



SIMATIC S7-1500F, CPU 1516F-3 PN/DP, central processing unit with 1.5 MB work memory for program and 5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 3rd interface: PROFIBUS, 10 ns bit performance, SIMATIC Memory Card required

| General information  |  |
|--|--|
| Product type designation   | CPU 1516F-3 PN/DP  |
| HW functional status   | FS01   |
| Firmware version   | V2.9   |
| Product function   |  |
| <ul style="list-style-type: none"> <li>I&amp;M data</li> </ul>   | Yes; I&M0 to I&M3  |
| <ul style="list-style-type: none"> <li>Isochronous mode</li> </ul>                                       | Yes; Distributed and central; with minimum OB 6x cycle of 375 µs (distributed) and 1 ms (central)          |
| Engineering with   |  |
| <ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul> | V17 (FW V2.9) / V16 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7516-3FN01-0AB0 |
| Configuration control  |  |
| via dataset  | Yes  |
| Display  |  |
| Screen diagonal [cm]   | 6.1 cm   |
| Control elements   |  |
| Number of keys   | 8  |
| Mode buttons   | 2  |
| 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  |  |
| <ul style="list-style-type: none"> <li>Mains/voltage failure stored energy time</li> </ul>               | 5 ms   |
| <ul style="list-style-type: none"> <li>Repeat rate, min.</li> </ul>                                      | 1/s  |
| Input current  |  |
| Current consumption (rated value)  | 0.85 A   |
| Current consumption, max.  | 1.1 A  |
| Inrush current, max.   | 2.4 A; Rated value   |
| I <sup>2</sup> t   | 0.02 A <sup>2</sup> ·s   |
| Power  |  |
| Infeed power to the backplane bus  | 12 W   |
| Power consumption from the backplane bus (balanced)  | 6.7 W  |
| Power loss   |  |
| Power loss, typ.   | 7 W  |
| Memory   |  |
| Number of slots for SIMATIC memory card  | 1  |
| SIMATIC memory card required   | Yes  |
| Work memory  |  |

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| <ul style="list-style-type: none"> <li>integrated (for program)</li> </ul>                   | 1.5 Mbyte   |
| <ul style="list-style-type: none"> <li>integrated (for data)</li> </ul>                      | 5 Mbyte   |
| <b>Load memory</b>   |   |
| <ul style="list-style-type: none"> <li>Plug-in (SIMATIC Memory Card), max.</li> </ul>        | 32 Gbyte  |
| <b>Backup</b>  |   |
| <ul style="list-style-type: none"> <li>maintenance-free</li> </ul>                           | Yes   |
| <b>CPU processing times</b>  |   |
| for bit operations, typ.   | 10 ns   |
| for word operations, typ.  | 12 ns   |
| for fixed point arithmetic, typ.   | 16 ns   |
| for floating point arithmetic, typ.  | 64 ns   |
| <b>CPU-blocks</b>  |   |
| Number of elements (total)   | 8 000; Blocks (OB, FB, FC, DB) and UDTs   |
| <b>DB</b>  |   |
| <ul style="list-style-type: none"> <li>Number range</li> </ul>                               | 1 ... 60 999; subdivided into: number range that can be used by the user: 1 ... 59 999, and number range of DBs created via SFC 86: 60 000 ... 60 999 |
| <ul style="list-style-type: none"> <li>Size, max.</li> </ul>                                 | 5 Mbyte; For DBs with absolute addressing, the max. size is 64 KB   |
| <b>FB</b>  |   |
| <ul style="list-style-type: none"> <li>Number range</li> </ul>                               | 0 ... 65 535  |
| <ul style="list-style-type: none"> <li>Size, max.</li> </ul>                                 | 1 Mbyte   |
| <b>FC</b>  |   |
| <ul style="list-style-type: none"> <li>Number range</li> </ul>                               | 0 ... 65 535  |
| <ul style="list-style-type: none"> <li>Size, max.</li> </ul>                                 | 1 Mbyte   |
| <b>OB</b>  |   |
| <ul style="list-style-type: none"> <li>Size, max.</li> </ul>                                 | 1 Mbyte   |
| <ul style="list-style-type: none"> <li>Number of free cycle OBs</li> </ul>                   | 100   |
| <ul style="list-style-type: none"> <li>Number of time alarm OBs</li> </ul>                   | 20  |
| <ul style="list-style-type: none"> <li>Number of delay alarm OBs</li> </ul>                  | 20  |
