



SIMATIC S7-1500H, CPU 1517H-3 PN, central processing unit with 2 MB work memory for program and 8 MB for data, 1st interface: PROFINET RT with 2-port switch, 2nd interface: PROFINET, 3rd/4th interface: H-SYNC, SIMATIC Memory Card required

| General information                                      |                                                 |
|----------------------------------------------------------|-------------------------------------------------|
| Product type designation                                 | CPU 1517H-3 PN                                  |
| HW functional status                                     | FS05                                            |
| Firmware version                                         | V2.9                                            |
| Product function                                         |                                                 |
| • I&M data                                               | Yes; I&M0 to I&M3                               |
| • Isochronous mode                                       | No                                              |
| Engineering with                                         |                                                 |
| • STEP 7 TIA Portal configurable/integrated from version | V17 (FW V2.9) / V16 (FW V2.8) / V15.1 (FW V2.6) |
| Display                                                  |                                                 |
| Screen diagonal [cm]                                     | 6.1 cm                                          |
| Control elements                                         |                                                 |
| Number of keys                                           | 6                                               |
| Mode selector switch                                     | 1                                               |
| Supply voltage                                           |                                                 |
| Rated value (DC)                                         | 24 V                                            |
| permissible range, lower limit (DC)                      | 19.2 V                                          |
| permissible range, upper limit (DC)                      | 28.8 V                                          |
| Reverse polarity protection                              | Yes                                             |
| Mains buffering                                          |                                                 |
| • Mains/voltage failure stored energy time               | 5 ms                                            |
| Input current                                            |                                                 |
| Current consumption (rated value)                        | 1.5 A                                           |
| Inrush current, max.                                     | 2.4 A; Rated value                              |
| $I^2t$                                                   | 0.02 A <sup>2</sup> ·s                          |
| Power loss                                               |                                                 |
| Power loss, typ.                                         | 24 W                                            |
| Memory                                                   |                                                 |
| Number of slots for SIMATIC memory card                  | 1                                               |
| SIMATIC memory card required                             | Yes                                             |
| Work memory                                              |                                                 |
| • integrated (for program)                               | 2 Mbyte                                         |
| • integrated (for data)                                  | 8 Mbyte                                         |
| Load memory                                              |                                                 |
| • Plug-in (SIMATIC Memory Card), max.                    | 32 Gbyte                                        |
| Backup                                                   |                                                 |
| • maintenance-free                                       | Yes                                             |
| CPU processing times                                     |                                                 |

|                                                           |                                                                             |
|-----------------------------------------------------------|-----------------------------------------------------------------------------|
| for bit operations, typ.                                  | 4 ns                                                                        |
| for word operations, typ.                                 | 6 ns                                                                        |
| for fixed point arithmetic, typ.                          | 6 ns                                                                        |
| for floating point arithmetic, typ.                       | 24 ns                                                                       |
| <b>CPU-blocks</b>                                         |                                                                             |
| Number of elements (total)                                | 12 000; Blocks (OB, FB, FC, DB) and UDTs                                    |
| <b>DB</b>                                                 |                                                                             |
| • Number range                                            | Number range: 1 to 59 999                                                   |
| • Size, max.                                              | 8 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB |
| <b>FB</b>                                                 |                                                                             |
| • Number range                                            | 0 ... 65 535                                                                |
| • Size, max.                                              | 1 Mbyte                                                                     |
| <b>FC</b>                                                 |                                                                             |
| • Number range                                            | 0 ... 65 535                                                                |
| • Size, max.                                              | 1 Mbyte                                                                     |
| <b>OB</b>                                                 |                                                                             |
| • Size, max.                                              | 1 Mbyte                                                                     |
| • Number of free cycle OBs                                | 100                                                                         |
| • Number of time alarm OBs                                | 20                                                                          |
| • Number of delay alarm OBs                               | 20                                                                          |
| • Number of cyclic interrupt OBs                          | 20                                                                          |
| • Number of process alarm OBs                             | 50                                                                          |
| • Number of startup OBs                                   | 100                                                                         |
| • Number of asynchronous error OBs                        | 4                                                                           |
| • Number of synchronous error OBs                         | 2                                                                           |
| • Number of diagnostic alarm OBs                          | 1                                                                           |
| <b>Nesting depth</b>                                      |                                                                             |
| • per priority class                                      | 24                                                                          |
| <b>Counters, timers and their retentivity</b>             |                                                                             |
| <b>S7 counter</b>                                         |                                                                             |
| • Number                                                  | 2 048                                                                       |
| <b>Retentivity</b>                                        |                                                                             |
| — adjustable                                              | Yes                                                                         |
| <b>IEC counter</b>                                        |                                                                             |
| • Number                                                  | Any (only limited by the main memory)                                       |
| <b>Retentivity</b>                                        |                                                                             |
| — adjustable                                              | Yes                                                                         |
| <b>S7 times</b>                                           |                                                                             |
| • Number                                                  | 2 048                                                                       |
| <b>Retentivity</b>                                        |                                                                             |
| — adjustable                                              | Yes                                                                         |
| <b>IEC timer</b>                                          |                                                                             |
| • Number                                                  | Any (only limited by the main memory)                                       |
| <b>Retentivity</b>                                        |                                                                             |
| — adjustable                                              | Yes                                                                         |
| <b>Data areas and their retentivity</b>                   |                                                                             |
| Retentive data area (incl. timers, counters, flags), max. | 768 kbyte                                                                   |
| <b>Flag</b>                                               |                                                                             |
| • Size, max.                                              | 16 kbyte                                                                    |
| • Number of clock memories                                | 8; 8 clock memory bit, grouped into one clock memory byte                   |
| <b>Data blocks</b>                                        |                                                                             |
| • Retentivity adjustable                                  | Yes                                                                         |
| • Retentivity preset                                      | No                                                                          |
| <b>Local data</b>                                         |                                                                             |
| • per priority class, max.                                | 64 kbyte; max. 16 KB per block                                              |
| <b>Address area</b>                                       |                                                                             |
| Number of IO modules                                      | 8 192; max. number of modules / submodules                                  |
| <b>I/O address area</b>                                   |                                                                             |
| • Inputs                                                  | 32 kbyte; All inputs are in the process image                               |

