# SIEMENS

**Data sheet**                                                    **6ES7417-4XT05-0AB0**



Figure similar

********** Replacement part ********** SIMATIC S7-400, CPU 417-4 Central processing unit with: work memory 30 MB, (15 MB code; 15 MB data) 1st interface MPI 12 Mbit/s; 2nd interface PROFIBUS DP, 3rd/4th interface plug-in IFM module

| General information | |
|---|---|
| Product type designation | CPU 417-4 |
| HW functional status | 04 |
| Firmware version | V5.3 |
| Product function | |
| ● Isochronous mode | Yes; For PROFIBUS only |
| Engineering with | |
| ● Programming package | STEP 7 V5.3 SP2 or higher with HW update |
| **CiR - Configuration in RUN** | |
| CiR synchronization time, basic load | 60 ms |
| CiR synchronization time, time per I/O byte | 7 µs |
| **Supply voltage** | |
| Rated value (DC) | Power supply via system power supply |
| **Input current** | |
| from backplane bus 5 V DC, typ. | 1.5 A |
| from backplane bus 5 V DC, max. | 1.8 A |
| from backplane bus 24 V DC, max. | 600 mA; 150 mA per DP interface |
| from interface 5 V DC, max. | 90 mA; At each DP interface |
| **Power loss** | |
| Power loss, typ. | 7.5 W |
| Power loss, max. | 8 W |
| **Memory** | |
| Type of memory | RAM |
| Work memory | |
| ● integrated | 30 Mbyte |
| ● integrated (for program) | 15 Mbyte |
| ● integrated (for data) | 15 Mbyte |
| ● expandable | No |
| Load memory | |
| ● expandable FEPROM | Yes; with Memory Card (FLASH) |
| ● expandable FEPROM, max. | 64 Mbyte |
| ● integrated RAM, max. | 1 Mbyte |
| ● expandable RAM | Yes; with Memory Card (RAM) |
| ● expandable RAM, max. | 64 Mbyte |
| Backup | |
| ● present | Yes |
| ● with battery | Yes; all data |
| ● without battery | No |

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| Battery | |
|---|---|
| **Backup battery** | |
| ● Backup current, typ. | 225 µA; up to 40 °C |
| ● Backup current, max. | 750 µA |
| ● Backup time, max. | See reference manual, module data, Chapter 3.3 |
| ● Feeding of external backup voltage to CPU | 5 V DC to 15 V DC |

| CPU processing times | |
|---|---|
| for bit operations, typ. | 18 ns |
| for word operations, typ. | 18 ns |
| for fixed point arithmetic, typ. | 18 ns |
| for floating point arithmetic, typ. | 54 ns |

| CPU-blocks | |
|---|---|
| **DB** | |
| ● Number, max. | 16 000; Number range: 1 to 16000 |
| ● Size, max. | 64 kbyte |
| **FB** | |
| ● Number, max. | 8 000; Number range: 0 to 7999 |
| ● Size, max. | 64 kbyte |
| **FC** | |
| ● Number, max. | 8 000; Number range: 0 to 7999 |
| ● Size, max. | 64 kbyte |
| **OB** | |
| ● Number, max. | see instruction list |
| ● Size, max. | 64 kbyte |
| ● Number of free cycle OBs | 1; OB 1 |
| ● Number of time alarm OBs | 8; OB 10-17 |
| ● Number of delay alarm OBs | 4; OB 20-23 |
| ● Number of cyclic interrupt OBs | 9; OB 30-38 (shortest cycle that can be set = 500 µs) |
| ● Number of process alarm OBs | 8; OB 40-47 |
| ● Number of DPV1 alarm OBs | 3; OB 55-57 |
| ● Number of isochronous mode OBs | 4; OB 61-64 |
| ● Number of multicomputing OBs | 1; OB 60 |
| ● Number of background OBs | 1; OB 90 |
| ● Number of startup OBs | 3; OB 100-102 |
| ● Number of asynchronous error OBs | 9; OB 80-88 |
| ● Number of synchronous error OBs | 2; OB 121, 122 |
| **Nesting depth** | |
| ● per priority class | 24 |
| ● additional within an error OB | 2 |

| Counters, timers and their retentivity | |
|---|---|
| **S7 counter** | |
| ● Number | 2 048 |
| Retentivity | |
| — adjustable | Yes |
| — lower limit | 0 |
| — upper limit | 2 047 |
| — preset | Z 0 to Z 7 |
| Counting range | |
| — lower limit | 0 |
| — upper limit | 999 |
| **IEC counter** | |
| ● present | Yes |
| ● Type | SFB |
| ● Number | Unlimited (limited only by RAM capacity) |
| **S7 times** | |
| ● Number | 2 048 |
| Retentivity | |
| — adjustable | Yes |
| — lower limit | 0 |

