SIEMENS

Data sheet

6ES7315-7TJ10-0AB0



SIMATIC S7-300, CPU 315T-3 PN/DP, Central processing unit for PLC and technology tasks, 384 KB work memory, 1st interface MPI/DP 12 Mbit/s, 2nd interface DP (drive), 3rd interface Ethernet PROFINET with 2-port switch, Integr. I/O for technology, Front connector (1x 40-pole) and Micro Memory Card min. 8 MB required

General information	
HW functional status	01
Firmware version	CPU: V3.2; integrated technology V4.1.5
Engineering with	
Programming package	STEP 7 V5.5 SP2 or higher and S7-Technology option package V4.2 SP3
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
external protection for power supply lines (recommendation)	2 A min.
Load voltage L+	
● Rated value (DC)	24 V
 Reverse polarity protection 	Yes
Digital outputs	
— Rated value (DC)	24 V; (2L+)
 Reverse polarity protection 	No; (2L+)

Input current	
Current consumption (rated value)	1 050 mA
Current consumption (in no-load operation), typ.	230 mA
Inrush current, typ.	6.5 A
	1 A²·s
Power loss	7.5 W
Power loss, typ.	7.5 VV
Memory	
Work memory	
• integrated	384 kbyte
• expandable	No
 Size of retentive memory for retentive data blocks 	128 kbyte
Load memory	
• Plug-in (MMC)	Yes
• Plug-in (MMC), max.	8 Mbyte
Data management on MMC (after last)	10 y
programming), min.	,
Backup	
• present	Yes; Guaranteed by MMC (maintenance-free)
without battery	Yes; Program and data
CDI Large sing times	
CPU processing times for bit operations, typ.	0.05 µs
for word operations, typ.	0.09 µs
for fixed point arithmetic, typ.	0.12 µs
for floating point arithmetic, typ.	0.45 µs
CPU-blocks	4 004. (DDs ECs EDs), the manifesture number of leadable blocks
Number of blocks (total)	1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
DB	
Number, max.	1 024; Number range: 1 to 16000
• Size, max.	64 kbyte
FB	
• Number, max.	1 024; Number range: 0 to 7999
• Size, max.	64 kbyte
FC	
• Number, max.	1 024; Number range: 0 to 7999
• Size, max.	64 kbyte
OB	
Description	see instruction list
• Size, max.	64 kbyte

Number of free cycle OBs	1; OB 1
 Number of time alarm OBs 	1; OB 10
 Number of delay alarm OBs 	2; OB 20, 21
 Number of cyclic interrupt OBs 	4; OB 32, 33, 34, 35
 Number of process alarm OBs 	1; OB 40
 Number of DPV1 alarm OBs 	3; OB 55, 56, 57
Number of isochronous mode OBs	1; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously)
• Number of technology synchronous alarm OBs	1; OB 65
Number of startup OBs	1; OB 100
 Number of asynchronous error OBs 	6; OB 80, 82, 83, 85, 86, 87 (OB83 only for PROFINET IO)
 Number of synchronous error OBs 	2; OB 121, 122
Nesting depth	
• per priority class	16
additional within an error OB	4

Counters, timers and their retentivity	
S7 counter	
Number	256
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	Z 0 to Z 7
Counting range	
— adjustable	Yes
— lower limit	0
— upper limit	999
IEC counter	
• present	Yes
• Type	SFB
Number	Unlimited (limited only by RAM capacity)
S7 times	
• Number	256
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	No retentivity
Time range	
— lower limit	10 ms
— upper limit	9 990 s

IEC timer	
• present	Yes
• Type	SFB
Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	
retentive data area in total	All, 128 KB max.
Flag	
• Number, max.	2 048 byte
Retentivity available	Yes; MB 0 to MB 2 047
Retentivity preset	MB 0 to MB 15
Number of clock memories	8; 1 memory byte
Data blocks	
Retentivity adjustable	Yes; via non-retain property on DB
Retentivity preset	Yes
Local data	
• per priority class, max.	32 768 byte; Max. 2048 bytes per block
Address area	
I/O address area	0.0401.4
• Inputs	2 048 byte
Outputs	2 048 byte
of which distributed	
— Inputs	2 048 byte
— Outputs	2 048 byte
Process image	
• Inputs	2 048 byte
Outputs	2 048 byte
Inputs, adjustable	2 048 byte
 Outputs, adjustable 	2 048 byte
Inputs, default	128 byte
Outputs, default	128 byte
Default addresses of the integrated channels	
— Digital inputs	66
— Digital outputs	66
Subprocess images	
 Number of subprocess images, max. 	1; With PROFINET IO, the length of the user data is limited to 1600 bytes
Digital channels	
• Inputs	16 384
mpato	10 00 1
— of which central	256
·	

