



SIPLUS S7-1500 CPU 1511-1 PN based on 6ES7511-1AK02-0AB0 with conformal coating, -40...+70 °C, heat sink, no PS usable, central processing unit with work memory 150 KB for program and 1 MB for data, 1st interface: PROFINET IRT with 2-port switch, 60 ns bit performance, SIMATIC Memory Card required spare part display: 6AG1591-1AB00-2AA0

| General information                                      |                                                                                                   |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Product type designation                                 | CPU 1511-1 PN                                                                                     |
| based on                                                 | <a href="#">6ES7511-1AK02-0AB0</a>                                                                |
| Product function                                         |                                                                                                   |
| • I&M data                                               | Yes; I&M0 to I&M3                                                                                 |
| • Isochronous mode                                       | Yes; Distributed and central; with minimum OB 6x cycle of 625 µs (distributed) and 1 ms (central) |
| Engineering with                                         |                                                                                                   |
| • STEP 7 TIA Portal configurable/integrated from version | see entry ID: 109746275                                                                           |
| Configuration control                                    |                                                                                                   |
| via dataset                                              | Yes                                                                                               |
| Display                                                  |                                                                                                   |
| Screen diagonal [cm]                                     | 3.45 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                                          |                                                                                                   |
| • Mains/voltage failure stored energy time               | 5 ms                                                                                              |
| • Repeat rate, min.                                      | 1/s                                                                                               |
| Input current                                            |                                                                                                   |
| Current consumption (rated value)                        | 0.7 A                                                                                             |
| Current consumption, max.                                | 0.95 A                                                                                            |
| Inrush current, max.                                     | 1.9 A; Rated value                                                                                |
| I <sup>2</sup> t                                         | 0.02 A <sup>2</sup> ·s                                                                            |
| Power                                                    |                                                                                                   |
| Infeed power to the backplane bus                        | 10 W                                                                                              |
| Power consumption from the backplane bus (balanced)      | 5.5 W                                                                                             |
| Power loss                                               |                                                                                                   |
| Power loss, typ.                                         | 5.7 W                                                                                             |
| Memory                                                   |                                                                                                   |
| Number of slots for SIMATIC memory card                  | 1                                                                                                 |
| SIMATIC memory card required                             | Yes                                                                                               |
| Work memory                                              |                                                                                                   |
| • integrated (for program)                               | 150 kbyte                                                                                         |
| • integrated (for data)                                  | 1 Mbyte                                                                                           |

