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Figure similar

SIMATIC S7-1500, Drive Controller CPU 1504D TF with SINAMICS S120 Integrated; interfaces: 12 DI, 16 DI/DQ, 4 DRIVE-CLiQ, 3 PROFINET: 3+1+1 ports, 1 PROFIBUS, SIMATIC Memory Card required; supported firmware version: SIMATIC S7-1500 FW up to V3.1 (technology version up to V8.0), SINAMICS FW V5.2/V5.2 SP3

General information	
Product type designation	CPU 1504D TF
HW functional status	FS13
Firmware version	PLC: V3.1 / SINAMICS Integrated: V5.2 SP3
● FW update possible	Yes; PLC up to V3.1 / SINAMICS Integrated up to V5.2 SP3
based on	SIMATIC S7-1500 TF-CPU and SINAMICS S120
Product function	
● I&M data	Yes; I&M0 to I&M3
● Isochronous mode	Yes; With minimum OB 6x cycle of 500 µs
● SysLog	Yes
Engineering with	
● STEP 7 TIA Portal configurable/integrated from version	V21 (FW V3.1) / V16 (FW V2.8) or higher
Integrated drive control	
● Number of axes for servo control, max.	6
● Number of axes for vector control, max.	6
● Number of axes for V/f control, max.	12
● Remark	alternative control modes; drive control based on SINAMICS S120 CU320-2 (firmware version V5.x); functional subset compared to CU320-2: no free function blocks, ... ; for details, see the manual
Configuration control	
via dataset	Yes
Control elements	
Number of keys	1; FUNCT button
Mode selector switch	1
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Mains buffering	
● Mains/voltage failure stored energy time	3 ms; Refers to the power supply on the CPU section
● Repeat rate, min.	1 event every 10 s
Input current	
Current consumption (rated value)	0.65 A; Without load on inputs/outputs, without supply via DRIVE- CLiQ/USB interface
Current consumption, max.	13.1 A; With load

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Inrush current, max.	6 A; Rated value
I²t	0.62 A²·s
Power loss	
Power loss, typ.	17 W
Storage	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	
● integrated (for program)	4 Mbyte
● integrated (for data)	6 Mbyte
Load memory	
● Plug-in (SIMATIC Memory Card), required	12 Mbyte; Recommended at least when integrated drive is used
● Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	
● maintenance-free	Yes
CPU-blocks	
Number of elements (total)	20 000; 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.	6 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	
● Number range	0 ... 65 535
● Size, max.	1 Mbyte
FC	
● Number range	0 ... 65 535
● Size, max.	1 Mbyte
OB	
● Size, max.	1 Mbyte
● Number of free cycle OBs	100
● Number of time alarm OBs	20
● Number of delay alarm OBs	20
● Number of cyclic interrupt OBs	20; with minimum OB 3x cycle of 100 µs
● Number of process alarm OBs	50
● Number of DPV1 alarm OBs	3
● Number of isochronous mode OBs	3
● 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; Up to 8 possible for F-blocks
Counters, timers and their retentivity	
S7 counter	
● Number	2 048
Retentivity	
— can be set	Yes
IEC counter	
● Number	Any (only limited by the main memory)
Retentivity	
— can be set	Yes
S7 timer	
● Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	
● Number	Any (only limited by the main memory)
Retentivity	

