



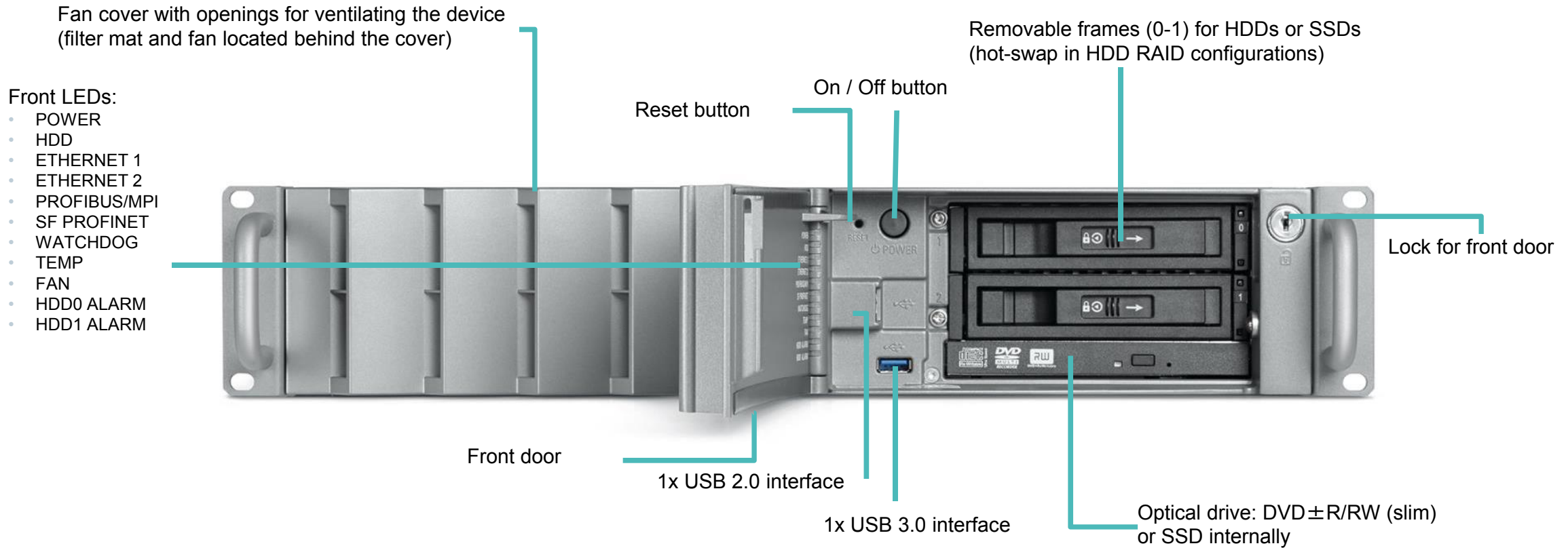
SIMATIC IPC647D

Technical Information

SIMATIC IP647D

Overview front

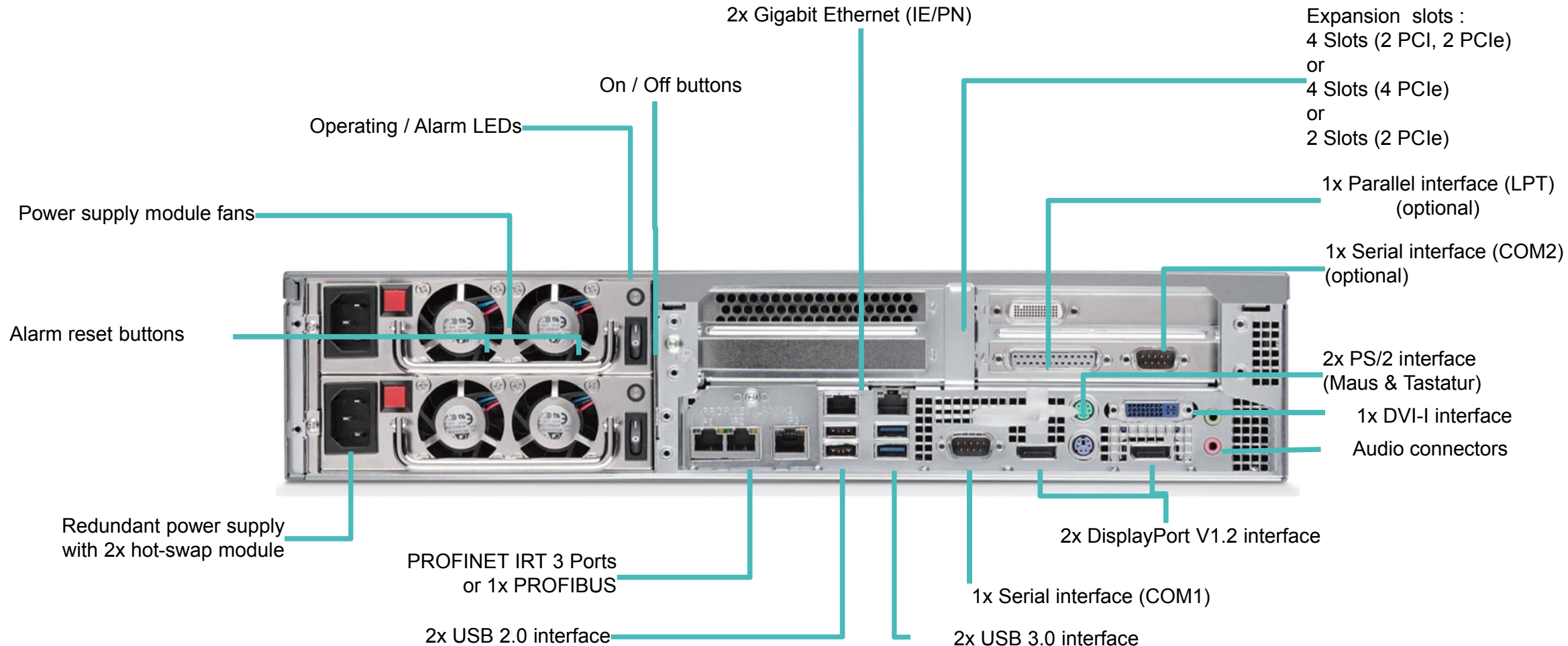
SIEMENS
Ingenuity for life



SIMATIC IPC647D

Overview rear

SIEMENS
Ingenuity for life



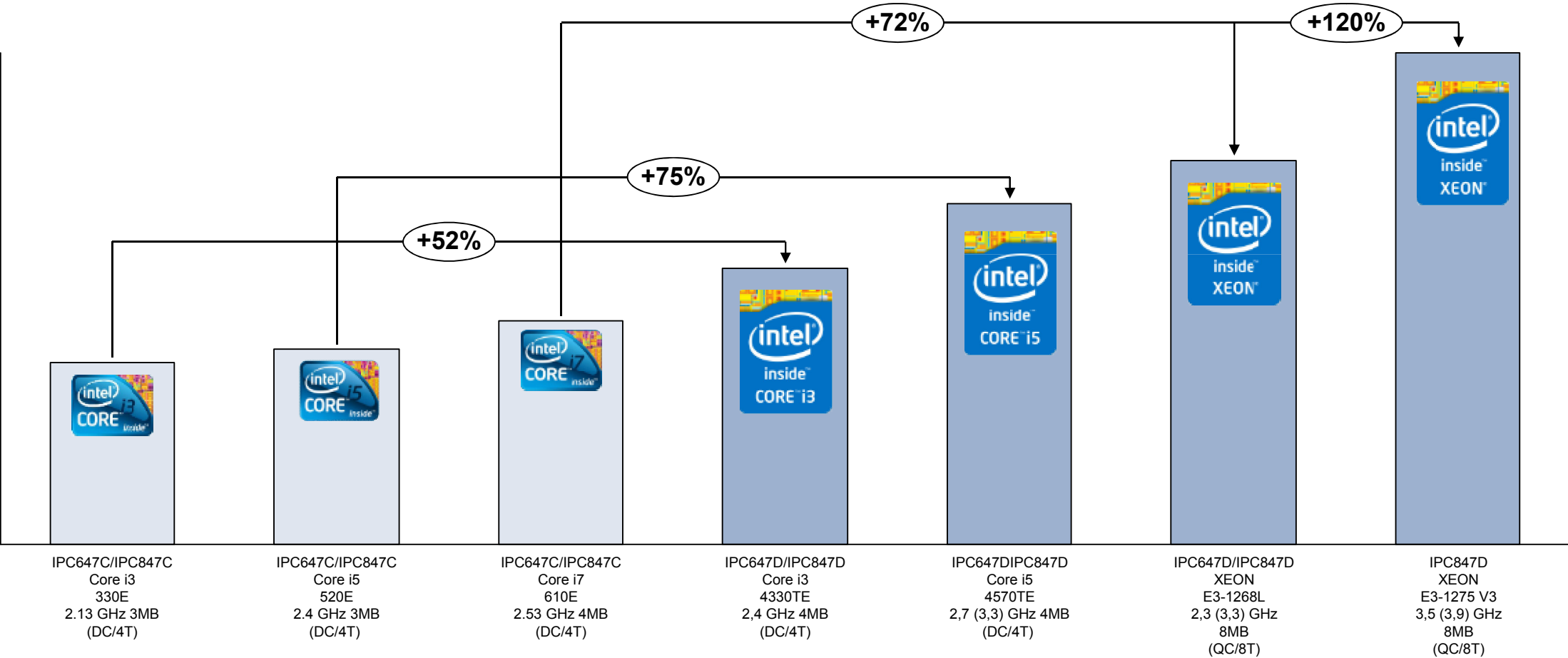
SIMATIC IPC647D / IPC847D

Processors characteristics

	Processor name	Processor number	Number of physical cores (Cores)	Number of virtual cores (Threads)	Clock rate / Clock rate with Turbo Boost (GHz)	Cache (MByte)	Turbo Boost 2.0	Virtualization (VT-x / VT-d)	64 Bit (EM64T)	iAMT 9.0	ECC
	Xeon	E3-1268L v3	4	8	2,3 / 3,3	8	✓	✓ / ✓	✓	✓	✓(*)
	Core i5	i5-4570TE	2	4	2,7 / 3,3	4	✓	✓ / ✓	✓	✓	✓
	Core i3	i3-4330TE	2	2	2,4 / -	4	-	✓ / -	✓	-	✓