| <ul style="list-style-type: none"> <li>Number of cyclic interrupt OBs</li> </ul>             | 20; With minimum OB 3x cycle of 250 µs  |
| <ul style="list-style-type: none"> <li>Number of process alarm OBs</li> </ul>                | 50  |
| <ul style="list-style-type: none"> <li>Number of DPV1 alarm OBs</li> </ul>                   | 3   |
| <ul style="list-style-type: none"> <li>Number of isochronous mode OBs</li> </ul>             | 3   |
| <ul style="list-style-type: none"> <li>Number of technology synchronous alarm OBs</li> </ul> | 2   |
| <ul style="list-style-type: none"> <li>Number of startup OBs</li> </ul>                      | 100   |
| <ul style="list-style-type: none"> <li>Number of asynchronous error OBs</li> </ul>           | 4   |
| <ul style="list-style-type: none"> <li>Number of synchronous error OBs</li> </ul>            | 2   |
| <ul style="list-style-type: none"> <li>Number of diagnostic alarm OBs</li> </ul>             | 1   |
| <b>Nesting depth</b>   |   |
| <ul style="list-style-type: none"> <li>per priority class</li> </ul>                         | 24; Up to 8 possible for F-blocks   |
| <b>Counters, timers and their retentivity</b>  |   |
| <b>S7 counter</b>  |   |
| <ul style="list-style-type: none"> <li>Number</li> </ul>                                     | 2 048   |
| <b>Retentivity</b>   |   |
| — adjustable   | Yes   |
| <b>IEC counter</b>   |   |
| <ul style="list-style-type: none"> <li>Number</li> </ul>                                     | Any (only limited by the main memory)   |
| <b>Retentivity</b>   |   |
| — adjustable   | Yes   |
| <b>S7 times</b>  |   |
| <ul style="list-style-type: none"> <li>Number</li> </ul>                                     | 2 048   |
| <b>Retentivity</b>   |   |
| — adjustable   | Yes   |
| <b>IEC timer</b>   |   |
| <ul style="list-style-type: none"> <li>Number</li> </ul>                                     | 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.                                    | 512 kbyte; In total; available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 472 KB                           |
| Extended retentive data area (incl. timers, counters, flags), max.                           | 5 Mbyte; When using PS 6 0W 24/48/60 V DC HF  |
| <b>Flag</b>  |   |
| <ul style="list-style-type: none"> <li>Size, max.</li> </ul>                                 | 16 kbyte  |


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| <ul style="list-style-type: none"> <li>Number of clock memories</li> </ul>   | 8; 8 clock memory bit, grouped into one clock memory byte   |
| <b>Data blocks</b>   |   |
| <ul style="list-style-type: none"> <li>Retentivity adjustable</li> <li>Retentivity preset</li> </ul>   | Yes<br>No   |
| <b>Local data</b>  |   |
| <ul style="list-style-type: none"> <li>per priority class, max.</li> </ul>   | 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>  |   |
| <ul style="list-style-type: none"> <li>Inputs</li> <li>Outputs</li> </ul>  | 32 kbyte; All inputs are in the process image<br>32 kbyte; All outputs are in the process image   |
| <b>per integrated IO subsystem</b>   |   |
| <ul style="list-style-type: none"> <li>Inputs (volume)</li> <li>Outputs (volume)</li> </ul>  | 8 kbyte<br>8 kbyte  |
| <b>per CM/CP</b>   |   |
| <ul style="list-style-type: none"> <li>Inputs (volume)</li> <li>Outputs (volume)</li> </ul>  | 8 kbyte<br>8 kbyte  |
| <b>Subprocess images</b>   |   |
| <ul style="list-style-type: none"> <li>Number of subprocess images, max.</li> </ul>  | 32  |
| <b>Hardware configuration</b>  |   |
| Number of distributed IO systems   | 64; A distributed I/O system is characterized not only by the integration of distributed I/O via PROFINET or PROFIBUS communication modules, but also by the connection of I/O via AS-i master modules or links (e.g. IE/PB-Link) |
| <b>Number of DP masters</b>  |   |
| <ul style="list-style-type: none"> <li>integrated</li> <li>Via CM</li> </ul>   | 1<br>8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total  |
| <b>Number of IO Controllers</b>  |   |
| <ul style="list-style-type: none"> <li>integrated</li> <li>Via CM</li> </ul>   | 2<br>8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total  |