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— adjustable	Yes
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	700 kbyte; in total; for bit memories, timers, counters, DBs, and technology data (axes)
Flag	
● Size, max.	16 kbyte
● Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
Data blocks	
● Retentivity adjustable	Yes
● Retentivity preset	No
Local data	
● per priority class, max.	64 kbyte; max. 16 KB per block
Address area	
Number of IO modules	16 384; max. number of modules / submodules
I/O address area	
● Inputs	32 kbyte; All inputs are in the process image
● Outputs	32 kbyte; All outputs are in the process image
per integrated IO subsystem	
— Inputs (volume)	32 kbyte; Max. 32 KB via X150; max. 8 KB via X160 or X126
— Outputs (volume)	32 kbyte; Max. 32 KB via X150; max. 8 KB via X160 or X126
Subprocess images	
● Number of subprocess images, max.	32
Hardware configuration	
Number of distributed IO systems	64; A distributed I/O system is characterized not only by the integration of distributed I/O via PROFINET or PROFIBUS, but also by the connection of I/O via AS-i master modules or links (e.g. IE/PB-Link)
Number of DP masters	
● integrated	1
● Via CM	Expansion via CMs / CPs (PROFIBUS, PROFINET, Ethernet) not possible; these CMs / CPs can only be operated in a central rack
Number of IO Controllers	
● Integrated	2
● via CM	Expansion via CMs / CPs (PROFIBUS, PROFINET, Ethernet) not possible; these CMs / CPs can only be operated in a central rack
PtP CM	
● Number of PtP CMs	The number of connectable PtP CMs (distributed) is only limited by the number of available slots
Time of day	
Clock	
● Type	Hardware clock
● Backup time	6 wk; At 40 °C ambient temperature, typically
● Deviation per day, max.	10 s; Typ.: 2.4 s
Operating hours counter	
● Number	16
Clock synchronization	
● supported	Yes
● to DP, master	Yes
● on DP, device	Yes
● in AS, master	Yes
● in AS, device	Yes
● on Ethernet via NTP	Yes
Digital inputs	
integrated channels (DI)	28; max. depending on parameterization
Digital inputs, parameterizable	Yes; 12 DI, 8 DI/DQ (X122/X132, SINAMICS Integrated) + 8 DI/DQ (X142, PLC)
Sourcing/sinking input	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
● Freely usable digital input	Yes; Max. 20 (X122/X132) + max. 8 (X142)
● Probe	Yes; Max. 8 (X122/X132) + max. 8 (X142)
● Digital input with time stamp	Yes; Max. 8 (X142); e.g. for probes

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● Counter	Yes; Max. 8 (X142); event/cycle duration measurement
● Digital input with oversampling	Yes; Max. 8 (X142); 32-fold oversampling
Input voltage	
● Type of input voltage	DC
● Rated value (DC)	24 V
● for signal "0"	-3 to +5V
● for signal "1"	+11 to +30V
● permissible voltage at input, min.	-3 V
● permissible voltage at input, max.	30 V
Input current	
● for signal "1", typ.	4 mA
Input delay (for rated value of input voltage)	
● Minimum pulse width for program reactions	5 µs
for standard inputs	
— parameterizable	No; For X122/X132
— with "0" to "1", typ.	For X122/X132: 10 µs (DI) / 5 µs (DI/DQ as DI)
— with "1" to "0", typ.	For X122/X132: 30 µs (DI) / 5 µs (DI/DQ as DI)
for interrupt inputs	
— Parameterizable	Yes; identical to those for technological functions
for technological functions	
— parameterizable	Yes; For X142, additionally adjustable input filter: 1 µs / 125 µs
— with "0" to "1", typ.	5 µs; For X142; HW delay
— with "1" to "0", typ.	5 µs; For X142; HW delay
Cable length	
● shielded, max.	30 m; For technological functions: Shielding of the DI recommended depending on the requirements
● unshielded, max.	30 m
Digital outputs	
Type of digital output	Transistor
integrated channels (DO)	16; max. depending on parameterization
Current-sinking	Yes; With High Speed output
Current-sourcing	Yes; Optionally as a P-switch or high-speed push-pull switch (high-speed output)
Digital outputs, parameterizable	Yes; 8 DI/DQ (X122/X132, SINAMICS Integrated) + 8 DI/DQ (X142, PLC)
Short-circuit protection	Yes; electronic/thermal
● Response threshold, typ.	X122/X132: 1.4 A / X142: 0.9 A (high-speed output: 0.7 A)
Limitation of inductive shutdown voltage to	X122/X132: max. -60 V / X142: max. -64.5 V
Controlling a digital input	Yes
minimum pulse duration	2 µs; For high-speed output, single pulse
Digital output functions, parameterizable	
● Freely usable digital output	Yes; Max. 8 (X122/X132) + max. 8 (X142)
● Digital output with time stamp	Yes; Max. 8 (X142); e.g. for output cams
● PWM output	Yes; Max. 8 (X142)
— Cycle duration, parameterizable	Yes; Base frequency 1 / 2 / 4 / 8 / 16 kHz; specification of interpulse period ratio over 32-bit pattern
— ON period, min.	0 %
— ON period, max.	100 %
— Resolution of the duty cycle	3.125 %
● Digital output with oversampling	Yes; Max. 8 (X142)
Switching capacity of the outputs	
● with resistive load, max.	0.5 A; 0.4 A for high-speed output
● on lamp load, max.	5 W
Load resistance range	
● lower limit	48 Ω; with 24 V DC supply
Output voltage	
● Type of output voltage	DC
● Rated value (DC)	24 V
● for signal "0", max.	28.8 V
● for signal "1", min.	20.4 V
Output current	