The Intel Xeon E3 offers a optimized performance / watt and supports ECC memory – the comparable Intel Core i7 processors do not

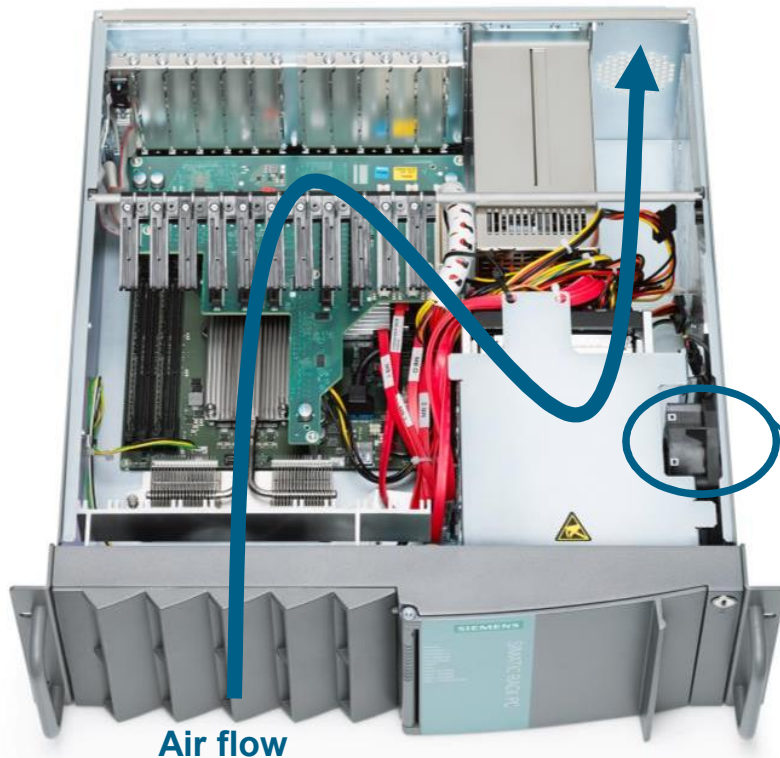
Passmark 7 Rating IPC647C/847C versus IPC647D/847D



SIMATIC IPC647D/ IPC847D

Designed and tested for the 24 / 7 Operation

SIEMENS
Ingenuity for life



Optimized Cooling Concept

- Air flow is designed for constant heat removal
- Speed-controlled and ball bearing mounted fans

Full processing power up to
50°C operating environment
– no Throttling

additional fan



Dust Protection

- Controlled overpressure ventilation protects IPC for dust intrusion
- Filter mat replaceable without tools

Reliability and constant
performance also at harsh
industrial environment

SIMATIC IPC647D/ IPC847D

Designed and tested for the 24 / 7 Operation

SIEMENS
Ingenuity for life



Drive Mounting

- Rubber-cushioned mounting of the drives
- Shock and vibration protection during operation

Reliability and data availability
also under high vibration and
shock stress

Redundant Power Supply

- Redundant power supply is replaceable during operation

Reliability and system
availability for the non-stop
operation



Metal Housing

- Robust aluminum housing offers mechanical ruggedness and electromagnetic shielding
- Very low emission of electromagnetic radiation

High mechanical ruggedness
and EMC compliance for a
maximum in operational
reliability

SIMATIC IPC647D/ IPC847D

Easy to service for facilitated maintenance & expansion



Easy to service Housing

- Opening of the housing with just one screw
- Components are easy to access for replacement or expansion
- Replacement of the dust protection and front fan without any tools



Great Expandability

- Up to 4 PCI(e) expansion card with IPC647D
- 11 PCI(e) expansion slots with IPC847D

Easy expandability for greater flexibility

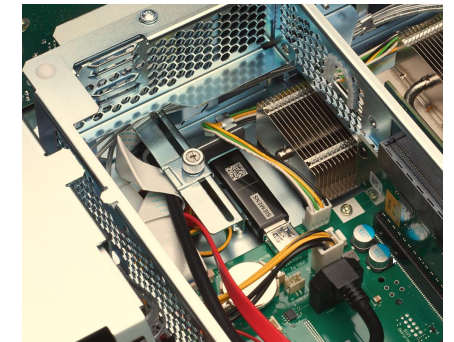


Reduction of service and maintenance time

Internal USB 3.0 – port with optional interlocking

- Software-Dongle
- Recipes and configurations

Access protected data storage



SIMATIC IPC647D/IPC847D

Additional options for the use as Industrial Server

- + High performance and energy efficiency with Intel Xeon processor
- + Memory expansion up to 32 GB with or without ECC
- + High performance hardware RAID-Controller (PCI-Express x8) incl. maintenance-free Zero Maintenance Cache Protection Module
- + Reliable SAS hard disk with 1 TB capacity in Hot-Swap removable frame and Hot Spare functionality
- + Redundant power supply incl. monitoring or USV Industrial-power supply incl. maintenance lead-stannic-battery
- + Remote control with iAMT-Technology and monitoring with SIMATIC IPC DiagMonitor Software
- + Long-time available and robust (EMV, dust cover) server platform with Microsoft Windows Server operating system 64Bit
- + Certificated server platform for virtualisation with Vmware ESXi Server operating system

