

Overview



SIMATIC IPC647E

The SIMATIC IPC647E is a very rugged, high-performance industrial PC in 19" rack design (2 U) with excellent industrial functionality.

It offers:

- Extreme compactness
- Extreme ruggedness
- Intel® Core® i / Xeon technology 8th generation

Technical specifications

Article number	6AG4112-3....-.... SIMATIC IPC647E (Rack PC)
Installation type/mounting	
Mounting	For horizontal installation; prepared for telescopic rails; 19" mounting bracket can be removed externally
Design	Rack PC, 19", 2U
Supply voltage	
Type of supply voltage	100/240 V AC (autorange) 50 / 60 Hz; optional redundant 100/240 V AC
Line frequency	
• Rated value 50 Hz / 60 Hz	Yes / Yes
Mains buffering	
• Mains/voltage failure stored energy time	20 ms
Processor	
Processor type	Intel Xeon E-2176G (6C/12T, 3.7 (4.7) GHz, 12 MB cache, Turbo Boost 2.0, VT-x/-d technology, iAMT); Intel Core i7-8700 (6C/12T, 3.2 (4.6) GHz, 12 MB cache, Turbo Boost 2.0, VT-x/-d technology, iAMT); Intel Core i5-8500 (6C/6T, 3.0 (4.1) GHz, 9 MB cache, Turbo Boost 2.0, VT-x/-d technology, iAMT); Intel Core i3-8100 (4C/4T, 3.6 GHz, 6 MB cache, VT-x/-d technology)
Chipset	Intel C246
Graphic	
Graphics controller	Onboard Intel UHD graphics P630/630 integrated in processor; graphics card NVIDIA Quadro P400 PCIe (x16) triple head (optional)
Drives	
Hard disk	1x 1 TB 3.5" SATA HDD, 2x 1 TB 3.5" SATA HDD, RAID1 2x 1 TB 3.5" SATA HDD, RAID1 2x 1 TB 3.5" SATA HDD (Enterprise), RAID1 2x 2 TB 3.5" SATA HDD (Enterprise)
SSD	Yes; 1x 480 GB 2.5" SATA SSD, 1x 960 GB 2.5" SATA SSD, 2x 480 GB 2.5" SATA SSD, RAID1 2x 480 GB 2.5" SATA SSD; 1x 512 GB M.2 NVMe SSD, 1x 1 024 GB M.2 NVMe SSD
Slot for drives	Mounting internally in vibration/shock-absorbing drive cage Type B or mounting on the front in removable trays (hot swap in RAID configurations) in drive cage Type A; mounting internally on the fixed drive cage optional

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Memory	
Main memory	4 GB to 64 GB DDR4 2666 SDRAM DIMM, ECC optional
Hardware configuration	
Slots	
• free slots	2 slots: 1x PCI Express (x16) (16 lanes), 1x PCI Express (x16) (4 lanes) or 4 slots: 2x PCI, 2x PCI Express (x16) (8 lanes) or 4 slots: 2x PCI Express (x16) (8 lanes), 1x PCI Express (x16) (4 lanes), 1x PCI Express (x16) (1 lane); expansion modules up to 312 mm in length can be used
Interfaces	
Interfaces/bus type	1x COM1, 1x COM2 (optional), 2x DisplayPort, 1x DVI-D, audio (microphone in, line in, line out), 9x USB, 3x Gigabit Ethernet
PROFIBUS/MPI	can be implemented with plug-in card
USB port	4x USB 3.1 Gen. 2 Type A, 2x USB 3.1 Gen. 2 Type C on the rear; 1x USB 3.1 Gen. 2 Type A internally, e.g. for software dongle with optional interlock, 2x USB 3.1 Gen. 1 Type A on the front, can be used with door closed
Connection for keyboard/mouse	USB
serial interface	COM1: 1x RS 232, COM2 (optional): 1x RS 232
Multimedia	
• Audio In/Out	Yes
• Microphone In	Yes
Industrial Ethernet	
• Industrial Ethernet interface	3x Gigabit Ethernet (IE/PN), RJ45
- 100 Mbps	Yes
- 1000 Mbps	Yes
Integrated Functions	
Monitoring functions	
• Temperature monitoring	Yes
• Watchdog	Yes
• Status LEDs	Power, HDD, Ethernet 1, Ethernet 2, Ethernet 3, Watchdog, Temp, Fan, HDD1 alarm, HDD0 alarm
• Fan	Yes
• Monitoring function via network	Optional