| | |
|---|---|
| — upper limit | 2 047 |
| — preset | No times retentive |
| **Time range** | |
| — lower limit | 10 ms |
| — upper limit | 9 990 s |
| **IEC timer** | |
| ● present | Yes |
| ● Type | SFB |
| ● Number | Unlimited (limited only by RAM capacity) |
| **Data areas and their retentivity** | |
| Retentive data area (incl. timers, counters, flags), max. | Total working and load memory (with backup battery) |
| **Flag** | |
| ● Size, max. | 16 kbyte; Size of bit memory address area |
| ● Retentivity available | Yes |
| ● Retentivity preset | MB 0 to MB 15 |
| ● Number of clock memories | 8; in 1 memory byte |
| **Local data** | |
| ● adjustable, max. | 64 kbyte |
| ● preset | 32 kbyte |
| **Address area** | |
| **I/O address area** | |
| ● Inputs | 16 kbyte |
| ● Outputs | 16 kbyte |
| **Process image** | |
| ● Inputs, adjustable | 16 kbyte |
| ● Outputs, adjustable | 16 kbyte |
| ● Inputs, default | 1 024 byte |
| ● Outputs, default | 1 024 byte |
| ● consistent data, max. | 244 byte |
| ● Access to consistent data in process image | Yes |
| **Subprocess images** | |
| ● Number of subprocess images, max. | 15 |
| **Digital channels** | |
| ● Inputs | 131 072 |
| — of which central | 131 072 |
| ● Outputs | 131 072 |
| — of which central | 131 072 |
| **Analog channels** | |
| ● Inputs | 8 192 |
| — of which central | 8 192 |
| ● Outputs | 8 192 |
| — of which central | 8 192 |
| **Hardware configuration** | |
| Integrated power supply | No |
| Number of expansion units, max. | 21 |
| connectable OPs | 63 |
| Multicomputing | Yes; 4 CPUs max. (with UR1 or UR2) |
| **Interface modules** | |
| ● Number of connectable IMs (total), max. | 6 |
| ● Number of connectable IM 460s, max. | 6 |
| ● Number of connectable IM 463s, max. | 4; IM 463-2 |
| **Number of DP masters** | |
| ● integrated | 2 |
| ● via CP | 10; CP 443-5 Extended |
| ● via IM 467 | 4 |
| ● Mixed mode IM + CP permitted | No; IM 467 not suitable for use with CP 443-5 Ext. and CP 443-1 EX4x, EX20, GX20 (in PROFINET IO mode) |
| ● via interface module | 2 |
| ● Number of pluggable S5 modules (via adapter capsule in central device), max. | 6 |

| | |
|---|---|
| **Number of IO Controllers** | |
| ● integrated | 0 |
| ● via CP | 4; No mixed operation of CP443-1 EX40 and CP443-1 EX 41/EX20/GX20, max. 4 in central controller |
| **Number of operable FMs and CPs (recommended)** | |
| ● FM | Limited by number of slots and number of connections |
| ● CP, PtP | CP 440: Limited by number of slots; CP 441: limited by number of connections |
| ● PROFIBUS and Ethernet CPs | 14; Of which 10 CPs max. or IMs as DP master, 4 PROFINET controller maximum |
| **Slots** | |
| ● required slots | 2 |
| **Time of day** | |
| **Clock** | |
| ● Hardware clock (real-time) | Yes |
| ● retentive and synchronizable | Yes |
| ● Resolution | 1 ms |
| ● Deviation per day (buffered), max. | 1.7 s; Power off |
| ● Deviation per day (unbuffered), max. | 8.6 s; For power On |
| **Operating hours counter** | |
| ● Number | 16 |
| ● Number/Number range | 0 to 15 |
| ● Range of values | SFCs 2, 3 and 4: 0 to 32767 hours SFC 101: 0 to 2^31 - 1 hours |
| ● Granularity | 1 h |
| ● retentive | Yes |
| **Clock synchronization** | |
| ● supported | Yes |
| ● to MPI, master | Yes |
| ● to MPI, slave | Yes |
| ● to DP, master | Yes |
| ● to DP, slave | Yes |
| ● in AS, master | Yes |
| ● in AS, slave | Yes |
| ● on Ethernet via NTP | No; Via CP |
| ● to IF 964 DP | Yes |
| **Time difference in system when synchronizing via** | |
| ● MPI, max. | 200 ms |
| **Interfaces** | |
| Interfaces/bus type | 1 x MPI/PROFIBUS DP, 1 x PROFIBUS DP, 2 x PROFIBUS DP (optionally pluggable) |
| Number of RS 485 interfaces | 2 |
| Number of other interfaces | 0 |
| Optical interface | No |
| **1. Interface** | |
| Interface type | MPI/PROFIBUS DP |
| Isolated | Yes |
| **Interface types** | |
| ● RS 485 | Yes |
| ● Output current of the interface, max. | 150 mA |
| **Protocols** | |
| ● MPI | Yes |
| ● PROFIBUS DP master | Yes |
| ● PROFIBUS DP slave | Yes |
| **MPI** | |
| ● Number of connections | 44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 |
| ● Transmission rate, max. | 12 Mbit/s |
| **Services** | |
| — PG/OP communication | Yes |
| — Routing | Yes |
| — Global data communication | Yes |