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● for signal "1" rated value	0.5 A; 0.4 A for high-speed output
● for signal "1" permissible range, min.	2 mA
● for signal "1" permissible range, max.	0.6 A; 0.44 A for high-speed output
Output delay with resistive load	
● "0" to "1", typ.	100 µs; For X122/X132; at 48 ohm load
● "1" to "0", typ.	150 µs; For X122/X132; at 48 ohm load
for technological functions	
— "0" to "1", typ.	1 µs; For X142
— "1" to "0", typ.	1 µs; For X142 as a high-speed output; 150 µs for standard output
Parallel switching of two outputs	
● for logic links	Yes; For technological functions and high-speed outputs: No
● for uprating	No
● for redundant control of a load	Yes; For technological functions and high-speed outputs: No
Switching frequency	
● with resistive load, max.	35 kHz; With High Speed output, 1 kHz with standard output
● with inductive load, max.	2 Hz; Max. 1 J per channel
● on lamp load, max.	11 Hz
Total current of the outputs	
● Current per module, max.	8 A
Cable length	
● shielded, max.	30 m
● unshielded, max.	30 m
Interfaces	
Number of PROFINET interfaces	3
Number of PROFIBUS interfaces	1
Number of USB interfaces	2; USB 3.0 (without function, no connection permissible)
Number of DRIVE-CLiQ interfaces	4; DRIVE-CLiQ interfaces (24 V / 450 mA per interface for connecting encoders/measuring systems)
1. Interface	
Interface types	
● RJ 45 (Ethernet)	Yes; X150
● Number of ports	3
● integrated switch	Yes
Protocols	
● 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
PROFINET IO Controller	
Services	
— Isochronous mode	Yes
— Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
— IRT	Yes
— Dynamic Frame Packing (DFP)	Yes
— PROFIenergy	Yes; per user program
— Prioritized startup	Yes; Max. 32 PROFINET devices
— Number of connectable IO Devices, max.	256; In total, up to 1 000 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.	256
— of which in line, max.	256
— 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

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— PROFINET Security Class	1
Update time for IRT	
— for send cycle of 500 µs	500 µs to 8 ms
— 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)
Update time for RT	
— 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
PROFINET IO Device	
Services	
— Isochronous mode	No
— IRT	Yes
— Dynamic Frame Packing (DFP)	No
— PROFIenergy	Yes; per user program
— Prioritized startup	Yes
— Shared device	Yes
— Number of IO Controllers with shared device, max.	4
— activation/deactivation of I-devices	Yes; per user program
— Asset management record	Yes; per user program
— PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface types	
● RJ 45 (Ethernet)	Yes; X160
● Number of ports	1
● integrated switch	No
Protocols	
● 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	No
PROFINET IO Controller	
Services	
— Isochronous mode	No
— Direct data exchange	No
— IRT	No
— PROFIenergy	Yes; per user program
— Prioritized startup	No
— Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
— Number of connectable IO Devices for RT, max.	128
— of which in line, max.	128
— Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
— IO Devices changing during operation (partner ports), supported	Yes
— 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
— PROFINET Security Class	1
Update time for RT	
— for send cycle of 1 ms	1 ms to 512 ms
PROFINET IO Device	