SIEMENS
Ingenuity for life



SIMATIC IPC647D/IPC847D

New options

SIEMENS
Ingenuity for life



Hardware RAID controller

with Zero Maintenance Cache Protection (ZMCP) Module

Low operating costs

- no additional costs for installation, monitoring, maintenance, disposal or exchange of batteries (Battery Backup Units (BBUs))

High data security

of in the RAID-Cache saved data when it comes to electricity failure

- Replaces lithium ion accumulators
- State of battery charge does not have to be monitored
- No shutting down for battery change necessary
- Secured data is being saved for up to 10 years
- Does only need a few minutes instead of some hours for loading



AC UPS-power supply *

combines UPS functions with PC power supply

High data security

- in case of an interruption of the source, the UPS functions will set up instantaneously and feed the load with energy taken from its battery pack
- secure shut down a windows operating system

Low operating costs with

Maintenance-free lead-tin battery

- The equipped CYCLON cells are based on a special lead-tin alloy which results in a service life of up to 10 years in stand-by mode
- Due to its low self-discharge a fully charged battery pack can be stored for up to 1 year



SIMATIC IPC647D / IPC847D

Turbo Boost 2.0 (Xeon CPU)

Depending on the CPU core utilization and the temperature levels (TDP and ambient temperature), CPUs which support Turbo Boost technology automatically increase the clock frequency of CPU cores in steps of 133 MHz (bins). Additionally the graphics frequency increases.

The Intel Xeon Processor E3-1268L v3 offers these Turbo Boost values

- Processor frequency: 2.3 GHz Max. frequency (Turbo): 3.3 GHz
- Graphics frequency: 350 MHz Max. frequency (Turbo): 1000 MHz
- Burst Mode: Increased over clocking of the cores by utilizing the thermal budget (TDP) of the CPU for a short time



SIMATIC Rack PC

RAID1 vs. RAID5: Overview

RAID 1: Data mirroring

Process

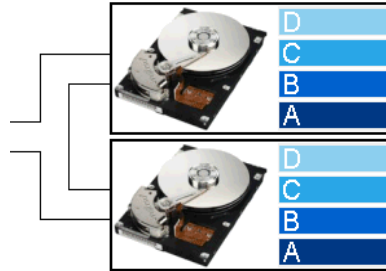
Data is being duplicated and written in parallel on two HDDs

Advantages

- Same data set is secured automatically
- If one HDD fails, the system is still working
→ No data is lost
→ Simple data recovery

Disadvantage

- Only the capacity of one HDD can be effectively used



RAID 5: Data striping with parity*

Process

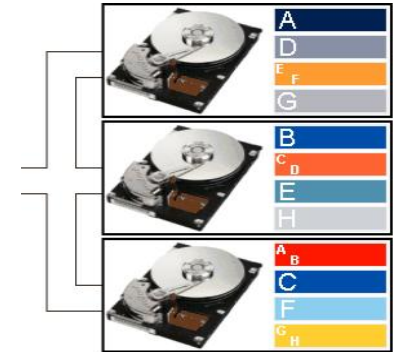
Data is being written block by block (striping) on all HDDs (with check sums on all HDDs)

Advantages

- Very efficient with small data blocks
- High data transfer rates when reading
- If one HDD fails, the system is still working
→ No data is lost
→ Cost-effective possibility for redundant data storage on several HDDs with the available memory volume efficiently used

Disadvantages

- At least three HDDs are required
- Slower data transfer rates when writing compared to RAID1 as the error correction data (parity bits) has to be calculated



Additional HDD as hot spare in RAID configurations*

Process

Hot spare disks are preparatory HDDs that are kept on active standby for use when a HDD in a RAID configuration fails

Advantages

- Automatic integration of the hot spare disk into the RAID configuration and start of the rebuild process in case of failure of a contained HDD
→ Maximum data availability