| <b>Rack</b>  |   |
| <ul style="list-style-type: none"> <li>Modules per rack, max.</li> <li>Number of lines, max.</li> </ul>  | 32; CPU + 31 modules<br>1   |
| <b>PtP CM</b>  |   |
| <ul style="list-style-type: none"> <li>Number of PtP CMs</li> </ul>  | the number of connectable PtP CMs is only limited by the number of available slots  |
| <b>Time of day</b>   |   |
| <b>Clock</b>   |   |
| <ul style="list-style-type: none"> <li>Type</li> <li>Backup time</li> <li>Deviation per day, max.</li> </ul>   | Hardware clock<br>6 wk; At 40 °C ambient temperature, typically<br>10 s; Typ.: 2 s  |
| <b>Operating hours counter</b>   |   |
| <ul style="list-style-type: none"> <li>Number</li> </ul>   | 16  |
| <b>Clock synchronization</b>   |   |
| <ul style="list-style-type: none"> <li>supported</li> <li>to DP, master</li> <li>in AS, master</li> <li>in AS, slave</li> <li>on Ethernet via NTP</li> </ul> | Yes<br>Yes<br>Yes<br>Yes<br>Yes   |
| <b>Interfaces</b>  |   |
| Number of PROFINET interfaces  | 2   |
| Number of PROFIBUS interfaces  | 1   |
| <b>1. Interface</b>  |   |
| <b>Interface types</b>   |   |
| <ul style="list-style-type: none"> <li>RJ 45 (Ethernet)</li> <li>Number of ports</li> <li>integrated switch</li> </ul>                                       | Yes; X1<br>2<br>Yes   |
| <b>Protocols</b>   |   |
| <ul style="list-style-type: none"> <li>IP protocol</li> <li>PROFINET IO Controller</li> <li>PROFINET IO Device</li> <li>SIMATIC communication</li> </ul>     | Yes; IPv4<br>Yes<br>Yes<br>Yes  |

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| <ul style="list-style-type: none"> <li>• Open IE communication</li> <li>• Web server</li> <li>• Media redundancy</li> </ul>   | <p>Yes; Optionally also encrypted</p> <p>Yes</p> <p>Yes; MRP Automanager according to IEC 62439-2 Edition 2.0</p>  |
| <b>PROFINET IO Controller</b>   |  |
| <b>Services</b>   |  |
| <ul style="list-style-type: none"> <li>— PG/OP communication</li> <li>— Isochronous mode</li> <li>— Direct data exchange</li> <li>— IRT</li> <li>— PROFIenergy</li> <li>— Prioritized startup</li> <li>— Number of connectable IO Devices, max.</li> <li>— Of which IO devices with IRT, max.</li> <li>— Number of connectable IO Devices for RT, max.</li> <li>— of which in line, max.</li> <li>— Number of IO Devices that can be simultaneously activated/deactivated, max.</li> <li>— Number of IO Devices per tool, max.</li> <li>— Updating times</li> </ul> | <p>Yes</p> <p>Yes</p> <p>Yes; Requirement: IRT and isochronous mode (MRPD optional)</p> <p>Yes</p> <p>Yes; per user program</p> <p>Yes; Max. 32 PROFINET devices</p> <p>256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET</p> <p>64</p> <p>256</p> <p>256</p> <p>8; in total across all interfaces</p> <p>8</p> <p>The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data</p> |
| <b>Update time for IRT</b>  |  |
| <ul style="list-style-type: none"> <li>— for send cycle of 250 µs</li> <li>— for send cycle of 500 µs</li> <li>— for send cycle of 1 ms</li> <li>— for send cycle of 2 ms</li> <li>— for send cycle of 4 ms</li> <li>— With IRT and parameterization of "odd" send cycles</li> </ul>  | <p>250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 375 µs of the isochronous OB is decisive</p> <p>500 µs to 8 ms</p> <p>1 ms to 16 ms</p> <p>2 ms to 32 ms</p> <p>4 ms to 64 ms</p> <p>Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)</p>  |
| <b>Update time for RT</b>   |  |
| <ul style="list-style-type: none"> <li>— for send cycle of 250 µs</li> <li>— for send cycle of 500 µs</li> <li>— for send cycle of 1 ms</li> <li>— for send cycle of 2 ms</li> <li>— for send cycle of 4 ms</li> </ul>  | <p>250 µs to 128 ms</p> <p>500 µs to 256 ms</p> <p>1 ms to 512 ms</p> <p>2 ms to 512 ms</p> <p>4 ms to 512 ms</p>  |
| <b>PROFINET IO Device</b>   |  |
| <b>Services</b>   |  |
| <ul style="list-style-type: none"> <li>— PG/OP communication</li> <li>— Isochronous mode</li> <li>— IRT</li> <li>— PROFIenergy</li> <li>— Shared device</li> <li>— Number of IO Controllers with shared device, max.</li> <li>— activation/deactivation of I-devices</li> <li>— Asset management record</li> </ul>  | <p>Yes</p> <p>No</p> <p>Yes</p> <p>Yes; per user program</p> <p>Yes</p> <p>4</p> <p>Yes; per user program</p> <p>Yes; per user program</p>   |