|                                          |                                                |
|------------------------------------------|------------------------------------------------|
| • Outputs                                | 32 kbyte; All outputs are in the process image |
| per integrated IO subsystem              |                                                |
| — Inputs (volume)                        | 16 kbyte                                       |
| — Outputs (volume)                       | 16 kbyte                                       |
| Subprocess images                        |                                                |
| • Number of subprocess images, max.      | 32                                             |
| <b>Hardware configuration</b>            |                                                |
| Number of distributed IO systems         | 1                                              |
| Number of IO Controllers                 |                                                |
| • integrated                             | 1                                              |
| <b>Time of day</b>                       |                                                |
| Clock                                    |                                                |
| • Type                                   | Hardware clock                                 |
| • Backup time                            | 6 wk; At 40 °C ambient temperature, typically  |
| • Deviation per day, max.                | 10 s; Typ.: 2 s                                |
| Operating hours counter                  |                                                |
| • Number                                 | 16                                             |
| Clock synchronization                    |                                                |
| • supported                              | Yes                                            |
| • on Ethernet via NTP                    | Yes                                            |
| <b>Interfaces</b>                        |                                                |
| Number of PROFINET interfaces            | 2                                              |
| <b>1. Interface</b>                      |                                                |
| Interface types                          |                                                |
| • RJ 45 (Ethernet)                       | Yes; X1                                        |
| • Number of ports                        | 2                                              |
| • integrated switch                      | Yes                                            |
| Protocols                                |                                                |
| • IP protocol                            | Yes; IPv4                                      |
| • PROFINET IO Controller                 | Yes                                            |
| • PROFINET IO Device                     | No                                             |
| • SIMATIC communication                  | Yes; Only Server                               |
| • Open IE communication                  | Yes                                            |
| • Web server                             | No                                             |
| • Media redundancy                       | Yes                                            |
| PROFINET IO Controller                   |                                                |
| Services                                 |                                                |
| — PG/OP communication                    | Yes                                            |
| — Isochronous mode                       | No                                             |
| — IRT                                    | No                                             |
| — PROFIenergy                            | Yes                                            |
| — Number of connectable IO Devices, max. | 256                                            |
| Update time for RT                       |                                                |
| — for send cycle of 1 ms                 | 1 ms to 512 ms                                 |
| <b>2. Interface</b>                      |                                                |
| Interface types                          |                                                |
| • RJ 45 (Ethernet)                       | Yes; X2                                        |
| • Number of ports                        | 1                                              |
| • integrated switch                      | No                                             |
| Protocols                                |                                                |
| • IP protocol                            | Yes; IPv4                                      |
| • PROFINET IO Controller                 | No                                             |
| • PROFINET IO Device                     | No                                             |
| • SIMATIC communication                  | Yes; Only Server                               |
| • Open IE communication                  | Yes                                            |
| • Web server                             | No                                             |
| • Media redundancy                       | No                                             |
| <b>3. Interface</b>                      |                                                |
| Interface type                           | Pluggable synchronization submodule (FO)       |