SIMATIC Rack PC

RAID1 vs. RAID5: Feature comparison

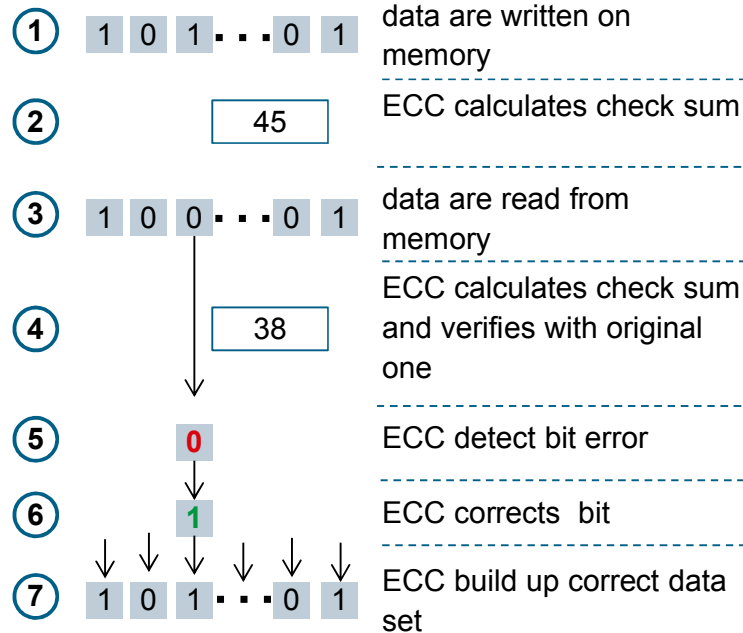
RAID features	RAID1 (Mirroring)	RAID5* (Striping with parity)
Minimum amount of HDDs	2 (2x 1 TByte)	3 (3x 1 TByte)
Data security	Failure of one HDD	Failure of one HDD
Read performance	Medium	High
Write performance	Medium	Low
Capacity utilization of HDDs	50% (1 TByte)	67% - 94% (2 TByte)
Benefits	High data availability in case of a single HDD failure	Optimal utilization of the used HDD capacity with high fault tolerance
Typical applications	Real-time critical applications, e.g. databases	Storage of large data volumes, e.g. archiving

SIMATIC IPC647D / IPC847D

ECC – RAM for increased Data Integrity and System Stability



ECC – Error Correction Code



ECC - RAM

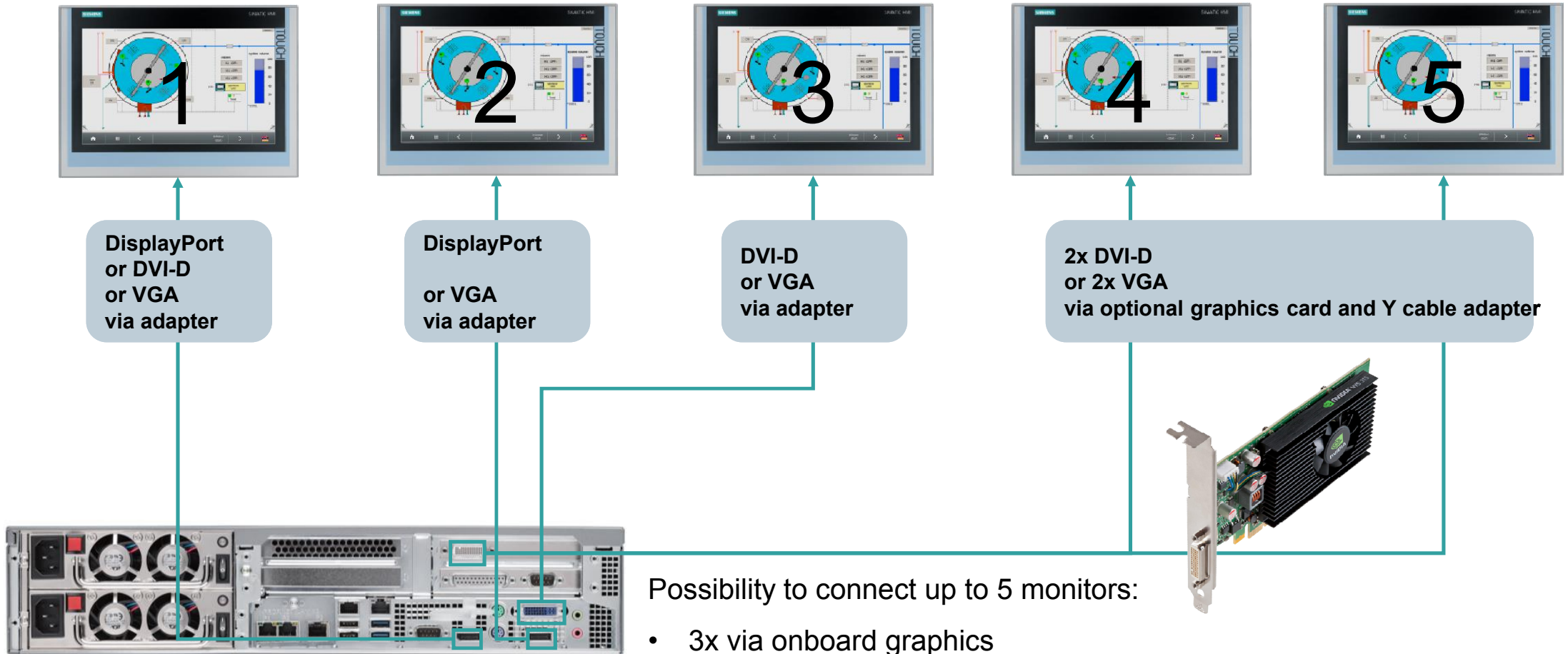
- Optional ECC RAM protects for damage and variation of data processing and transmission
- ECC RAM reduces clearly the probability of critical data failures and system crashes

Maximum data integrity and system stability for a reliable data handling and storage

SIMATIC IPC647D / IPC847D

Multi-Monitoring (Intel Hybrid Multi-Monitor Support)

