SIMATIC IPC647D

The SIMATIC IPC647D is a very rugged, high-performance industrial PC in 19" rack design (2 U) with excellent industrial functionality.

It offers:

- Extreme compactness
- Extreme ruggedness
- 4th generation Intel® Core™ i technology

Basic design

- All-metal 19" enclosure (2 U) for high mechanical robustness (vibration/shock) and high EMC
- For mounting in a horizontal and prepared for the mounting of telescopic rails
- Lockable front door for authorized access (access protection) to swap media at the front, operating controls (Reset, Power), USB interface, front fan and dust filter
- Card retainer for PC modules for safe operation and transport (vibration, shock)
- Opening of the enclosure cover with only one screw and replacement of PC components (e.g. PC cards or HDD) with a single tool
- Front fan and dust filter can be replaced without tools
- Dust protection thanks to overpressure ventilation using ball bearing mounted front fan via filter; 3 slots for installation of drives
  - Front:
    - 2 x HDD swap frames (low profile);
    - 1 x optical drive (slimline)
  - Internal:
    - 2 x 3.5" (in optional, shock and vibration-damped disk-drive support) as an alternative to swap frames
- Graphics on-board, Intel® HD 4600 integrated in the processor, up to 3840 x 2160 pixels, 60 Hz, 32-bit colors
- Interfaces:
  - 2 x Intel Gbit Ethernet (RJ45, teaming-capable)
  - 4 x USB 3.0: 2 x rear, 1 x front, 1 x internal e.g. for software dongle with optional interlocking
  - 3 x USB 2.0: 2 x rear, 1 x front, can be used with door closed
  - 2 x DisplayPort V1.2, 1 x DVI-I, VGA via adapter cable (optional)
  - 1 x COM1, 2 x PS/2
  - Audio: Line Out, Micro
- Power supply: 100 ... 240 V AC, 50 ... 60 Hz
Design versions

- **Processor:**
  - Intel® Xeon™ E3-1268L v3
    4C/8T, 2.3 (3.3) GHz, 8 MB cache, turbo-boost 2.0, Extended Memory 64 (EM64) and virtualization technology (VT-x/-d), iAMT 9.0
  - Intel® Core™ i5-4570TE
    2C/4T, 2.7 (3.3) GHz, 4 MB cache, turbo-boost 2.0, Extended Memory 64 (EM64) and virtualization technology (VT-x/-d), iAMT 9.0
  - Intel® Core™ i3-4330TE
    2C/4T, 2.4 GHz, 4 MB cache, Extended Memory 64 (EM64) and virtualization technology (VT-x)

- **Main memory configuration as dual channel with 4 GB and higher for best performance:**
  - 2 GB to 32 GB DDR3-1600 SDRAM
  - 8 GB to 32 GB DDR3-1600 SDRAM, ECC memory

**Note:**
In order to use a memory with more than 4 GB, a 64-bit operating system is required. In the case of configurations with at least 4 GB, the visible memory can be reduced to about 3.5 GB or less (with 32-bit operating systems).

- **Fieldbus onboard:**
  - PROFIBUS/MPI, CP 5622-compatible or PROFINET, 3 x RJ45, CP 1616-compatible

- **Bus modules with 4 spare slots for expansions (all long):**
  - PCI slots (2 PCI, 2 PCI-Express)
    2 x PCI
    2 x PCI-Express x16 (8 lanes) Gen 3
  - PCI-Express slots (4 PCI-Express)
    1 x PCI-Express x16 (4 lanes) Gen 3
    1 x PCI-Express x16 (4 lanes) Gen 2
    1 x PCI-Express x16 (4 lanes) Gen 3
    1 x PCI-Express x16 (8 lanes) Gen 3
  - PCI-Express slots (2 PCI-Express)
    1 x PCI-Express x16 (4 lanes) Gen 3

- **Graphics expansion:**
  - PCI-Express graphics card x16 (Dual Head: 2 x VGA or 2 x DVI-D); 512 MB; up to 2048 x 1536 pixels, 60 Hz, 32-bit colors
  - Adapter cable (DVI-I to VGA) for the onboard graphics interface (1 x VGA) for connecting an analog monitor