| | |
|---|---|
| — S7 basic communication | Yes |
| — S7 communication | Yes |
| — S7 communication, as client | Yes |
| — S7 communication, as server | Yes |
| **PROFIBUS DP master** | |
| ● Number of connections, max. | 32; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 |
| ● Transmission rate, max. | 12 Mbit/s |
| ● Number of DP slaves, max. | 32 |
| Services | |
| — PG/OP communication | Yes |
| — Routing | Yes |
| — Global data communication | No |
| — S7 basic communication | Yes |
| — S7 communication | Yes |
| — S7 communication, as client | Yes |
| — S7 communication, as server | Yes |
| — Equidistance | Yes |
| — Isochronous mode | Yes |
| — SYNC/FREEZE | Yes |
| — Activation/deactivation of DP slaves | Yes |
| — Direct data exchange (slave-to-slave communication) | Yes |
| — DPV1 | Yes |
| Address area | |
| — Inputs, max. | 2 kbyte |
| — Outputs, max. | 2 kbyte |
| User data per DP slave | |
| — User data per DP slave, max. | 244 byte |
| — Inputs, max. | 244 byte |
| — Outputs, max. | 244 byte |
| — Slots, max. | 244 |
| — per slot, max. | 128 byte |
| **PROFIBUS DP slave** | |
| ● Number of connections | 32 |
| ● GSD file | http://support.automation.siemens.com/WW/view/en/113652 |
| ● Transmission rate, max. | 12 Mbit/s |
| ● automatic baud rate search | No |
| ● Address area, max. | 32; Virtual slots |
| ● User data per address area, max. | 32 byte |
| — of which consistent, max. | 32 byte |
| Services | |
| — PG/OP communication | Yes; with interface active |
| — Routing | Yes; with interface active |
| — Global data communication | No |
| — S7 basic communication | No |
| — S7 communication | Yes |
| — S7 communication, as client | Yes |
| — S7 communication, as server | Yes |
| — Direct data exchange (slave-to-slave communication) | No |
| — DPV1 | No |
| Transfer memory | |
| — Inputs | 244 byte |
| — Outputs | 244 byte |
| **2. Interface** | |
| Interface type | PROFIBUS DP |
| Isolated | Yes |
| Number of connection resources | 32 |
| Interface types | |
| ● RS 485 | Yes |

| | |
|---|---|
| ● Output current of the interface, max. | 150 mA |
| **Protocols** | |
| ● PROFIBUS DP master | Yes |
| ● PROFIBUS DP slave | Yes |
| **PROFIBUS DP master** | |
| ● Number of connections, max. | 32 |
| ● Transmission rate, max. | 12 Mbit/s |
| ● Number of DP slaves, max. | 125 |
| **Services** | |
| — PG/OP communication | Yes |
| — Routing | Yes |
| — Global data communication | No |
| — S7 basic communication | Yes |
| — S7 communication | Yes |
| — S7 communication, as client | Yes |
| — S7 communication, as server | Yes |
| — Equidistance | Yes |
| — Isochronous mode | Yes |
| — SYNC/FREEZE | Yes |
| — Activation/deactivation of DP slaves | Yes |
| — Direct data exchange (slave-to-slave communication) | Yes |
| — DPV1 | Yes |
| **Address area** | |
| — Inputs, max. | 8 kbyte |
| — Outputs, max. | 8 kbyte |
| **User data per DP slave** | |
| — User data per DP slave, max. | 244 byte |
| — Inputs, max. | 244 byte |
| — Outputs, max. | 244 byte |
| — Slots, max. | 244 |
| — per slot, max. | 128 byte |
| **PROFIBUS DP slave** | |
| ● Number of connections | 32 |
| ● GSD file | http://support.automation.siemens.com/WW/view/en/113652 |
| ● Transmission rate, max. | 12 Mbit/s |
| ● Address area, max. | 32 |
| ● User data per address area, max. | 32 byte |
| — of which consistent, max. | 32 byte |
| **Services** | |
| — Routing | Yes |
| **Transfer memory** | |
| — Inputs | 244 byte |
| — Outputs | 244 byte |
| **3. Interface** | |
| Interface type | pluggable interface module (IF), technical data as for 2nd interface |
| Plug-in interface modules | IF 964-DP (MLFB: 6ES7964-2AA04-0AB0) |
| Isolated | Yes |
| automatic detection of transmission rate | No |
| Number of connection resources | 32 |
| **Interface types** | |
| ● RS 485 | Yes |
| ● Output current of the interface, max. | 150 mA |
| **Protocols** | |
| ● MPI | No |
| ● PROFIBUS DP master | Yes |
| ● PROFIBUS DP slave | Yes |
| **PROFIBUS DP master** | |
| ● Number of connections, max. | 32 |
| ● Transmission rate, max. | 12 Mbit/s |

