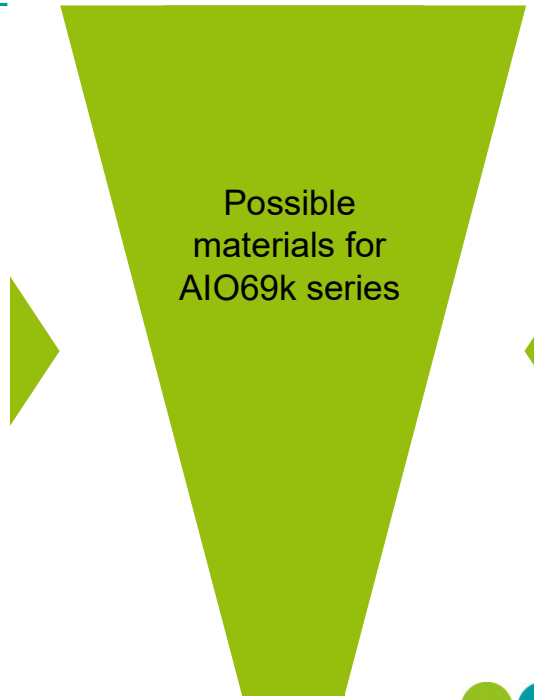
2 Design and construction

3 Functional requirements

Increased hygiene requirements – 1 Material selection

Requirements from a hygiene point of view

- Non-toxic materials
- Non-absorbing materials
- Compliance with official regulations
- Inert to detergents & disinfectants
- Inert to product contacts
- Leaching
- Corrosion resistant
- Smooth surface structure
- Durable surface finish
- Mechanically stable
- Easy to clean
- Temperature-resistant
- Observe application conditions
- Strength
- Elasticity



Requirements from a functional point of view

- Permanent stability
- Good processing possibilities
- Good serial quality
- Thermal conductivity
- Haptics
- UV-resistance
- Optics
- Price
- Availability
- Longterm availability
- Other

Hygienic designed Panel-PCs and Monitors

Increased hygiene requirements – 1 Material selection

Exterior materials of the AIO69k series

- Stainless steel
- Aluminium
- Glass
- Thermoplastic Elastomers (TPV; TPU)
- Silicon (Si)
- Polyamid (PA)
- Acrylnitril-Butadien-Styrol (ABS)
- Nitrile Butadiene Rubber (NBR)
- Polyethylenterephthalat (PET)

Recommendations of the Federal Institute for Risk Assessment (BfR)

These materials are all included in the „BfR recommendations on materials for food-contact.“

The device series is suitable for use in the food industry.

11 Detergents and disinfectants were tested and approved

- Ethanol und Isopropanol based
- Neutral detergents
- disinfectants
- Acidic cleaners
- Quaternary ammonium compounds

Increased hygiene requirements – 2 Design & construction

Requirements from a hygiene point of view

- Only exterior materials that meet all defined requirements
- Hidden cable routing
- Fan-free, encapsulated
- No metallic contact surfaces
- Surfaces cleanable, smooth and of permanently high grade
- All surfaces easily accessible for cleaning
- Geometry, especially. sealing points without gaps
- Mechanically stable
- No product contact with threads
- Corners with minimum radius except at sealing points
- Low roughness, without damage spots

Possible construction techniques for the MMT/MMD series

Requirements from a functional point of view

- Device can be opened for service
- Flexible keypad module
- Pipe feeding from above and below
- Permanent stability
- Good processing possibilities
- Good serial quality
- Long-term availability
- Other

PHOENIX CONTACT
INSPIRING INNOVATIONS

Hygienic designed Panel-PCs and Monitors

Increased hygiene requirements – 2 Design & Construction

Rear housing

- Screwless design
- Edges, angles, corners hygienically executed
- Fan-free
- Encapsulated interior

Supportarm/Polemount

- Without metallic contact surfaces
- 7 coordinated compontents
- hidden cable routing
- Completely sealed

Cleanability

- Optimized for cleaning recommendation of the Fraunhofer IVV and EHEDG

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INSPIRING INNOVATIONS

Increased hygiene requirements – 2 Design & Construction

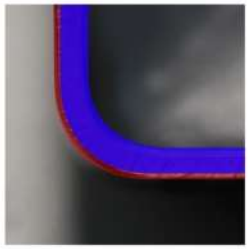
Complete protection against dust intrusion	
Test medium:	Talc
Test equipment:	Talc dust chamber
Negative pressure:	approximately 20 mbar
Test duration:	approximately 8 h
Category:	1
Test temperature:	RT