- **Serial ATA 3.5” hard disks (HDD) with NCQ technology and serial ATA 2.5” solid-state drive (SSD) with MLC technology**
  - Mounted internally on the permanent hard disk support: 1x 240 GB SSD
  - Internal installation in vibration/shock-absorbing hard disk support:
    - 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
  - Installed on the front in the low-profile swap frame (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

- **Optical drive:**
  - DVD±R/RW (slimline)

- **Interfaces:**
  - 1 x COM2 and 1 x LPT (in slot cover, occupies one slot) at rear

- **Power supply:**
  - 100...240 V AC, 50...60 Hz, redundant
  - Country-specific power cable

- **Operating systems (preinstalled and activated):**
  - Windows 7 Ultimate SP1, 32-bit, multi-language
  - Windows 7 Ultimate SP1, 64-bit, multi-language
  - Windows Server 2008 R2 Standard Edition SP1 incl. 5 clients, multi-language

- **Software expansions:**
  - SIMATIC IPC DiagMonitor
  - SIMATIC IPC Image & Partition Creator
  - TPM module – onboard security hardware (Trusted Platform Module)
## Technical specifications SIMATIC IPC647D

### SIMATIC rack PC  SIMATIC IPC647D

#### General features

**Design**
- 19” rack, 2 U, external coating

**Processor**
- Intel® Xeon™ E3-1268L v3
  - 4C/8T, 2.3 (3.3) GHz, 8 MB cache, turbo-boost 2.0, Extended Memory 64 (EM64) and virtualization technology (VT-x/-d), iAMT 9.0
- Intel® Core™ i5-4570TE
  - 2C/4T, 2.7 (3.3) GHz, 4 MB cache, turbo-boost 2.0, Extended Memory 64 (EM64) and virtualization technology (VT-x/-d), iAMT 9.0
- Intel® Core™ i3-4330TE
  - 2C/4T, 2.4 GHz, Extended Memory 64 (EM64) and virtualization technology (VT-x)

**Chipset**
- Intel C226

**Main memory**
- From 2 GB DDR3 1600 SDRAM
- Dual channel support
- 4 DIMM bases expandable up to 32 GB
- ECC memory (optional)

**Spare slots for expansions (all long)**
- PCI slots (2 PCI, 2 PCI-Express):
  - 2 x PCI
  - 2 x PCI-Express x16 (8 lanes) Gen 3 or PCI-Express slots (4 PCI-Express):
  - 1 x PCI-Express x16 (Gen 3)
  - 1 x PCI-Express x16 (Gen 4)
  - 1 x PCI-Express x16 (Gen 2)
  - 1 x PCI-Express x16 (Gen 3)
  - 1 x PCI-Express x16 (8 Gen 3)

**Graphics**
- Onboard Intel HD 4600 graphics controller integrated into the processor
- Dynamic video memory up to 1.7 GB, up to 3840 x 2160 pixels at 60 Hz image refresh rate and 32-bit colors
- PCI Express graphics card (Dual Head: 2 x VGA or 2 x DVI-D) in the PCIe x16 slot (optional) 512 MB, up to 2048 x 1536 pixels at 60 Hz image refresh rate and 32-bit colors

**Operating system**
- without Preinstalled, activated, and supplied on restore DVD
- Windows 7 Ultimate MUI, 32/64-bit
- Windows Server 2008 R2 incl. 5 client MUI, 64-bit (MUI: Multi-Language User Interface; 5 languages (English, French, German, Italian, Spanish)
- Project-specific on request Linux ²
- Other

**Power supply**
- 100 ... 240 V AC, 50 ... 60 Hz, with bridging of temporary power failures in accordance with NAMUR: max. 20 ms at 0.85 % rated voltage
- Redundant 100 ... 240 V AC, 50 ... 60 Hz

### SIMATIC rack PC  SIMATIC IPC647D

#### Drives

**Serial ATA 3.5” hard disks (HDD) with NCQ technology and serial ATA 2.5” solid-state drive (SSD) with MLC technology**
- Mounted internally on the permanent hard disk support:
  - 1 x 240 GB SSD
- Mounted internally in vibration/shock-absorbing hard disk support:
  - 1 x 500 GB HDD
  - 1 x 1 TB HDD
  - 2 x 3 TB HDD
  - RAID 1, 1 TB (2 x 1 TB HDD, mirror disks)

