SIEMENS

Data sheet   **6ES7315-6TH13-0AB0**

Spare part SIMATIC S7-300, CPU 315T-2 DP, Central processing unit for PLC and Technology tasks, 256 KB work memory, 1st interface MPI/DP 12 Mbit/s, 2nd interface DP (drive), Integr. I/O for technology, Front connector (1x 40-pole) and Micro Memory Card min. 8 MB required

General information	
Product type designation	CPU 315T-2 DP
HW functional status	01
Firmware version	CPU: V2.7, integrated technology: V4.1.5
Engineering with	
● Programming package	STEP 7 V5.4 + SP5 (and higher) and Optional package S7-Technology V4.2
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 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 (in no-load operation), typ.	200 mA
Inrush current, typ.	2.5 A
I²t	1 A²·s
Power loss	
Power loss, typ.	6 W
Memory	
Work memory	
● integrated	256 kbyte
● expandable	No
Load memory	
● Plug-in (MMC)	Yes
● Plug-in (MMC), max.	8 Mbyte
● Data management on MMC (after last programming), min.	10 a
Backup	
● present	Yes; Guaranteed by MMC (maintenance-free)
● without battery	Yes; Program and data
CPU processing times	
for bit operations, typ.	0.1 µs
for bit operations, max.	0.1 µs
for word operations, typ.	0.2 µs
for fixed point arithmetic, typ.	2 µs

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for floating point arithmetic, typ.	3 µs
CPU-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.	1 023; Number band: 1 to 1023
● Size, max.	64 kbyte
FB	
● Number, max.	1 024; Number range: 0 to 2047
● Size, max.	64 kbyte
FC	
● Number, max.	1 024; Number range: 0 to 2047
● Size, max.	64 kbyte
OB	
● Number, max.	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	1; OB 20
● Number of cyclic interrupt OBs	1; OB 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
● Number of technology synchronous alarm OBs	1; OB 65
● Number of startup OBs	1; OB 100
● Number of asynchronous error OBs	5; OB 80, 82, 85, 86, 87
● Number of synchronous error OBs	2; OB 121, 122
Nesting depth	
● per priority class	8
● additional within an error OB	4
Counters, timers and their retentivity	
S7 counter	
● Number	256; Number range: 0 to 255
Retentivity	
— adjustable	Yes
— preset	8
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; Number range: 0 to 255
Retentivity	
— adjustable	Yes
— 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 (incl. timers, counters, flags), max.	128 kbyte
Flag	
● Size, 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.	1 024 byte
Address area	
I/O address area	
● Inputs	2 048 byte
● Outputs	2 048 byte
of which distributed	
— Inputs	2 048 byte
— Outputs	2 048 byte
Process image	
● 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
Digital channels	
● Inputs	16 384
— of which central	512
● Outputs	16 384
— of which central	512
Analog channels	
● Inputs	1 024
— of which central	64
● Outputs	1 024
— of which central	64
Hardware configuration	
Number of expansion units, max.	0
Number of DP masters	
● integrated	2; 1 DP and 1 DP (drive)
● via CP	2; for DP
Number of operable FMs and CPs (recommended)	
● FM	8
● CP, PtP	8
● CP, LAN	10
Rack	
● Racks, max.	1
● Modules per rack, max.	8
Time of day	
Clock	
● Hardware clock (real-time)	Yes
● retentive and synchronizable	Yes
● Backup time	6 wk; At 40 °C ambient temperature
● Deviation per day, max.	10 s
Operating hours counter	
● 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
● on MPI, device	Yes
● to DP, master	Yes
● on DP, device	Yes
● in AS, master	Yes
● in AS, device	Yes

Digital inputs

Number of digital inputs	4
● of which inputs usable for technological functions	4
Input characteristic curve in accordance with IEC 61131, type 1	Yes
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 +30 V
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.	3 A
Cable length	
● shielded, max.	1 000 m
Analog inputs	
Number of analog inputs	0
Encoder	
Connectable encoders	
● 2-wire sensor	No
Interfaces	
Number of PROFINET interfaces	0
Number of RS 485 interfaces	2
Number of RS 422 interfaces	0
1. Interface	
Interface type	Integrated RS 485 interface
Isolated	Yes
Interface types	
● RS 485	Yes
● Output current of the interface, max.	200 mA
Protocols	
● MPI	Yes
● PROFIBUS DP master	Yes
● PROFIBUS DP device	Yes
● Point-to-point connection	No
MPI	
● Number of connections	32
● 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; Connection configured on one side only
PROFIBUS DP master	
● Transmission rate, max.	12 Mbit/s
● max. number of DP devices	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; but via CP and loadable FB
— S7 communication, as server	Yes; Connection configured on one side only
— Equidistance	Yes
— Isochronous mode	Yes; OB 61
— SYNC/FREEZE	Yes
— activation/deactivation of DP devices	Yes
— DPV1	Yes
Address area	
— Inputs, max.	2 048 byte
— Outputs, max.	2 048 byte
User data per DP device	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
1st interface / PROFIBUS DP device / header	
● Transmission rate, max.	12 Mbit/s
● automatic baud rate search	No
● Address area, max.	32

● User data per address area, max.	32 byte
Services	
— 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; but via CP and loadable FB
— 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 RS 485 interface
Isolated	Yes
Interface types	
● RS 485	Yes
● Output current of the interface, max.	200 mA
Protocols	
● MPI	No
● PROFIBUS DP master	Yes; DP(DRIVE)-Master
● PROFIBUS DP device	No
● Point-to-point connection	No
PROFIBUS DP master	
● Transmission rate, max.	12 Mbit/s
● max. number of DP devices	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 devices	Yes
— DPV1	No
Address area	
— Inputs, max.	1 024 byte
— Outputs, max.	1 024 byte
User data per DP device	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
2nd interface / PROFIBUS DP device / header	
● GSD file	http://support.automation.siemens.com in Product Support area
● Transmission rate, max.	12 Mbit/s
Protocols	
PROFIsafe	No
communication functions / header	
PG/OP communication	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
● 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), 76 bytes (with X_PUT or X_GET as server)

S7 communication	
● supported	Yes
● as server	Yes
● as client	Yes; Via 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	12
— reserved for S7 basic communication	0
— adjustable for S7 basic communication, min.	0
— adjustable for S7 basic communication, max.	12
● usable for routing	8; additional

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.	40

Test commissioning functions	
Status block	Yes
Single step	Yes
Number of breakpoints	2

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.	100
— adjustable	No

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	
● between the channels and backplane bus	Yes
Potential separation digital outputs	

● between the channels and backplane bus	Yes
Isolation	
Isolation tested with	500 V DC
Ambient conditions	
Ambient temperature during operation	
● min.	0 °C
● max.	60 °C
configuration / header	
Configuration software	
● STEP 7	Yes; V5.2 SP1 or higher and S7 Technology option package
configuration / programming / header	
● 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
programming / cycle time monitoring / header	
● lower limit	1 ms
● upper limit	6 000 ms
● adjustable	Yes
● preset	150 ms
Dimensions	
Width	160 mm
Height	125 mm
Depth	130 mm
Weights	
Weight, approx.	750 g

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