| <b>2. Interface</b>   |  |
| <b>Interface types</b>  |  |
| <ul style="list-style-type: none"> <li>• RJ 45 (Ethernet)</li> <li>• Number of ports</li> <li>• integrated switch</li> </ul>  | <p>Yes; X2</p> <p>1</p> <p>No</p>  |
| <b>Protocols</b>  |  |
| <ul style="list-style-type: none"> <li>• IP protocol</li> <li>• PROFINET IO Controller</li> <li>• PROFINET IO Device</li> <li>• SIMATIC communication</li> <li>• Open IE communication</li> <li>• Web server</li> <li>• Media redundancy</li> </ul>   | <p>Yes; IPv4</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes; Optionally also encrypted</p> <p>Yes</p> <p>No</p>   |
| <b>PROFINET IO Controller</b>   |  |
| <b>Services</b>   |  |
| <ul style="list-style-type: none"> <li>— PG/OP communication</li> </ul>   | <p>Yes</p>   |

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| — Isochronous mode  | No   |
| — Direct data exchange  | No   |
| — IRT   | No   |
| — PROFIenergy   | Yes; per user program  |
| — Prioritized startup   | No   |
| — Number of connectable IO Devices, max.                                      | 32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET  |
| — Number of connectable IO Devices for RT, max.                               | 32   |
| — of which in line, max.  | 32   |
| — Number of IO Devices that can be simultaneously activated/deactivated, max. | 8; in total across all interfaces  |
| — Number of IO Devices per tool, max.   | 8  |
| — Updating times  | The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data |
| <b>Update time for RT</b>   |  |
| — for send cycle of 1 ms  | 1 ms to 512 ms   |
| <b>PROFINET IO Device</b>   |  |
| <b>Services</b>   |  |
| — PG/OP communication   | Yes  |
| — Isochronous mode  | No   |
| — IRT   | No   |
| — PROFIenergy   | Yes; per user program  |
| — Prioritized startup   | No   |
| — Shared device   | Yes  |
| — Number of IO Controllers with shared device, max.                           | 4  |
| — activation/deactivation of I-devices  | Yes; per user program  |
| — Asset management record   | Yes; per user program  |
| <b>3. Interface</b>   |  |
| <b>Interface types</b>  |  |
| • RS 485  | Yes; X3  |
| • Number of ports   | 1  |
| <b>Protocols</b>  |  |
| • PROFIBUS DP master  | Yes  |
| • PROFIBUS DP slave   | No   |
| • SIMATIC communication   | Yes  |
| <b>Interface types</b>  |  |
| <b>RJ 45 (Ethernet)</b>   |  |
| • 100 Mbps  | Yes  |
| • Autonegotiation   | Yes  |
| • Autocrossing  | Yes  |
| • Industrial Ethernet status LED  | Yes  |
| <b>RS 485</b>   |  |
| • Transmission rate, max.   | 12 Mbit/s  |
| <b>Protocols</b>  |  |
| PROFIsafe   | Yes; V2.4 / V2.6   |
| <b>Number of connections</b>  |  |
| • Number of connections, max.   | 256; via integrated interfaces of the CPU and connected CPs / CMs  |
| • Number of connections reserved for ES/HMI/web                               | 10   |
| • Number of connections via integrated interfaces                             | 128  |
| • Number of S7 routing paths  | 16   |
| <b>Redundancy mode</b>  |  |
| • H-Sync forwarding   | Yes  |
| <b>Media redundancy</b>   |  |
| — Media redundancy  | Yes; only via 1st interface (X1)   |
| — MRP   | Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client   |
| — MRP interconnection, supported  | Yes; as MRP ring node according to IEC 62439-2 Edition 3.0   |
| — MRPD  | Yes; Requirement: IRT  |
| — Switchover time on line break, typ.   | 200 ms; For MRP, bumpless for MRPD   |
| — Number of stations in the ring, max.  | 50   |
| <b>SIMATIC communication</b>  |  |

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| <ul style="list-style-type: none"> <li>● PG/OP communication</li> <li>● S7 routing</li> <li>● Data record routing</li> <li>● S7 communication, as server</li> <li>● S7 communication, as client</li> <li>● User data per job, max.</li> </ul>  | <p>Yes; encryption with TLS V1.3 pre-selected</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>See online help (S7 communication, user data size)</p>   |