Protection against water during high-pressure/steam jet cleaning	
Test medium:	Water
Water temperature:	85 ± 5) °C
Water pressure:	(80 – 100) bar
Nozzle:	40° Flat jet
Positions:	0°, 30°, 60°, 90°
Test duration:	ca. 30 sec per position
Rotational speed turntable:	(5 ± 1) turns/min
Nozzle Spacing:	(175 ± 25) mm

Hygienic designed Panel-PCs and Monitors

Increased hygiene requirements – 2 Design & construction

- Hygienic-Design stainless steel surface for optimum cleanability
- Fanless with powerful Intel i5 processor
- Achieved through patented concept sandwich material:
  - 2,2mm Aluminium (Heat dissipation) and
  - 0,3mm stainless steel (Hygiene requirement)



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INSPIRING INNOVATIONS

Hygienic designed Panel-PCs and Monitors

Increased hygiene requirements – 3 functional requirements

Requirements from a hygiene point of view

- Cleanability, decontamination
- Preventing the penetration of microorganisms
- Avoidance of growth of microorganisms

Highlights of our solution

- AIO69k Serie is being investigated at the Fraunhofer Institute for Processing Machines and Packaging Technology in Dresden.
- On the basis of the investigations, a standard for the hygienic design and cleaning of operator terminals will be developed
- Cavities, gaps and cracks were avoided

EHEDG EUROPEAN HYGIENIC ENGINEERING & DESIGN GROUP

Fraunhofer IVV

PHOENIX CONTACT INSPIRING INNOVATIONS

Hygienic designed Panel-PCs and Monitors

Productportfolio

Hygienic industrial PCs and monitors

	All-in-one industrial PC		Monitors		
Designation	**PPC 17.3 AIO 69K**	**PPC 23.8 AIO 69K**	**FPM 15.6 69K**	**FPM 17.3 69K**	**FPM 23.8 69K**
Order no.	1262469	1262470	1261660	1261657	1261659
Display size in cm (in.)	44 (17.3")	60.4 (23.8")	30.7 (15.6")	44 (17.3")	60.4 (23.8")
Touch technology	PCAP multi-touch				
Resolution (W x H) in pixels	1920 x 1080 (FHD)				
Brightness in cd/m²	400 cd/m2	250 cd/m2	400 cd/m2	250 cd/m2	400 cd/m2
Backlight MTBF in h	50,000	30,000	50,000	50,000	30,000
Viewing angle (left / right / top / bottom) in °	89 / 89 / 89/ 89		90 / 90 / 90 / 90	89 / 89 / 89/ 89	
CPU	Intel® Celeron™ 1.6 GHz (2980U) Intel® Core™ i5 1.9 GHz (4300U)		-	-	-
RAM	Up to 8 GB DDR3		-	-	-
Data memory	120 GB 2,5" SSD or 250 GB 2,5" SSD		-	-	-
Ethernet interfaces	2 x 1 GBit/s Ethernet RJ45		-	-	-
Interfaces	1 x USB 2.0 2 x USB 3.0		1 x USB 2.0 1 x display port	3 x USB; 2.01 x USB slave 1 x HDMI; 1 x display port	
Wireless interfaces (optional)	Integrated WLAN-Modul IEEE 802.11 ac/a/b/g/n		-	-	-
Operating system (optional)	Windows® 10 IoT Enterprise		-	-	-
Dimensions (W x H x D)	431 x 261 x 68 mm	578 x 374 x 67 mm	372 x 239 x 31 mm	431 x 261 x 68 mm	578 x 347 x 67
Weight	5 kg	7.5 kg	4.5 kg	5 kg	7.5 kg
Power consumption (in W)	Max. 96		Max.48	Max. 48	Max. 12
Panel with screen shatter protection	(Configurable)		FPM 15.6 69K SP 1261658	FPM 17.3 69K SP 1261656	FPM 23.8 69K SP 1261662

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INSPIRING INNOVATIONS

Specialty and Industry Ready Panel PCs

- ✓ Suitable for outdoor applications with sunlight readable display option
- ✓ UV and IR resistance
- ✓ Corrosion resistant materials (i.e. salt spray test)
- ✓ Rugged, passive cooled design with wide operating temperature components
- ✓ Usable with work gloves