**Mounted on the front in the low-profile swap frame (hot swapping in RAID configurations):**
- 1 x 500 GB HDD
- 1 x 1 TB HDD
- 1 x 240 GB SSD
- RAID 1, 1 TB (2 x 1 TB HDD, mirror disks)

**DVD±R/RW, 5.25”, SATA**
- 8 x 8 x 6 x (DVD media)
- 24 x 10 x 16 x (CD media)

**Spare slots for drives**
- Front: 2 x low profile swap frames (for 3.5” HDD)
- 1 x 12.7 mm slimline (for ODD)
- Internal: 2 x 3.5” as an alternative to swap frames (in the optional, shock and vibration-damped drive cage)

#### Interfaces

**PROFINET**
- 3 x RJ45 (CP 1616-compatible), optional

**PROFIBUS**
- 12 Mbit/s (isolated, CP 5622-compatible), optional

**Ethernet**
- 2 x 10/100/1000 Mbit/s (RJ45, teaming-capable)

**USB 3.0**
- 1 x front (high current)
- 2 x rear (high current)
- 1 x internal (high current), e.g. for USB dongle

**USB 2.0**
- 1 x front (high current) can be used with door closed
- 2 x rear (high current)

**Serial**
- 9-pin COM1 (V.24)
- 9-pin COM2 (V.24) optional

**Parallel**
- LPT1 (optional)

**VGA**
- Optionally via adapter cable

**DVI-I**
- 1 x

**DisplayPort V1.2**
- 2 x
<table>
<thead>
<tr>
<th><strong>SIMATIC IPC647D</strong></th>
<th><strong>SIMATIC rack PC</strong></th>
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<tbody>
<tr>
<td><strong>Keyboard</strong></td>
<td>PS/2</td>
</tr>
<tr>
<td><strong>Mouse</strong></td>
<td>PS/2</td>
</tr>
<tr>
<td><strong>Audio</strong></td>
<td>1 x Line Out; 1 x Micro</td>
</tr>
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</table>

### Monitoring functions

#### Basic functionality
- Message locally via DiagBase software

#### Temperature
- Overshoot/undershoot of permissible operating temperature range
- Messages can be evaluated by the application program

#### Fan
- Speed monitoring
- 2 x enclosure fans
- 1 x fan power supply

#### Watchdog
- Monitoring of program execution
- Monitoring time can be parameterized in software
- Restart can be parameterized in the event of a fault
- Messages can be evaluated by the application program

#### Monitoring functions via the network

- SIMATIC IPC DiagMonitor (optional)
- Remote monitoring capability for:
  - Watchdog
  - Temperature
  - Fan speed
  - Hard disk monitoring (SMART)
  - System/Ethernet monitoring (heartbeat)
  - Communication:
    - Ethernet interface (SNMP protocol)
    - OPC for integration in SIMATIC software
    - Configuration of client/server architectures
    - Configuration of log files

#### Front LEDs
- POWER (internal power supply unit, PC switched on)
- HDD (access to hard disk)
- ETHERNET1 (Ethernet status, "heartbeat")
- ETHERNET2 (Ethernet status, "heartbeat")
- PROFIBUS/MPI (PROFIBUS status)
- SF PROFINET (PROFINET status)
- WATCHDOG (ready/fault indication)
- TEMP (temperature status)
- FAN (fan speed monitoring)
- HDD0 ALARM 4)
- HDD1 ALARM 4)

### Ambient conditions

<table>
<thead>
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<tr>
<td><strong>Degree of protection</strong></td>
<td>IP41 at the front, IP20 at the rear acc. to EN 60529</td>
</tr>
<tr>
<td><strong>Dust protection</strong></td>
<td>with front door closed: G2 EN 779, 99 % of particles &gt; 0.5 mm are held back</td>
</tr>
<tr>
<td><strong>Protection class</strong></td>
<td>Protection class I according to IEC 61140</td>
</tr>
<tr>
<td><strong>Vibration load during operation</strong></td>
<td>DIN EN 60068-2-6, 10 cycles Internal mounting of the hard disk drives in optional, internal drive cage: • 10 ... 58 Hz: 0.0375 mm; • 58 ... 500 Hz: 5 m/s² (approx. 0.5 g) Note: There are limitations when DVD+/-RW and HDD are operated in a swap frame.</td>
</tr>
<tr>
<td><strong>Shock loading during operation</strong></td>
<td>DIN EN 60068-2-27, IEC 60068-2-29 Internal mounting of the hard disk drives in optional, internal drive cage: • Half-sine: 50 m/s², 30 ms (approx. 5 g), 100 shocks per axis Note: There are limitations when DVD+/-RW and HDD are operated in a swap frame.</td>
</tr>
</tbody>
</table>