| <b>Open IE communication</b>   |   |
| <ul style="list-style-type: none"> <li>● TCP/IP <ul style="list-style-type: none"> <li>— Data length, max.</li> <li>— several passive connections per port, supported</li> </ul> </li> <li>● ISO-on-TCP (RFC1006) <ul style="list-style-type: none"> <li>— Data length, max.</li> </ul> </li> <li>● UDP <ul style="list-style-type: none"> <li>— Data length, max.</li> <li>— UDP multicast</li> </ul> </li> <li>● DHCP</li> <li>● DNS</li> <li>● SNMP</li> <li>● DCP</li> <li>● LLDP</li> <li>● Encryption</li> </ul>   | <p>Yes</p> <p>64 kbyte</p> <p>Yes</p> <p>Yes</p> <p>64 kbyte</p> <p>Yes</p> <p>2 kbyte; 1 472 bytes for UDP broadcast</p> <p>Yes; Max. 5 multicast circuits</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes; Optional</p>  |
| <b>Web server</b>  |   |
| <ul style="list-style-type: none"> <li>● HTTP</li> <li>● HTTPS</li> </ul>  | <p>Yes; Standard and user pages</p> <p>Yes; Standard and user pages</p>   |
| <b>OPC UA</b>  |   |
| <ul style="list-style-type: none"> <li>● Runtime license required</li> <li>● OPC UA Client <ul style="list-style-type: none"> <li>— Application authentication</li> <li>— Security policies</li> <li>— User authentication</li> <li>— Number of connections, max.</li> <li>— Number of nodes of the client interfaces, recommended max.</li> <li>— Number of elements for one call of OPC-UA_NodeGetHandleList/OPC-UA_ReadList/C max.</li> <li>— Number of elements for one call of OPC-UA_NameSpaceGetIndexList, max.</li> <li>— Number of elements for one call of OPC-UA_MethodGetHandleList, max.</li> <li>— Number of simultaneous calls of the client instructions for session management, per connection, max.</li> <li>— Number of simultaneous calls of the client instructions for data access, per connection, max.</li> <li>— Number of registerable nodes, max.</li> <li>— Number of registerable method calls of OPC-UA_MethodCall, max.</li> <li>— Number of inputs/outputs when calling OPC-UA_MethodCall, max.</li> </ul> </li> <li>● OPC UA Server <ul style="list-style-type: none"> <li>— Application authentication</li> <li>— Security policies</li> <li>— User authentication</li> <li>— Number of sessions, max.</li> <li>— Number of accessible variables, max.</li> <li>— Number of registerable nodes, max.</li> <li>— Number of subscriptions per session, max.</li> <li>— Sampling interval, min.</li> <li>— Publishing interval, min.</li> <li>— Number of server methods, max.</li> <li>— Number of inputs/outputs per server method, max.</li> </ul> </li> </ul> | <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</p> <p>"anonymous" or by user name &amp; password</p> <p>10</p> <p>2 000</p> <p>300</p> <p>20</p> <p>100</p> <p>1</p> <p>5</p> <p>5 000</p> <p>100</p> <p>20</p> <p>Yes; Data access (read, write, subscribe), method call, custom address space</p> <p>Yes</p> <p>Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</p> <p>"anonymous" or by user name &amp; password</p> <p>48</p> <p>100 000</p> <p>20 000</p> <p>20</p> <p>100 ms</p> <p>200 ms</p> <p>50</p> <p>20</p> |

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| — Number of monitored items, recommended max.                                | 2 000; for 1 s sampling interval and 1 s send interval  |
| — Number of server interfaces, max.  | 10 of each "Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace"                          |
| — Number of nodes for user-defined server interfaces, max.                   | 5 000   |
| <b>Further protocols</b>   |   |
| • MODBUS   | Yes; MODBUS TCP   |
| <b>Isochronous mode</b>  |   |
| Equidistance   | Yes   |
| <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   | 1 000   |
| • Number of alarms for system diagnostics                                    | 200   |
| • Number of alarms for motion technology objects                             | 160   |
| <b>Test commissioning functions</b>  |   |
| Joint commission (Team Engineering)  | Yes; Parallel online access possible for up to 8 engineering systems  |
| Status block   | Yes; Up to 8 simultaneously (in total across all ES clients)  |