PHOENIX CONTACT
INSPIRING INNOVATIONS

Box and panel PCs for hazardous locations - VL2 EX Series

- Complete range of fully configurable Box and Panel PCs
  - ✓ Passive cooled
  - ✓ Windows 7 & Windows 10 IoT
  - ✓ Expansion options
  - ✓ Box PC and PCAP panel PPCs
  - ✓ Designed for Oil & Gas
  - ✓ Unique part numbers
  - ✓ Thicker front glass
  - ✓ Triple HAZLOC
- Intel CPU technology
  - ✓ VL2 BPC 2000 – Celeron N2930 1.6 GHz (4 core)
  - ✓ VL2 BPC 3000 – 4th gen. (Haswell) Core i3-4010U 1.7 GHz (2 core)
  - ✓ VL2 BPC 7000 – 4th gen. (Haswell) Core i5-4300U 1.9 GHz (2 core)
  - ✓ VL2 BPC 9000 – 6th gen. (Sky Lake) Core i7-6822 EQ 2 GHz (4 core)

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INSPIRING INNOVATIONS

Box and panel PCs for hazardous locations - VL2 EX Series

- Enhanced approvals
  - ✓ BPC: Class I Div 2, ATEX Zone 2 and IECex Zone 2
  - ✓ PPC: Class I Div 2, ATEX Zone2/22 and IECex Zone2/22
    - ✓ NOTE: Not approved for C2D2 combustible dust!

- Changes from standard “VL2”
  - ✓ Unique “EX” part numbers
  - ✓ Component based system enhancements
  - ✓ Thicker front glass with higher impact resistance
  - ✓ Does not replace the “standard” VL2

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INSPIRING INNOVATIONS

Standalone IP66 protected Panel PCs with sunlight readable displays – VMT 9000

- Fully enclosed, fanless IP66 outdoor rated Panel PCs
  - ✓ 4:3 Display sizes 10”, 12” and 15”
  - ✓ 16:9 Display size 12.1”
  - ✓ Sunlight readable
  - ✓ 4 configurable front buttons
  - ✓ Optional WIFI and LTE/GPS
  - ✓ Passive cooled
  - ✓ Impact resistant screen
  - ✓ -30°C to +60°C
  - ✓ 9V to 30VDC operation
  - ✓ UL ord. loc.
- Performance class
  - ✓ VMT 9000 – Atom x7-E3950 2.0 GHz

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Rugged HMI & IPC – Applications

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IPC Applications

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Panel PCs

Technologies

Single Touch

BL2 PPC 1000
BL2 PPC 2000
BL2 PPC 7000

VL PPC 2000
VL PPC 3000

Multi Touch

BL2 PPC 2100
BL2 PPC 3100
BL2 PPC 7100
BL2 PPC 9100

BL2 PPC15.6 2101
BL2 PPC15.6 3101
BL2 PPC15.6 7101
BL2 PPC15.6 9101

BL2 PPC18.5 2101

BL2 PPC21.5 2101
BL2 PPC21.5 7101

Multi Touch

VL2 PPC 1000
VL2 PPC 2000
VL2 PPC 3000
VL2 PPC 7000
VL2 PPC 9000

VL2 PPC7 1000
VL2 PPC9 1000
VL2 PPC12 1000

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Panel PCs IP 65

Technologies

Single Touch

VMT 9000

Multi Touch

BL2 PPC AIO65 2000
BL2 PPC AIO65 7000

DL PPC15M 2000
DL PPC15M 7000

DL PPC18.5M 7000

DL PPC21.5M 7000

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INSPIRING INNOVATIONS

Panel PCs Ex

Technologies

Multi Touch

VL2 PPC 1000 EX
VL2 PPC 2000 EX
VL2 PPC 3000 EX
VL2 PPC 7000 EX
VL2 PPC 9000 EX

Ask availability and Certificates before Purchasing

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Panel PCs Mobile

Technologies

Single Touch

HTP10 1000

Multi Touch

ITC 8113

Ask availability and Certificates before Purchasing

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INSPIRING INNOVATIONS

Tethered robot & machine teach-panels – HTP10 1000

- ✓ Hand-held operator panel with software for on-site visualization, or multi-user operation
- ✓ Rugged design for high shock resistance
- ✓ All-round protection (IP65)
- ✓ Ergonomic design
- ✓ Simple and intuitive operation
- ✓ Integrated safety function

PHOENIX CONTACT
INSPIRING INNOVATIONS

Tethered robot & machine teach-panels – HTP10 1000

- Hand-held operator panel with software for on-site visualization or multi-user operation
- 16:9 display aspect ratio