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EMC	
Interference immunity against discharge of static electricity	
<ul style="list-style-type: none"> Interference immunity against discharge of static electricity 	±6 kV contact discharge acc. to IEC 61000-4-2; ±8 kV air discharge acc. to IEC 61000-4-2
Interference immunity against high-frequency electromagnetic fields	
<ul style="list-style-type: none"> Interference immunity against high frequency radiation 	10 V/m for 80 ... 2 700 MHz, 80% AM acc. to IEC 61000-4-3; 3 V/m for 2.7 to 6 GHz, 80% AM acc. to IEC 61000-4-3; 10 V for 10 kHz to 80 MHz, 80% AM acc. to IEC 61000-4-6
Interference immunity to cable-borne interference	
<ul style="list-style-type: none"> Interference immunity on supply cables 	±2 kV acc. to IEC 61000-4-4, burst; ±1 kV acc. to IEC 61000-4-5, surge symmetric; ±2 kV acc. to IEC 61000-4-5, surge asymmetric
<ul style="list-style-type: none"> Interference immunity on signal cables > 30 m 	±2 kV acc. to IEC 61000-4-5, surge, length > 30 m
<ul style="list-style-type: none"> Interference immunity on signal cables < 30 m 	±1 kV acc. to IEC 61000-4-4; burst, length < 3 m
Interference immunity against voltage surge	
<ul style="list-style-type: none"> asymmetric interference 	±2 kV acc. to IEC 61000-4-5, surge asymmetric
<ul style="list-style-type: none"> symmetric interference 	±1 kV acc. to IEC 61000-4-5, surge symmetric
Interference immunity to magnetic fields	
<ul style="list-style-type: none"> Interference immunity to magnetic fields at 50 Hz 	100 A/m; to IEC 61000-4-8
Emission of conducted and non-conducted interference	
<ul style="list-style-type: none"> Interference emission via line/AC current cables 	EN 61000-6-3; EN 61000-6-4, CAN/CSA CISPR 22 Class B, EN 55032 Class B; FCC Class A; KN32 Class B, EN 61000-3-2 Class D; EN 61000-3-3
Degree and class of protection	
IP (at the front)	IP41
IP (rear)	IP20

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Standards, approvals, certificates	
CE mark	Yes; For use in industrial areas as well as domestic, business and commercial environments (emitted interference: EN 61000-6-3:2007 +A1:2011, noise immunity: EN 61000-6-2:2005)
CSA approval	Yes; CAN/CSA-C22.2 No. 61010-2-201 Second Edition
UL approval	Yes; UL 61010-2-201 Second Edition, File E115352 (I.T.E.)
cULus	Yes; UL 61010-2-201 Second Edition, File E115352 (I.T.E.)
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
EMC	EN 61000-6-3; EN 61000-6-4, CAN/CSA CISPR 22 Class B, EN 55032 Class B; FCC Class A; KN32 Class B, EN 61000-3-2 Class D; EN 61000-3-3
Dust protection	With front door closed: G2 EN 779, 99% of particles > 0.5 mm are filtered
Ambient conditions	
Ambient temperature during operation	
<ul style="list-style-type: none"> Ambient temperature during operation 	0 °C to +50 °C with full configuration
Relative humidity	
<ul style="list-style-type: none"> Relative humidity 	Tested according to IEC 60068-2-78, IEC 60068-2-30: Operation: 5 % to 85 % at 30 °C (no condensation), storage / transport: 5 % to 95 % at 25 / 55 °C (no condensation)
Vibrations	
<ul style="list-style-type: none"> Vibration resistance during operation acc. to IEC 60068-2-6 	Tested according to IEC 60068-2-6: 10 cycles, 10 Hz to 58 Hz: 0.0375 mm, 58 Hz to 500 Hz: 4.9 m/s ² (0.5 g)
Shock testing	
<ul style="list-style-type: none"> Shock load during operation 	Tested according to DIN IEC 60068-2-7: 50 m/s ² (5 g), 30 ms, 100 shocks
Operating systems	
Operating system	Windows 10 Enterprise 2016 LTSC, multi-language (64-bit); Windows Server 2016 Standard Edition incl. 5 clients, multi-language (64-bit)
pre-installed operating system	Yes
Additional info on operating system	Multi-Language User Interface (MUI): 5 languages (English, German, French, Spanish, Italian)
without operating system	Yes
Dimensions	
Width	430 mm
Height	88 mm; 2 U
Depth	444 mm