SIEMENS
Ingenuity for life



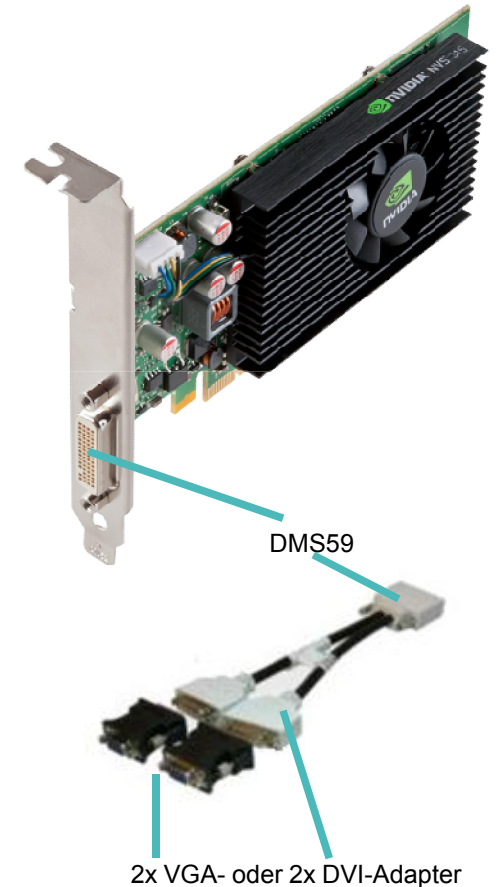
SIMATIC IPC647D

Graphics card (new)

NVIDIA Quadro NVS 315 Grafikkarte

NVIDIA Quadro graphics processor:	48 CUDA parallel computing cores ¹⁾
Overall frame buffer:	1024 MByte
Width of the memory interface:	64 bit
Memory bandwidth:	14 Gbit/s
Max. VGA resolution:	2048 x 1536 @ 85Hz
Max. DVI resolution:	1920 x 1200 @ 60 Hz
Max. DP resolution:	2560 x 1600 @ 60 Hz
Graphics slot:	PCI-Express x16
Form factor:	69,37 mm x 167,64 mm (ATX bracket, 1 slot)
Interfaces:	2x DVI-D or 2x VGA
Max. power:	19,5 W
Cooling:	Activ with fan / fan monitoring over DiagBase / DiagMonitor
Scope of supply in configurator :	DMS-59 to DVI-D adapter or DVI to VGA adapter
API:	OpenGL 4.1 / DirectX 11 / Shader Model 5.0

¹⁾ CUDA, the parallel calculation architecture from NVIDIA, enables a significant increase in computing performance, using the performance of the graphics processor.

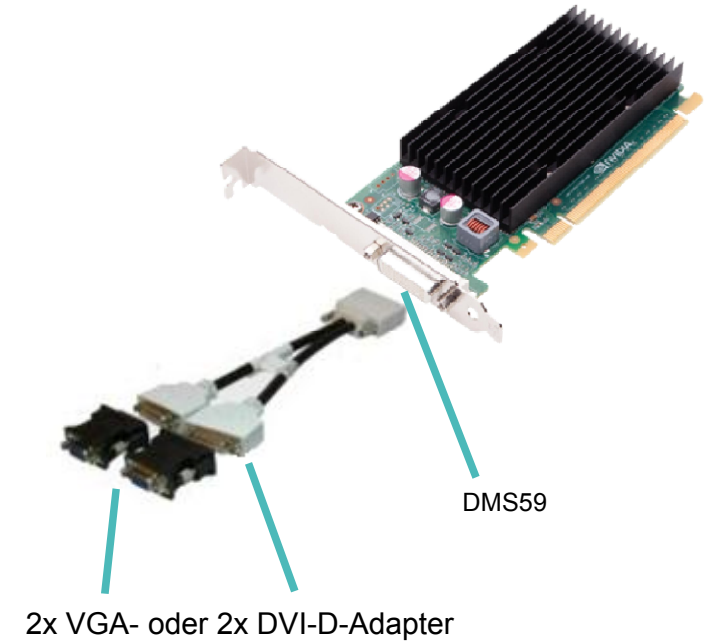


SIMATIC IPC647D

Graphics card (old)

NVIDIA Quadro NVS 300 graphics card

NVIDIA Quadro graphics processor:	16 CUDA parallel computing cores ¹⁾
Overall frame buffer:	512 MByte
Width of the memory interface:	64 bit
Memory bandwidth:	12.6 Gbit/s
Max. digital monitor resolution at 60 Hz:	2560 x 1600
Graphics slot:	PCI-Express x16
Form factor:	69.37 mm x 167.64 mm (ATX bracket, 1 slot)
Interfaces:	2x DVI-D or 2x VGA
Max. power:	17 W
Cooling:	Fanless
Scope of supply in configurator:	DMS-59 to DVI-D adapter or DVI to VGA adapter
API:	OpenGL 3.3 DirectX 10.1 Shader Model 4.1



¹⁾ CUDA, the parallel calculation architecture from NVIDIA, enables a significant increase in computing performance, using the performance of the graphics processor.