|                                                           |                                                                                                                                                       |
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| Load memory                                               |                                                                                                                                                       |
| • Plug-in (SIMATIC Memory Card), max.                     | 32 Gbyte                                                                                                                                              |
| Backup                                                    |                                                                                                                                                       |
| • maintenance-free                                        | Yes                                                                                                                                                   |
| CPU processing times                                      |                                                                                                                                                       |
| for bit operations, typ.                                  | 60 ns                                                                                                                                                 |
| for word operations, typ.                                 | 72 ns                                                                                                                                                 |
| for fixed point arithmetic, typ.                          | 96 ns                                                                                                                                                 |
| for floating point arithmetic, typ.                       | 384 ns                                                                                                                                                |
| CPU-blocks                                                |                                                                                                                                                       |
| Number of elements (total)                                | 2 000; Blocks (OB, FB, FC, DB) and UDTs                                                                                                               |
| DB                                                        |                                                                                                                                                       |
| • Number range                                            | 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 |
| • Size, max.                                              | 1 Mbyte; For DBs with absolute addressing, the max. size is 64 KB                                                                                     |
| FB                                                        |                                                                                                                                                       |
| • Number range                                            | 0 ... 65 535                                                                                                                                          |
| • Size, max.                                              | 150 kbyte                                                                                                                                             |
| FC                                                        |                                                                                                                                                       |
| • Number range                                            | 0 ... 65 535                                                                                                                                          |
| • Size, max.                                              | 150 kbyte                                                                                                                                             |
| OB                                                        |                                                                                                                                                       |
| • Size, max.                                              | 150 kbyte                                                                                                                                             |
| • Number of free cycle OBs                                | 100                                                                                                                                                   |
| • Number of time alarm OBs                                | 20                                                                                                                                                    |
| • Number of delay alarm OBs                               | 20                                                                                                                                                    |
| • Number of cyclic interrupt OBs                          | 20; With minimum OB 3x cycle of 500 µs                                                                                                                |
| • Number of process alarm OBs                             | 50                                                                                                                                                    |
| • Number of DPV1 alarm OBs                                | 3                                                                                                                                                     |
| • Number of isochronous mode OBs                          | 2                                                                                                                                                     |
| • Number of technology synchronous alarm OBs              | 2                                                                                                                                                     |
| • Number of startup OBs                                   | 100                                                                                                                                                   |
| • Number of asynchronous error OBs                        | 4                                                                                                                                                     |
| • Number of synchronous error OBs                         | 2                                                                                                                                                     |
| • Number of diagnostic alarm OBs                          | 1                                                                                                                                                     |
| Nesting depth                                             |                                                                                                                                                       |
| • per priority class                                      | 24                                                                                                                                                    |
| Counters, timers and their retentivity                    |                                                                                                                                                       |
| S7 counter                                                |                                                                                                                                                       |
| • Number                                                  | 2 048                                                                                                                                                 |
| Retentivity                                               |                                                                                                                                                       |
| — adjustable                                              | Yes                                                                                                                                                   |
| IEC counter                                               |                                                                                                                                                       |
| • Number                                                  | Any (only limited by the main memory)                                                                                                                 |
| Retentivity                                               |                                                                                                                                                       |
| — adjustable                                              | Yes                                                                                                                                                   |
| S7 times                                                  |                                                                                                                                                       |
| • Number                                                  | 2 048                                                                                                                                                 |
| Retentivity                                               |                                                                                                                                                       |
| — adjustable                                              | Yes                                                                                                                                                   |
| IEC timer                                                 |                                                                                                                                                       |
| • Number                                                  | Any (only limited by the main memory)                                                                                                                 |
| Retentivity                                               |                                                                                                                                                       |
| — adjustable                                              | Yes                                                                                                                                                   |
| Data areas and their retentivity                          |                                                                                                                                                       |
| Retentive data area (incl. timers, counters, flags), max. | 128 kbyte; In total; available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 88 KB                            |
| Flag                                                      |                                                                                                                                                       |
| • Size, max.                                              | 16 kbyte                                                                                                                                              |
| • Number of clock memories                                | 8; 8 clock memory bit, grouped into one clock memory byte                                                                                             |
| Data blocks                                               |                                                                                                                                                       |