Ordering data	Article No.	Article No.	
SIMATIC IPC647E Rack PC, 19", 2 U; Interfaces: 3x Gbit Ethernet (IE/PN), RJ45; 1x DVI-D; 2x DisplayPort; 1x COM1; audio; 4x USB 3.1, 2x USB 3.1 (type C) on the rear; 2x USB 3.0 on the front, 1x USB 3.1 internal. 1x M.2 slot internal; Temperature and fan monitoring, watchdog, card retainer <u>Processor / main board</u> <ul style="list-style-type: none"> Core i3-8100 (4C/4T, 3.6 GHz, 6 MB cache, VT-d) Board 2 slots: 1x PCIe x16 (16 L), 1x PCIe x16 (4 L) Core i3-8100 (4C/4T, 3.6 GHz, 6 MB cache, VT-d). Board 4 slots: 2x PCI, 2x PCIe x16 (8 L) Core i3-8100 (4C/4T, 3.6 GHz, 6 MB cache, VT-d). Board 4 slots: 2x PCIe x16 (8 L), 1x PCIe x16 (4 L), 1x PCIe x16 (1 L) Core i5-8500 (6C/6T, 3.0 (4.1) GHz, 9 MB cache, TB, VT-d, AMT). Board 2 slots: 1x PCIe x16 (16 L), 1x PCIe x16 (4 L) Core i5-8500 (6C/6T, 3.0 (4.1) GHz, 9 MB cache, TB, VT-d, AMT). Board 4 slots: 2x PCI, 2x PCIe x16 (8 L) Core i5-8500 (6C/6T, 3.0 (4.1) GHz, 9 MB cache, TB, VT-d, AMT). Board 4 slots: 2x PCIe x16 (8 L), 1x PCIe x16 (4 L), 1x PCIe x16 (1 L) Core i7-8700 (6C/12T, 3.2 (4.6) GHz, 12 MB cache, TB, VT-d, AMT). Board 2 slots: 1x PCIe x16 (16 L), 1x PCIe x16 (4 L) Core i7-8700 (6C/12T, 3.2 (4.6) GHz, 12 MB cache, TB, VT-d, AMT); Board 4 slots: 2x PCI, 2x PCIe x16 (8 L) Core i7-8700 (6C/12T, 3.2 (4.6) GHz, 12 MB cache, TB, VT-d, AMT). Board 4 slots: 2x PCIe x16 (8 L), 1x PCIe x16 (4 L), 1x PCIe x16 (1 L) Xeon E-2176G (6C/12T, 3.7 (4.7) GHz, 12 MB cache, TB, VT-d, AMT). Board 2 slots: 1x PCIe x16 (16 L), 1x PCIe x16 (4 L) Xeon E-2176G (6C/12T, 3.7 (4.7) GHz, 12 MB cache, TB, VT-d, AMT). Board 4 slots: 2x PCI, 2x PCIe x16 (8 L) Xeon E-2176G (6C/12T, 3.7 (4.7) GHz, 12 MB cache, TB, VT-d, AMT). Board 4 slots: 2x PCIe x16 (8 L), 1x PCIe x16 (4 L), 1x PCIe x16 (1 L) 	6AG4112 - 3	SIMATIC IPC647E <u>Drives</u> <ul style="list-style-type: none"> 1 TB HDD 3.5" SATA 2x 1 TB HDD 3.5" SATA RAID1, 2x 1 TB HDD 3.5" SATA RAID1, 2x 1 TB HDD [Enterprise] 3.5" SATA RAID1, 2x 2 TB HDD [Enterprise] 3.5" SATA 1 TB HDD 3.5" SATA + 480 GB SSD 2.5" SATA (for operating system if M.2 SSD not ordered) 480 GB SSD 2.5" SATA 960 GB SSD 2.5" SATA 2x 480 GB SSD 2.5" SATA RAID1, 2x 480 GB SSD 2.5" SATA Without drives <u>Type of enclosure / power supplies</u> <ul style="list-style-type: none"> Enclosure with drive cage type B (for internal installation/0.5 g vibration, 5 g shock); 100/240 V AC industrial power supply Enclosure with drive cage type A (for removable frames on the front); 100/240 V AC industrial power supply Enclosure with drive cage type B (for internal installation/0.5 g vibration, 5 g shock); 2x 100/240 V AC redundant industrial power supply Enclosure with drive cage type A (for removable frames on the front); 2x 100/240 V AC redundant industrial power supply Enclosure with drive cage type B (for internal installation/0.5 g vibration, 5 g shock) + COM2 port; 100/240 V AC industrial power supply Enclosure with drive cage type A (for removable frames on the front) + COM2 interface; 100/240 V AC industrial power supply Enclosure with drive cage type B (for internal installation/0.5 g vibration, 5 g shock) + COM2 port; 2x 100/240 V AC redundant industrial power supply Enclosure with drive cage type A (for removable frames on the front) + COM2 port; 2x 100/240 V AC redundant industrial power supply 	6AG4112 - 3
	A	A	
	B	B	
	C	C	
	D	D	
	E	E	
	F	F	
	G	G	
	H	H	
	J	J	
	K	K	
	L	L	
	M	M	
	0	0	
	1	1	
	2	2	
	3	3	
	4	4	
	5	5	
	6	6	
	7	7	

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Ordering data

Article No.