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Services	
— Isochronous mode	No
— IRT	No
— PROFIenergy	Yes; per user program
— Prioritized startup	No
— Shared device	Yes
— Number of IO Controllers with shared device, max.	4
— activation/deactivation of I-devices	Yes; per user program
— Asset management record	Yes; per user program
— PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
● RJ 45 (Ethernet)	Yes; X130
● Number of ports	1
● integrated switch	No
Protocols	
● IP protocol	Yes; IPv4
● PROFINET IO Controller	No
● PROFINET IO device	No
● SIMATIC communication	Yes
● Open IE communication	Yes; Optionally also encrypted
● Web server	Yes
4. Interface	
Interface types	
● RS 485	Yes; X126
● Number of ports	1
Protocols	
● PROFIBUS DP master	Yes
● PROFIBUS DP device	No
● SIMATIC communication	Yes
PROFIBUS DP master	
● Number of connections, max.	48; for the integrated PROFIBUS DP interface
● max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Services	
— Equidistance	Yes
— Isochronous mode	Yes
— activation/deactivation of DP devices	Yes
Interface types	
RJ 45 (Ethernet)	
● 100 Mbps	Yes
● 1000 Mbps	Yes; Only at the X130 interface
● Autonegotiation	Yes
● Autocrossing	Yes
● Industrial Ethernet status LED	Yes; LINK and ACTIVITY
RS 485	
● Transmission rate, max.	12 Mbit/s
Protocols	
PROFIsafe	Yes; V2.4 / V2.6 (V2.6 only with PROFINET)
Number of connections	
● Number of connections, max.	384; Via integrated interfaces of the CPU
● Number of connections reserved for ES/HMI/web	10
● Number of connections via integrated interfaces	320
● Number of S7 routing paths	64; in total, only 16 S7-Routing connections are supported via PROFIBUS
Redundancy mode	
● PROFINET system redundancy (S2)	No
● PROFINET system redundancy (R1)	No
● H-Sync forwarding	Yes
Media redundancy	

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— Media redundancy	only via interface X150
— MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
— MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
— MRPD	Yes; Requirement: IRT
— Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
— Number of stations in the ring, max.	50
SIMATIC communication	
● PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
● S7 routing	Yes
● Data record 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)
Open IE communication	
● TCP/IP	Yes
— Data length, max.	64 kbyte
— several passive connections per port, supported	Yes
● ISO-on-TCP (RFC1006)	Yes
— Data length, max.	64 kbyte
● UDP	Yes
— Data length, max.	2 kbyte; 1 472 bytes for UDP broadcast
— UDP multicast	Yes; 128 multicast circuits (of which max. 5 via X150)
● DHCP	Yes
● DNS	Yes
● SNMP	Yes
● DCP	Yes
● LLDP	Yes
● Encryption	Yes; Optional
Web server	
● HTTP	Yes; Standard and user pages
● HTTPS	Yes; Standard and user pages
● web API	
— Number of sessions, max.	200
— number of simultaneous HTTP calls, max.	4
— HTTP request body, max.	131 072 byte
OPC UA	
● Runtime license required	Yes; "Small" license required
● OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
— Application authentication	Yes
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
— User authentication	"anonymous" or by user name & password
— Number of connections, max.	40
— Number of nodes of the client interfaces, recommended max.	5 000
— Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_U 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	20