|                                     |                                                                                                                                                                                                                                   |
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| • 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                | 1 024; 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                                                                                                                                                                                    |
| <b>per integrated IO subsystem</b>  |                                                                                                                                                                                                                                   |
| — Inputs (volume)                   | 8 kbyte                                                                                                                                                                                                                           |
| — Outputs (volume)                  | 8 kbyte                                                                                                                                                                                                                           |
| <b>per CM/CP</b>                    |                                                                                                                                                                                                                                   |
| — Inputs (volume)                   | 8 kbyte                                                                                                                                                                                                                           |
| — Outputs (volume)                  | 8 kbyte                                                                                                                                                                                                                           |
| <b>Subprocess images</b>            |                                                                                                                                                                                                                                   |
| • Number of subprocess images, max. | 32                                                                                                                                                                                                                                |
| <b>Hardware configuration</b>       |                                                                                                                                                                                                                                   |
| Number of distributed IO systems    | 32; 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>         |                                                                                                                                                                                                                                   |
| • Via CM                            | 4; A maximum of 4 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total                                                                                                                                                 |
| <b>Number of IO Controllers</b>     |                                                                                                                                                                                                                                   |
| • integrated                        | 1                                                                                                                                                                                                                                 |
| • Via CM                            | 4; A maximum of 4 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total                                                                                                                                                 |
| <b>Rack</b>                         |                                                                                                                                                                                                                                   |
| • Modules per rack, max.            | 32; CPU + 31 modules; no system power supply (PS) can be used                                                                                                                                                                     |
| • Number of lines, max.             | 1                                                                                                                                                                                                                                 |
| <b>PtP CM</b>                       |                                                                                                                                                                                                                                   |
| • Number of PtP CMs                 | the number of connectable PtP CMs is only limited by the number of available slots                                                                                                                                                |
| <b>Time of day</b>                  |                                                                                                                                                                                                                                   |
| <b>Clock</b>                        |                                                                                                                                                                                                                                   |
| • Type                              | Hardware clock                                                                                                                                                                                                                    |
| • Backup time                       | 6 wk; At 40 °C ambient temperature, typically                                                                                                                                                                                     |
| • Deviation per day, max.           | 10 s; Typ.: 2 s                                                                                                                                                                                                                   |
| <b>Operating hours counter</b>      |                                                                                                                                                                                                                                   |
| • Number                            | 16                                                                                                                                                                                                                                |
| <b>Clock synchronization</b>        |                                                                                                                                                                                                                                   |
| • supported                         | Yes                                                                                                                                                                                                                               |
| • in AS, master                     | Yes                                                                                                                                                                                                                               |
| • in AS, device                     | Yes                                                                                                                                                                                                                               |
| • on Ethernet via NTP               | Yes                                                                                                                                                                                                                               |
| <b>Interfaces</b>                   |                                                                                                                                                                                                                                   |
| Number of PROFINET interfaces       | 1                                                                                                                                                                                                                                 |
| <b>1. Interface</b>                 |                                                                                                                                                                                                                                   |
| <b>Interface types</b>              |                                                                                                                                                                                                                                   |
| • RJ 45 (Ethernet)                  | Yes; X1                                                                                                                                                                                                                           |
| • Number of ports                   | 2                                                                                                                                                                                                                                 |
| • integrated switch                 | Yes                                                                                                                                                                                                                               |
| <b>Protocols</b>                    |                                                                                                                                                                                                                                   |
| • IP protocol                       | Yes; IPv4                                                                                                                                                                                                                         |
| • PROFINET IO Controller            | Yes                                                                                                                                                                                                                               |
| • PROFINET IO Device                | Yes                                                                                                                                                                                                                               |
| • SIMATIC communication             | Yes                                                                                                                                                                                                                               |
| • Open IE communication             | Yes; Optionally also encrypted                                                                                                                                                                                                    |
| • Web server                        | Yes                                                                                                                                                                                                                               |
| • Media redundancy                  | Yes                                                                                                                                                                                                                               |
| <b>PROFINET IO Controller</b>       |                                                                                                                                                                                                                                   |

|                                                                               |                                                                                                                                                                        |
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| <b>Services</b>                                                               |                                                                                                                                                                        |
| — PG/OP communication                                                         | Yes                                                                                                                                                                    |
| — Isochronous mode                                                            | Yes                                                                                                                                                                    |
| — Direct data exchange                                                        | Yes; Requirement: IRT and isochronous mode (MRPD optional)                                                                                                             |
| — IRT                                                                         | Yes                                                                                                                                                                    |
| — PROFINergy                                                                  | Yes; per user program                                                                                                                                                  |
| — Prioritized startup                                                         | Yes; Max. 32 PROFINET devices                                                                                                                                          |
| — Number of connectable IO Devices, max.                                      | 128; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET                                                                       |
| — Of which IO devices with IRT, max.                                          | 64                                                                                                                                                                     |
| — Number of connectable IO Devices for RT, max.                               | 128                                                                                                                                                                    |
| — of which in line, max.                                                      | 128                                                                                                                                                                    |
| — 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 IRT</b>                                                    |                                                                                                                                                                        |
| — for send cycle of 250 µs                                                    | 250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous OB is decisive                                    |
| — for send cycle of 500 µs                                                    | 500 µs to 8 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous OB is decisive                                    |
| — for send cycle of 1 ms                                                      | 1 ms to 16 ms                                                                                                                                                          |
| — for send cycle of 2 ms                                                      | 2 ms to 32 ms                                                                                                                                                          |
| — for send cycle of 4 ms                                                      | 4 ms to 64 ms                                                                                                                                                          |
| — With IRT and parameterization of "odd" send cycles                          | Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)                                                                               |
| <b>Update time for RT</b>                                                     |                                                                                                                                                                        |
| — for send cycle of 250 µs                                                    | 250 µs to 128 ms                                                                                                                                                       |
| — for send cycle of 500 µs                                                    | 500 µs to 256 ms                                                                                                                                                       |
| — for send cycle of 1 ms                                                      | 1 ms to 512 ms                                                                                                                                                         |
| — for send cycle of 2 ms                                                      | 2 ms to 512 ms                                                                                                                                                         |
| — for send cycle of 4 ms                                                      | 4 ms to 512 ms                                                                                                                                                         |
| <b>PROFINET IO Device</b>                                                     |                                                                                                                                                                        |
| <b>Services</b>                                                               |                                                                                                                                                                        |
| — PG/OP communication                                                         | Yes                                                                                                                                                                    |
| — Isochronous mode                                                            | No                                                                                                                                                                     |
| — IRT                                                                         | Yes                                                                                                                                                                    |
| — PROFINergy                                                                  | Yes; per user program                                                                                                                                                  |
| — Shared device                                                               | Yes                                                                                                                                                                    |
| — Number of IO Controllers with shared device, max.                           | 4                                                                                                                                                                      |
| — Asset management record                                                     | Yes; per user program                                                                                                                                                  |
| <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.                                                 | 96; 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                             | 64                                                                                                                                                                     |
| • Number of S7 routing paths                                                  | 16                                                                                                                                                                     |
| <b>Redundancy mode</b>                                                        |                                                                                                                                                                        |
| • H-Sync forwarding                                                           | Yes                                                                                                                                                                    |
| <b>Media redundancy</b>                                                       |                                                                                                                                                                        |
| — MRP                                                                         | Yes; as MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50                                                                               |
| — MRPD                                                                        | Yes; Requirement: IRT                                                                                                                                                  |
| — Switchover time on line break, typ.                                         | 200 ms; For MRP, bumpless for MRPD                                                                                                                                     |