• Inputs	Analog channels	
Outputs — of which central 64 Hardware configuration Number of Expansion units, max. 0 Number of DP masters Integrated 2; 1 DP and 1 DP (drive) 2; for DP Number of operable FMs and CPs (recommended) FM 8 CP, PP 8 CP, LAN 8 Rack Racks, max. 1 Modules per rack, max. 8 Firme of day Clock Hardware clock (real-time) Yes 1 Behavior of the clock following POWER-ON Ebehavior of the clock following expiry of backup period Operating hours counter Number Number Number of Operable FMs and CPs (recommended) Time of day Clock Other of the clock following POWER-ON Operating hours counter Number of the clock following expiry of backup period Operating hours counter Number of the clock following the counter occurred Operating hours counter Number of the clock following the counter of the clock following expiry of backup the occurred Operating hours counter Number of the clock following the counter occurred Operating hours counter Number of the clock following the counter occurred Operating hours counter Number of the clock following the counter occurred Operating hours counter Number of the clock following the counter occurred Operating hours counter Number of the clock following the counter occurred Operating hours counter Number of the clock following the counter occurred Operating hours counter Number of the clock following the counter occurred Operating hours counter Number of the clock following the counter occurred Operating hours counter Number of the clock following the counter occurred Operating hours counter Number of the clock following the counter occurred Operating hours counter Number of the clock following the counter occurred Operating hours counter occurred Ope	• Inputs	1 024
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Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Operating hours counter Number Number 1 Number/Number range 0 Range of values 0 to 2^31 hours (when using SFC 101) Granularity 1 h retentive Yes; Must be restarted at each restart Clock synchronization Supported Yes to MPI, master Yes to DP, master to DP, slave Yes; Only time-of-day slave in AS, master find AS, slave Clock continues running after POWER OFF Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred Operating AS, slave Other Clock continues running after POWER OFF Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred Operating As have which the power failure occurred Operating As, slave POWER OFF Clock continues to run with the time at which the power failure occurred Operating As, slave POWER OFF Clock continues to run with the time at which the power failure occurred Operating As which the power failure occu	Backup time	6 wk; At 40 °C ambient temperature
Behavior of the clock following expiry of backup period Operating hours counter Number Number Number range Range of values Granularity retentive Clock synchronization Supported to MPI, master to MPI, slave to DP, master to DP, slave in AS, master in AS, slave Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred 1 Yes 1 Yes Yes Yes Yes In AS, master Yes Yes In AS, slave Yes	Deviation per day, max.	10 s; Typ.: 2 s
occurred Operating hours counter Number Number Number 1 Number/Number range O Range of values O to 2^31 hours (when using SFC 101) In Granularity Yes; Must be restarted at each restart Clock synchronization supported Yes Oto MPI, master Oto MPI, slave Oto MPI, slave Yes Oto DP, master Yes Oto DP, slave Ot	 Behavior of the clock following POWER-ON 	Clock continues running after POWER OFF
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 supported to MPI, master to MPI, slave to DP, master to DP, slave in AS, master in AS, slave Yes	• retentive	Yes; Must be restarted at each restart
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 to MPI, slave to DP, master to DP, slave in AS, master in AS, slave Yes Yes Yes Yes Yes Yes Yes	• supported	Yes
 to DP, master to DP, slave to DP, slave in AS, master in AS, slave Yes Yes Yes	● to MPI, master	Yes
 to DP, slave in AS, master in AS, slave Yes; Only time-of-day slave Yes Yes	● to MPI, slave	Yes
 in AS, master in AS, slave Yes Yes 	• to DP, master	Yes
• in AS, slave Yes	• to DP, slave	Yes; Only time-of-day slave
	• in AS, master	Yes
• on Ethernet via NTP Yes; As client	• in AS, slave	Yes
	• on Ethernet via NTP	Yes; As client