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OPC_UA_MethodCall, max.	
● OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
— Application authentication	Yes
— Security policies	available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256, Aes128Sha256RsaOaep, Aes256Sha256RsaPss
— User authentication	"anonymous" or by user name & password
— GDS support (certificate management)	Yes
— Number of sessions, max.	64
— Number of accessible variables, max.	200 000
— Number of registerable nodes, max.	50 000
— Number of subscriptions per session, max.	50
— Sampling interval, min.	10 ms
— Publishing interval, min.	10 ms
— Number of server methods, max.	100
— Number of inputs/outputs per server method, max.	20
— Number of monitored items, recommended max.	10 000; for 1 s sampling interval and 1 s send interval
— Number of server interfaces, max.	10 of each "Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace"
— Number of nodes for user-defined server interfaces, max.	50 000
● Alarms and Conditions	Yes
— Number of program alarms	400
— Number of alarms for system diagnostics	200
Further protocols	
● MODBUS	Yes; MODBUS TCP
Isochronous mode	
Equidistance	Yes
Jitter, max.	1 µs
S7 message functions	
Number of login stations for message functions, max.	64
number of subscriptions, max.	750
number of tags/attributes for subscriptions, max.	50 000
Program alarms	Yes
Number of configurable program messages, max.	10 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH
Number of loadable program messages in RUN, max.	10 000
Number of simultaneously active program alarms	
● Number of program alarms	4 000
● Number of alarms for system diagnostics	1 000
● Number of alarms for motion technology objects	480
Test commissioning functions	
Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 10 engineering systems
Status block	Yes; Up to 16 simultaneously (in total across all ES clients)
Single step	No
Number of breakpoints	20
Profiling	No
Status/control	
● Status/control variable	Yes; without fail-safe
● Variables	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters
● Number of variables, max.	
— of which status variables, max.	200; per job
— of which control variables, max.	200; per job
Forcing	
● Forcing	Yes; without fail-safe
● Forcing, variables	peripheral inputs/outputs (without fail-safe)
● Number of variables, max.	200
Diagnostic buffer	
● present	Yes

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● Number of entries, max.	3 200
— of which powerfail-proof	1 000
Traces	
● Number of configurable Traces	8
● Memory size per trace, max.	512 kbyte
Interrupts/diagnostics/status information	
Diagnostics indication LED	
● RUN/STOP LED	Yes
● ERROR LED	Yes
● MAINT LED	Yes
● ACT LED	Yes; For memory card access
● RDY LED	Yes
● COM LED	Yes
● Connection display LINK TX/RX	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
● Number of available Motion Control resources for technology objects	3 200
● 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
● Number of available Extended Motion Control resources for technology objects	160
● Required Extended Motion Control resources	
— per cam (1 000 points and 50 segments)	2
— per cam (10 000 points and 50 segments)	20
— for each set of kinematics	30
— per Interpreter	60
— Per leading axis proxy	3
● kinematics functions	
— kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
— kinematics with 5 or more interpolating axes	No
— user-defined kinematics	Yes
— SIMATIC Safe Kinematics	No
● Positioning axis	
— Number of positioning axes at motion control cycle of 4 ms (typical value)	12
— Number of positioning axes at motion control cycle of 8 ms (typical value)	24
Controller	
● PID_Compact	Yes; Universal PID controller with integrated optimization
● PID_3Step	Yes; PID controller with integrated optimization for valves
● PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
● High-speed counter	Yes
Integrated Functions	
Counter	
● Number of counters	8; Event/cycle duration measurement
● Counting frequency, max.	32 kHz
Counting functions	
● Continuous counting	Yes
Measuring functions	
Measuring range	
— Cycle duration measurement, min.	10 µs; 5 µs minimum pulse width

