SIEMENS

Data sheet

6ES7511-1FK02-0AB0



SIMATIC S7-1500F, CPU 1511F-1 PN, CENTRAL PROCESSING UNIT WITH WITH WORKING MEMORY 225 KB FOR PROGRAM AND 1 MB FOR DATA, 1. INTERFACE: PROFINET IRT WITH 2 PORT SWITCH, 60 NS BIT-PERFORMANCE, SIMATIC MEMORY CARD NECESSARY

Product type designation HW functional status FS03 Firmware version • I&M data • Isochronous mode • I&M data • Isochronous mode Product function • I&M data • Isochronous mode Programmare • STEP 7 TIA Portal configurable/integrated from version V16 (FW V2.8) /V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7511-1FK01-0AB0 Configuration control Via dataset Yes Display Screen diagonal [cm] Control elements Number of keys 8 Mode buttons 2 Supply voltage permissible range, lower limit (DC) permissible range, upper limit (DC) Pressible range, upper limi	General information	
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Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes Work memory • integrated (for program) 225 kbyte	Power loss, typ.	5.7 W
SIMATIC memory card required Yes Work memory • integrated (for program) 225 kbyte	Memory	
Work memory ● integrated (for program) 225 kbyte	Number of slots for SIMATIC memory card	1
• integrated (for program) 225 kbyte	SIMATIC memory card required	Yes
	Work memory	
• integrated (for data) 1 Mbyte	• integrated (for program)	225 kbyte
	• integrated (for data)	1 Mbyte

Landman	
Load memory • Plug in (SIMATIC Memory Card) may	32 Gbyte
Plug-in (SIMATIC Memory Card), max. Backup	oz Guyte
maintenance-free	Yes
CPU processing times	165
	60 no
for bit operations, typ.	60 ns 72 ns
for word operations, typ. for fixed point arithmetic, typ.	96 ns
for floating point arithmetic, typ.	384 ns
CPU-blocks	304 115
Number of elements (total)	2 000; Blocks (OB, FB, FC, DB) and UDTs
DB	2 000, blocks (Ob, 1 b, 1 G, bb) and ob 15
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; Up to 8 possible for F-blocks
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	200
• Number	2 048
Retentivity	S.
— adjustable	Yes
IEC timer	
• Number	Any (only limited by the main memory)
Retentivity	V
— 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
Extended retentive data area (incl. timers, counters, flags), max.	1 Mbyte; When using PS 6 0W 24/48/60 V DC HF
Flag	2, 13, 1111011 doing 1 0 0 011 27/70/00 1 DO 111
• Size, max.	16 kbyte
Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
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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	1 024; 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)	8 kbyte
— Outputs (volume)	8 kbyte
per CM/CP	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
Subprocess images	
Number of subprocess images, max.	32
Hardware configuration	
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)
Number of DP masters	
• Via CM	4; A maximum of 4 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Number of IO Controllers	
integrated	1
• Via CM	4; A maximum of 4 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Rack	
 Modules per rack, max. 	32; CPU + 31 modules
PtP CM	
Number of PtP CMs	the number of connectable PtP CMs 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 s
Operating hours counter	
Number	16
Clock synchronization	
• supported	Yes
• in AS, master	Yes
• in AS, slave	Yes
on Ethernet via NTP	Yes
Interfaces	
Number of PROFINET interfaces	1
1. Interface	
Interface types	
RJ 45 (Ethernet)	Vae: Y1
Number of ports	Yes; X1
Number of ports integrated quitely	2
• integrated switch	
• integrated switch Protocols	2 Yes
integrated switch Protocols IP protocol	2 Yes Yes; IPv4
integrated switch Protocols IP protocol PROFINET IO Controller	2 Yes Yes; IPv4 Yes
integrated switch Protocols IP protocol PROFINET IO Controller PROFINET IO Device	2 Yes Yes; IPv4 Yes Yes
integrated switch Protocols IP protocol PROFINET IO Controller PROFINET IO Device SIMATIC communication	2 Yes; IPv4 Yes Yes Yes Yes
integrated switch Protocols IP protocol PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication	2 Yes; IPv4 Yes Yes Yes Yes Yes Yes Yes; Optionally also encrypted
integrated switch Protocols IP protocol PROFINET IO Controller PROFINET IO Device SIMATIC communication	2 Yes; IPv4 Yes Yes Yes Yes
integrated switch Protocols IP protocol PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication	2 Yes; IPv4 Yes Yes Yes Yes Yes Yes Yes Yes; Optionally also encrypted