SIMATIC IPC647

Migration C→D

IPC647C		IPC647D		
				
				
				
Installation compatibility				
Housing measures	No changes			
Housing design	No major changes			
Interface compatibility				
Number of expansion slots	No changes			
Type of expansion slots	PCI and PC-Express			
Installation slots front	2x low-profile removable frame / 1x (slim) for DVD±R/RW			
Installation slots internaly	CF-Drive not available anymore			
External interfaces	2x DisplayPort V1.2 and DVI-I <u>instead of</u> 1x DVI-I 4x USB 3.0 & 3x USB 2.0 <u>instead of</u> 7x USB 2.0 - COM2 & LPT as Slot (option) <u>instead</u> COM2 & LPT onboard			
Software compatibility				
Software	Applications can still be used; maybe new drivers need to be loaded			
Operating system support	Windows XP 7 / Windows Server 2003 R2 (32 bit) / Windows Server 2008 (32 bit) <u>not</u> available anymore			
Miscellaneous compatibility				
Image	New chipset, therefore <u>not</u> image compatible			

SIMATIC IPC647D

Technical data

Housing, Chipset, Processors, Main Memory, and Expansion Slots

Housing	• 19" Rack, 2U • Rugged all-metal housing, painted outside and coated inside • Lockable front flap for access protection • Prepared for telescopic slides • For horizontal mounting		
Chipset	• Intel DH82C226 PCH (C226)		
Processors	• Intel® Xeon™ E3-1268L v3 4C/8T, 2.3 (3.3) GHz, 8 MByte Cache, Turbo Boost 2.0, Virtualization (VT-x/-d)-Technology, iAMT 9.0 • Intel® Core™ i5-4570TE 2C/4T, 2.7 (3.3) GHz, 4 MByte Cache, Turbo Boost 2.0, Virtualization (VT-x/-d)-Technology, iAMT 9.0 • Intel® Core™ i3-4330TE 2C/4T, 2.4 GHz, 4 MByte Cache, Virtualization (VT-x)-Technology		
Main Memory	• from 2 GByte DDR3-1600 SDRAM, Dual Channel support, Expandable up to 32 GByte¹⁾ • ECC from 8 GByte optional		
Expansion Slots (all 312 mm)	PCI-/ PCIe-Slots (2 PCI, 2 PCI-Express) • 2 x PCI • 2 x PCI-Express x16 (8 Lane) Gen 3	PCI-Express Slots (4 PCI-Express) • 1 x PCI-Express x16 (4 Lane) Gen 3 • 1 x PCI-Express x16 (4 Lane) Gen 2 • 1 x PCI-Express x16 (4 Lane) Gen 3 • 1 x PCI-Express x16 (8 Lane) Gen 3	PCI-Express Slots (2 PCI-Express) • 1 x PCI-Express x16 (4 Lane) Gen 3 • 1 x PCI-Express x16 (4 Lane) Gen 2

¹⁾ For configurations up to 4 GByte, the visible memory could be reduced to ca. 3.5 GByte or less (when using 32 bit operating systems).

SIMATIC IPC647D

Technical data

Installation Slots and Drives

Installation Slots	• Internal: 2x 3.5" • Front: 2x low-profile removable frame; 1x slim for ODD or 1x 2,5" SSD
Hard disks (HDD), SATA / SAS 3.5", NCQ Solid-state drive (SSD) SATA 2.5"	Mounted internally: • 1x 240 GB SSD ¹⁾ Internal installation in drive holder (shock and vibration-damped) (up to 5g/0.5g): • 1 x 500 GB HDD • 1 x 1 TB HDD • 2 x 1 TB HDD • 2 x 1 TB HDD; RAID1, 1 TB (2 x 1 TB HDD, mirror disks), RAID controller onboard Installed on the front in the low-profile removable drive bay (hot swapping in RAID configurations): • 1 x 500 GB HDD • 1 x 1 TB HDD • 2 x 1 TB HDD • 1 x 240 GB SSD • RAID1, 1 TB (2 x 1 TB HDD, mirror disks), RAID controller onboard • RAID1, 1 TB (2x 1 TB HDD SAS, mirror disks), PCIe x8 RAID controller incl. ZMCP module; (2 slots occupied) • RAID1, 240 GB (2 x 240 GB SSD, mirror disks), RAID controller onboard
Optical Drive	• without • DVD±R/RW (slim)

¹⁾ Operating system if ordered is installed on SSD

SIMATIC IPC647D

Technical data



Graphics, Power Supplies and Operating Systems

Graphics

- Onboard
Intel HD Graphics 4600 integrated in the processor with Dynamic Video Memory with up to 1.7 GByte
VGA, DVI and DisplayPort with up to 3840 x 2160 pixels at 60 Hz image refresh rate and 32 bit colors
- PCI-Express graphics card in PCIe x16 slot (as an option)
NVIDIA NVS 315 graphics controller with 1 GByte graphics memory
Dual Head: 2x VGA or 2x DVI-D with up to 2048 x 1536 pixels at 60 Hz image refresh rate and 32 bit colors

Power Supplies

- AC: 100-240 V, 400 W, wide range
- AC redundant: 2x 100-240 V, 350 W, wide range (as an option)