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— Cycle duration measurement, max.	178 s
Accuracy	
— Cycle duration measurement	Sampling of the time period with 41.67 ns increments
Potential separation	
Potential separation digital inputs	
● between the channels	Yes; 12 DI (X122/X132), in 2 groups of 6 DI each
Potential separation digital outputs	
● between the channels	No; 8 DI/DQ (X122/X132) and 8 DI/DQ (X142)
Degree and class of protection	
IP degree of protection	IP20 control cabinet installation / open type
Standards, approvals, certificates	
Siemens Eco Profile (SEP)	Siemens EcoTech
CE mark	Yes
UKCA mark	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
Ecological footprint	
● environmental product declaration	Yes
Global warming potential	
— global warming potential, (total) [CO2 eq]	403 kg
— global warming potential, (during production) [CO2 eq]	107 kg
— global warming potential, (during operation) [CO2 eq]	306 kg
— global warming potential, (after end of life cycle) [CO2 eq]	-10.7 kg
Highest safety class achievable in safety mode	
● Performance level according to ISO 13849-1	PLd (PLe if exclusively F-CPU is used)
● SIL acc. to IEC 61508	SIL 2 (SIL 3 if exclusively F-CPU is used)
Probability of failure (for service life of 20 years and repair time of 100 hours)	
— Low demand mode: PFDavg in accordance with SIL2	< 14.00E-04
— Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05 PLd (if exclusively F-CPU is used)
— High demand/continuous mode: PFH in accordance with SIL2	< 14.00E-09
— High demand/continuous mode: PFH in accordance with SIL3	if exclusively F-CPU is used: < 1.00E-09 (at a site altitude of up to 3000 m); < 2.00E-09 (at a site altitude of more than 3000 m and up to 4000 m)
Security	
PROFINET Security Class	1
signed firmware update	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
● min.	0 °C
● max.	55 °C
Ambient temperature during storage/transportation	
● min.	-40 °C; Long-term storage: -25 °C
● max.	70 °C; Long-term storage: +55 °C
Altitude during operation relating to sea level	
● Installation altitude above sea level, max.	4 000 m; as of an altitude of 2000 m, the maximum ambient air temperature is reduced by 7 °C per 1000 m; see SINAMICS documentation for SINAMICS S120 drive components
● Ambient air temperature-barometric pressure-altitude	Permissible air pressure: 620 hPa ... 1 060 hPa
Configuration	
Programming	
Programming language	
— LAD	Yes; incl. failsafe
— FBD	Yes; incl. failsafe

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— STL	Yes
— SCL	Yes
— CFC	No
— GRAPH	Yes
Know-how protection	
● User program protection/password protection	Yes
● Copy protection	Yes
● Block protection	Yes
Access protection	
● protection of confidential configuration data	Yes
● Protection level: Write protection	Yes
● Protection level: Read/write protection	Yes
● Protection level: Write protection for Failsafe	Yes
● Protection level: Complete protection	Yes
● User administration	Yes
Cycle time monitoring	
● lower limit	adjustable minimum cycle time
● upper limit	adjustable maximum cycle time
Dimensions	
Width	50 mm
Height	300 mm
Depth	226 mm; 270 mm with spacer (included in scope of supply)
Weights	
Weight, approx.	2 400 g
Other	
Note:	The SIMATIC Drive Controller deviates from the usual SIMATIC S7-1500 ambient conditions and specifications as well as the available approvals and certificates because of the drive design. For details, see the SIMATIC Drive Controller device and system manual. Operation is without fan.

Classifications

	Version	Classification
eClass	16	27-24-20-02
eClass	14	27-24-20-02
eClass	12	27-24-20-02
eClass	9.1	27-24-20-02
eClass	9	27-24-20-02
eClass	8	27-24-20-02
eClass	7.1	27-24-20-02
eClass	6	27-24-20-02
ETIM	10	EC000236
ETIM	9	EC000236
ETIM	8	EC000236
ETIM	7	EC000236
IDEA	4	1472
UNSPSC	15	26-11-15-27

Approvals / Certificates

General Product Approval

Miscellaneous

General Product Approval	Functional Saftey	other

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