Digital inputs	
Number of digital inputs	4
 of which inputs usable for technological functions 	4
Input characteristic curve in accordance with IEC	Yes
61131, type 1	
Number of simultaneously controllable inputs	
horizontal installation	
— up to 40 °C, max.	4
— up to 60 °C, max.	4
vertical installation	
— up to 40 °C, max.	4
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+15 to +30V
Input current	
• for signal "1", typ.	7 mA
Input delay (for rated value of input voltage)	
for technological functions	
— at "0" to "1", max.	10 μs; Typical
— at "1" to "0", max.	10 μs; Typical
Cable length	
• shielded, max.	1 000 m
Digital outputs	
Number of digital outputs	8
of which high-speed outputs	8
Functions	For technology functions, e.g. high-speed cam switch signals
Short-circuit protection	Yes
 Response threshold, typ. 	1 A
Limitation of inductive shutdown voltage to	48 V
Controlling a digital input	No
Switching capacity of the outputs	
● on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	4 kΩ
Output voltage	
• for signal "0", max.	3 V; (2L+)
• for signal "1", min.	Rated voltage -2.5 V
Output current	
• for signal "1" rated value	0.5 A

 for signal "1" permissible range for 0 to 60 °C, min. 	5 mA
 for signal "1" permissible range for 0 to 60 °C, max. 	0.6 A
• for signal "0" residual current, max.	0.3 mA
Parallel switching of two outputs	
• for uprating	No
 for redundant control of a load 	No
Switching frequency	
with resistive load, max.	100 Hz
• with inductive load, max.	0.2 Hz; According to IEC 60947-5-1, DC-13
• on lamp load, max.	100 Hz
Total current of the outputs (per group)	
horizontal installation	
— up to 40 °C, max.	4 A
— up to 60 °C, max.	3 A
all other mounting positions	
— up to 40 °C, max.	4 A
Integrated high-speed cams	
Switching accuracy (+/-)	70 μs
Cable length	
• shielded, max.	1 000 m
Analog inputs	
Number of analog inputs	0
Analog outputs	
Number of analog outputs	0
Encoder Connectable encoders	
2-wire sensor	No
2-wife SellSol	NO
Interfaces	
Number of industrial Ethernet interfaces	1
Number of PROFINET interfaces	1
Number of RS 485 interfaces	2
Number of RS 422 interfaces	0
1. Interface	
Interface type	Integrated RS 485 interface
	Integrated RS 485 interface RS 485
Interface type Physics Isolated	
Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max.	RS 485
Interface type Physics Isolated	RS 485 Yes

PROFIBUS DP master	Yes
PROFIBUS DP slave	Yes
Point-to-point connection	No
MPI	
Transmission rate, max.	12 Mbit/s
Services	
— PG/OP communication	Yes
— Routing	Yes
Global data communication	Yes
— S7 basic communication	Yes
— S7 communication	Yes
— S7 communication, as client	No; but via CP and loadable FB
— S7 communication, as server	Yes
PROFIBUS DP master	
• Transmission rate, max.	12 Mbit/s
Number of DP slaves, max.	124
Services	
— PG/OP communication	Yes
— Routing	Yes
Global data communication	No
— S7 basic communication	Yes; I blocks only
— S7 communication	Yes
 — S7 communication, as client 	No
— S7 communication, as server	Yes
— Equidistance	Yes
— Isochronous mode	Yes; OB 61; isochronous mode can only be used alternatively on PROFIBUS DP or PROFINET IO
— SYNC/FREEZE	Yes
 Activation/deactivation of DP slaves 	Yes
 Number of DP slaves that can be simultaneously activated/deactivated, max. 	8
 Direct data exchange (slave-to-slave communication) 	Yes; As subscriber
— DPV1	Yes
Address area	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
User data per DP slave	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
PROFIBUS DP slave	
Transmission rate, max.	12 Mbit/s