| Single step  | No  |
| Number of breakpoints  | 8   |
| <b>Status/control</b>  |   |
| • Status/control variable  | Yes; without fail-safe  |
| • 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; without fail-safe  |
| • 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   | 500   |
| <b>Traces</b>  |   |
| • Number of configurable Traces  | 4; Up to 512 KB of data per trace are possible  |
| <b>Interrupts/diagnostics/status information</b>                             |   |
| <b>Diagnostics indication LED</b>  |   |
| • RUN/STOP LED   | Yes   |
| • ERROR LED  | Yes   |
| • MAINT LED  | Yes   |
| • STOP ACTIVE LED  | Yes   |
| • Connection display LINK TX/RX  | Yes   |
| <b>Supported technology objects</b>  |   |
| Motion Control   | Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool |
| • Number of available Motion Control resources for technology objects        | 2 400   |
| • Required Motion Control resources  |   |
| — per speed-controlled axis  | 40  |
| — per positioning axis   | 80  |
| — per synchronous axis   | 160   |
| — per external encoder   | 80  |
| — per output cam   | 20  |
| — per cam track  | 160   |
| — per probe  | 40  |
| • Positioning axis   |   |
| — Number of positioning axes at motion control cycle of 4 ms (typical value) | 7   |

|  |  |
|--|--|
| — Number of positioning axes at motion control cycle of 8 ms (typical value)       | 14   |
| Controller   |  |
| • 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                                   |
| Counting and measuring   |  |
| • High-speed counter   | Yes  |
| <b>Standards, approvals, certificates</b>  |  |
| Highest safety class achievable in safety mode                                     |  |
| • Performance level according to ISO 13849-1                                       | PLe  |
| • SIL acc. to IEC 61508  | SIL 3  |
| Probability of failure (for service life of 20 years and repair time of 100 hours) |  |
| — Low demand mode: PFDavg in accordance with SIL3                                  | < 2.00E-05   |
| — High demand/continuous mode: PFH in accordance with SIL3                         | < 1.00E-09   |
| <b>Ambient conditions</b>  |  |
| Ambient temperature during operation   |  |
| • horizontal installation, min.  | -25 °C; No condensation  |
| • horizontal installation, max.  | 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off |
| • vertical installation, min.  | -25 °C; No condensation  |
| • vertical installation, max.  | 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off |
| Ambient temperature during storage/transportation                                  |  |
| • min.   | -40 °C   |
| • max.   | 70 °C  |
| Altitude during operation relating to sea level                                    |  |
| • Installation altitude above sea level, max.                                      | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual                             |
| <b>configuration / header</b>  |  |
| configuration / programming / header   |  |
| Programming language   |  |
| — LAD  | Yes; incl. failsafe  |
| — FBD  | Yes; incl. failsafe  |
| — STL  | Yes  |
| — SCL  | Yes  |
| — GRAPH  | Yes  |
| Know-how protection  |  |
| • User program protection/password protection                                      | Yes  |
| • Copy protection  | Yes  |
| • Block protection   | Yes  |
| Access protection  |  |
| • Password for display   | Yes  |
| • Protection level: Write protection   | Yes; Specific write protection both for Standard and for Failsafe                                  |
| • Protection level: Read/write protection  | Yes  |
| • Protection level: Write protection for Failsafe                                  | Yes  |
| • Protection level: Complete protection  | Yes  |
| programming / cycle time monitoring / header                                       |  |
| • lower limit  | adjustable minimum cycle time  |
| • upper limit  | adjustable maximum cycle time  |
| <b>Dimensions</b>  |  |
| Width  | 70 mm  |
| Height   | 147 mm   |
| Depth  | 129 mm   |
| <b>Weights</b>   |  |
| Weight, approx.  | 845 g  |
| <b>last modified:</b>  | 4/1/2022        |