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Services	V
— PG/OP communication	Yes
— Isochronous mode	Yes
Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
— IRT	Yes
— PROFlenergy	Yes
 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
Update time for IRT	Ŭ
— 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
The state parameterization of our solid cycles	875 µs)
Update time for RT	
— 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
PROFINET IO Device	
Services	
— PG/OP communication	Yes
— Isochronous mode	No
— IRT	Yes
— PROFlenergy	Yes; per user program
— Shared device	Yes
Number of IO Controllers with shared device, max.	4
Asset management record	Yes; per user program
2. Interface	
PROFINET IO Device	
Services	
— PG/OP communication	Yes
— Isochronous mode	No
— ISOCITORIOUS Mode — IRT	No
— PROFlenergy	Yes; per user program
Prioritized startup Shared device	No Yes
Number of IO Controllers with shared device, max. Asset management record.	4
— Asset management record	Yes; per user program
Interface types	
RJ 45 (Ethernet)	V
• 100 Mbps	Yes
Autonegotiation	Yes
Autocrossing	Yes
Industrial Ethernet status LED	Yes
Protocols	
PROFIsafe	Yes
Number of connections	

 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
Redundancy mode	
H-Sync forwarding	Yes
Media redundancy	
— 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
 Number of stations in the ring, max. 	50
SIMATIC communication	
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)
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; Max. 5 multicast circuits
• DHCP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Web server	
• HTTP	Yes; Standard and user pages
• HTTPS	Yes; Standard and user pages
OPC UA	
 Runtime license required 	Yes
OPC UA Client	Yes
 Application authentication 	Yes
 Security policies 	Available security policies: None, Basic128Rsa15, Basic256Rsa15,
occurry policies	
, ·	Basic256Sha256
User authentication	Basic256Sha256 "anonymous" or by user name & password
User authenticationNumber of connections, max.	Basic256Sha256 anonymous" or by user name & password 4
 User authentication Number of connections, max. Number of nodes of the client interfaces, 	Basic256Sha256 "anonymous" or by user name & password
 User authentication Number of connections, max. Number of nodes of the client interfaces, recommended max. 	Basic256Sha256 and an anonymous or by user name & password and anonymous or by user name & password anonymous or by user name & password and anonymous or by user name & password anon
 User authentication Number of connections, max. Number of nodes of the client interfaces, 	Basic256Sha256 "anonymous" or by user name & password 4 1 000
 User authentication Number of connections, max. Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_max. Number of elements for one call of 	Basic256Sha256 "anonymous" or by user name & password 4 1 000
 User authentication Number of connections, max. Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_max. 	Basic256Sha256 "anonymous" or by user name & password 4 1 000 300
 User authentication Number of connections, max. Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_max. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. 	Basic256Sha256 "anonymous" or by user name & password 4 1 000 300
 User authentication Number of connections, max. Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_max. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of elements for one call of OPC_UA_MethodGetHandleList, max. Number of simultaneous calls of the client instructions for session management, per connection, 	Basic256Sha256 "anonymous" or by user name & password 4 1 000 300
 User authentication Number of connections, max. Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_max. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of elements for one call of OPC_UA_MethodGetHandleList, max. Number of simultaneous calls of the client 	Basic256Sha256 "anonymous" or by user name & password 4 1 000 300 20 100
 User authentication Number of connections, max. Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_max. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of elements for one call of OPC_UA_MethodGetHandleList, max. Number of simultaneous calls of the client instructions for session management, per connection, max. Number of simultaneous calls of the client 	Basic256Sha256 "anonymous" or by user name & password 4 1 000 300 20 100 1
 User authentication Number of connections, max. Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_max. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of elements for one call of OPC_UA_MethodGetHandleList, max. Number of simultaneous calls of the client instructions for session management, per connection, max. Number of simultaneous calls of the client instructions for data access, per connection, max. 	Basic256Sha256 "anonymous" or by user name & password 4 1 000 300 20 100 1
 User authentication Number of connections, max. Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_max. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of elements for one call of OPC_UA_MethodGetHandleList, max. Number of simultaneous calls of the client instructions for session management, per connection, max. Number of simultaneous calls of the client instructions for data access, per connection, max. Number of registerable nodes, max. Number of registerable method calls of 	Basic256Sha256 "anonymous" or by user name & password 4 1 000 300 20 100 1 5 5 000
 User authentication Number of connections, max. Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_max. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of elements for one call of OPC_UA_MethodGetHandleList, max. Number of simultaneous calls of the client instructions for session management, per connection, max. Number of simultaneous calls of the client instructions for data access, per connection, max. Number of registerable nodes, max. Number of registerable method calls of OPC_UA_MethodCall, max. Number of inputs/outputs when calling 	Basic256Sha256 "anonymous" or by user name & password 4 1 000 300 20 100 1 5 5 000 100
 User authentication Number of connections, max. Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_max. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of elements for one call of OPC_UA_MethodGetHandleList, max. Number of simultaneous calls of the client instructions for session management, per connection, max. Number of simultaneous calls of the client instructions for data access, per connection, max. Number of registerable nodes, max. Number of registerable method calls of OPC_UA_MethodCall, max. Number of inputs/outputs when calling OPC_UA_MethodCall, max. 	Basic256Sha256 "anonymous" or by user name & password 4 1 000 300 20 100 1 5 5 000 100 20
 User authentication Number of connections, max. Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_max. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of elements for one call of OPC_UA_MethodGetHandleList, max. Number of simultaneous calls of the client instructions for session management, per connection, max. Number of simultaneous calls of the client instructions for data access, per connection, max. Number of registerable nodes, max. Number of registerable method calls of OPC_UA_MethodCall, max. Number of inputs/outputs when calling OPC_UA_MethodCall, max. OPC UA Server 	Basic256Sha256 "anonymous" or by user name & password 4 1 000 300 20 100 1 5 5 000 100 20 Yes; Data access (read, write, subscribe), method call, custom address space