automatic baud rate search	Yes; only with passive interface
Address area, max.	32
User data per address area, max.	32 byte
Services	62 Byte
— PG/OP communication	Yes
— Routing	Yes; Only with active interface
Global data communication	No
— S7 basic communication	No
— S7 communication	Yes
S7 communication, as client	No
— S7 communication, as server	Yes; Connection configured on one side only
Direct data exchange (slave-to-slave communication)	Yes
— DPV1	No
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte
·	•
2. Interface Interface type	Integrated BS 495 interface
Physics	Integrated RS 485 interface RS 485
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA
Protocols	
• MPI	No
PROFIBUS DP master	Yes; DP(DRIVE)-Master
PROFIBUS DP slave	No
Point-to-point connection	No
PROFIBUS DP master	
Transmission rate, max.	12 Mbit/s
Number of DP slaves, max.	64
Services	
— PG/OP communication	No
— Routing	No
 Global data communication 	No
 S7 basic communication 	No
— S7 communication	No
— Equidistance	Yes
— Isochronous mode	Yes
— SYNC/FREEZE	No
 Activation/deactivation of DP slaves 	Yes
— DPV1	No

Address area	
— Inputs, max.	1 024 byte
— Outputs, max.	1 024 byte
User data per DP slave	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
PROFIBUS DP slave	
• GSD file	http://support.automation.siemens.com in Product Support area
Transmission rate, max.	12 Mbit/s

- Transmission rate, max.	
3. Interface	
Interface type	PROFINET
Physics	Ethernet RJ45
Isolated	Yes
automatic detection of transmission rate	Yes; 10/100 Mbit/s
Autonegotiation	Yes
Autocrossing	Yes
Change of IP address at runtime, supported	Yes
Interface types	
Number of ports	2
• integrated switch	Yes
Media redundancy	
• supported	Yes
 Switchover time on line break, typ. 	200 ms; PROFINET MRP
 Number of stations in the ring, max. 	50
Protocols	
• MPI	No
 PROFINET IO Controller 	Yes; Also simultaneously with IO-Device functionality
 PROFINET IO Device 	Yes; Also simultaneously with IO Controller functionality
 PROFIBUS DP master 	No
 PROFIBUS DP slave 	No
Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP
Web server	Yes
PROFINET IO Controller	
Transmission rate, max.	100 Mbit/s
Services	
— PG/OP communication	Yes
— Routing	Yes
— S7 communication	Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32
— Isochronous mode	Yes; OB 61; isochronous mode can only be used alternatively on PROFIBUS DP or PROFINET IO
Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP

— Shared device	Yes
 Prioritized startup 	Yes
 Number of IO devices with prioritized 	32
startup, max.	
 Number of connectable IO Devices, max. 	128
Of which IO devices with IRT, max.	64
— of which in line, max.	64
 Number of connectable IO Devices for RT, max. 	128
— of which in line, max.	128
 Activation/deactivation of IO Devices 	Yes
 Number of IO Devices that can be simultaneously activated/deactivated, max. 	8
 IO Devices changing during operation (partner ports), supported 	Yes
 Number of IO Devices per tool, max. 	8
— Device replacement without swap medium	Yes
— Send cycles	250 μs, 500 μs, 1 ms, 2 ms, 4 ms
— Updating time	250 μs to 512 ms (depending on the operating mode, see Manual "S7-300 CPU 31xC and CPU 31x, Technical Data" for more details)
Address area	,
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
User data consistency, max.	1 024 byte
PROFINET IO Device	
Services	
— PG/OP communication	Yes
— Routing	Yes
— S7 communication	Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32
— Isochronous mode	No
— Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP
— IRT	Yes
— PROFlenergy	Yes; With SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device
— Shared device	Yes
 Number of IO Controllers with shared device, max. 	2
Transfer memory	
— Inputs, max.	1 440 byte; Per IO Controller with shared device
— Outputs, max.	1 440 byte; Per IO Controller with shared device
Submodules	

— Number, max.	64
 User data per submodule, max. 	1 024 byte
Open IE communication	
Number of connections, max.	8
 Local port numbers used at the system end 	0, 20, 21, 23, 25, 80, 102, 135, 161, 443, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535
 Keep-alive function, supported 	Yes