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| — Number of stations in the ring, max.                                                                 | 50                                                                              |
| <b>SIMATIC communication</b>                                                                           |                                                                                 |
| • S7 routing                                                                                           | Yes                                                                             |
| • S7 communication, as server                                                                          | Yes                                                                             |
| • S7 communication, as client                                                                          | Yes                                                                             |
| • User data per job, max.                                                                              | See online help (S7 communication, user data size)                              |
| <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; Max. 5 multicast circuits                                                  |
| • DHCP                                                                                                 | No                                                                              |
| • SNMP                                                                                                 | Yes                                                                             |
| • DCP                                                                                                  | Yes                                                                             |
| • LLDP                                                                                                 | Yes                                                                             |
| <b>Web server</b>                                                                                      |                                                                                 |
| • HTTP                                                                                                 | Yes; Standard and user pages                                                    |
| • HTTPS                                                                                                | Yes; Standard and user pages                                                    |
| <b>OPC UA</b>                                                                                          |                                                                                 |
| • Runtime license required                                                                             | Yes                                                                             |
| • OPC UA Client                                                                                        | Yes                                                                             |
| — Application authentication                                                                           | Yes                                                                             |
| — Security policies                                                                                    | Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 |
| — User authentication                                                                                  | "anonymous" or by user name & password                                          |
| — Number of connections, max.                                                                          | 4                                                                               |
| — Number of nodes of the client interfaces, recommended max.                                           | 1 000                                                                           |
| — Number of elements for one call of OPC-UA_NodeGetHandleList/OPC-UA_ReadList/OPC-UA_WriteList, max.   | 300                                                                             |
| — Number of elements for one call of OPC-UA_NameSpaceGetIndexList, max.                                | 20                                                                              |
| — Number of elements for one call of OPC-UA_MethodGetHandleList, max.                                  | 100                                                                             |
| — Number of simultaneous calls of the client instructions for session management, per connection, max. | 1                                                                               |
| — Number of simultaneous calls of the client instructions for data access, per connection, max.        | 5                                                                               |
| — Number of registerable nodes, max.                                                                   | 5 000                                                                           |
| — Number of registerable method calls of OPC-UA_MethodCall, max.                                       | 100                                                                             |
| — Number of inputs/outputs when calling OPC-UA_MethodCall, max.                                        | 20                                                                              |
| • OPC UA Server                                                                                        | Yes; Data access (read, write, subscribe), method call, custom address space    |
| — Application authentication                                                                           | Yes                                                                             |
| — Security policies                                                                                    | Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 |
| — User authentication                                                                                  | "anonymous" or by user name & password                                          |
| — Number of sessions, max.                                                                             | 32                                                                              |
| — Number of accessible variables, max.                                                                 | 50 000                                                                          |
| — Number of registerable nodes, max.                                                                   | 10 000                                                                          |
| — Number of subscriptions per session, max.                                                            | 20                                                                              |
| — Sampling interval, min.                                                                              | 100 ms                                                                          |
| — Publishing interval, min.                                                                            | 500 ms                                                                          |
| — Number of server methods, max.                                                                       | 20                                                                              |
| — Number of inputs/outputs per server method, max.                                                     | 20                                                                              |
| — Number of monitored items, recommended max.                                                          | 1 000; for 1 s sampling interval and 1 s send interval                          |
| — Number of server interfaces, max.                                                                    | 10; or 20, depending on type of server interface                                |