  - ✓ 10.1” Wide Screen Display
  - ✓ Mobile (tethered) panel operation
  - ✓ Ergonomic design
  - ✓ Windows 10 IoT
  - ✓ Passive cooled
  - ✓ Multiple accessories available
  - ✓ Integrated safety
  - ✓ Software flexibility

- Intel CPU technology

  - ✓ HTP10-1000 – 3rd gen. (Bay Trail) E3815 1.46 GHz (1 core)

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INSPIRING INNOVATIONS

Basic industrial panel PC application

Printing / cutting machinery

Application
- ✓Print & Cutting Machines

IPC Model
- ✓ BL BPC 2000
- ✓ BL FPM

Winning factors
- ✓ Esthetics of BL FPM (clean, flush design)
- ✓ Competitive combination of BL BPC & BL FPM

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INSPIRING INNOVATIONS

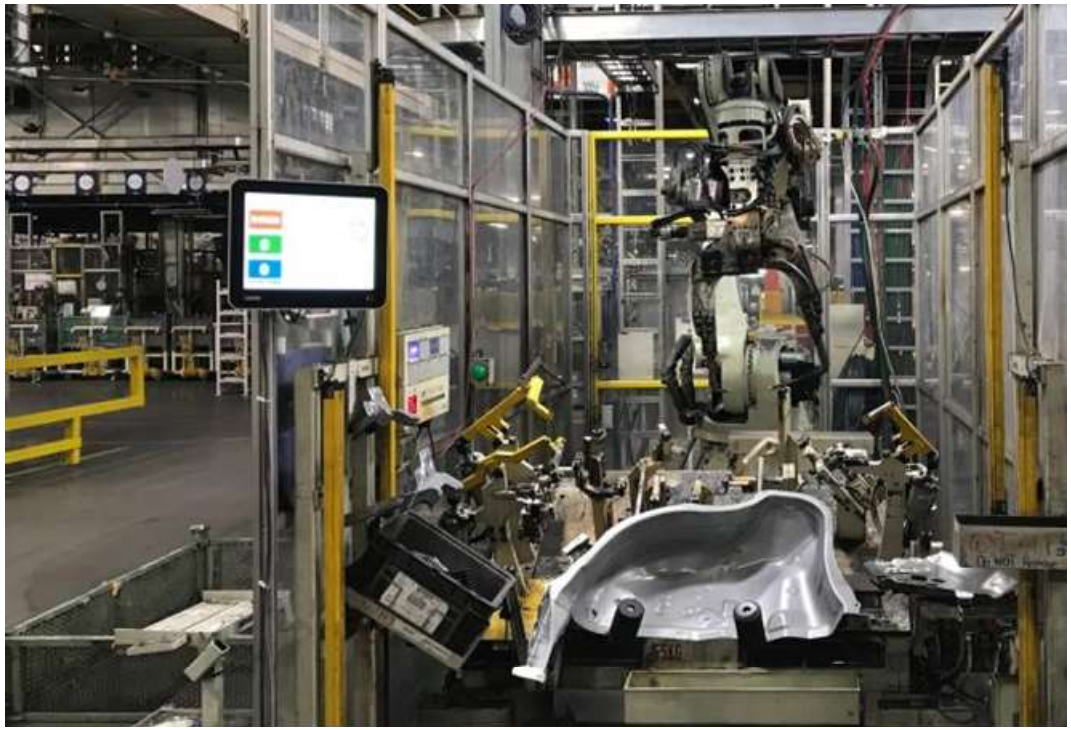
All-in-one panel PC application

Automotive

Application/Industry
- Welding robot control

IPC Model
- DL PPC15M 2000

Winning factors
- Custom part number
- Rugged design
- Space savings



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INSPIRING INNOVATIONS

All-in-one panel PC application

Total plant management system

IPC Model
- ✓ DL PPC21.5 7000

Competiton
- ✓ N/A

Winning factors
- ✓ Modern, ergonomic design
- ✓ All-round IP65 protection
- ✓ Robust construction needed in harsh environment
- ✓ Easily serviceable
- ✓ VESA mount

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INSPIRING INNOVATIONS

HazLoc industrial panel PC application

Process industry

Application/Industry
- ✓ Control systems for process

✓ IPC Model
- ✓ VL2 PPC EX 9000

✓ Winning factors
- ✓ Custom part number
- ✓ Custom software image
- ✓ Global support

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Thank you

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