| | |
|---|---|
| ● Number of DP slaves, max. | 125 |
| **Services** | |
| — PG/OP communication | Yes |
| — Routing | Yes; S7 routing |
| — Global data communication | No |
| — S7 basic communication | No |
| — S7 communication | Yes |
| — S7 communication, as client | Yes |
| — S7 communication, as server | Yes |
| — Equidistance | Yes |
| — Isochronous mode | Yes |
| — SYNC/FREEZE | Yes |
| — Activation/deactivation of DP slaves | Yes |
| — Direct data exchange (slave-to-slave communication) | Yes |
| — DPV0 | Yes |
| — DPV1 | Yes |
| **Address area** | |
| — Inputs, max. | 8 kbyte |
| — Outputs, max. | 8 kbyte |
| **User data per DP slave** | |
| — User data per DP slave, max. | 244 byte |
| — Inputs, max. | 244 byte |
| — Outputs, max. | 244 byte |
| — Slots, max. | 244 |
| — per slot, max. | 128 byte |
| **PROFIBUS DP slave** | |
| ● Number of connections | 32 |
| ● GSD file | http://support.automation.siemens.com/WW/view/en/113652 |
| ● Transmission rate, max. | 12 Mbit/s |
| ● automatic baud rate search | No |
| ● Address area, max. | 32 |
| ● User data per address area, max. | 32 byte |
| — of which consistent, max. | 32 byte |
| **Services** | |
| — PG/OP communication | Yes |
| — Routing | Yes; with interface active |
| — Global data communication | No |
| — S7 basic communication | No |
| — S7 communication | Yes |
| — S7 communication, as client | Yes |
| — S7 communication, as server | Yes |
| — Direct data exchange (slave-to-slave communication) | No |
| — DPV1 | No |
| **Transfer memory** | |
| — Inputs | 244 byte |
| — Outputs | 244 byte |
| **4. Interface** | |
| Interface type | pluggable interface module (IF), technical data as for 2nd interface |
| Plug-in interface modules | IF 964-DP (MLFB: 6ES7964-2AA04-0AB0) |
| **Protocols** | |
| **SIMATIC communication** | |
| ● S7 routing | Yes |
| **Open IE communication** | |
| ● ISO-on-TCP (RFC1006) | Via CP 443-1 and loadable FB |
| — Data length, max. | 1 452 bytes via CP 443-1 Adv. |
| **Web server** | |
| ● supported | No |
| **Isochronous mode** | |