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| — Number of nodes for user-defined server interfaces, max.                   | 1 000                                                                                                                        |
| <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.                         | 32                                                                                                                           |
| Program alarms                                                               | Yes                                                                                                                          |
| Number of configurable program messages, max.                                | 5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH                                         |
| Number of loadable program messages in RUN, max.                             | 2 500                                                                                                                        |
| Number of simultaneously active program alarms                               |                                                                                                                              |
| • Number of program alarms                                                   | 300                                                                                                                          |
| • Number of alarms for system diagnostics                                    | 100                                                                                                                          |
| • Number of alarms for motion technology objects                             | 80                                                                                                                           |
| <b>Test commissioning functions</b>                                          |                                                                                                                              |
| Joint commission (Team Engineering)                                          | Yes; Parallel online access possible for up to 5 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                                                                                                                          |
| • 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, variables                                                         | Peripheral inputs/outputs                                                                                                    |
| • Number of variables, max.                                                  | 200                                                                                                                          |
| <b>Diagnostic buffer</b>                                                     |                                                                                                                              |
| • present                                                                    | Yes                                                                                                                          |
| • Number of entries, max.                                                    | 1 000                                                                                                                        |
| — 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 axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER |
| • Number of available Motion Control resources for technology objects        | 800                                                                                                                          |
| • 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) | 5                                                                                                                            |
| — Number of positioning axes at motion control cycle of 8 ms (typical value) | 10                                                                                                                           |
| Controller                                                                   |                                                                                                                              |