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rotocols	
Open IE communication	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
Number of connections, max.	8
 Data length for connection type 01H, max. 	1 460 byte
 Data length for connection type 11H, max. 	32 768 byte
 several passive connections per port, supported 	Yes
• ISO-on-TCP (RFC1006)	Yes; via integrated PROFINET interface and loadable FBs
Number of connections, max.	8
— Data length, max.	32 768 byte
• UDP	Yes; via integrated PROFINET interface and loadable FBs
Number of connections, max.	8
— Data length, max.	1 472 byte
Web server	
• supported	Yes
 User-defined websites 	Yes
Number of HTTP clients	5
b	

Isochronous operation (application synchronized up to terminal)	Yes; Via PROFIBUS DP or PROFINET interface
Communication functions	
PG/OP communication	Yes
Data record routing	Yes
Global data communication	
• supported	Yes
 Number of GD loops, max. 	8
 Number of GD packets, max. 	8
 Number of GD packets, transmitter, max. 	8
 Number of GD packets, receiver, max. 	8
 Size of GD packets, max. 	22 byte
• Size of GD packet (of which consistent), max.	22 byte
S7 basic communication	
• supported	Yes

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User data per job, max.	76 byte
 User data per job (of which consistent), max. 	76 byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server)
S7 communication	7_
• supported	Yes
as server	Yes
• as client	Yes; via integrated PROFINET interface and loadable FB or via
as client	CP and loadable FB
User data per job, max.	See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication)
S5 compatible communication	
• supported	Yes; via CP and loadable FC
Number of connections	
• overall	16
 usable for PG communication 	15
 reserved for PG communication 	1
 adjustable for PG communication, min. 	1
 adjustable for PG communication, max. 	15
 usable for OP communication 	15
 reserved for OP communication 	1
 adjustable for OP communication, min. 	1
 adjustable for OP communication, max. 	15
usable for S7 basic communication	14
 reserved for S7 basic communication 	0
 adjustable for S7 basic communication, min. 	0
 adjustable for S7 basic communication, max. 	14
usable for S7 communication	14
 reserved for S7 communication 	0
 adjustable for S7 communication, min. 	0
— adjustable for S7 communication, max.	14
total number of instances, max.	32
usable for routing	X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as PROFINET: 24 max.
S7 message functions	
Number of login stations for message functions, max.	16; Depending on the configured connections for PG/OP and S7 basic communication
Process diagnostic messages	Yes
simultaneously active Alarm-S blocks, max.	300
Test commissioning functions	
Status block	Yes; Up to 2 simultaneously

Single step	Yes
Number of breakpoints	4; without continuation
Status/control	
Status/control variable	Yes
Variables	Inputs, outputs, memory bits, DB, times, counters
Number of variables, max.	30
— of which status variables, max.	30
— of which control variables, max.	14
Forcing	
• Forcing	Yes
• Forcing, variables	Inputs, outputs
Number of variables, max.	10
Diagnostic buffer	
• present	Yes
• Number of entries, max.	500
— adjustable	No
— of which powerfail-proof	100; Only the last 100 entries are retained
Number of entries readable in RUN, max.	499
— adjustable	Yes; From 10 to 499
— preset	10
Service data	
• can be read out	Yes
Interrunta/diagnostics/status information	
Interrupts/diagnostics/status information Alarms	No
Diagnostics function	No
Diagnostics indication LED	
Status indicator digital input (green)	Yes
Status indicator digital output (green)	Yes
Potential separation	
Potential separation digital inputs	Yes
between the channels and backplane bus Petential separation digital outputs	1 63
Potential separation digital outputs	Yes
 between the channels and backplane bus 	163
Isolation	
Isolation tested with	500 V DC
Ambient conditions	
Ambient temperature during operation	
● min.	0 °C
	60 °C
• max.	00 C

Configuration software	
• STEP 7	Yes; STEP 7 V5.5 SP2 or higher and S7-Technology option package V4.2 SP3
Programming	
Command set	see instruction list
 Nesting levels 	8
System functions (SFC)	see instruction list
 System function blocks (SFB) 	see instruction list
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
Know-how protection	
User program protection/password protection	Yes
Block encryption	Yes; With S7 block Privacy
Dimensions	
Width	120 mm
Height	125 mm
Depth	130 mm
Weights	
Weight, approx.	640 g
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