|                                                      |                                                                                       |
|------------------------------------------------------|---------------------------------------------------------------------------------------|
| Plug-in interface modules                            | Synchronization module 6ES7960-1CB00-0AA5 or 6ES7960-1FB00-0AA5                       |
| <b>4. Interface</b>                                  |                                                                                       |
| Interface type                                       | Pluggable synchronization submodule (FO)                                              |
| Plug-in interface modules                            | Synchronization module 6ES7960-1CB00-0AA5 or 6ES7960-1FB00-0AA5                       |
| <b>Interface types</b>                               |                                                                                       |
| <b>RJ 45 (Ethernet)</b>                              |                                                                                       |
| • 100 Mbps                                           | Yes                                                                                   |
| • Autonegotiation                                    | Yes                                                                                   |
| • Autocrossing                                       | Yes                                                                                   |
| • Industrial Ethernet status LED                     | Yes                                                                                   |
| <b>Protocols</b>                                     |                                                                                       |
| PROFIsafe                                            | No                                                                                    |
| <b>Number of connections</b>                         |                                                                                       |
| • Number of connections, max.                        | 288                                                                                   |
| • Number of connections reserved for ES/HMI/web      | 10                                                                                    |
| • Number of S7 routing paths                         | 64                                                                                    |
| <b>Redundancy mode</b>                               |                                                                                       |
| <b>Media redundancy</b>                              |                                                                                       |
| — MRP                                                | Yes; MRP Automanager according to IEC 62439-2 Edition 2.0                             |
| — MRP interconnection, supported                     | Yes; as MRP ring node according to IEC 62439-2 Edition 3.0                            |
| — MRPD                                               | No                                                                                    |
| — Switchover time on line break, typ.                | 200 ms; PROFINET MRP                                                                  |
| — Number of stations in the ring, max.               | 50                                                                                    |
| <b>SIMATIC communication</b>                         |                                                                                       |
| • PG/OP communication                                | Yes; encryption with TLS V1.3 pre-selected                                            |
| • S7 routing                                         | Yes                                                                                   |
| • S7 communication, as server                        | Yes                                                                                   |
| • S7 communication, as client                        | No                                                                                    |
| <b>Open IE communication</b>                         |                                                                                       |
| • TCP/IP                                             | Yes                                                                                   |
| — Data length, max.                                  | 64 kbyte                                                                              |
| — several passive connections per port, supported    | Yes                                                                                   |
| • ISO-on-TCP (RFC1006)                               | Yes                                                                                   |
| — Data length, max.                                  | 64 kbyte                                                                              |
| • UDP                                                | Yes                                                                                   |
| — Data length, max.                                  | 2 kbyte; 1 472 bytes for UDP broadcast                                                |
| — UDP multicast                                      | Yes; 128 multicast circuits (of which max. 5 via X1)                                  |
| • DHCP                                               | No                                                                                    |
| • DNS                                                | Yes                                                                                   |
| • SNMP                                               | Yes                                                                                   |
| • DCP                                                | Yes                                                                                   |
| • LLDP                                               | Yes                                                                                   |
| <b>Web server</b>                                    |                                                                                       |
| • HTTP                                               | No                                                                                    |
| • HTTPS                                              | No                                                                                    |
| <b>OPC UA</b>                                        |                                                                                       |
| • OPC UA Client                                      | No                                                                                    |
| • OPC UA Server                                      | No                                                                                    |
| <b>Further protocols</b>                             |                                                                                       |
| • MODBUS                                             | Yes; MODBUS TCP                                                                       |
| <b>Isochronous mode</b>                              |                                                                                       |
| Equidistance                                         | No                                                                                    |
| <b>S7 message functions</b>                          |                                                                                       |
| Number of login stations for message functions, max. | 64                                                                                    |
| Program alarms                                       | Yes                                                                                   |
| Number of configurable program messages, max.        | 10 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH |

|                                                          |                                                                                                    |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Number of loadable program messages in RUN, max.         | 5 000                                                                                              |
| Number of simultaneously active program alarms           |                                                                                                    |
| • Number of program alarms                               | 2 000                                                                                              |
| • Number of alarms for system diagnostics                | 1 000                                                                                              |
| <b>Test commissioning functions</b>                      |                                                                                                    |
| Joint commission (Team Engineering)                      | No                                                                                                 |
| Status block                                             | Yes; Up to 16 simultaneously                                                                       |
| Single step                                              | No                                                                                                 |
| Number of breakpoints                                    | 20; Breakpoints are only supported in RUN-Solo status                                              |
| <b>Status/control</b>                                    |                                                                                                    |
| • Status/control variable                                | Yes                                                                                                |
| • Variables                                              | Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters                               |
| • Number of variables, max.                              |                                                                                                    |
| — of which status variables, max.                        | 200; per job                                                                                       |
| — of which control variables, max.                       | 200; per job                                                                                       |
| <b>Forcing</b>                                           |                                                                                                    |
| • Forcing                                                | Yes                                                                                                |
| • Forcing, variables                                     | Peripheral inputs/outputs                                                                          |
| • Number of variables, max.                              | 200                                                                                                |
| <b>Diagnostic buffer</b>                                 |                                                                                                    |
| • present                                                | Yes                                                                                                |
| • Number of entries, max.                                | 3 200                                                                                              |
| — of which powerfail-proof                               | 1 000                                                                                              |
| <b>Traces</b>                                            |                                                                                                    |
| • Number of configurable Traces                          | 8                                                                                                  |
| • Memory size per trace, max.                            | 512 kbyte                                                                                          |
| <b>Interrupts/diagnostics/status information</b>         |                                                                                                    |
| <b>Diagnostics indication LED</b>                        |                                                                                                    |
| • RUN/STOP LED                                           | Yes                                                                                                |
| • ERROR LED                                              | Yes                                                                                                |
| • MAINT LED                                              | Yes                                                                                                |
| • Connection display LINK TX/RX                          | Yes                                                                                                |
| <b>Supported technology objects</b>                      |                                                                                                    |
| Motion Control                                           | No                                                                                                 |
| <b>Controller</b>                                        |                                                                                                    |
| • PID_Compact                                            | Yes; Universal PID controller with integrated optimization                                         |
| • PID_3Step                                              | Yes; PID controller with integrated optimization for valves                                        |
| • PID-Temp                                               | Yes; PID controller with integrated optimization for temperature                                   |
| <b>Counting and measuring</b>                            |                                                                                                    |
| • High-speed counter                                     | No                                                                                                 |
| <b>Ambient conditions</b>                                |                                                                                                    |
| <b>Ambient temperature during operation</b>              |                                                                                                    |
| • horizontal installation, min.                          | 0 °C                                                                                               |
| • horizontal installation, max.                          | 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off |
| • vertical installation, min.                            | 0 °C                                                                                               |
| • vertical installation, max.                            | 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off |
| <b>Ambient temperature during storage/transportation</b> |                                                                                                    |
| • min.                                                   | -40 °C                                                                                             |
| • max.                                                   | 70 °C                                                                                              |
| <b>Altitude during operation relating to sea level</b>   |                                                                                                    |
| • Installation altitude above sea level, max.            | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual                             |
| <b>configuration / header</b>                            |                                                                                                    |
| <b>configuration / programming / header</b>              |                                                                                                    |
| <b>Programming language</b>                              |                                                                                                    |
| — LAD                                                    | Yes                                                                                                |
| — FBD                                                    | Yes                                                                                                |
| — STL                                                    | Yes                                                                                                |
| — SCL                                                    | Yes                                                                                                |

|                                                     |                                                                                             |
|-----------------------------------------------------|---------------------------------------------------------------------------------------------|
| — CFC                                               | No                                                                                          |
| — GRAPH                                             | Yes                                                                                         |
| <b>Know-how protection</b>                          |                                                                                             |
| • User program protection/password protection       | Yes                                                                                         |
| • Copy protection                                   | No                                                                                          |
| • Block protection                                  | Yes                                                                                         |
| <b>Access protection</b>                            |                                                                                             |
| • protection of confidential configuration data     | Yes                                                                                         |
| • Password for display                              | Yes                                                                                         |
| • Protection level: Write protection                | Yes                                                                                         |
| • Protection level: Read/write protection           | Yes                                                                                         |
| • Protection level: Complete protection             | Yes                                                                                         |
| <b>programming / cycle time monitoring / header</b> |                                                                                             |
| • lower limit                                       | adjustable minimum cycle time                                                               |
| • upper limit                                       | adjustable maximum cycle time                                                               |
| <b>Dimensions</b>                                   |                                                                                             |
| Width                                               | 210 mm                                                                                      |
| Height                                              | 147 mm                                                                                      |
| Depth                                               | 129 mm                                                                                      |
| <b>Weights</b>                                      |                                                                                             |
| Weight, approx.                                     | 2 119 g; Interface modules: 2x 18 g                                                         |
| <b>last modified:</b>                               | 11/3/2021  |