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| <ul style="list-style-type: none"> <li>• PID_Compact</li> <li>• PID_3Step</li> <li>• PID-Temp</li> </ul>                                                                                                                                                                                                                                                                        | <p>Yes; Universal PID controller with integrated optimization</p> <p>Yes; PID controller with integrated optimization for valves</p> <p>Yes; PID controller with integrated optimization for temperature</p> |
| Counting and measuring                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                              |
| <ul style="list-style-type: none"> <li>• High-speed counter</li> </ul>                                                                                                                                                                                                                                                                                                          | Yes                                                                                                                                                                                                          |
| <b>Ambient conditions</b>                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                              |
| Ambient temperature during operation                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                              |
| <ul style="list-style-type: none"> <li>• horizontal installation, min.</li> <li>• horizontal installation, max.</li> </ul>                                                                                                                                                                                                                                                      | <p>-40 °C; = Tmin (incl. condensation/frost)</p> <p>70 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off</p>                                                   |
| <ul style="list-style-type: none"> <li>• vertical installation, min.</li> <li>• vertical installation, max.</li> </ul>                                                                                                                                                                                                                                                          | <p>-40 °C; = Tmin (incl. condensation/frost)</p> <p>40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off</p>                                                   |
| Ambient temperature during storage/transportation                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                              |
| <ul style="list-style-type: none"> <li>• min.</li> <li>• max.</li> </ul>                                                                                                                                                                                                                                                                                                        | <p>-40 °C</p> <p>70 °C</p>                                                                                                                                                                                   |
| Altitude during operation relating to sea level                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                              |
| <ul style="list-style-type: none"> <li>• Installation altitude above sea level, max.</li> <li>• Ambient air temperature-barometric pressure-altitude</li> </ul>                                                                                                                                                                                                                 | <p>5 000 m; Restrictions for installation altitudes &gt; 2 000 m, see manual</p> <p>Restrictions for installation altitudes &gt; 2 000 m, see entry ID: 109763260</p>                                        |
| Relative humidity                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                              |
| <ul style="list-style-type: none"> <li>• With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>                                                                                                                                                                                                                                                           | 100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation                                                                                                            |
| Resistance                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                              |
| Coolants and lubricants                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                              |
| — Resistant to commercially available coolants and lubricants                                                                                                                                                                                                                                                                                                                   | Yes; Incl. diesel and oil droplets in the air                                                                                                                                                                |
| Use in stationary industrial systems                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                              |
| — to biologically active substances according to EN 60721-3-3                                                                                                                                                                                                                                                                                                                   | Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request                                                                                                           |
| — to chemically active substances according to EN 60721-3-3                                                                                                                                                                                                                                                                                                                     | Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *                                                                                                                     |
| — to mechanically active substances according to EN 60721-3-3                                                                                                                                                                                                                                                                                                                   | Yes; Class 3S4 incl. sand, dust, *                                                                                                                                                                           |
| Use on ships/at sea                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                              |
| — to biologically active substances according to EN 60721-3-6                                                                                                                                                                                                                                                                                                                   | Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)                                                                                                                                             |
| — to chemically active substances according to EN 60721-3-6                                                                                                                                                                                                                                                                                                                     | Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *                                                                                                                     |
| — to mechanically active substances according to EN 60721-3-6                                                                                                                                                                                                                                                                                                                   | Yes; Class 6S3 incl. sand, dust; *                                                                                                                                                                           |
| Usage in industrial process technology                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                              |
| — Against chemically active substances acc. to EN 60654-4                                                                                                                                                                                                                                                                                                                       | Yes; Class 3 (excluding trichlorethylene)                                                                                                                                                                    |
| — Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04                                                                                                                                                                                                                                                                                    | Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)                          |
| Remark                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                              |
| — Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04                                                                                                                                                                                                                                                                     | * The supplied plug covers must remain in place over the unused interfaces during operation!                                                                                                                 |
| Conformal coating                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                              |
| <ul style="list-style-type: none"> <li>• Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>• Protection against fouling acc. to EN 60664-3</li> <li>• Military testing according to MIL-I-46058C, Amendment 7</li> <li>• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul> | <p>Yes; Class 2 for high reliability</p> <p>Yes; Type 1 protection</p> <p>Yes; Discoloration of coating possible during service life</p> <p>Yes; Conformal coating, Class A</p>                              |
| <b>configuration / header</b>                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                              |
| configuration / programming / header                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                              |
| Programming language                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                              |
| — LAD                                                                                                                                                                                                                                                                                                                                                                           | Yes                                                                                                                                                                                                          |
| — FBD                                                                                                                                                                                                                                                                                                                                                                           | Yes                                                                                                                                                                                                          |
| — 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                           |
| • Protection level: Read/write protection     | Yes                           |
| • Protection level: Complete protection       | Yes                           |
| programming / cycle time monitoring / header  |                               |
| • lower limit                                 | adjustable minimum cycle time |
| • upper limit                                 | adjustable maximum cycle time |
| Dimensions                                    |                               |
| Width                                         | 70 mm                         |
| Height                                        | 147 mm                        |
| Depth                                         | 129 mm                        |
| Weights                                       |                               |
| Weight, approx.                               | 590 g                         |
| Classifications                               |                               |

|  |        | Version | Classification |
|--|--------|---------|----------------|
|  | eClass | 14      | 27-24-22-07    |
|  | eClass | 12      | 27-24-22-07    |
|  | eClass | 9.1     | 27-24-22-07    |
|  | eClass | 9       | 27-24-22-07    |
|  | eClass | 8       | 27-24-22-07    |
|  | eClass | 7.1     | 27-24-22-07    |
|  | eClass | 6       | 27-24-22-07    |
|  | ETIM   | 10      | EC000236       |
|  | ETIM   | 9       | EC000236       |
|  | ETIM   | 8       | EC000236       |
|  | ETIM   | 7       | EC000236       |
|  | IDEA   | 4       | 3565           |
|  | UNSPSC | 15      | 32-15-17-05    |

|                          |     |
|--------------------------|-----|
| Approvals / Certificates |     |
| General Product Approval | EMV |

[China RoHS](#)


[Manufacturer Declaration](#)






|                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| For use in hazardous locations                                                      |                                                                                     |
|  |  |

last modified:

7/1/2025