Ordering data	Article No.
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<u>Memory configuration</u>	
• 4 GB DDR4 SDRAM (1x 4 GB), single channel	0
• 8 GB DDR4 SDRAM (2x 4 GB), dual channel	1
• 16 GB DDR4 SDRAM (2x 8 GB), dual channel	2
• 32 GB DDR4 SDRAM (2x 16 GB), dual channel	3
• 64 GB DDR4 SDRAM (4x 16 GB), dual channel	4
• 16 GB DDR4 SDRAM (2x 8 GB), ECC, dual channel (only with Core i3/Xeon)	6
• 32 GB DDR4 SDRAM (2x 16 GB), ECC, dual channel (only with Core i3/Xeon)	7
• 64 GB DDR4 SDRAM (4x 16 GB), ECC, dual channel (only with Core i3/Xeon)	8
<u>Expansion hardware</u>	
• Without expansions	0
• PCIe x16 graphics card (3x mDP; 3x adapter mDP on DP) (1 slot occupied)	2
• 512 GB SSD M.2 NVMe (M.2 slot occupied) (for operating system)	4
• 512 GB SSD M.2 NVMe (M.2 slot occupied) (for operating system) + PCIe x16 graphics card (3x mDP; 3x adapter mDP on DP) (1 slot occupied)	5
• 1 024 GB SSD M.2 NVMe (M.2 slot occupied) (for operating system)	6
<u>Operating system (pre-installed and activated)</u>	
• Windows 10 Enterprise 2016 LTSB, multi-language (en, de, fr, it, sp), 64-bit [for Core i3/i5]	A
• Windows 10 Enterprise 2016 LTSB, multi-language (en, de, fr, it, sp), 64-bit, for Core i7/Xeon	B
• Windows Server 2016 Standard Edition incl. 5 clients, 64-bit, MUI (en, de, fr, it, sp)	H
• Without operating system	X
<u>Software / adapters / security expansions</u>	
• SIMATIC IPC DiagMonitor software enclosed	A
• SIMATIC IPC Image & Partition Creator software included	B
• SIMATIC IPC DiagMonitor + Image & Partition Creator software enclosed	C
• Adapter cable DP to VGA for onboard graphics	H
• Adapter cable DP to DVI-D for onboard graphics	J
• Without expansions	X
• TPM ¹⁾ 2.0 (not for China)	Y
<u>Cables, country-specific versions</u>	
• Without power supply cord	0
• Power supply cord for Europe	1
• Power supply cord for USA	2
• Power supply cord for China	3

¹⁾ TPM = Trusted Platform Module

Article No.

Accessories	Article No.
<u>Memory expansions</u>	
• 4 GB DDR4 2666 SDRAM, DIMM	6ES7648-2AL60-0QA0
• 8 GB DDR4 2666 SDRAM, DIMM	6ES7648-2AL70-0QA0
• 16 GB DDR4 2666 SDRAM, DIMM	6ES7648-2AL80-0QA0
<u>Removable drive bay</u>	6ES7648-0EH00-1BA0
For 3.5" hard disk or 2.5" solid-state drive, SATA (without hard disk drive/solid-state drive)	
<u>Retainer</u>	6ES7648-1AA00-0XK0
For mechanically interlocking the internal USB port	
<u>Adapter cable</u>	
• DisplayPort to DVI-D for on-board graphics	6ES7648-3AF00-0XA0
• DisplayPort to VGA for on-board graphics	6ES7648-3AG00-0XA0
• Mini DisplayPort to VGA for graphics card	6ES7648-3AL00-0XA0
• Mini DisplayPort to DVI-D for graphics card	6ES7648-3AK00-0XA0
• Mini DisplayPort to DVI-D for graphics card (3 per package)	6ES7648-3AK00-1XA0
• Mini DisplayPort to DisplayPort for graphics card	6ES7648-3AJ00-0XA0
• Mini DisplayPort to DisplayPort for graphics card (3 per package)	6ES7648-3AJ00-1XA0

Note:

Please assemble the required IPC configuration using the TIA Selection Tool or the configurator in the Industry Mall in order to ensure suitability; we do not accept any liability for configurations compiled by users themselves.

For an up-to-date overview, see the SIMATIC IPC online configurator at: <http://www.siemens.com/ipc-configurator>

Further information can be found on the Internet at:

<http://www.siemens.com/simatic-pc>