### Electromagnetic compatibility (EMC)

#### Emitted interference (AC)
- EN 61000-6-3, FCC class A
- EN 61000-6-4, CISPR 22, EN 55022 class B
- EN 61000-3-2 class D; EN 61000-3-3

#### Immunity to conducted interference on the supply lines
- ± 2 kV (IEC 61000-4-4, burst)
- ± 1 kV (IEC 61000-4-5, symm. surge)
- ± 2 kV (IEC 61000-4-5, asymm. surge)

#### Noise immunity on signal lines
- ± 1 kV (IEC 61000-4-4, burst, length < 30 m)
- ± 2 kV (IEC 61000-4-4, symm. surge, length > 30 m)
- ± 2 kV (IEC 61000-4-5, asymm. surge, length > 30 m)

#### Immunity to static discharge
- ± 6 kV, contact discharge (IEC 61000-4-2)
- ± 8 kV, air discharge (IEC 61000-4-2)

#### Immunity to high radio frequency interference
| 10 V/m, 80-1000 MHz and 1.4 - 2 GHz, 80% AM (acc. to IEC 61000-4-3) | 3 V/m 2 - 2.7 GHz, 80% AM (acc. to IEC 61000-4-3) |
| 10 V, 10 KHz-80 MHz, 80% AM (acc. to IEC 61000-4-8) |

#### Immunity to magnetic fields
- 100 A/m, 50/60 Hz (IEC 61000-4-8)

#### Ambient temperature during operation
- 5 ... 50 °C
- Note: Limitations for operation of DVD+/-RW

#### Humidity during operation
- 5 ... 85 % at 30 °C (no condensation)
1) Memory information: In order to use a memory with more than 4 GB, a 64-bit operating system is required. In the case of configurations with at least 4 GB, the visible memory can be reduced to about 3.5 GB or less (with 32-bit operating systems).

2) Available soon. Suitable for specific LINUX versions in accordance with the specifications of the Siemens manufacturer declaration “Suitable for LINUX” (LINUX is a trademark of Linus Torvald).

3) SATA RAID controller onboard in Intel chipset

4) Hard disk alarm in conjunction with RAID and monitoring software

**Note regarding SIMATIC PC operating system licenses**

The accompanying operating system license is only valid for installation on the respective supplied SIMATIC IPC. Installation can only be performed on these SIMATIC systems in accordance with Microsoft OEM licensing regulations.

**SIMATIC IPC – the more Industrial PC**

More information on SIMATIC IPC is available at: [www.siemens.com/simatic-ipc](http://www.siemens.com/simatic-ipc)

A current overview of the configurations is provided by the SIMATIC IPC Online-Konfigurator: [www.siemens.com/ipc-configurator](http://www.siemens.com/ipc-configurator)

In-depth information is available in the SIMATIC manuals: [www.siemens.com/simatic-doku](http://www.siemens.com/simatic-doku)

Information material for download: [www.siemens.com/simatic/printmaterial](http://www.siemens.com/simatic/printmaterial)

Technical documentation is available in our Service& Support portal: [www.siemens.com/automation/support](http://www.siemens.com/automation/support)

Your personal contact partner is listed at: [www.siemens.com/automation/partner](http://www.siemens.com/automation/partner)

Electronic ordering via the Internet with the Mall: [www.siemens.com/industrymall](http://www.siemens.com/industrymall)

Additional information on PC-based Automation with SIMATIC is available under: [www.siemens.com/pc-based-automation](http://www.siemens.com/pc-based-automation)

Additional information on the TIA Portal: [www.siemens.com/tia-portal](http://www.siemens.com/tia-portal)

Additional information on SIMATIC Safety Integrated: [www.siemens.com/f-cpu](http://www.siemens.com/f-cpu)