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| | |
|---|---|
| Equidistance | Yes |
| Number of DP masters with isochronous mode | 4 |
| User data per isochronous slave, max. | 244 byte |
| shortest clock pulse | 1 ms; 0.5 ms without use of SFC 126, 127 |
| max. cycle | 32 ms |
| **communication functions / header** | |
| PG/OP communication | Yes |
| ● Number of connectable OPs without message processing | 63 |
| ● Number of connectable OPs with message processing | 63; When using alarm_S and alarm_D |
| Data record routing | Yes |
| Global data communication | |
| ● supported | Yes |
| ● Number of GD loops, max. | 16 |
| ● Number of GD packets, transmitter, max. | 16 |
| ● Number of GD packets, receiver, max. | 32 |
| ● Size of GD packets, max. | 54 byte |
| ● Size of GD packet (of which consistent), max. | 1 variable |
| S7 basic communication | |
| ● supported | Yes |
| ● User data per job, max. | 76 byte |
| ● User data per job (of which consistent), max. | 1 variable |
| S7 communication | |
| ● supported | Yes |
| ● as server | Yes |
| ● as client | Yes |
| ● User data per job, max. | 64 kbyte |
| ● User data per job (of which consistent), max. | 462 byte; 1 variable |
| S5 compatible communication | |
| ● supported | Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5 |
| ● User data per job, max. | 8 kbyte |
| ● User data per job (of which consistent), max. | 240 byte |
| ● Number of simultaneous AG-SEND/AG-RECV orders per CPU, max. | 64/64 |
| Standard communication (FMS) | |
| ● supported | Yes; Via CP and loadable FB |
| Number of connections | |
| ● overall | 64 |
| ● usable for PG communication | |
| — reserved for PG communication | 1 |
| — adjustable for PG communication, max. | 0 |
| ● usable for OP communication | |
| — reserved for OP communication | 1 |
| — adjustable for OP communication, max. | 0 |
| ● usable for S7 basic communication | |
| — reserved for S7 basic communication | 0 |
| — adjustable for S7 basic communication, max. | 0 |
| ● usable for S7 communication | |
| — reserved for S7 communication | 0 |
| — adjustable for S7 communication, max. | 0 |
| ● usable for routing | |
| — reserved for routing | 0 |
| — adjustable for routing, max. | 0 |
| **S7 message functions** | |
| Number of login stations for message functions, max. | 63; Max. 63 with ALARM_S and ALARM_D (OPs); max. 12 with ALARM_8 and ALARM_P (e.g. WinCC) |
| Symbol-related messages | Yes |
| SCAN procedure | Yes |
| Program alarms | Yes |
| Process diagnostic messages | Yes |

| | |
|---|---|
| simultaneously active Alarm-S blocks, max. | 1 000; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks |
| Alarm 8-blocks | Yes |
| ● Number of instances for alarm 8 and S7 communication blocks, max. | 10 000 |
| ● preset, max. | 1 200 |
| Process control messages | Yes |
| Number of archives that can log on simultaneously (SFB 37 AR_SEND) | 64 |
| **Number of messages** | |
| ● overall, max. | 1 024 |
| ● in 100 ms grid, max. | 128 |
| ● in 500 ms grid, max. | 512 |
| ● in 1000 ms grid, max. | 1 024 |
| **Number of additional values** | |
| ● with 100 ms grid, max. | 1 |
| ● with 500, 1000 ms grid, max. | 10 |
| **Test commissioning functions** | |
| Status block | Yes; Up to 2 simultaneously |
| Single step | Yes |
| Number of breakpoints | 4 |
| **Status/control** | |
| ● Status/control variable | Yes; Up to 16 variable tables |
| ● Variables | Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters |
| ● Number of variables, max. | 70; Status/control |
| **Forcing** | |
| ● Forcing | Yes |
| ● Forcing, variables | Inputs, outputs, bit memories, peripheral inputs, peripheral outputs |
| ● Number of variables, max. | 512 |
| **Diagnostic buffer** | |
| ● present | Yes |
| ● Number of entries, max. | 3 200 |
| — adjustable | Yes |
| — preset | 120 |
| **EMC** | |
| Emission of radio interference acc. to EN 55 011 | |
| ● Limit class A, for use in industrial areas | Yes |
| ● Limit class B, for use in residential areas | No |
| **configuration / header** | |
| **Configuration software** | |
| ● STEP 7 | Yes |
| **configuration / programming / header** | |
| ● Command set | see instruction list |
| ● Nesting levels | 7 |
| ● Access to consistent data in process image | Yes |
| ● System functions (SFC) | see instruction list |
| ● System function blocks (SFB) | see instruction list |
| Programming language | |
| — LAD | Yes |
| — FBD | Yes |
| — STL | Yes |
| — SCL | Yes |
| — CFC | Yes |
| — GRAPH | Yes |
| — HiGraph® | Yes |
| **configuration / programming / number of simultaneously active SFC / header** | |
| — DPSYC_FR | 2 |
| — D_ACT_DP | 8 |
| — RD_REC | 8 |
| — WR_REC | 8 |
| — WR_PARM | 8 |

| | |
|---|---|
| — PARM_MOD | 1 |
| — WR_DPARM | 2 |
| — DPNRM_DG | 8 |
| — RDSYSST | 8 |
| — DP_TOPOL | 1 |
| configuration / programming / number of simultaneously active SFB / header | |
| — RDREC | 8 |
| — WRREC | 8 |
| **Know-how protection** | |
| ● User program protection/password protection | Yes |
| **Dimensions** | |
| Width | 50 mm |
| Height | 290 mm |
| Depth | 219 mm |
| **Weights** | |
| Weight, approx. | 0.9 kg |

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