Short-time voltage interruption

- Max. 20 ms

Operating Systems

- without
Pre-installed and activated (and enclosed on Restore DVD):
- Windows 7 Ultimate SP1, 32 Bit, MUI ¹⁾
- Windows 7 Ultimate SP1, 64 Bit, MUI ¹⁾
- Windows 10 Enterprise 2015 LTSC, 64 Bit, MUI ¹⁾
- Windows 10 Enterprise 2016 LTSC, 64 Bit, MUI ¹⁾
- Windows Server 2008 R2 Standard Edition SP1 incl. 5 Clients, 64 Bit, MUI ¹⁾
- Windows Server 2012 R2 Standard Edition incl. 5 Clients, 64 Bit, MUI ¹⁾
- Windows Server 2016 Standard Edition incl. 5 Clients, 64 Bit, MUI ¹⁾

¹⁾ Multi Language User Interface, 5 languages: English, German, French, Spanish, Italian

SIMATIC IPC647D

Technical data

Interfaces	
Ethernet	• 2x Gigabit Ethernet (IE/PN), RJ 45, teaming capable • Intel Ethernet Controller WGi217LM und WGi210IT • Wake on LAN (WoL) support
PROFIBUS DP/MPI	• 12 Mbit/s, isolated, compatible with CP 5622, (optional)
PROFINET	• 10/100 Mbit/s with integral 3-port switch, CP1616-compatible (optional)
DisplayPort	• 2x (V1.2)
DVI-I	• 1x
VGA	• Via cable adapter (as an option)
USB 3.0 (high current)	• Front: 1x • Rear: 2x • Internal: 1x
USB 2.0 (high current)	• Front: 1x • Rear: 2x
Serial	• 1x COM1 (V.24) • 1x COM2 (V.24) (as an option)
Parallel	• 1x LPT (EPP/ECP) (as an option)
PS/2	• 2x (Keyboard, Mouse)
Audio	• 1x Line Out, 1x Micro

SIMATIC IPC647D

Technical data

Electromagnetic Compatibility (EMC) / climatic ambient conditions

Noise emissions	• EN 61000-6-3, EN 61000-6-4 • EN 61000-3-2 Class D; EN 61000-3-3 • CISPR 22 • EN 55022 Class B • FCC Class A
Immunity against conducted interference on the supply lines	• ± 2 kV; according to IEC 61000-4-4; Burst • ± 1 kV; according to IEC 61000-4-5; Surge symm. • ± 2 kV; according to IEC 61000-4-5; Surge asymm.
Noise immunity on signal lines	• ± 2 kV; according to IEC 61000-4-4; Burst, length > 30 m • ± 1 kV; according to IEC 61000-4-4; Burst, length < 30 m • ± 2 kV; according to IEC 61000-4-5; Surge, length > 30 m
Immunity against discharge of static electricity	• ± 6 kV contact discharge; according to IEC 61000-4-2 • ± 8 kV discharge to air; according to IEC 61000-4-2
Immunity against high-frequency radiation	• 10 V/m, 80 MHz to 1 GHz, 80% AM; according to IEC 61000-4-3 • 3 V/m, 1.4 to 2 GHz, 80% AM; according to IEC 61000-4-3 • 10 V, 150 kHz to 80 MHz; according to IEC 61000-4-6
Immunity against magnetic fields	• 100 A/m, 50/60 Hz; according to IEC 61000-4-8
Temperature	• 0 °C to +50 °C acc. to IEC 60068-2-2; IEC 60068-2-1; IEC 60068-2-14 (limitations s. operating instruction)

SIMATIC IPC647D

Technical data

System-tested SIMATIC Software, Approvals, Dimensions and Weight

SIMATIC Software	• STEP 7 • WinAC / Software Controller S7-1500 • WinCC • SOFTNET	
Safety regulations	• IEC60950-1 / EN60950-1 / UL60950-1 • CSA C22.2 No. 60950-1-07	
Approvals	• CE • cULus (UL 60950) • KC • RCM (C-Tick) • EAC • BIS	Marine approvals (only with SSD) • Lloyds Register (LR) • American Bureau of Shipping (ABS) • Bureau Veritas (BV) • Det Norske Veritas / Germanischer Lloyd (DNV GL) • Korean Register of Shipping (KR) • Nippon Kaiji Kyokai (NK) • Registro Italiano Navale (RINA) • China Classification Society (CCS)
CE Mark	Operation in residential, office, and industrial areas • Interference emission: EN 61000-6-3:2007 + A1:2011 • Noise immunity: EN 61000-6-2:2005	
EU Directives	• RoHS	
Installation dimensions	430 mm x 88 mm x 444 mm (W x H x D)	
Weight	From 10 kg	

SIMATIC IPC647D

Information



Rumpf-MLFB	6AG4112-2....-....	
Ordering system	- A&D Mall: http://www.siemens.de/automation/mall - Online configurator: http://www.siemens.com/ipc-configurator	
Support	- Aftersales: http://www.siemens.com/asis http://www.siemens.com/automation/support-request	

Subject to changes and errors. The information given in this document only contains general descriptions and/or performance features which may not always specifically reflect those described, or which may undergo modification in the course of further development of the products. The requested performance features are binding only when they are expressly agreed upon in the concluded contract.

All product designations, product names, etc. may contain trademarks or other rights of Siemens AG, its affiliated companies or third parties. Their unauthorized use may infringe the rights of the respective owner.