— 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
 Number of nodes for user-defined server interfaces, 	1 000
max.	
Further protocols	
• MODBUS	Yes; MODBUS TCP
S7 message functions	
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	600
Number of alarms for system diagnostics	100
Number of alarms for motion technology objects	80
Test commissioning functions	
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
	8
Number of breakpoints	8
Status/control	Vacantith aut fail and
Status/control variable Variables	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	200, μα μου
• Forcing	Yes; without fail-safe
Ü	peripheral inputs/outputs (without fail-safe)
Forcing, variables Number of variables, may	, , , , , , , , , , , , , , , , , , , ,
Number of variables, max. Diamagnetic buffer.	200
Diagnostic buffer	Van
• present	Yes
Number of entries, max.	1 000
— of which powerfail-proof	500
Traces	
Number of configurable Traces	4; Up to 512 KB of data per trace are possible
Interrupts/diagnostics/status information	
Diagnostics indication LED	
RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT LED	Yes
STOP ACTIVE 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 	15 360
Required Motion Control resources	
per speed-controlled axis	40
per speed-controlled axis per positioning axis	80
per positioning axis per synchronous axis	160
— per synchronous axis	100

per external encoder	90
— 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	512
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 leading axis proxy	3
Positioning axis	
 Number of positioning axes at motion control cycle of 4 ms (typical value) 	140
Number of positioning axes at motion control cycle of 8 ms (typical value)	192
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
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
Performance level according to ISO 13849-1	PLe
SIL acc. to IEC 61508	SIL 3
Probability of failure (for service life of 20 years and repair time	of 100 hours)
 Low demand mode: PFDavg in accordance with SIL3 	< 2.00E-05
 High demand/continuous mode: PFH in accordance with SIL3 	< 1.00E-09
Ambient conditions	
Ambient temperature during operation	
Ambient temperature during operation • horizontal installation, min.	-25 °C; No condensation
-	-25 °C; No condensation 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
horizontal installation, min.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation
horizontal installation, min.horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
horizontal installation, min.horizontal installation, max.vertical installation, min.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the
 horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. 	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the
 horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
 horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. 	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
 horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. max. Altitude during operation relating to sea level Installation altitude above sea level, max. 	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
 horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. max. Altitude during operation relating to sea level	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C
 horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. max. Altitude during operation relating to sea level Installation altitude above sea level, max. 	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C
horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. max. Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C
 horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. max. Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header 	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C
horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. max. Altitude during operation relating to sea level lnstallation altitude above sea level, max. configuration / header configuration / programming / header Programming language	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. max. Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes; incl. failsafe
 horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. max. Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language LAD FBD 	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes; incl. failsafe Yes; incl. failsafe
 horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. max. Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language LAD FBD STL 	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes; incl. failsafe Yes; incl. failsafe Yes
 horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. max. Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language LAD FBD STL SCL 	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes; incl. failsafe Yes; incl. failsafe Yes Yes
 horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. max. Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language LAD FBD STL SCL GRAPH 	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes; incl. failsafe Yes; incl. failsafe Yes Yes
 horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. max. Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language LAD FBD STL SCL GRAPH Know-how protection	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes
 horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. max. Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language LAD FBD STL SCL GRAPH Know-how protection User program protection/password protection 	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes
 horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. max. Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language LAD FBD STL SCL GRAPH Know-how protection User program protection/password protection Copy protection 	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes
 horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. max. Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language LAD FBD STL SCL GRAPH Know-how protection User program protection/password protection Copy protection Block protection 	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes
 horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. max. Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / programming / header Programming language LAD FBD STL SCL GRAPH Know-how protection User program protection/password protection Copy protection Block protection Access protection Access protection	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes
 horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. max. Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language LAD FBD STL SCL GRAPH Know-how protection User program protection/password protection Copy protection Block protection Access protection Password for display 	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes
horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. max. Altitude during operation relating to sea level lonstallation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection User program protection/password protection Copy protection Block protection Access protection Password for display Protection level: Write protection	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
 horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Ambient temperature during storage/transportation min. max. Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language LAD FBD STL SCL GRAPH Know-how protection User program protection/password protection Copy protection Block protection Access protection Password for display Protection level: Write protection Protection level: Read/write protection 	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -25 °C; No condensation 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye

• lower limit	adjustable minimum cycle time
• upper limit	adjustable maximum cycle time
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	405 g

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